UNIVERSITY OF WASHINGTON

2018 CAMPUS MASTER PLAN

DRAFT ENVIRONMENTAL IMPACT STATEMENT

OCTOBER 2016

UNIVERSITY of WASHINGTON
CAPITAL PLANNING & DEVELOPMENT

PUBLIC NOTICE
UNIVERSITY OF WASHINGTON

Pursuant to the provisions of WAC 197-11-510 and WAC 478-324-140, the University of Washington hereby provides public notice of the:

AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
AND DRAFT SHORELINE PUBLIC ACCESS PLAN,
AND PUBLIC HEARING

Project Name: University of Washington 2018 Draft Seattle Campus Master Plan

Proponent: University of Washington

Description of Proposal: The University of Washington 2018 Seattle Campus Master Plan will guide development on the Seattle Campus, replacing the 2003 Campus Master Plan and extending the continuity of planning developed over the last century. The Draft 2018 Seattle Campus Master Plan includes guidelines and policies for new development on the campus. It is formulated to maintain and enhance the fundamental mission of the University, its multiple important roles in undergraduate and professional education, and its dedication to research and public service. Campus growth is needed to accommodate the projected growth in students, faculty, staff, and expanded research opportunities. The Draft 2018 Seattle Campus Master Plan defines open spaces, circulation patterns, building sites and campus physical capacity along with planned growth. It also includes a shoreline public access plan proposed pursuant to WAC 173-26-221(4). Both the City and the University recognize the need for coordinated development and conservation planning that allows the University to continue to pursue its instruction, research, and service goals. At the same time, the planning process including the EIS process is intended to foresee, assess, and outline mitigation measures for the direct, indirect and cumulative impacts of development. The anticipated outcome of the planning process is to maximize the positive impacts and minimize adverse impacts upon the City and communities surrounding the University, and to promote the health and vitality of the residential, business, and academic communities.

Location of Proposal: The University of Washington Major Institution Overlay Zone is generally bounded by NE 45th Street on the north, Mary Gates Memorial Way NE and the Center for Urban Horticulture on the east, Union Bay, Portage Bay and the Lake Washington Ship Canal on the south, and 15th Avenue NE, Roosevelt Way NE and the Ship Canal Bridge on the west.

Lead Agency: University of Washington

Public Hearing: October 26, 2016
6:30-9:00 pm
UW Tower, Auditorium
4333 Brooklyn Ave NE, Seattle WA

Comment Period Ends: November 21, 2016

Public comment will be accepted at the public hearing. If you cannot attend the public hearing to make your comments, you can email them to cmpinfo@uw.edu or jblakesl@uw.edu or mail them to the address below, by the comment deadline.

Contact Person: Julie Blakeslee
Environmental and Land Use Planner
Capital Planning & Development
Box 352205
Seattle, WA 98195-2205
206.543.5200

Send comments to Julie Blakeslee at the address listed above.

SEPA Responsible Official: Jan Arntz
Responsible Official
Capital Planning & Development
Box 352205
Seattle, WA 98195-2205

Document Location: The Draft 2018 Seattle Campus Master Plan and Draft EIS are available online at http://pm.uw.edu/cmp/about and at the following libraries: Seattle Public Libraries Central, University, and Montlake branches; UW Libraries Suzzallo (Reference Division) and Health Sciences branches.

DRAFT

ENVIRONMENTAL IMPACT STATEMENT

for the

UNIVERSITY of WASHINGTON

2018 SEATTLE CAMPUS MASTER PLAN

University of Washington

Capital Projects Office

The Draft EIS (DEIS) for the University of Washington *2018 Seattle Campus Master Plan ha*s been prepared in compliance with the State Environmental Policy Act (SEPA) of 1971 (Chapter 43.21C, Revised Code of Washington); the SEPA Rules, effective April 4, 1984, as amended (Chapter 197-11, Washington Administrative Code); and rules adopted by the University of Washington implementing SEPA (478-324 WAC). Preparation of this DEIS is the responsibility of the University's Capital Projects Office. The Capital Projects Office and the University's SEPA Advisory Committee have determined that this document has been prepared in a responsible manner using appropriate methodology and they have directed the areas of research and analysis that were undertaken in preparation of this DEIS. This document is not an authorization for an action, nor does it constitute a decision or a recommendation for an action; in its final form, it will accompany the *Proposed Action* and will be considered in making the final decisions on the proposal.

Date of DEIS Issuance.....**October 5, 2016**

Date Comments are Due on the DEIS.....**November 21, 2016**

FACT SHEET

PROJECT TITLE	**University of Washington – 2018 Seattle Campus Master Plan**
PROPONENT/APPLICANT	University of Washington
LOCATION	The Seattle Campus of the University of Washington is located in Northeast Seattle. The area of the campus is approximately 639 acres. In general, the campus is bounded by NE 45th Street on the north; 6th Avenue NE, Roosevelt Way NE and 15th Avenue NE on the west; Portage Bay and Lake Washington Ship Canal on the south; and, Union Bay and 35th Avenue NE to the east.
PROPOSED ACTION	The Proposed Action is a Campus Master Plan for the University of Washington's Seattle campus. Through its master planning process, the University of Washington has identified a total of 85 potential development sites with a development capacity of approximately 12.9 million gsf of net new building space. However, during the 10-year planning horizon for the *2018 Seattle Campus Master Plan*, the University would develop a total of 6.0 million gsf to meet the anticipated growth in demand for building space. Therefore, only a portion of the 85 potential development sites would be developed over the planning horizon. Consistent with the *1998 City-University-Community Agreement*, the *2018 Seattle Campus Master Plan* includes the following: • Goals and policies to guide campus conservation and development over the planning horizon, which is expected to be the 10-year period between 2018-2028; • Proposed activities include construction of approximately 6.0 million gsf of net new building space consisting of 85 potentially developable sites; proposed activities may

include demolitions, remodeling, renovations and new construction;

- Identification of areas reserved for proposed new open space;

- Modification of the University's Transportation Management Plan (TMP) to provide -

  - additional opportunities for improvements to modes of travel to and from the University;
  - pedestrian, bicycle and vehicular changes;
  - maintaining the current 12,300 parking cap (replacement parking would be calibrated with demand as development is planned);
  - maintaining an AM and PM motor vehicle cap.

- Analysis of potential street, alley and aerial vacations; and,

- Applicable development standards (e.g. boundaries, height limits, square footages, etc.)

EIS ALTERNATIVES

For the purposes of environmental review, five action alternatives and a no action alternative are analyzed in this Draft EIS, including: No Action Alternative; Alternative 1 – CMP Proposed Allocation with Requested Height Increases Alternative 2 – Campus Development with Existing Height Limits; Alternative 3 – Campus Development Reflecting Increased West and South Campus Density; Alternative 4 – Campus Development Reflecting Increased West and East Campus Density; and, Alternative 5 – No Street, Alley and Aerial Vacations.

No Action Alternative

Under the No Action Alternative, no physical improvements that are proposed as part of the *2018 Seattle Campus Master Plan*, including the addition of 6.0 million gsf of new building development, potential improvements to open space, vehicle/pedestrian/bicycle circulation and parking would occur.

It is estimated that the approximately 211,000 gsf of remaining campus building capacity under the *2003 CMP-Seattle* would be developed.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 would include a level of development and campus improvements to sufficiently meet the forecasted growth in student, faculty, and staff over the 10-year planning horizon of the 10-year master plan. This alternative would include six million gsf of new building development on the campus, broken down by sector as follows:

- 3.0 million gsf on West Campus;
- 1.35 million gsf on South Campus;
- 0.9 million gsf on Central Campus; and
- 0.75 million gsf on East Campus.

Alternative 1 also includes an amendment to increase the allowable building heights in areas of the campus. The amendment would change the current limit on West Campus from a current range of 37 to 105 feet to a new range of 30 to 240 feet. The limit on South Campus would remain the same at 30 to 240 feet, but the area in the 240-foot height range would increase. On Central Campus, the range of 50 to 160 feet would be maintained. The allowable height range on East Campus would also remain the same as currently allowed at 30 to 160 feet, but the height allowable in the E1 parking lot would be increased to a range of 65 to 130 feet. Overall, 85 potential development sites in the

University of Washington Seattle Campus have been identified.

Under Alternative 1, existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and areas would be reserved for up to nine (9) acres of potential open space. In addition, vehicle/pedestrian/bicycle circulation improvements including street and aerial vacations, and various parking improvements would occur under Alternative 1.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 is intended to provide a level and distribution of preferred campus development allocation under the 2018 Seattle Campus Master Plan with no changes to the allowable building heights. Without the allowable building height changes proposed under Alternative 1; however, the preferred allocation of campus development in the 2018 Seattle Campus Master Plan cannot be achieved. Without the height increases proposed under Alternative 1 the 85 identified potential development sites would provide the following development area by sector:

- 2.4 million gsf on West Campus;
- 1.35 million gsf on South Campus;
- 0.9 million gsf on Central Campus; and
- 1.35 million gsf on East Campus.

Under Alternative 2, the 0.6 million gsf of development that could not be accommodated in West Campus would instead be moved to East Campus.

Existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and areas would be reserved for up to four (4) acres of potential open space.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. This density under Alternative 3 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and South Campus Sectors, as follows:

- West Campus: 3.2 million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

Increases in the proposed building height limits are as described under Alternative 1.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 represents a focus of development in the West, Central and East Campus sectors, with increased density in the Central and East Campus sectors when compared with Alternative 1. This increased density in the Central and East Campus sectors would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall six (6) million gsf of net new development for the campus during the planning horizon. Alternative 4 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in

Alternative 1 with allowed sector increase in the West and East Campus sectors, as follows:

- West Campus: 3.0 million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf
- East Campus: 1.7 million gsf

The proposed increase in allowable building heights in the West, South and East Campus sectors, as assumed under Alternative 1, are assumed under Alternative 4.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5 none of the proposed Street, Alley or Aerial Vacations would occur. The vacations identified under the *2018 Seattle Campus Master Plan* and under Alternatives 1 through 4 include:

- *Street Vacation* – Portion of NE Boat Street west of Brooklyn Avenue NE.
- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE.
- *Aerial Vacation* – Portion of Montlake Boulevard NE.

The street and aerial vacations are designed to improve circulation and open space and are not intended to increase the amount of building development capacity of the campus. Therefore, the assumed amount of building area under Alternative 5 is 6.0 million gsf, as under Alternatives 1 through 4.

LEAD AGENCY

University of Washington, Capital Planning & Development

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PURPOSE OF THIS DRAFT EIS

The SEPA environmental review process is designed to be used along with other decision-making factors to provide a comprehensive review of the proposal (WAC 197-11-055). The purpose of SEPA is to ensure that environmental values are given appropriate deliberation, along with other considerations.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single specific project, and involves decisions on policies, plans or programs. A Draft EIS for a non-project proposal does not require site specific analysis; instead the Draft EIS addresses conditions at a more general level (WAC 197-11-422). As SEPA Lead Agency, the University of Washington is responsible for ensuring SEPA compliance.

FINAL ACTION

The decision by the Board of Regents, after consideration of environmental impacts and mitigation, to approve the *2018 Seattle Campus Master Plan* and associated Final EIS.

PERMITS AND APPROVALS

Preliminary investigation indicates that the following permits and/or approvals could be required or requested for the Proposed Actions. Additional permits/approvals may be identified during the review process associated with specific development projects.

University of Washington

- ***Board of Regents***
  - Approval of the Final *2018 Seattle Campus Master Plan* and associated Final EIS
  - Adoption of the Final *2018 Seattle Campus Master Plan*
  - *Adoption of the Shoreline Public Access Plan*

Agencies with Jurisdiction

- ***State of Washington***
  - Dept. of Labor and Industries
  - Dept. of Ecology, Construction Stormwater General Permit

- ***Puget Sound Clean Air Agency***
  - Demolition and Asbestos Notification

- ***City of Seattle***
  - City Council approval of the *2018 Seattle Campus Master Plan*
  - Approval of the *Shoreline Public Access Plan*
  - Subsequent approval[1] of street, alley and aerial vacations, consistent with the *2018 Seattle Campus Master Plan*
  - Master Use Permit
  - Grading Permit
  - Shoring Permit
  - Building Permits

[1] Approval of the *2018 Seattle Campus Master Plan i*s not contingent upon the approval of the street, alley and aerial vacations that are described in the plan. These vacations may be petitioned during the planning horizon of this plan and they are not actions that are imminent or necessary to the *2018 Seattle Campus Master Plan*.

- Electrical Permits
- Mechanical Permits
- Occupancy Permits
- Comprehensive Drainage Control Plain, Inspection and Maintenance Schedule
- Construction Stormwater Control Plan Approvals

- ***Seattle Department of Transportation***
  - Street Use Permits (i.e., construction staging, construction operations, etc.)
  - Street Improvements (i.e., sidewalks, curbcuts, etc.)

- ***Seattle-King County Department of Health***
  - Plumbing Permits

DRAFT EIS AUTHORS AND PRINCIPAL CONTRIBUTORS

The *2018 Seattle Campus Master Plan* Draft EIS has been prepared under the direction of the University Capital Planning & Development and analyses were provided by the following consulting firms:

Draft EIS Project Manager, Primary Author, Earth, Air Quality, Energy and Natural Resources, Environmental Health, Land Use and Relationship to Plans/Policies, Population and Housing, Light, Glare and Shadows, Aesthetics, Recreation and Open Space, Cultural Resources, Historic Resources, Public Services, Utilities and Construction.
EA Engineering, Science and Technology, Inc., PBC.
2200 Sixth Avenue, Suite 707
Seattle, WA 98121

Cultural Resources
Historic Research Associates, Inc.
1904 3rd Avenue, Suite 240
Seattle, WA 98101

Wetlands and Plants and Animals
Raedeke Associates
2111 N Northgate Way, Suite 219
Seattle, WA 98133

Transportation
The Transpo Group
12131 113th Ave NE, Suite 203
Kirkland, WA 98034

PREVIOUS ENVIRONMENTAL DOCUMENTS

Per WAC 191-11-635, this Draft EIS incorporates by reference the following environmental document:

- University of Washington Master Plan-Seattle Campus EIS (2003)

LOCATION OF BACKGROUND INFORMATION

Background material and supporting documents are located at the office of:

University of Washington
Capital Planning & Development
University Facilities Building
Box 352205
Seattle, WA 98195-2205
(206) 543-5200

DATE OF DRAFT EIS ISSUANCE

October 5, 2016

DATE DRAFT EIS COMMENTS ARE DUE

Pursuant to the SEPA Rules (WAC 197-11-502), a 30-day comment period is required for Draft EIS documents and the University is providing 45 days. Comments on the Draft EIS are due on:

November 21, 2016

PUBLIC HEARING

A public hearing for the Draft EIS has been scheduled for October 26, 2016 from 6:30 PM to 9:00 PM. The public hearing will be held at:

UW Tower, Auditorium
4333 Brooklyn Avenue NE
Seattle, WA 98195

AVAILABILITY OF THE DRAFT EIS

This Draft EIS has been distributed to agencies, organizations and individuals noted on the Distribution List contained in **Appendix A** to this document. Copies of the Draft EIS are also available for review at the University Capital Planning & Development (University Facilities Building), on the University's Online Public Information Center (https://cpo.uw.edu/projects/sepa), and at the following University and Seattle Public Libraries:

University of Washington

- Suzzallo Library
- Health Sciences Library

Seattle Public Libraries

- Downtown Central Library (1000 Fourth Avenue)
- University District Branch (5009 Roosevelt Way NE)
- Montlake Branch (2300 24th Avenue E)

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Summary

CHAPTER 1
SUMMARY

1.1 INTRODUCTION

This chapter provides a summary of the Draft Environmental Impact Statement (Draft SEIS) for the University of Washington *2018 Seattle Campus Master Plan*. **Chapter 1** briefly describes the Proposed Action and the EIS Alternatives (Alternative 1, Alternative 2, Alternative 3, Alternative 4, and the No Action Alternative), and contains a comprehensive overview of environmental impacts identified for the alternatives. Please see **Chapter 2** of this Draft EIS for a more detailed description of the Proposed Action and alternatives and **Chapter 3** for a detailed description of the affected environment, environmental impacts, mitigation measures, and significant unavoidable adverse impacts.

1.2 PROJECT SUMMARY

The Proposed Action is a new master plan for the University of Washington's Seattle campus. As described in detail in **Chapter 3** of this Draft EIS (Historic and Cultural Resources), the University has an approximately 125-year tradition of campus master planning at the Seattle campus. Each of the previous master plans that have been prepared for the University over this timeframe have influenced campus decision-making in terms of the siting of buildings, location of open space, and provision of circulation systems.

More recent master planning efforts have been directed by a City-University Agreement that was adopted in 1983 by the University of Washington Board of Regents and the Seattle City Council and subsequently updated; the Agreement is the GMA development regulation applicable to University development on campus. The Agreement also specifies that the master plan and EIS include boundaries surrounding the University identified as Primary and Secondary Impact Zones. The Agreement further indicates that the Primary and Secondary Impact Zones will be used to assess and monitor the direct, indirect and cumulative impacts resulting from all proposed University development.

In 2003, the University of Washington Master Plan Seattle Campus (*CMP Seattle 2003*) was adopted. The *CMP Seattle 2003* includes guidelines and policies for developing up to three (3) million gross square feet (gsf) on the Seattle campus.[1] While a 10-year planning period was used in its formulation, the *CMP Seattle 2003* remains in effect until the development

[1] The CMP Seattle 2003 identifies 68 development sites with approximately 8.2 million gsf of development capacity on the Seattle campus of which up to three million gsf was approved to be developed.

of the approved three million gsf is complete. As of 2015, approximately 2.7 million gsf of development has been developed under the *CMP Seattle 2003*.[2]

Consistent with the City-University Agreement, the University of Washington is proposing a new master plan to accommodate both the increase in the number of students, faculty and staff, as well as the continued growth in the areas of research and service on the Seattle campus through approximately 2028 (reflecting a 10-year planning horizon; although the master plan will remain in effect until all the authorized development is used). The Campus Master Plan guides development on the Seattle campus, and will include guidelines and policies for new development. An aim of the *2018 Seattle Campus Master Plan* is to maintain and enhance the mission of the University, its multiple important roles in undergraduate and professional education, and its dedication to research and public service. The scope of the *2018 Seattle Campus Master Plan* includes defining future planned open spaces, circulation patterns, building sites and campus physical capacity to accommodate growth necessary to fulfill the University's mission.

1.3 MISSION STATEMENT AND GUIDING PRINCIPLES

The following presents the overall mission statement of the University of Washington and the guiding principles of the *2018 Seattle Campus Master Plan*.

Mission Statement

The primary mission of the University of Washington is the preservation, advancement, and dissemination of knowledge.

Guiding Principles

As indicated earlier in this chapter, the University of Washington is proposing a new master plan to accommodate both the anticipated increased growth in the number of students, faculty and staff, as well as the continued growth in the areas of research and service over the 10-year planning horizon (through approximately 2028; although the 2018 Seattle Campus Master Plan would remain in effect until all the proposed development authorized is used). The University of Washington has identified the following Guiding Principles for the proposed *2018 Seattle Campus Master Plan*.

- **Flexible Framework** – Create a lasting and flexible planning framework to identify potential development sites and development guidelines and standards in support of the University of Washington's education, research and service missions.

[2] The University of Washington will rely on the CMP Seattle 2003 until all of the proposed development is used.

- **Learning-Based Academic and Research** – Support and catalyze academic and research partnership with allied industries, contribute to a highly livable innovation district, and stimulate job growth and economic development.

- **Sustainable Development** – Extend University of Washington's commitment to sustainable land use to maximize the utilization of its existing property and balance development with public spaces.

- **Connectivity** – Extend the University of Washington's commitment to better connect the University internally and with its broader context.

- **Stewardship of Historic and Cultural Resources** – Continue responsible and proactive stewardship of University of Washington's campus assets through preservation of its historic and cultural resources and managed strategy of property development.

- **City-University Agreement** – Prepare a Master Plan consistent with the City-University Agreement, including addressing the following areas:

  - *MIO Boundary.*
  - *Non-Institutional Zones.*
  - *Height and location of Existing Facilities.*
  - *Existing and Proposed Open Space.*
  - *General Land Use and Location of Proposed Development.*
  - *Institutional Zone/Development Standards.*
  - *Existing and proposed Circulation Network.*
  - *Transportation Management Plan.*
  - *Future Energy and Utility Needs.*
  - *Alt. Proposals for Physical Development.*
  - *Proposed Development Timetable.*
  - *Proposed Street, Alley and Aerial Vacations.*

The Guiding Principles form the basis for the Master Plan Frameworks, which are described in detail in the Draft *2018 Seattle Campus Master Plan*. These principles are broad guidelines that are reflected in the various Master Plan Frameworks, including: Public Realm, Circulation and Parking, Built Environment, Sustainability, Innovation, and Utilities. Refer to the *2018 Seattle Campus Master Plan* for detail on the frameworks.

1.4 PROPOSED ACTION

The long-range growth potential of the Seattle Campus was a fundamental starting point for the master planning process. Through this process, a total of 85 potential development sites were identified with a development potential of approximately 12.9 million gsf of net new development. However, during the 10-year planning horizon of the Campus Master Plan, the University would only build a total of six (6) million net new gsf (assuming funding

is available) to meet the anticipated growth in demand for building space; thus, only a portion of the identified 85 potential development sites would be developed. Identification of specific sites and phasing to accommodate the six million net new gsf would be determined through the University's annual capital planning and budgeting process.

The Proposed Action is a new Campus Master Plan for the University of Washington's Seattle Campus. Consistent with the current City-University Agreement, the proposed *2018 Seattle Campus Master Plan* is intended to accommodate both the increase in the number of students, faculty and staff, as well as accommodate the evolving nature of instruction and continued growth in the areas of research and service. Among other items, the proposed *2018 Seattle Campus Master Plan* includes provisions for the following:

- **Guiding Principles** – Principals to guide campus conservation and development during the plan planning horizon, which is expected to be the 10-year period between 2018 and 2028, or until the six (6) million gsf of campus development capacity is used. See the list of Guiding Principles provided earlier in this chapter.

- **Maximum Allowable Building Heights** – The *2018 Seattle Campus Master Plan* identifies 10 building height zones that range from 30 feet along the shoreline to 240 feet in portions of the West and South Campus sectors. The proposed maximum building height limits for the Central Campus maintain the existing *CMP 2003 Seattle* heights, while the proposed maximum heights in portions of the South, West and East Campus sectors are increased to support diversity of functions.

- **Potential Development Sites** - The *2018 Seattle Campus Master Plan* identifies 85 potential development sites throughout campus. Eighteen potential development sites are located in West Campus, 20 potential development sites are located in South Campus, 20 potential development sites are located in Central Campus,[3] and 27 potential development sites are located in East Campus. Full development of all potential development sites would result in a total of approximately 12.9 million gsf of net new building development capacity[4] on the Seattle Campus, with approximately 3.2 million gsf of building capacity in the West Campus, approximately 2.9 million gsf of building capacity in the South Campus; approximately 2 million gsf of building capacity in the Central Campus; and, approximately 4.7 million gsf of building capacity in the East Campus.

- **Proposed Building Development –** As indicated above, the proposed *2018 Seattle Campus Master Plan* identifies a total of 85 potential development sites with a total

[3] Three of the identified Potential Development Sites in the Central campus (Sites C5, C6 and C15) are currently approved as projects and their square footage has been accounted for in the 2003 CMP total development capacity.
[4] Net increase over existing gsf (i.e. new building development minus demolished space).

development capacity of approximately 12.9 million gsf of net building area. To meet the anticipated growth for building space during the assumed 10-year planning horizon of the Campus Master Plan, the University would need to build a total of six (6) million net new gsf, and only a portion of the identified 85 potential development sites would be developed. Identification of specific sites and phasing to accommodate the six million net new gsf would be determined through the University's annual capital planning and budgeting process. As SEPA lead agency, the University of Washington is responsible for ensuring SEPA compliance for future projects as they are proposed.

- **Open Space Opportunities** – The *2018 Seattle Campus Master Plan* includes the identification of areas reserved for potential new open spaces, including:

  - *West Campus Green* – The *2018 Seattle Campus Master Plan* includes provisions to allow for a new approximately five (5)-acre West Campus Green that would tie into the existing two (2)-acre Portage Bay Park, and would connect the West Campus Area and the University District to the waterfront. The vacation of a portion of NE Boat Street is identified to increase the connectivity between the West Campus Green and Portage Bay Park.

  - *South Campus Green Corridor* – The *2018 Seattle Campus Master Plan* includes provisions to allow for a new open space located between the existing Magnuson Health Sciences Center pedestrian bridge over NE Pacific Street and Portage Bay. Associated with the redevelopment strategy for the South Campus Area, the Green Corridor would enhance the existing pedestrian bridge and visually and spatially connect South and Central Campus Areas to the waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the Continuous Waterfront Trail on the south.

  - *East Campus Land Bridge* – The *2018 Seattle Campus Master Plan* includes provisions to allow for a land bridge across Montlake Boulevard NE connecting the HUB to the existing E1 parking lot. The Bridge would enhance connection between the Central and East Campus Areas and the Union Bay Natural Area. The land bridge is envisioned as a pedestrian pathway connecting active ground floor uses in the Central and East Campus sectors.

  - *Continuous Waterfront Trail* – The *2018 Seattle Campus Master Plan* includes provisions to allow for an approximately 2.5-mile Continuous Waterfront Trail following the University's shoreline (Portage Bay, Ship Canal and Union Bay) and connecting the Portage Bay/ potential West Campus Green on the west to the Union bay natural area on the east. The trail would provide numerous

connections to the waterfront and other open spaces, including Sakuma Viewpoint, proposed South Campus Event Lawn, Hospital Glade, Waterfront Activity Center, and the Union Bay Natural Area.

- **Transportation System Improvements** - The *2018 Seattle Campus Master Plan* includes the identification of future potential transportation system improvements including

  - Additional opportunities for improvements to modes of travel to and from the University;
  - Pedestrian, bicycle and vehicular circulation improvements;
  - Maintaining the current 12,300 parking space cap (replacement parking would be calibrated with demand as development is planned) and,
  - Maintaining an AM and PM single occupant vehicle cap.

- **Street, Alley and Aerial Vacations** – The *2018 Seattle Campus Master Plan* identifies potential future street, alley and aerial vacations that may occur during the planning horizon of the Master Plan. All of the vacations are potential; none are imminent and development under the Master Plan could occur without the vacations (refer to the Alternative 5 analysis presented in **Chapter 3** of the Draft EIS for analysis of campus development without the identified vacations). The Master Plan indicates that the vacations are intended to create a better campus design and improve open spaces and improve circulation conditions. The vacations are not intended to increase development capacity. Each of the potential future vacations are included in the Master Plan for disclosure and SEPA compliance purposes and are intended to identify the range of alternatives that may be pursued during the life of the plan; no petitions or applications are pending.

  At such time as a specific vacation is proposed, a vacation petition package would be prepared[5]. The petition package would identify opportunities for public participation with regard to the vacation, traffic/circulation analysis, utilities analysis, project-specific design, landscape plans, and identification of public benefits that could be derived from the proposed vacation. Once finalized, the petition package to vacate the street would be submitted to the City of Seattle, consistent with City of Seattle ordinances and procedural guidelines. No Master Plan amendment would be required unless a vacation proposal is made which is outside the range of alternatives discussed in the *2018 Seattle Campus Master Plan* and in this EIS.

[5] SEPA compliance for street and aerial vacation petitions consistent with the 2018 Seattle Campus Master Plan is provided by this EIS.

The following lists the vacations that may occur during the planning horizon of the Master Plan.

- *Street Vacation* – NE Boat Street west of Brooklyn Avenue NE. This vacation is identified to allow the City of Seattle Portage Bay Park to merge with the potential West Campus Green to the north, allowing the creation of a large continuous park from the water to NE Pacific Street.
- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE. This vacation is identified to allow for improved layout of Potential Development Sites.
- *Aerial Vacation* – Montlake Boulevard NE to allow for the potential East Campus Land Bridge, an ADA-accessible bridge to East Campus sector development from the E1 parking lot.

- **Development Standards** - Chapter 6 of the *2018 Seattle Campus Master Plan* identifies proposed modifications and/or clarifications concerning applicable development standards and the University's internal review process (design and environmental) for development that is contemplated on campus to meet anticipated growth. A list of the Development Standards addressed in the *2018 Seattle Campus Master Plan* is provided below.

  - Boundaries
  - Demolitions
  - Development
  - Gross Square Footage
  - Historic Preservation
  - Leasing and Acquisitions
  - Light and Glare
  - Modulation
  - Noise
  - Odors
  - Parking
  - Review Process
  - Setbacks
  - Shorelines
  - Signs and Banners
  - Structure Height
  - Telecommunications Equipment
  - Temporary Facilities and Uses
  - Transportation
  - Trees
  - Uses

1.5 EIS ALTERNATIVES

For the purposes of environmental review, five action alternatives and a no action alternative are analyzed in this Draft SEIS, including Alternative 1 – CMP Proposed Allocation with Requested Height Increase; Alternative 2 – Campus Development with Existing Height Limits; Alternative 3 – Campus Development Reflecting Increased West and South Campus Density; Alternative 4 – Campus Development Reflecting Increased West and East Campus Density; Alternative 5 – No Street, Alley and Aerial Vacations; and the No Action Alternative. A full description of these alternatives is provided in Chapter 2.

No Action Alternative

Under the No Action Alternative, physical improvements proposed as part of the 2018 Seattle Campus Master Plan (as analyzed under Alternatives 1 through 5) would not be undertaken, despite an assumed demand for increased instructional, research, and public service needs. The addition of six million gsf of new on-campus development would not occur under the No Action Alternative. It is anticipated that the remaining campus building capacity under the 2003 Seattle CMP would be developed and would accommodate three percent of anticipated building space demand for the 10-year planning horizon of the Seattle Campus Master Plan. This alternative would not meet the University's Guiding Principles.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 would include a level of development and campus improvements to sufficiently meet the forecasted growth in student, faculty, and staff over the 10-year planning horizon of the 10-year master plan. This alternative would include six million gsf of new building development on the campus, broken down by sector as follows:

- 3.0 million gsf on West Campus;
- 1.35 million gsf on South Campus;
- 0.9 million gsf on Central Campus; and
- 0.75 million gsf on East Campus.

Alternative 1 also includes an amendment to the allowable building heights on the campus. The amendment would change the current limit on West Campus from a current range of 30 to 105 feet to a new range of 30 to 240 feet. The limit on South Campus would remain the same at 30 to 240 feet, but the area in the 240-foot height range would increase. On Central Campus, the range of 50 to 160 feet would be maintained. The allowable height range on East Campus would also remain the same as currently allowed at 30 to 160 feet, but the height allowable in the E1 parking lot would be increased to a range of 65 to 130 feet. Overall, 85 potential development sites in the University of Washington Seattle Campus have been identified.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 is intended to provide a level and distribution of preferred campus development allocation under the 2018 Seattle Campus Master Plan with no changes to the allowable building heights. Without the allowable building height changes proposed under Alternative 1, the preferred allocation of campus development in the 2018 Seattle Campus Master Plan cannot be achieved. Without the height increases proposed under Alternative 1 the 85 identified potential development sites would provide the following development area by sector:

- 2.4 million gsf on West Campus;
- 1.35 million gsf on South Campus;
- 0.9 million gsf on Central Campus; and
- 1.35 million gsf on East Campus.

Under Alternative 2, 0.6 million gsf of development not accommodated in West Campus would instead be moved to East Campus.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. This density under Alternative 3 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and South Campus Sectors, as follows:

- West Campus: 3.2 million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

Increases in the proposed building height limits are as described under Alternative 1.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 represents campus development with a focus in the West and South Campus sectors, and more density than assumed under Alternative 1 in the Central and East Campus sectors. This increased density in the Central and East Campus sectors would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall six (6) million gsf of net new development for the campus during the planning horizon. Alternative 4 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and East Campus sectors, as follows:

- West Campus: 3.0 million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf
- East Campus: 1.7 million gsf

The proposed increase in allowable building heights in the West, South and East Campus sectors, as assumed under Alternative 1, are assumed under Alternative 4.

Alternative 5 – No Street, Alley or Aerial Vacations

The No Street, Alley or Aerial Vacations Alternative is provided pursuant of the City of Seattle policy when potential or proposed vacations are included as part of a Proposed Action. The following vacations proposed under the 2018 Seattle Campus Master Plan would not occur under Alternative 5:

- Street Vacation – Portion of NE Boat Street west of Brooklyn Avenue NE;
- Street Vacation – Portion of NE Northlake Place east of 8th Avenue NE; and
- Aerial Vacation – Portion of Montlake Boulevard NE.

Alternative 5 would provide 6 million gsf of assumed building area, as these vacations are not intended to increase the amount of building development capacity on the campus, but serve to improve circulation and open space conditions. Under Alternative 5, none of the identified street or aerial vacations would occur. This alternative would generally meet the University's Guiding Principles, although overall campus connectivity would not be as efficient under Alternative 1.

1.6 IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The following highlights the impacts, mitigation measures, and significant unavoidable adverse impacts that would potentially result from the alternatives analyzed in this Draft EIS. **Table 1-1** provides a summary of the potential impacts that would be anticipated under the Draft EIS Alternatives. This summary is not intended to be a substitute for the complete discussion of each element that is contained in **Chapter 3**.

Table 1-1
IMPACT SUMMARY MATRIX

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
3.1 – EARTH					
• Development of 211,000 gsf of building space would result in approximately 53,000 cubic yards of excavation.	• Development of 6.0 million gsf of net new building space would result in approximately 1.5 million cubic yards of excavation, with most excavation in West and South Campus.	• Development of 6.0 million gsf of net new building space would result in approximately 1.5 million cubic yards of excavation, with most excavation in West, South and East Campus.	• Development of 6.0 million gsf of net new building space would result in approximately 1.5 million cubic yards of excavation, with most excavation in West and South Campus.	• Development of 6.0 million gsf of net new building space would result in approximately 1.5 million cubic yards of excavation, with most excavation in West, Central and East Campus.	• Proposed vacations would not require substantial amounts of excavation; as such, impacts would be similar to those described under Alternatives 1 - 4.
• Construction of 211,000 gsf of building space would result in temporary potential for erosion; level of potential erosion less than Alternatives 1–5,	• Construction impacts would include short-term potential for erosion; highest potential for erosion in West and South Campus.	• Construction impacts would include short-term potential for erosion; highest potential for erosion in West, South and East Campus.	• Construction impacts would include short-term potential for erosion; highest potential for erosion in West and South Campus. .	• Construction impacts would include short-term potential for erosion; highest potential for erosion in West, Central and East Campus.	• Proposed vacations would not require substantial amounts of excavation or associated erosion; as such, impacts would be similar to those described under Alternatives 1 - 4.
• Potential for development to occur in proximity to SMC 25.09 environmentally critical areas (ECA) less than Alternatives 1-5.	• Focus of development in West and South Campus with low potential to encounter ECA.	• Focus of development in West, South and East Campus with higher potential to encounter ECA (primarily in East Campus) than Alternative 1.	• Focus of development in West and South Campus with low potential to encounter ECA.	• Focus of development in West, Central and East Campus with higher potential to encounter ECA (primarily in East Campus) than Alternative 1.	• Potential for development to occur in proximity to ECA same as Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
3.2 – AIR QUALITY					
• Short-term construction air quality increases in particulates and emissions related to 211,000 gsf of building space; approximately 3 percent of Alternatives 1-5.	• Short-term construction air quality increases in particulates and emissions related to 6.0 million gsf of building space with focus of construction in West and South Campus.	• Short-term construction air quality increases in particulates and emissions related to 6.0 million gsf of building space with focus of construction in West, South and East Campus.	• Short-term construction air quality increases in particulates and emissions related to 6.0 million gsf of building space with focus of construction in West and South Campus.	• Short-term construction air quality increases in particulates and emissions related to 6.0 million gsf of building space with focus of construction in West, Central and East Campus.	• Similar short-term construction air quality increases in particulates and emissions as under Alternatives 1-4.
• Overall lifespan and annual greenhouse gas emissions would be 220,596 MTCO2e and 3,530 MTCO2e, respectively.	• Overall lifespan and annual greenhouse gas emissions would be 6,272,882 MTCO2e and 100,366 MTCO2e, respectively.	• Similar to Alternative 1.	• Similar to Alternative 1.	• Similar to Alternative 1.	• Similar to Alternative 1.
3.3 – WETLANDS AND PLANTS/ANIMALS					
Wetland Resources • No direct wetland impacts (filling) anticipated.	*Wetland Resources* • No direct impacts to wetlands or wetland buffers would occur.	*Wetland Resources* • No direct impacts to wetlands or wetland buffers would occur	*Wetland Resources* • No direct impacts to wetlands or wetland buffers would occur	*Wetland Resources* • No direct impacts to wetlands or wetland buffers would occur.	*Wetland Resources* • Impacts would be similar to those described under Alternative 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
Wetland Resources • Indirect impacts to wetlands (erosion or sedimentation) related to development of 211,000 gsf of building space. Overall, potential for impacts less than under Alternatives 1-5.	*Wetland Resources* • Potential indirect impacts from development in proximity to wetlands, including erosion or sedimentation. East Campus contains majority of wetland resources – focus of development in West and South Campus with low potential for development in proximity to wetlands.	*Wetland Resources* • Potential indirect impacts from development in proximity to wetlands. East Campus contains majority of wetland resources – focus of development in West, South and East Campus with higher potential for development in proximity to wetlands than Alternative 1	*Wetland Resources* • Potential indirect impacts from development in proximity to wetlands. East Campus contains majority of wetland resources – focus of development in West and South Campus with low potential for development in proximity to wetlands	*Wetland Resources* • Potential indirect impacts from development in proximity to wetlands. East Campus contains majority of wetland resources – focus of development in West, Central and East Campus with higher potential for development in proximity to wetlands than Alternative 1	*Wetland Resources* • Impacts would be similar to those described under Alternative 1-4.
Plants • Development of 211,000 gsf of building space could result in removal of lawns, trees and shrubs, but at a substantially lower level than under Alternatives 1-5.	*Plants* • Development of 6.0 million gsf of building space could result in removal of lawns, trees and shrubs; replanting would occur in certain areas.	*Plants* • Potential for impacts would be as described under Alternative 1.	*Plants* • Potential for impacts would be as described under Alternative 1.	*Plants* • Potential for impacts would be as described under Alternative 1.	*Plants* • Potential for impacts would be as described under Alternative 1.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
Animals • Potential for loss of animal habitat related to construction of 211,000 gsf of building space; potential for animal habitat impact less than under Alternatives 1-5.	*Animals* • Potential for loss of animal habitat related to construction of 6.0 million gsf of building space. Majority of development would occur in area currently developed and potential to impact animal habitat would be low.	*Animals* • Potential impacts would be similar to those described under Alternative 1.	*Animals* • Potential impacts would be similar to those described under Alternative 1.	*Animals* • Potential impacts would be similar to those described under Alternative 1. Alternative 4 includes more development in East Campus, but this would occur largely in already developed areas.	*Animals* • Potential impacts would be similar to those described under Alternative 1-4.
Animals - Fisheries • Construction associated with 211,000 gsf could result in short-term water quality or sedimentation to area fisheries habitat; potential for fisheries impact less than under Alternatives 1-5.	*Animals - Fisheries* • Construction of 6.0 million gsf of building space could have short-term impacts on water quality and sedimentation, potentially impacting fish habitat; focus of development in West and South Campus with area in proximity to fisheries habitat.	*Animals - Fisheries* • Construction of 6.0 million gsf of building space could have short-term impacts on water quality and sedimentation, potentially impacting fish habitat; focus of development in West, South and East Campus with more area in proximity to fisheries habitat than Alternative 1.	*Animals - Fisheries* • Construction of 6.0 million gsf of building space could have short-term impacts on water quality and sedimentation, potentially impacting fish habitat; focus of development in West and South Campus with area in proximity to fisheries habitat	*Animals - Fisheries* • Construction of 6.0 million gsf of building space could have short-term impacts on water quality and sedimentation, potentially impacting fish habitat; focus of development in West, Central and East Campus with less area in proximity to fisheries habitat than Alternative 1.	*Animals - Fisheries* • Impacts would be similar to those described under Alternative 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
Threatened and Endangered Species • No direct impacts to Endangered Species anticipated.	*Threatened and Endangered Species* • . No direct impacts to Endangered Species anticipated.	*Threatened and Endangered Species* • No direct impacts to Endangered Species anticipated.	*Threatened and Endangered Species* • No direct impacts to Endangered Species anticipated.	*Threatened and Endangered Species* • No direct impacts to Endangered Species anticipated.	*Threatened and Endangered Species* • No direct impacts to Endangered Species anticipated.
3.4 – ENERGY RESOURCES					
• Development of 211,000 gsf would represent one percent increase in energy demand.	• Development of 6.0 million gsf would represent 24 percent increase in energy demand; focus of new development in West and South Campus	•Development of 6.0 million gsf would represent 24 percent increase in energy demand; focus of new development in West, South and East Campus.	• Development of 6.0 million gsf would represent 24 percent increase in energy demand; focus of new development in West and South Campus.	• Development of 6.0 million gsf would represent 24 percent increase in energy demand; focus of new development in West, Central and East Campus.	• Energy demand would be similar to Alternatives 1-4.
• Existing electrical system sufficient to serve new development.	• Existing electrical system has capacity to serve up to 2.0 million gsf of new development; development above 2.0 million gsf would require improvements to existing system.	•Same as Alternative 1.	• Same as Alternative 1.	• Same as Alternative 1.	• Electrical system demands same as under Alternative 1-4.
• Fossil fuel fed steam heat and emergency back-up power systems adequate to serve 211,000 gsf of	• Fossil fuel fed steam heat and emergency back-up power systems adequate to serve 6.0 million gsf of	•Same as Alternative 1.	• Same as Alternative 1.	• Same as Alternative 1.	• Fossil fuel system demands same as under Alternative 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
new development.	new development.				
3.5 – ENVIRONMENTAL HEALTH					
Hazardous Materials • Development would result in some increases in hazardous materials, but amounts of materials would be lower than under Alternatives 1-5.	*Hazardous Materials* • New development would include uses of research chemicals and hazardous materials, but impacts to environmental health would not increase significantly as materials would be managed in accordance with all applicable rules and regulations.	*Hazardous Materials* • Potential impacts would be similar to those under Alternative 1. New sources of hazardous materials on the campus would be managed under all applicable rules and regulations.	*Hazardous Materials* • Potential impacts would be similar to those under Alternative 1, but greater development in South Campus could result in a greater increase in hazardous materials.	*Hazardous Materials* • Potential impacts would be similar to those under Alternative 1, but less development in South Campus could result in a smaller increase in hazardous materials.	*Hazardous Materials* • Impacts would be similar to those analyzed in Alternatives 1-4.
Noise • Development would result in some increases in noise, but impacts would be lower than under Alternatives 1-5.	*Noise* • Short-term impacts would occur during construction. Long-term impacts would occur from building operation, but the campus is in a developed area and these impacts are not anticipated to be significant.	*Noise* • Potential noise impacts would be similar to those described under Alternative 1.	*Noise* • Potential noise impacts would be similar to those described under Alternative 1.	*Noise* • Potential noise impacts would be similar to those described under Alternative 1.	*Noise* • Impacts would be similar to those analyzed in Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
Vibration • Development would result in some increases in vibration, but impacts would be lower than under the action alternatives.	*Vibration* • Construction activities would generate vibration on development sites, resulting in short-term impacts. Impacts to sensitive research uses would require project-specific coordination to prevent impacts. Future new buildings could contain uses sensitive to vibrations, and would require planning with sensitive research uses.	*Vibration* • Vibration conditions would be similar to those described under Alternative 1.	*Vibration* • Vibration conditions would be similar to those described under Alternative 1.	*Vibration* • Vibration conditions would be similar than those described under Alternative 1; although there would be less development in South Campus, where a number of vibration-sensitive uses are located.	*Vibration* • Impacts would be similar to those analyzed in Alternatives 1-4.
3.6 – LAND USE					
• Development of 211,000 gsf of new building space would be substantially less than under Alternatives 1-5	• Development of 6.0 million gsf of building space, demolition of up to 1,500,000 gsf of existing building space, 9-acres of land reserved for open space, and increased building heights.	• Similar amounts of overall new building space and demolition as under Alternative 1, with lower building heights and less area reserved for open space.	• Similar to Alternative 1.	• Similar to Alternative 1.	• Similar to Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
• Development could occur on any of the remaining development sites under the 2003 CMP, the majority of which are currently developed.	• Development would primarily occur on currently developed sites and would not represent a change in land use. Development would densify existing land use character, primarily in West and South Campus.	• Development would primarily occur on currently developed sites and would not represent a change in land use. Development would densify existing land use character, primarily in West, South and East Campus.	• Development would primarily occur on currently developed sites and would not represent a change in land use. Development would densify existing land use character, primarily in West and South Campus.	• Development would primarily occur on currently developed sites and would not represent a change in land use. Development would densify existing land use character, primarily in West, Central and East Campus.	• Development conditions would be similar to those under Alternatives 1-4.
• Development could occur on any of the remaining development sites under the 2003 CMP, the majority of which are currently developed	• Focus of development in West and South Campus results in increased building density and heights in proximity to the University District (West Campus) and the Montlake neighborhood (South Campus).	• Focus of development in West, South and East Campus results in increased building density in proximity to University District (West Campus), Montlake neighborhood (South Campus), and Laurelhurst neighborhood (East Campus). Building heights lower than Alternative 1	• Focus of development in West and South Campus results in increased building density and heights in proximity to University District (West Campus) and Montlake neighborhood (South Campus).	• Focus of development in West, Central and East Campus results in increased building density and heights in proximity to University District (West Campus), University District north of NE 45th Street (Central Campus) and Laurelhurst neighborhood (East Campus).	• Proposed vacations would not increase building development and increase in density same as under Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
3.7– POPULATION AND HOUSING					
Population • Development under the 2003 CMP could generate a population increase of 422 new people.	*Population* • By 2028 the total campus population could increase by 13,324 people (to 80,479 people in total) including: 8,675 new students, 1,410 new staff, and 3,239 new faculty. The bulk of the new population would be concentrated in the West Campus (6,600 people), followed by the South Campus (3,000 people), Central Campus (2,000 people) and East Campus (1,665 people).	*Population* • Total campus population growth (student, staff and faculty) would be the same as Alternative 1. The majority of new population would be accommodated in the West Campus (5,330 people), followed by the South Campus (3,000 people) and East Campus (3,000 people).	*Population* • Total campus population growth (student, staff and faculty) would be the same as Alternative 1. The majority of new population would be accommodated in the West Campus (7,105 people) and South Campus (3,660 people).	*Population* • Total campus population growth (student, staff and faculty) would be the same as Alternative 1. The majority of new population would be accommodated in the West Campus (6,660 people), East Campus (3,775 people) and Central Campus (2,445 people).	*Population* • The same amount of development and associated campus population increases would occur as under Alternatives 1-4.
Housing • Some increased housing demand could occur, however, this would be substantially less than under Alternatives 1- 5. No new campus student housing is assumed to	*Housing* • With the proposed 1,000 additional student beds, the University would have capacity to house approx. 23% of projected student population, similar to	*Housing* • Housing conditions would be the same as under Alternative 1.	*Housing* • Housing conditions would be the same as under Alternative 1.	*Housing* • Housing conditions would be the same as under Alternative 1.	*Housing* • The same housing conditions would occur as under Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
be developed beyond that currently under construction, and the private housing market would fulfill a portion of the increased housing demand.	the current ratio (25%) and exceeding the University's goal of 21%. The private housing market in the campus vicinity and region would continue to be a source of housing and would likely experience increased demand from students, faculty and staff.				
3.8 – LIGHT, GLARE and SHADOWS					
Light • Development 211,000 gsf of building space would be less than under Alternatives 1-5. Increases in light levels could occur, but would be substantially lower as compared to Alternatives 1-5.	*Light* • New light sources would be added to the campus including interior/ exterior building lighting, pedestrian-scale lighting and increased mobile lighting sources from car headlights. New light sources would be lowest in the East Campus and highest in the West Campus. Some localized light spillage	*Light* • Light impacts resulting from new development would be similar to Alternative 1, except that lighting levels and the number of new sources would be fewer in the West Campus and greater in the East Campus.	*Light* • Light impacts resulting from new development would be similar to Alternative 1, except that lighting levels and the number of new sources would be greater in the West Campus and South Campus.	*Light* • Light impacts resulting from new development would be similar to Alternative 1, except that lighting levels and the number of new sources would be less in the West Campus and South Campus, and greater in the Central Campus and East Campus.	*Light* • Light impacts would be similar to those that would occur under Alternatives 1-4.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
	could occur, including to areas adjacent to campus boundaries. Existing surface parking lot lighting and associated light spillage would be reduced by new building development on many of these sites.				
Glare • Development would be less than under Alternatives 1-5. Increases in glare levels could occur, but would be substantially lower as compared to Alternatives 1-5.	*Glare* • New sources of glare would be generated from vehicles traveling through and adjacent to campus, and from sunlight reflecting off new building surfaces. Future development would likely be similar to recent campus development (i.e. not highly reflective), and the potential for glare impacts is low.	*Glare* • Future development would introduce new sources of glare similar to those described for Alternative 1 with the potential for glare being greater in the East Campus and less in the West Campus.	*Glare* • Future development would introduce new sources of glare similar to those described for Alternative 1 with the potential for glare being greater the West Campus and South Campus, and less in the East Campus.	*Glare* • Future development would introduce new sources of glare similar to those described for Alternative 1 with the potential for glare being greater in the West Campus and East Campus, and less in the Central Campus and South Campus.	*Glare* • Glare impacts would be similar to those that would occur under Alternatives 1-4.
Shadows • Development would be less than under Alternatives 1-5.	*Shadows* • Development and associated landscaping would generate	*Shadows* • Future development and associated landscaping would	*Shadows* • Future development and associated landscaping would	*Shadows* • Future development and associated landscaping would	*Shadows* • Shadow impacts would be similar to those that would occur under

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
Increases in shadows could occur, but would be substantially lower as compared to Alternatives 1-5.	shadows over adjacent portions of the campus and surrounding streets. Due to the developed nature of the campus and surrounding areas, the potential for shadow impacts associated with future development would be low. Shadows in West Campus would not be anticipated to cast to Portage Bay Park or off-campus open space.	generate shadow impacts similar to Alternative 1, except that the potential for shadows would be greater in the East Campus and less in the West Campus.	generate shadow impacts similar to Alternative 1, except that the potential for shadows would be greater in the West Campus and South Campus, and less in the East Campus.	generate shadow impacts similar to Alternative 1, except that the potential for shadows would be greater in the Central Campus and East Campus, and less in the West Campus and South Campus.	Alternatives 1-4.
3.9 – AESTHETICS					
Aesthetics • Due to the lower level of development compared to Alternatives 1-5, the potential for aesthetic impacts would be substantially lower and aesthetic conditions would remain similar to existing conditions.	*Aesthetics* • The aesthetic character of the campus would change to a denser environment with taller buildings. Changes would be concentrated in the West and South Campus. A substantial amount of building demolition would be required to	*Aesthetics* • The aesthetic character of the campus would change to reflect increased development density and the use of more building development sites with larger footprints than Alternative 1. Building heights would be similar to existing	*Aesthetics* • The aesthetic character of the campus would change to a denser environment with taller buildings, similar to Alternative 1 in the West, South and Central Campus, but with fewer aesthetic changes in the East	*Aesthetics* • The aesthetic character of the campus would change to a denser environment with taller buildings, with changes concentrated in the West, Central and East Campus.	*Aesthetics* • Without street, alley or aerial vacations, the aesthetic character of certain campus areas would be different than under Alternatives 1-4, and would reflect less open space and more limited view corridors.

No Action Alternative	Alternative 1 – CMP Proposed Allocation with Requested Height Increases	Alternative 2 – Campus Development with Existing Height Limits	Alternative 3 – Campus Development Reflecting Increased West and South Campus Density	Alternative 4 – Campus Development Reflecting Increased West and East Campus Density	Alternative 5 – No Street, Alley or Aerial Vacations
	accommodate compact, high density development in the South Campus. This would free up additional campus areas for use as open space, circulation and/or landscaping.	buildings on and around the campus.	Campus.		
Views • Due to the lower level of development compared to Alternatives 1-5, impacts to views would be substantially lower, and view conditions would remain similar to existing conditions.	*Views* • Views would be modified to reflect increased density and building heights. New development would be intended to minimize visual impacts and preserve existing view corridors. New view corridors would also be provided as part of the planned West Campus Green and South Campus Green Corridor.	*Views* • Views would be modified to reflect increased density with lower building heights than Alternative 1. Existing view corridors would be preserved. Development would occur on the planned West Campus Green area which would result in minimal views in that area.	*Views* • Views would be modified to reflect increased density and building heights. Views would be similar to Alternative 1 in the West, South and Central Campus, but with fewer changes in views in the East Campus.	*Views* • Views would be similar to Alternative 1 in the West, Central and East Campus and reflect increased density and building heights, but with fewer changes in views in the South Campus. No new view corridor would be provided as part of a planned South Campus Green Corridor.	*Views* • Views would be similar to Alternatives 1-4. However, without street or aerial vacations new campus view corridors would be more limited (West Campus Green) or would not be provided (East Campus Land Bridge).
3.10 – RECREATION and OPEN SPACE					
• No substantial new recreation or open space improvements	• Up to 9 acres would be reserved for new open space areas, including	• Less area reserved for open space (total of 4 acres) than under	• Similar recreation and open space areas would be provided as	• Recreation and open space opportunities would be provided	• The lack of vacations would limit the recreational value and

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would be provided.	the 5-acre West Campus Green, 3-acre South Campus Green Corridor and 1-acre with the East Campus Land Bridge.	Alternative 1 due to the use of more building development sites with larger footprints. The 5-acre West Campus Green would not be provided.	Alternative 1.	similar to Alternative 1.	perceived connection to the shoreline from the planned West Campus Green. In the East Campus, the lack of a land bridge over Montlake Boulevard NE would limit the ability to provide a pedestrian connection between Central Campus and the sports fields in East Campus.
• The potential for increased demand on off-campus recreation and open space uses would be substantially less than under Alternatives 1-5.	• Increased campus population would increase the demand for use of recreation and open space facilities surrounding campus, but this demand would be partially offset by new on campus facilities. Primary demand would be for facilities in the vicinity of West and South Campus.	• Demand for off-campus recreation and open space facilities could be greater than under Alternative 1 due to less open space provided on campus. Primary demand would be for areas in the vicinity of West, South and East Campus.	• Demand for recreation and open space would be as under Alternative 1, with somewhat greater demand for facilities in the vicinity of West Campus.	• Demand for recreation and open space would be similar to Alternative 1. Primary demand would be for facilities in the vicinity of West, Central and East Campus.	• Recreation and open space facility demand would be similar to that would occur under Alternatives 1-4

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3.11 – CULTURAL RESOURCES					
• Development of 211,000 gsf of development on campus would represent 4 percent of that under Alternative 1-5, and the potential for development to encounter cultural resources would be lower than under Alternative 1-5.	• Development of 6 million gsf of building space would result in potential to encounter cultural resources during construction.	• Same amount of overall development as under Alternative 1.	• Same amount of overall development as under Alternative 1.	• Same amount of overall development as under Alternative 1.	• Same amount of overall development as under Alternatives 1-4
• Given the limited amount of development, the potential to encounter cultural resources is low.	• The sector of campus with the most area with high and medium sensitivity level for encountering cultural resources is East Campus – other campus sectors have isolated areas of high or medium sensitivity. Focus of development in West and South Campus, with 0.75 million gsf of building space in East Campus.	• Focus of development in South and East Campus; the 1.35 million gsf of building space in East Campus results in higher potential for encountering cultural resources than under Alternative 1.	• Focus of development in West and South Campus; the 0.25 million gsf of building space in East Campus results in lower potential for encountering cultural resources than under Alternative 1.	• Focus of development in West, Central and East Campus; the 1.7 million gsf of building space in East Campus results in higher potential for encountering cultural resources than under Alternative 1.	• Because construction associated with street and aerial vacations would not entail a substantial amount of excavation beyond that anticipated under Alternatives 1-4, the potential for impacts to cultural resources would generally be similar to Alternative 1-4.

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3.12 – HISTORIC RESOURCES					
• No demolitions or additions to any recognized historic structures anticipated	• Central Campus contains the majority of recognized historic structures on campus; other campus sectors contain no or limited number of historic structures. No demolitions or additions to any recognized historic structures on campus.	• No demolitions or additions to any recognized historic structures on campus, similar to Alternative 1.	• No demolitions or additions to any recognized historic structures on campus, similar to Alternative 1.	• No demolitions or additions to any recognized historic structures on campus, similar to Alternative 1.	• No demolitions or additions to any recognized historic structures on campus, similar to Alternative 1-4.
• Potential for indirect impacts to recognized historic structures less than under Alternatives 1-5.	• Potential for indirect impacts (dust, vibration) could occur from construction. Focus of development in West and South Campus has limited potential to indirectly impact historic structures; West Campus construction could occur in proximity to "Ye College Inn". A portion of Central Campus construction of 0.9 million gsf of building	• Focus of development in West, South and East Campus has limited potential to indirectly impact historic structures; West Campus construction could occur in proximity to "Ye College Inn" as under Alternative 1, with higher potential for construction to occur in proximity to "Canoe House than under Alternative 1. A portion of Central	• Focus of development in the West and South Campus would have a similar potential for indirect impacts to recognized historic structures as Alternative 1; slightly higher potential for indirect impacts to "Ye College Inn" in West Campus than under Alternative 1. Potential for indirect impacts to recognized historic structures in Central Campus would be the	• Focus of development in West, Central and East Campus would have a similar potential for indirect impacts to historic structures in the West Campus and lower potential in South Campus. The potential for indirect impacts to historic structures would be higher in the Central and East Campus than under Alternative 1.	• Potential for indirect impacts to recognized historic structures would be similar to Alternatives 1-4.

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	space could occur in proximity to historic structures.	Campus construction of 0.9 million gsf of building space could occur in proximity to historic structures, similar to Alternative 1.	same as Alternative 1.		
3.13 – PUBLIC SERVICES					
Fire and Emergency Services • Due to the lower level of development that would occur, it is anticipated that impacts to fire/emergency services would be lower in comparison to Alternatives 1-5.	*Fire and Emergency Services* • Increased demand for fire and emergency services would occur, including for fire dept. review for permits and inspection services. Service calls could increase by approximately 35%; however, increased calls could be much less with incorporation of fire suppression systems into new buildings.	*Fire and Emergency Services* • Fire and emergency services calls could increase as described for Alternative 1.	*Fire and Emergency Services* • Fire and emergency services calls could increase as described for Alternative 1.	*Fire and Emergency Services* • Fire and emergency services calls could increase as described for Alternative 1.	*Fire and Emergency Services* • Fire and emergency services impacts would be similar to Alternatives 1-4.
Police Services • Due to the lower level of development that would occur, it is anticipated that	*Police Services* • Increased demand for campus security and police services would occur. The largest	*Police Services* • Similar to Alternative 1, campus security and police services demands could	*Police Services* • Similar to Alternative 1, campus security and police services demands could	*Police Services* • Similar to Alternative 1, campus security and police services demands could	*Police Services* • Increases in police services demand would be similar to Alternatives 1-4.

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impacts to police services would be substantially lower in comparison to Alternatives 1-5.	increase in demand would primarily occur in the West Campus and South Campus, however, calls could occur throughout the campus and would not be limited to one specific area.	increase. The largest increase in demand would primarily occur in the West, South and East Campus; however, calls could occur throughout the campus and would not be limited to one specific area.	increase. The largest increase in demand would primarily occur in the West, and South Campus; however, calls could occur throughout the campus and would not be limited to one specific area.	increase. The largest increase in demand would primarily occur in the West, Central and East Campus; however, calls could occur throughout the campus and would not be limited to one specific area.	
3.14 – UTILITIES					
Water Supply • The potential for water supply impacts would be substantially less than under Alternatives 1-5; water demand would increase by approximately 1%.	*Water Supply* • Water demand could increase by 174 million gallons – a 26% increase over 2015 levels. The water distribution system is considered adequately sized to meet this future demand. New development would include measures to reduce water usage.	*Water Supply* • Increased demands on the water supply and distribution system would be similar to Alternative 1.	*Water Supply* • Increased demands on the water supply and distribution system would be similar to Alternative 1.	*Water Supply* • Increased demands on the water supply and distribution system would be similar to Alternative 1.	*Water Supply* • Increased demands on the water supply and distribution system would occur similar to Alternatives 1-4.
Sanitary Sewer • The potential for sanitary sewer impacts would be substantially less than under	*Sanitary Sewer* • Sewer system demand could increase by 132 million gallons annually – a 26 % over 2015	*Sanitary Sewer* • Increased sewer system demands would occur as described for Alternative 1.	*Sanitary Sewer* • Increased sewer system demands would occur at levels similar to Alternative 1.	*Sanitary Sewer* • Increased sewer system demands would occur at levels similar to Alternative 1.	*Sanitary Sewer* • Increased sewer system demands would occur similar to Alternatives 1-4.

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Alternatives 1-5; sewer demand would increase by approximately 1%.	levels. Existing systems are considered adequately sized to meet this future demand, although specific improvements could be needed, and combined systems would be converted to separate sewer and stormwater systems as feasible.				
Stormwater Drainage • Stormwater drainage impacts would be substantially less than under Alternatives 1-5.	*Stormwater Drainage* • The amount of impervious surfaces on campus would increase by 2 %. Existing drainage systems are anticipated to have adequate capacity to accommodate increased stormwater runoff resulting from this small increase in impervious surfaces.	*Stormwater Drainage* • Impervious surfaces and the amount of stormwater runoff would be greater than Alternative 1. As with Alternative 1, existing systems are anticipated to be adequate to handle increased stormwater runoff.	*Stormwater Drainage* • Stormwater runoff conditions would be similar to Alternative 1.	*Stormwater Drainage* • Stormwater runoff conditions would be similar to Alternative 1.	*Stormwater Drainage* • Stormwater runoff conditions would be similar to Alternatives 1-4.
Solid Waste • Solid waste impacts would be substantially less than under	*Solid Waste* • Solid waste generation rates would be consistent with current	*Solid Waste* • Solid waste generation would be similar to Alternative 1.	*Solid Waste* • Solid waste generation would be similar to Alternative 1.	*Solid Waste* • Solid waste generation would be similar to Alternative 1.	*Solid Waste* • Solid waste generation would be similar to Alternatives 1-4.

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Alternatives 1-5.	trends, and 60 % or more of campus waste would be recycled. The amount of solid waste transferred to a landfill could be less on a proportional basis than the proportional increase in campus building area.				
3.15 – TRANSPORTATION					
Construction Impacts • Construction could include temporary closures of pathways, streets, relocation or removal of parking, and increased truck traffic. TMP strategies would minimize impacts.	*Construction Impacts* • Construction could include temporary closures of pathways, streets, relocation or removal of parking, and increased truck traffic. Increased construction impacts would be anticipated due to the increased development on campus. TMP strategies would minimize impacts.	*Construction Impacts* • Similar overall construction impacts as Alternative 1, but less construction would occur in the West Campus and more would occur in the East Campus.	*Construction Impacts* • Similar overall construction impacts as Alternative 1, but less construction would occur in the East Campus and more would occur in the West and South Campus.	*Construction Impacts* • Similar overall construction impacts as Alternative 1, but less construction would occur in the South Campus and more would occur in the Central and East Campus.	*Construction Impacts* • Similar to Alternatives 1-4.
Trip Generation • Development under	*Trip Generation* • Development under	*Trip Generation* • Overall trip generation	*Trip Generation* • Overall trip generation	*Trip Generation* • Overall trip generation	*Trip Generation* • Similar to Alternatives

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the No Action Alternative (assuming approx.. 211,000 net new gsf) would result in approximately 165 net new daily UW trips, including 50 in the AM peak hour and 55 in the PM peak hour.	Alternative 1 would result in approximately 6,195 net new daily UW trips, including 1,955 in the AM peak hour and 1,955 in the PM peak hour.	would be the same as Alternative 1; however less would be generated by the West Campus and more would be generated by the East Campus.	would be the same as Alternative 1; however more would be generated by the West and South Campus.	would be the same as Alternative 1; however more would be generated by the Central and East Campus.	1-4.
Traffic Operations • Approximately 12 intersections would operate poorly (LOS E or F) with the No Action Alternative.	*Traffic Operations* • Approximately 15 intersections would operate poorly (LOS E or F) with Alternative 1. Three corridors would operate at a worse LOS than under the No Action Alternative.	*Traffic Operations* • Approximately 15 intersections would operate poorly (LOS E or F) with Alternative 2. Four corridors would operate at a worse LOS than under the No Action Alternative.	*Traffic Operations* • Approximately 15 intersections would operate poorly (LOS E or F) with Alternative 3. Four corridors would operate at a worse LOS than under the No Action Alternative.	*Traffic Operations* • Approximately 14 intersections would operate poorly (LOS E or F) with Alternative 4. Four corridors would operate at a worse LOS than under the No Action Alternative.	*Traffic Operations* • Similar to Alternatives 1-4.
Pedestrian Operations • The No Action Alternative would result in approximately 315 net new pedestrian trips. Impacts on the pedestrian system would be minimal.	*Pedestrian Operations* • Alternative 1 would result in approximately 2,820 net new pedestrian trips. Pedestrian enhancements under Alt. 1 would greatly improve circulation compared with the No	*Pedestrian Operations* • Net new pedestrian trips would be the same as Alt. 1 but added demand would be lower in West Campus and greater in East Campus. Pedestrian enhancements under	*Pedestrian Operations* • Net new pedestrian trips would be the same as Alt. 1 but added demand would be lower in East Campus and greater in West and South Campus. Pedestrian enhancements under	*Pedestrian Operations* • Net new pedestrian trips would be the same as Alt. 1 but added demand would be lower in South Campus and greater in Central and East Campus. Pedestrian enhancements under	*Pedestrian Operations* • Similar to Alternatives 1-4, but without street, alley or aerial vacations the East Campus Land Bridge and pedestrian connections in the West Campus would not be provided.

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	Action Alternative.	would improve circulation but would be less in the South Campus than Alt. 1.	would improve circulation but would be less in the East Campus than Alt. 1.	would improve circulation but would be less in the South Campus than Alt. 1.	
Bicycle Operations • The No Action Alternative would result in approximately 95 net new bicycle trips. Impacts on the bicycle system would be minimal.	*Bicycle Operations* • Alternative 1 would result in approximately 970 net new bicycle trips. Improved circulation, particularly in the West, South and East Campus would improve bicycle travel.	*Bicycle Operations* • Net new bicycle trips would be the same as Alt 1 but demand would lower in West Campus and higher in East Campus. Enhanced circulation would improve bicycle travel.	*Bicycle Operations* • Net new bicycle trips would be the same as Alt 1 but demand would higher in West and South Campus. Enhanced circulation would improve bicycle travel.	*Bicycle Operations* • Net new bicycle trips would be the same as Alt 1 but demand would higher in Central and East Campus and. Enhanced circulation would improve bicycle travel but would be limited in the South Campus.	*Bicycle Operations* • Similar to Alternatives 1-4, but without street, alley or aerial vacations the East Campus Land Bridge and pedestrian/bicycle connections in the West Campus would not be provided.
Transit Operations • The No Action Alternative would result in approximately 490 net new transit trips. Impacts on the transit system would be minimal.	*Transit Operations* • Alternative 1 would result in approximately 10,310 net new transit trips. Planned improvements to transit, including a new light rail station and Rapid Ride on adjacent corridors would enhance transit access.	*Transit Operations* • Net new transit trips would be the same as Alt 1 but demand would be lower near West Campus and higher near East Campus. Planned improvements would enhance transit access.	*Transit Operations* • Net new transit trips would be the same as Alt 1 but demand would be higher near West and South Campus. Planned improvements would enhance transit access.	*Transit Operations* • Net new transit trips would be the same as Alt 1 but demand would be higher near Central and East Campus. Planned improvements would enhance transit access.	*Transit Operations* • Similar to Alternatives 1-4.
Parking • Parking demand would	*Parking* • Parking demand would	*Parking* • Parking demand would	*Parking* • Parking demand would	*Parking* • Parking demand would	*Parking* • Similar to Alternatives

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increase by less than 50 vehicles and would be offset by an increase in parking supply. Utilization would be less than existing conditions. Parking in the Secondary Impact Zone would continue similar to existing conditions.	increase by approximately 1,660 vehicles and would be accommodated by the existing parking supply with no impacts on the CUA parking cap. Parking in the Secondary Impact Zone would continue similar to existing conditions.	be the same as Alt 1 but with lower demand in West Campus and higher demand in East Campus. Parking in the Secondary Impact Zone would continue similar to existing conditions.	be the same as Alt 1 but with lower demand in East Campus and higher demand in West and South Campus. Parking in the Secondary Impact Zone would continue similar to existing conditions.	be the same as Alt 1 but with lower demand in West Campus and higher demand in South, Central and East Campus. Parking in the Secondary Impact Zone would continue similar to existing conditions.	1-4.
Trip and Parking Caps • The No Action Alternative would continue to meet the trip and parking cap identified in the City-University Agreement (CUA).	*Trip and Parking Caps* • Assuming a conservative 20 percent SOV mode split, Alternative 1 would exceed the CUA trip cap. However, this does not factor in the benefits of increased light rail access and transit opportunities. The University would continue to maintain compliance with trip caps consistent with UW history and implemented with the TMP.	*Trip and Parking Caps* • Similar to Alternative 1.	*Trip and Parking Caps* • Similar to Alternative 1.	*Trip and Parking Caps* • Similar to Alternative 1.	*Trip and Parking Caps* • Similar to Alternative 1.

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3.16 – CONSTRUCTION					
Construction Activities • Approximately 211,000 gsf of building development with 53,000 cubic yards of excavation would occur. Construction-related impacts would be substantially less than under Alternatives 1-5.	*Construction Activities* • Approx. 6.0 million gsf of net new building space would be constructed. Up to 2.25 million gsf of building space could be demolished. Grading would total approximately 1.5 million cubic yards	*Construction Activities* • Similar overall construction activities as Alternative 1, but less would occur in the West Campus and more would occur in the East Campus.	*Construction Activities* • Increased construction activities in the West and South Campus and similar or lower construction activities in the Central and East Campus when compared with Alternative 1.	*Construction Activities* • Increased construction activities in the Central and East Campus and similar or lower construction activities in the West and South Campus when compared with Alternative 1.	*Construction Activities* • Construction activities would be similar to Alternatives 1-4.
Air Quality • Construction-related emissions would be substantially less than under Alternatives 1-5.	*Air Quality* • Construction activities would result in localized short-term increases in particulates and equipment emissions in the vicinity of construction sites.	*Air Quality* • Increased emissions in the West Campus due to more development sites utilized and increased emissions in the East Campus due to additional development.	*Air Quality* • Increased emissions in the West and South Campus and similar or lower emissions in the Central and East Campus.	*Air Quality* • Increased emissions in the Central and East Campus and similar or lower emissions in the West and South Campus.	*Air Quality* • Construction-related emissions would be similar to Alternatives 1-4.
GHG • Construction-related GHG emissions would be substantially less than under Alternatives 1-5.	*GHG* • Development would generate GHG emissions associated with construction activities. Construction-related GHG emissions	*GHG* • Similar overall GHG emissions as Alternative 1 but less emissions in the West Campus and more emissions in the East	*GHG* • Increased GHG emissions in the West and South Campus and similar or lower GHG emissions in the Central and East	*GHG* • Increased GHG emission in the Central and East Campus and similar or lower emissions in the West and South Campus.	*GHG* • Construction-related GHG emissions would be similar to Alternatives 1-4

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	would be approximately 4% of lifespan GHG emissions under Alternative 1.	Campus.	Campus.		
Noise • Construction-related noise increases would be substantially less than under Alternatives 1-5.	*Noise* • Localized sound levels would temporarily increase in the vicinity of individual construction sites and could impact teaching/ research activities or disturb student housing uses or adjacent off-campus land uses.	*Noise* • Increased noise in the West Campus due to more development sites utilized and increased noise in the East Campus due to additional development.	*Noise* • Increased noise in the West and South Campus and similar or lower noise levels in the Central and East Campus.	*Noise* • Increased noise in the Central and East Campus and similar or lower noise levels in the West and South Campus.	*Noise* • Construction-related noise increases would be similar to Alternatives 1-4.
Vibration • Construction-related vibration would be substantially less than under Alternatives 1-5.	*Vibration* • Construction activities would generate vibration that could impact sensitive research uses and/or equipment in the West, South and Central Campus. Project-specific coordination would be required to determine potential vibration issues.	*Vibration* • Increased vibration in the West Campus due to more development sites utilized and in the East Campus due to additional development.	*Vibration* • Increased construction-related vibration in the West and South Campus and similar or lower amounts of vibration in the Central and East Campus.	*Vibration* • Increased construction-related vibration in the Central and East Campus and similar or lower amounts of vibration in the West and South Campus.	*Vibration* • Construction-related vibration would be similar to Alternatives 1-4.

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Vegetation • Construction-related vegetation disturbance would be substantially less than under Alternatives 1-5.	*Vegetation* • Construction activities could result in temporary disturbance to existing lawns, trees and shrubs. Existing significant landscape open spaces would be preserved and area reserved for new planned open space.	*Vegetation* • Increased temporary vegetation disturbance in the West Campus due to more development sites utilized and in the East Campus due to additional development.	*Vegetation* • Similar temporary vegetation disturbance as Alternative 1.	*Vegetation* • Similar temporary vegetation disturbance as Alternative 1.	*Vegetation* • Temporary vegetation disturbance would be similar to Alternatives 1-4.
Transportation • Construction-related transportation impacts would be substantially less than under Alternatives 1-5.	*Transportation* • Construction impacts could include temporary closures of pathways and streets, removal of parking, increased truck traffic or other temporary disruptions. TMP strategies, outreach and coordination would minimize impacts and specific mitigation would be addressed as part of individual projects.	*Transportation* • Similar construction-related transportation impacts to Alternative 1.	*Transportation* • Similar construction-related transportation impacts to Alternative 1.	*Transportation* • Similar construction-related transportation impacts to Alternative 1.	*Transportation* • Similar construction-related transportation impacts to Alternative 1-4.

SUMMARY OF MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Earth

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- All earthwork and site preparation on the University of Washington Seattle Campus would be conducted in compliance with relevant grading criteria of the Seattle Municipal Code (Sections 22.170 and 22.802).

- The following Temporary Erosion and Sedimentation Control (TESC) measures would be implemented, as appropriate for the individual sites, as part of code compliance to reduce the risk of construction-related erosion:

    - The ground surface in the construction area would be sloped and sealed to reduce water infiltration, to promote rapid runoff, and to prevent water ponding.
    - To prevent soil disturbance, the size or type of construction equipment may have to be limited.
    - No soil would be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, would be used to seal the ground surface.
    - Work areas and soil stockpiles would be covered with plastic. Bales of straw and/or geotextile silt fences would be used as appropriate to control soil erosion.
    - During periods of wet weather, excavation and fill placement would be observed on a full-time basis by a geotechnical engineer (or engineer's representative) experienced in wet weather earthwork to determine that unsuitable materials are removed and that suitable compaction and site drainage is achieved. Excavation slopes would be protected from infiltration and erosion by directing water away from excavations and covering slopes with impermeable membranes, such as plastic sheeting.
    - Excavated materials, stockpiles, and equipment would be placed away from the top edge of excavations a distance equal to at least the depth of the excavation.

- To prevent an accumulation of dust and/or mud on campus during construction activities, the tires of construction equipment and trucks could be washed before they leave construction sites and streets could be swept as necessary.

- Site specific geotechnical recommendations would be provided as individual projects are proposed. Typical measures that could be implemented as part of code compliance, based on the specific conditions at the individual sites, include:

  - Excavations greater than four feet in height would be adequately sloped or braced to prevent localized sloughing and spalling.

  - Temporary shoring would be implemented during construction and would consist of a conventional soldier pile and lagging system.

  - All soil excavated from the site would be tested for contamination. All soil would be disposed of consistent with applicable University of Washington, State and local regulations.

  - Soldier piles and/or other slope stability techniques could be used as necessary in areas of unstable soils.

  - Structures could be designed with structural systems capable of supporting code-required floor loading and resisting lateral forces generated by earthquakes and wind.

- Whenever possible, construction could be scheduled to minimize overlapping of excavation periods for projects planned for construction in the same biennium.

- As individual projects are proposed, coordination with educational or research uses in the immediate vicinity that could be sensitive to vibration during construction would be conducted to determine appropriate measures to minimize the potential for disruption (see **Section 3.5 – Environmental Health**-for additional discussion and mitigation).

Additional Measure Applicable to Medium and High Campus Areas

- Construction activities conducted in portions of the campus identified as containing earth-related environmentally critical areas (primarily in the East Campus) identified by the City of Seattle Municipal Code (SMC) would comply with applicable development standards for: Liquefaction-Prone Areas (SMC 25.09.100); Peat Settlement-Prone Areas (SMC 25.09.110); Steep Slope Areas (SMC 25.09.180); and, Abandoned Landfills (SMC 25.09.220)

Significant Unavoidable Adverse Impacts

With implementation of the identified mitigation measures, significant earth related impacts are not anticipated.

Air Quality

The proposed *2018 Seattle Campus Master Plan* includes sustainability framework goals to create a more sustainable campus environment. These goals would, in part, guide future campus development and would indirectly relate to the overall air quality and GHG environment. In addition to compliance with applicable regulations related to construction and operations (including EPA, PSCAA and City of Seattle regulations), the following potential measures are intended to further reduce the potential for air quality and GHG impacts.

Measures Applicable to All Campus Areas (Low Potential)

Air Quality - Construction

During construction, applicable best management practices (BMPs) to control dust, vehicle and equipment emissions would be implemented. The University of Washington would coordinate with adjacent sensitive users to temporarily duct and protect air intakes to minimize the potential for the intake of fugitive dust and exhaust fumes.

- Building construction and demolition would be conducted in compliance with Seattle Municipal Code Section 15.22.060B which provides criteria related to suppression of dust-generating activities.

- Where appropriate, temporary asphalt roadways would be provided on Potential Development Sites to reduce the amount of dust and dirt that would be generated.

- As applicable, a Construction Management Plan would be prepared for each individual construction project to establish parking areas, construction staging areas, truck haul routes, and provisions for maintaining pedestrian and vehicle routes. These measures are intended to, among other things, minimize traffic delays and associated vehicle idling.

- As applicable, control measures in the Washington Associated General Contractors *Guide to Handling Fugitive Dust form Construction Projects* would be used, including:

    - using only equipment and trucks that are maintained in optimal operational condition;

- requiring all off-road equipment to have emission reduction equipment (e.g., require participation in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel, by project sponsors and contractors);
- implementing restrictions on construction truck and other vehicle idling (e.g., limit idling to a maximum of 5 minutes);
- spraying exposed soil with water or other suppressant to reduce emissions of PM and deposition of particulate matter;
- covering all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM emissions and deposition during transport;
- providing wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles in order to decrease deposition of particulate matter on area roadways; and
- covering dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

Air Quality - Operations

- Implementation of the proposed Transportation Management Plan would reduce vehicle trips and associated vehicle emissions.

- Research fume hoods would be provided within University laboratory areas and would be regulated and inspected by the University's Environmental Health and Safety Department.

Greenhouse Gas Emissions

- Implementation of the proposed Transportation Management Plan would reduce vehicle trips and associated GHG emissions.

- The University of Washington would embrace sustainability as an objective for all development on campus, including LEED provisions. Key measures that could be explored include:

    - installation of high performance glazing with low-E coatings to further reduce heat gain;
    - considering use of reflective roof surface treatments to reduce 'heat island effect' on building roofs;
    - planting of drought resistant and tolerant planting in landscaped areas to minimize irrigation requirements;
    - maximizing use of outside air for heating, ventilating, and air conditioning;

- installation of efficient light fixtures, including occupancy and daylight sensors, as well as nighttime sweep controls;
- use of low flow plumbing fixtures, which could result in a 30 percent reduction of water consumption;
- use of low VOC emitting materials for finishes, adhesives primers and sealants;
- incorporation of recycled content and rapidly renewable materials into project designs, including: concrete, steel and fibrous materials (bamboo, straw, jute, etc.);
- salvage of demolished material and construction waste for recycling; and
- Commitment to the Seattle 2030 District pilot program to reduce energy and water consumption, as well as CO_2 emissions from auto and freight traffic.

Significant Unavoidable Adverse Impacts

With implementation of the mitigation measures identified above, no significant unavoidable adverse impacts on air quality would be anticipated under all of the Alternatives. Climate change and other issues associated with GHG emissions is a global issue, and it is not possible to discern the impacts of the GHG emissions from a single campus master plan.

Wetlands and Plants/Animals

The proposed *2018 Seattle Campus Master Plan Update* includes goals and objectives to create a more sustainable environment and retain existing, significant campus open spaces, landscapes and natural features to the extent feasible. No development would occur within wetlands or associated buffer areas. In addition to compliance with applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for wetland, plant or animal impacts.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- All development would comply with federal, state and local regulatory standards (including SMC 25.09.020 regulations related to wetlands) for development and mitigation BMPs could include: site disturbance controls, construction staging, erosion and spill control, drainage control (water quantity and quality), vegetation retention and re-vegetation plans, and BMP training and monitoring

- Plant and animal mitigation opportunities include impact avoidance (e.g., working when fish species are not particularly sensitive to disturbance or avoiding identified

terrestrial habitats), stormwater drainage control, site and construction best management practices (BMP), site design (including vegetation retention and landscaping), and habitat enhancement or restoration, as feasible. Planned development would be sensitive to the existing shoreline.

- Stormwater controls would be applied during construction activities and over the long term. These controls and BMPs would control on-site erosion and transport of sediment and pollutants off site, by minimizing disturbance, stabilizing unworked materials, applying vegetative or mulch controls, and implementing other controls to reduce and treat contaminants in drainage water.

- Vegetation controls could continue to include an Integrated Pest Management Plan and a revegetation plan that emphasizes the propagation of native scrub-shrub and mixed coniferous species along shoreline areas. The development of new campus vistas or pedestrian viewpoints could be designed to not compromise opportunities to revegetate shoreline areas.

- Shoreline areas could be enhanced or restored through the retention or placement of shoreline-associated large woody debris for cover and forage production.

- Interpretative or education materials could be developed or made available to foster an appreciation of campus wetlands to help limit unnecessary disturbance or destruction of native vegetation or wildlife.

Additional Measure Applicable to Medium and High Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located on development sites that are within or proximate to the shoreline jurisdictional area could require additional analysis and mitigation measures (if necessary).

Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to wetland resources, plants or animals are anticipated under all of the Alternatives. Potential development under the *2018 Seattle Campus Master Plan c*ould include some clearing of native vegetation and construction of impervious surfaces which would increase stormwater runoff and change site recharge patterns. Some additional sediment deposition and water quality impacts could also occur. Impacts to vegetation and animals/habitat would also occur due to increased construction activity and human activities on the campus. With implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

Energy

The proposed *2018 Seattle Campus Master Plan* includes goals and objectives to create a more sustainable environment. These policies would guide future campus development and would indirectly relate to the overall energy demand. In addition to compliance with applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for energy demand impacts.

Measures Applicable to All Campus Areas (Low Potential)

- Centralized utilities such as the Central Power Plant and West Campus Utility Plant allow for the most efficient management of the related energy resource.

- New facilities would comply with applicable energy codes, including the Seattle Energy Code (SWC 22.700).

- Because the University of Washington must operate and maintain the facilities on a long-term basis, the economics of energy management and conservation are a primary design consideration. A standard of practicality must also be applied that assures that the building designs can be maintained properly. Sophisticated monitoring systems are available to assure efficient operations.

- Projects receiving separate service from SCL would be subject to SCL General Service Energy Efficiency Standards for new service.

- As plans for development of facilities are developed, the University Design Team could contact SCL and Puget Sound Energy customer services to confirm specific requirements for service.

- Aggressive energy conservation measures could continue to be studied and implemented on campus.

- Adopt Leadership in Energy and Environmental Design (LEED) standards for all new development to increase building sustainability in all state funded projects.

- The University of Washington would coordinate with SCL and monitor electrical demand and capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of an additional substation on campus.
    - Upgrades to the existing East and West Receiving Stations.
    - Serving additional buildings from the SCL grid where deemed appropriate.

- The University of Washington would monitor chiller capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of additional capacity at the Central Power Plant.
    - Provision of a single new chilled water plant.
    - Provision of multiple new "regional" chilled water plants.
    - Inclusion of local chillers installed in each building as constructed.

- The University of Washington would monitor emergency and standby power capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of additional capacity at the Central Power Plant.
    - Provision of a new emergency/standby power plant.
    - Inclusion of local generation facilities at individual projects.

Significant Unavoidable Adverse Impacts

Overall campus building area development during the 10-year planning horizon would increase the consumption of electricity, fossil fuel, and natural gas and fuel. With implementation identified mitigation measures, significant energy demand impacts are not anticipated.

Environmental Health

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Hazardous Materials

- Potential future development projects under the *2018 Seattle Campus Master Plan* should verify the presence, use and/or potential generation of hazardous materials on the project site prior to development.

Noise

- Construction activities would comply with the City of Seattle Noise Ordinance (SMC 25.08.425) which allows for temporary increases in the maximum permissible sound levels based on equipment type.

- The University of Washington also has additional conditions/considerations that project-specific campus contractors meet the following noise control criteria:

- The sound pressure level of construction noise inside adjacent buildings and/or rooms cannot exceed 60 dBA (with windows closed) between the hours of 8 AM and 5 PM on week days. Barriers can be erected between construction activities and such interior areas, or equipment noise attenuators can be provided.
- The use of electric equipment and machinery is preferred. If noise levels on any equipment or device cannot reasonably be reduced to criteria levels, either that equipment or device will not be allowed on the job or use times will have to be scheduled subject to approval.
- The sound pressure level of each piece of equipment cannot be greater than 85 dBA at a distance of 50 feet. Rubber-tired equipment is to be used whenever possible instead of equipment with metal tracks. Mufflers for stationary engines are to be used in the hospital areas. Construction traffic should be routed through nearest campus exit.
- Air compressors are to be equipped with silencing packages
- Jack hammers and roto hammers may be used where no other alternative is available; core drilling and saw cutting equipment is preferred.
- Specific scheduling of construction-related noise activities is required at the University of Washington Medical Center.

Vibration

- Potential future development projects under the *2018 Seattle Campus Master Plan* should verify the existence of vibration-sensitive uses located in proximity to the development site and if necessary, work to provide mitigation in the project design.

Additional Measures Applicable to Medium and High Potential Campus Areas

Hazardous Materials

- Hazardous materials generated and used on campus would continue to be managed in accordance with existing policies/standards established by the University's Environmental Health and Safety Department, as well as applicable local, state and federal standards/regulations.

- Existing facilities that handle hazardous materials (i.e. Magnuson Health Sciences Center, UW Medical Center, etc.) could be improved under the *2018 Seattle Campus Master Plan* to meet future needs and standards.

Noise

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located in areas that are proximate to noise-sensitive uses would require project-specific coordination with adjacent noise-sensitive users to determine potential noise-related issues associated with development on those sites and could require additional noise analysis and mitigation measures (if necessary).

Vibration

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located in areas that are proximate to vibration-sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites and could require additional mitigation measures (if necessary).

Significant Unavoidable Adverse Impacts

During construction activities, some temporary noise and vibration impacts would occur. It is also anticipated that an increase in hazardous materials and waste would occur on campus with the potential development of additional research and medical use facilities. However, with the implementation of the mitigation measures identified above, no significant unavoidable adverse environmental health impacts are anticipated.

Land Use

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- Areas reserved for potential new open spaces, including the West Campus Green under Alternatives 1, Alternative 3, 4, and Alternative 5, would help to offset the proposed increase in land use density and building heights on the campus.

- Increases in height and density under the *2018 Seattle Campus Master Plan* would be minimized through the implementation of the University's proposed general policies, development programs and development standards for the campus (including those standards identified within the *2018 Seattle Campus Master Plan*).

- New opportunities for potential open space areas, including the potential new West Campus Green, would be provided by the potential street vacations.

Additional Measure Applicable to Medium Potential Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located on development sites that are proximate to off-campus residential land uses would be considered as part of the University's Design Review process and could require additional mitigation measures (if necessary).

Significant Unavoidable Adverse Impacts

Under Alternatives 1 through 5 intensification in land uses on the campus would occur as a result of the increased density and building heights that would be provided under the *2018 Seattle Campus Master Plan*. The greatest potential for increases in development would occur in the West and South Campus sectors under Alternative 1 and 3, in the West, South and East Campus sectors under Alternative 2, and in the West, Central and East Campus under Alternative 4; development under Alternative 5 would feature a similar distribution of development as Alternatives 1 through 4. With implementation of the mitigation measures identified above, no significant unavoidable adverse land use impacts would be anticipated under the EIS Alternatives.

Population and Housing

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

No direct population-related mitigations measures would be necessary. Mitigation associated with indirect population impacts identified above are discussed under their respective sections.

The *2018 Seattle Campus Master Plan* identifies approximately 1,000 new student beds on-campus over the life of the plan, which would minimize potential housing impacts associated with new students and allow the University to house a higher percentage of students in on-campus facilities, compared to existing conditions[6]. Additional growth in students, faculty and staff would not be anticipated to result in significant housing impacts to the private housing market in the surrounding areas and region, and no additional mitigation would be necessary.

Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to population or housing are anticipated.

[6] The University currently has the capacity to housing approximately 20 percent of the student population.

Light, Glare and Shadows

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The University of Washington's existing design review processes (architectural, landscaping and environmental review) would continue to be used to review all building projects on campus.
- Exterior light fixtures would continue to be shielded and sited to focus lighting and direct light away from adjacent off-campus land uses.
- The design of potential future development would consider the use of the least reflective glazing available to minimize the effects of reflective solar glare.

Additional Measure Applicable to High Potential Campus Areas

- Potential future development on the N5 parking area under the *2018 Seattle Campus Master Plan* would require project-specific coordination with the adjacent Observatory to determine potential light-related issues and could require additional analysis and mitigation measures (if necessary).

Significant Unavoidable Adverse Impacts

Potential future development under the *2018 Seattle Campus Master Plan* would result in an increase in light, glare, and shadows on campus associated with new buildings and associated campus landscaping. With the implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

Aesthetics/Views

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- Potential future development projects would be consistent with the development guidelines and development standards identified in the *2018 Seattle Campus Master Plan*.
- The University of Washington's existing design review processes (architectural, landscaping and environmental review) would continue to review all building projects on campus and consider views as part of individual projects.

Additional Measures Applicable to Medium and High Potential Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located proximate to existing identified primary view corridors and vistas would require project-specific coordination to determine potential aesthetic/view-related issues associated with development on those sites, and could require additional aesthetics/view analysis and mitigation measures (if necessary).

Significant Unavoidable Adverse Impacts

Development under the *2018 Seattle Campus Master Plan* would result in changes to the aesthetic character of the campus, including increased density and building heights in the West Campus, South Campus, and East Campus sectors. With the implementation of general policies, development programs, and development standards in the *2018 Seattle Campus Master Plan*, the changes to aesthetic character could be interpreted as positive changes and significant aesthetic impacts would not be anticipated.

Recreation and Open Space

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The *2018 Seattle Campus Master Plan* includes substantial areas that would be reserved for potential open space features, including the planned West Campus Green, South Campus Green Corridor, East Campus Land Bridge, and Continuous Waterfront Trail.

- Additional maintenance staff and acquisition of equipment for existing recreational facilities could be needed to effectively address the increase in use of active and passive recreational resources.

Additional Measures Applicable to Medium and High Potential Campus Areas

- Existing campus tennis courts located in the East Campus sector would be replaced if development were to occur on these sites.

Significant Unavoidable Adverse Impacts

With proposed mitigation measures, significant unavoidable adverse impacts to recreational and open space resources are not expected to occur.

Cultural Resources

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Inadvertent Discovery of Archaeological Resources

- In the event that archaeological deposits are inadvertently discovered during construction of at a potential development site, ground-disturbing activities would be halted immediately, and University of Washington would be notified. The University would then contact DAHP and the interested Tribes, as appropriate, and as described in the recommended inadvertent discovery plan.

Discovery of Human Remains

- Any human remains that are discovered during construction at a potential development site would be treated with dignity and respect.

    - If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause further disturbance to those remains must cease, and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the county coroner and local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

    - The county coroner will assume jurisdiction over the human skeletal remains, and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, they will report that finding to the DAHP. DAHP will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian, and report that finding to any appropriate cemeteries and the affected tribes. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

Additional Measures Applicable to Medium and High Potential Areas

- If a project is proposed in an area identified as having Medium Potential to contain cultural resources, the project should follow pertinent cultural resources regulations and project specific desktop analysis accompanied by a project site visit by a

Secretary of Interior Qualified archaeologist and an inadvertent discovery plan prepared. The project site visit should be geared toward assessing and documenting obvious signs of landscape modification. An archaeological inventory may be needed if no obvious signs of landscape modification are observed.

- Noticing and coordination with Native American tribes would take place on projects conducted by the University of Washington as the lead agency under the State Environmental Policy Act (SEPA) and/or Governor's Executive Order 05-05.

Additional Measure Applicable to High Potential Areas

- If a project is proposed in an area identified as having High Potential to contain cultural resources, the project would follow pertinent cultural resources regulations (as identified for low and medium potential areas) and additionally include archaeological inventory work consisting of a survey.

Significant Unavoidable Adverse Impacts

Campus development under EIS Alternatives 1 through 5 would occur within the context of a campus with potential cultural resources. With implementation of the identified mitigation measures, no significant adverse impacts to cultural resources are anticipated.

Historic Resources

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The University of Washington's existing internal design review processes (architectural, landscape, environmental review, and Board or Regents) would continue to review and authorize major building projects in terms of siting, scale, and the use of compatible materials relative to recognized historic structures.

- The University of Washington would continue to follow the Historic Resources Addendum (HRA) process for all proposed projects that include exterior alterations to buildings over 50 years old, or are located adjacent to buildings or features over 50 years old. The HRA is intended to insure that important elements of the campus, its historic character and value, environmental considerations and landscape context are valued.

- The potential for indirect impacts to on-campus and identified off-campus historic resources associated with construction noise, dust, and pedestrian/bicycle

circulation distribution would be mitigated by the following the measures identified in Sections 3.2 (Air Quality), 3.6 (Environmental Health) and 3.16 (Transportation).

Significant Unavoidable Adverse Impacts

Campus development under EIS Alternatives 1 through 5 would occur within the context of a campus with historic buildings and spaces. With implementation of the identified mitigation measures, no significant adverse impacts are anticipated.

Public Services

Measures Applicable to All Campus Areas (Low Potential)

- All potential future development under *2018 Seattle Campus Master Plan* would be constructed in accordance with applicable City of Seattle Fire Code requirements and would include fire alarms and fire suppression systems in accordance with applicable standards.
- During the construction process for potential future development, the SFD would be notified of any major utility shutdowns or campus street closures/detours.
- In the case of an emergency, during the construction process for potential future development, the UWPD could provide police escort services for fire and emergency service vehicles.
- The University of Washington would review the designs of specific development projects for potential life/safety and personnel security issues.
- The UWPD would increase its law enforcement staff capacity and expand operations, as necessary, to meet the increased security needs associated with development and increased population under the *2018 Seattle Campus Master Plan*.

Significant Unavoidable Adverse Impacts

Potential future development and the associated increase in campus population under the *2018 Seattle Campus Master Plan* would result in an increase in demand for fire and emergency services and police services on the University of Washington campus. With the implementation of mitigation measures identified above, significant unavoidable impacts to public services would not be anticipated.

Utilities

The proposed *2018 Seattle Campus Master Plan* includes goals and objectives to create a more sustainable environment. These policies would guide future campus development and would indirectly relate to the overall utilities demand. In addition to compliance with

applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for energy demand impacts.

Measures Applicable to All Campus Sectors (Low and High Potential)

Water

- Use of low- or no-flow fixtures and other water saving devices would be utilized as feasible.
- Collection and re-use of stormwater for non-potable uses (i.e. irrigation, toilet flushing, etc.) would be utilized as feasible to reduce public water supply demand.
- Drip watering or low precipitation systems would be utilized as feasible for irrigation, and types of ground cover that requires less irrigation could continue to be utilized

Stormwater

- Low-Impact Demand design features could be considered to minimize stormwater runoff quantity.

Solid Waste

- University efforts to encourage the recycling of solid waste materials would continue to be implemented in the construction and operation of new facilities. The University Facilities Services Department would to implement recycling programs on the campus, including paper recycling, paper towel composting, food waste composting, electronic media recycling, Husky Football Recycling Outreach, waste collection solar kiosks, and special event recycling programs.

Measures Applicable to High Potential Campus Sectors

Sewer and Stormwater

- As potential development sites in Central Campus sector currently containing combined sewer/stormwater piping systems are proposed for development, the combined systems would be converted to separate sewer and stormwater systems, as feasible.

Significant Unavoidable Adverse Impacts

With implementation of the identified mitigation measures, no significant unavoidable adverse utility impacts are anticipated.

Transportation

Mitigation Measures

The 2028 CMP development would accommodate up to 6 million net new gross square feet of new development. As part of this development, improvements such as new and wider sidewalks and bikeways, bicycle lockers, and loading areas are anticipated, as well as replacing parking. The following table summarizes improvements by campus sector and travel mode.

Table 1-2
PEDESTRIAN, BICYCLE, AND VEHICLULAR IMPROVEMENTS SUMMARY

West Campus	South Campus	East Campus
Pedestrian		
• Mid-block connections south of Gould Hall • Walkways adjacent to West Campus Green • Improvements along NE Campus Parkway • Mid-block connector east from West Campus Green	• Connection between Central Campus & waterfront along East Campus Lawn • Connection along Continuous Waterfront Trail	• Potential East Campus Land Bridge • Improved pedestrian network
Bicycle		
• Connection between West Campus Park and Burke-Gilman Trail • Improved bicycle parking facilities	• Improved bicycle parking facilities	• Improved bicycle parking facilities • Improved bicycle network and Burke Gilman Trail access
Vehicular		
• Removal of University of Washington NE Cowlitz Road • Extensions of 11th and 12th Avenues	• Removal of University of Washington NE San Juan Road • New University of Washington roadway connections between NE Columbia/NE Pacific • Enhanced access for Marine Sciences from NE Columbia Road	

Transportation Management Plan

The University of Washington has successfully maintained traffic levels that fall well below the agreed upon traffic and parking caps, which hold University traffic and parking impacts at and below 1990 levels. The UW has accomplished this by successfully reducing percentage of student, faculty, and staff commuters choosing single occupant vehicles (SOVs) as their commute mode, despite growing campus population by over one-third since 1990. The implementation of the TMP within which the U-PASS program exists, has been the means through which all primary and supporting strategies have been implemented.

The University has actually reduced the proportion of drive alone traffic and resulting traffic generation (and parking) over the past 25 years, and remains well below City-University Agreement Cap goals.

The stated goal of the proposed CMP is to continue to limit UW peak period, peak direction vehicle trips by commuter students, faculty, and staff at or below 1990 levels. As a result, actual impacts associated with the proposed growth, even assuming no further improvement (reduction) in SOV travel would be less than described in the preceding analyses.

The UW will continue to mitigate transportation impacts through the implementation of the TMP and assure that 1990 levels of impact are not exceeded, despite ongoing growth. Specific strategies will continue to be refined annually, subsequent to the annual transportation survey and publication of the CMP Annual Monitoring Reports.

Potential TMP strategies included in the Plan presently include, but are not limited to, maintenance or enhancements to programs related to:

- U-PASS
- Transit
- Parking Management
- Shared Use Transportation
- Pedestrian and Bicycle Travel
- Telecommuting

The recently-opened Link light rail station at Husky Stadium will result in substantial changes in the way commuters access the campus. Additionally, anticipated extensions of Link light rail to Northgate in 2021 and to Lynnwood, Redmond, and Federal Way in 2023 will improve the opportunities and access to transit for University students, faculty, staff and visitors. Prior to the publication of the Final EIS for this master plan, the 2016 data reflecting this opening will be collected and summarized for inclusion in the annual CMP report and FEIS.

Intersection Operations

Mitigation measures were reviewed at the signalized intersections that are anticipated to operate at LOS E or F and experience a 5 second or greater increase in delay. Additionally, one unsignalized intersection was reviewed for potential mitigations measures. Mitigation was reviewed at the following intersections:

15. 7th Avenue NE (I-5 NB)/NE 45th Street (Signalized)
29. Montlake Boulevard NE/Mary Gates Memorial Drive NE (Signalized)
67. 15th Avenue NE/NE Pacific Street (Signalized)
69. 15th Avenue NE/NE Boat Street (All Way Stop)

For the currently signal controlled intersections, mitigation was reviewed in the form of modifications to the signal timing such as phasing, offsets, and cycle length due to limitations in right-of-way at the intersections. While modifications to the signal timing could decrease the delay at the signalized intersections it won't decrease the delay to at or near No Action conditions. For the 15th Avenue NE/NE Boat Street intersection, installation of traffic signals at the intersection would improve the intersection operations to LOS A under Alternative 1 conditions. Installation of traffic signals should be monitored and only implemented if warranted.

Significant Unavoidable Adverse Impacts

Implementation of the University of Washington 2018 Campus Master Plan would result in increases to all travel modes – pedestrian, bicycle, transit, vehicle, and freight. Local agency partners like the City of Seattle, King County Metro and Sound Transit all have plans to expand transportation facilities and services in and surrounding the campus. These include expanding the Burke-Gilman Trail, completing pedestrian and bicycle networks and expanding frequency, capacity and travel time of transit. Additionally, the University will be working to enhance connectivity and circulation with each development. Finally, the University, as specified in their City-University Agreement, continues to annually monitor parking and trips. The University also conducts annual surveys of mode splits. With access to Light rail at the University of Washington Station that opened in March 2016, the University is already seeing a significant (roughly 13%) increase in transit ridership. With the opening in 2021 of another new light rail station serving the University District, access to expanded RapidRide and new regional trail connections across Montlake students, faculty, staff and visitors will have more reliable transportation choices as alternatives to driving alone. With planned construction of multi-family housing nearby, drive alone trips may continue to decline as students, faculty and staff have choices for living near campus. With implementation of the identified mitigation measures, no significant unavoidable adverse impacts are anticipated.

Construction Impacts

The following measures would be available for development under the *2018 Seattle Campus Master Plan*. Mitigation measures that are identified below *in italics* are also included in their respective environmental element discussions as well (i.e., Section 3.1, **Earth**; Section 3.2, **Air Quality**; Section 3.3, **Wetlands, Plants and Animals**; and, Section 3.5, **Environmental Health**).

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Construction Activities

- *All earthwork and site preparation on the University of Washington Seattle Campus would be conducted in compliance with relevant grading criteria of the Seattle Municipal Code (Sections 22.170 and 22.802).*

- *The following Temporary Erosion and Sedimentation Control (TESC) measures would be implemented, as appropriate for the individual site, as part of code compliance to reduce the risk of construction-related erosion:*

    - *The ground surface in the construction area would be sloped and sealed to reduce water infiltration, to promote rapid runoff, and to prevent water ponding.*
    - *To prevent soil disturbance, the size or type of construction equipment may have to be limited.*
    - *No soil would be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, would be used to seal the ground surface.*
    - *Work areas and soil stockpiles would be covered with plastic. Bales of straw and/or geotextile silt fences would be used as appropriate to control soil erosion.*
    - *During periods of wet weather, excavation and fill placement would be observed on a full-time basis by a geotechnical engineer (or engineer's representative) experienced in wet weather earthwork to determine that unsuitable materials are removed and that suitable compaction and site drainage is achieved.*
    - *Excavation slopes would be protected from infiltration and erosion by directing water away from excavations and covering slopes with impermeable membranes, such as plastic sheeting.*

- *Excavated materials, stockpiles, and equipment would be placed away from the top edge of excavations a distance equal to at least the depth of the excavation.*

- *To prevent an accumulation of dust and/or mud on campus during construction activities, the tires of construction equipment and trucks could be washed before they leave construction sites and streets could be swept as necessary.*

- *Site specific geotechnical recommendations would be provided as individual projects are proposed. Typical measures that could be implemented as part of code compliance, based on the specific conditions at the individual sites, include:*

  - *Excavations greater than four feet in height would be adequately sloped or braced to prevent localized sloughing and spalling.*

  - *Temporary shoring would be implemented during construction and would consist of a conventional soldier pile and lagging system.*

  - *All soil excavated from the site would be tested for contamination. All soil would be disposed of consistent with applicable University of Washington, State and local regulations.*

  - *Soldier piles and/or other slope stability techniques could be used as necessary in areas of unstable soils.*

  - *Structures could be designed with structural systems capable of supporting code-required floor loading and resisting lateral forces generated by earthquakes and wind.*

- *Whenever possible, construction could be scheduled to minimize overlapping of excavation periods for projects planned for construction in the same biennium.*

- *As individual projects are proposed, coordination with educational or research uses in the immediate vicinity that could be sensitive to vibration during construction would be conducted to determine appropriate measures to minimize the potential for disruption (see **Section 3.5 – Environmental Health**-for additional discussion and mitigation).*

Air Quality and GHG Emissions

- *During construction, applicable best management practices (BMPs) to control dust, vehicle and equipment emissions would be implemented. The University of Washington would coordinate with adjacent sensitive users to temporarily duct and*

protect air intakes to minimize the potential for the intake of fugitive dust and exhaust fumes.

- Building construction and demolition would be conducted in compliance with Seattle Municipal Code Section 15.22.060B which provides criteria related to suppression of dust-generating activities.

- *Where appropriate, temporary asphalt roadways would be provided on Potential Development Sites to reduce the amount of dust and dirt that would be generated.*

- *As applicable, a Construction Management Plan would be prepared for each individual construction project to establish parking areas, construction staging areas, truck haul routes, and provisions for maintaining pedestrian and vehicle routes. These measures are intended to, among other things, minimize traffic delays and associated vehicle idling.*

- *As applicable, control measures in the Washington Associated General Contractors Guide to Handling Fugitive Dust form Construction Projects would be used, including:*

    - *Use only equipment and trucks that are maintained in optimal operational condition;*
    - *Require all off-road equipment to have emission reduction equipment (e.g., require participation in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel, by project sponsors and contractors);*
    - *Implement restrictions on construction truck and other vehicle idling (e.g., limit idling to a maximum of 5 minutes);*
    - *Spray exposed soil with water or other suppressant to reduce emissions of PM and deposition of particulate matter;*
    - *Cover all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM emissions and deposition during transport;*
    - *Provide wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles in order to decrease deposition of particulate matter on area roadways; and*
    - *Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.*

Noise

- *Construction activities would comply with the City of Seattle Noise Ordinance (SMC 25.08.425) which allows for temporary increases in the maximum permissible sound levels based on equipment type.*

- *The University of Washington also has additional conditions/considerations that project-specific campus contractors meet the following noise control criteria:*

    - *The sound pressure level of construction noise inside adjacent buildings and/or rooms cannot exceed 60 dBA (with windows closed) between the hours of 8 AM and 5 PM on week days. Barriers can be erected between construction activities and such interior areas, or equipment noise attenuators can be provided.*
    - *The use of electric equipment and machinery is preferred. If noise levels on any equipment or device cannot reasonably be reduced to criteria levels, either that equipment or device will not be allowed on the job or use times will have to be scheduled subject to approval.*
    - *The sound pressure level of each piece of equipment cannot be greater than 85 dBA at a distance of 50 feet. Rubber-tired equipment is to be used whenever possible instead of equipment with metal tracks. Mufflers for stationary engines are to be used in the hospital areas. Construction traffic should be routed through nearest campus exit.*
    - *Air compressors are to be equipped with silencing packages*
    - *Jack hammers and roto hammers may be used where no other alternative is available; core drilling and saw cutting equipment is preferred.*
    - *Specific scheduling of construction-related noise activities is required at the University of Washington Medical Center.*

Vibration

- *Potential future development projects under the 2018 Seattle Campus Master Plan should verify the existence of vibration-sensitive uses located in proximity to the development site and if necessary, work to provide mitigation in the project design.*

Transportation

- *Potential impacts associated with construction-related transportation disruptions would be mitigated by the implementation of the TMP, including outreach and project coordination.*

Additional Measure Applicable to Medium and High Campus Areas

Construction Activities

- *Construction activities conducted in portions of the campus identified as containing earth-related environmentally critical areas (primarily in the East Campus) identified by the City of Seattle Municipal Code (SMC) could comply with applicable development standards for: liquefaction-prone areas (SMC 25.09.100); peat settlement-prone areas (SMC 25.09.110); steep slope areas (SMC 25.09.180); and, abandoned landfills (SMC 25.09.220)*

Noise

- *Potential future development projects under the 2018 Seattle Campus Master Plan that are located in areas that are proximate to noise-sensitive uses would require project-specific coordination with adjacent noise-sensitive users to determine potential noise-related issues associated with development on those sites and could require additional noise analysis and mitigation measures (if necessary).*

Vibration

- *Potential future development projects under the 2018 Seattle Campus Master Plan that are located in areas that are proximate to vibration-sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites and could require additional mitigation measures (if necessary).*

Significant Unavoidable Adverse Impacts

During construction activities, some temporary construction-related impacts would occur, including short-term, localized construction activities, dust, emissions, noise, vibration and vegetation removal. However, with the implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

CHAPTER 2

Description of Proposed Action and Alternatives

CHAPTER 2

INTRODUCTION AND DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter of the Draft Environmental Impact Statement (EIS) provides a discussion of the planning activities conducted in support of the proposed *University of Washington 2018 Seattle Campus Master Plan*, information on the campus and surrounding area, and a description of the *2018 Seattle Campus Master Plan* EIS Alternatives (Alternatives 1 through 5). A description of the No Action Alternative is also provided in this chapter. A detailed description of the affected environment, environmental impacts, mitigation measures and significant unavoidable adverse impacts is provided in **Chapter 3** of this Draft EIS.

Memorial Way Monument

2.1 PROJECT LOCATION

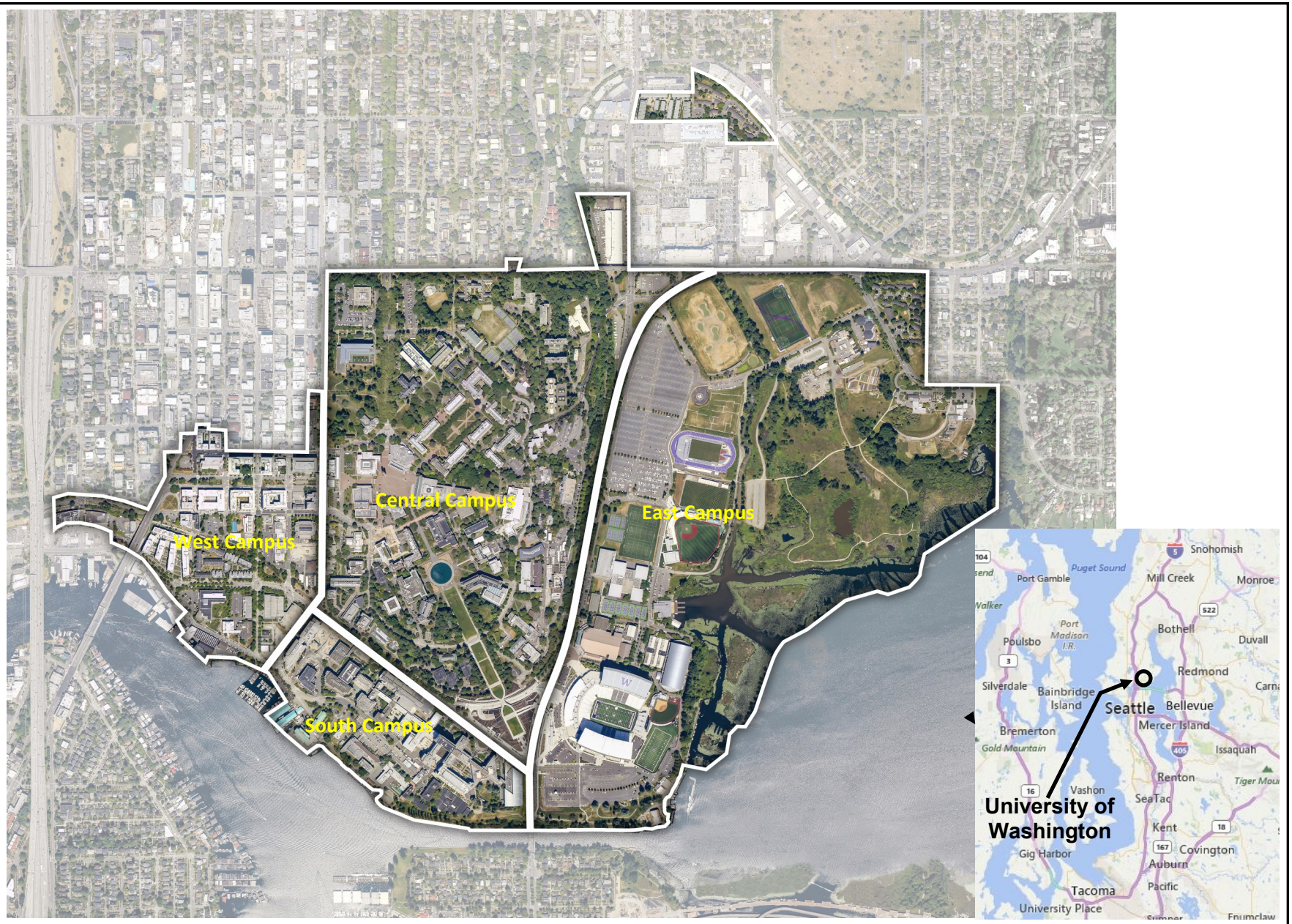
The University of Washington has three campuses – the original campus in Seattle, a Tacoma campus and a Bothell campus. This master plan is for the University of Washington's Seattle campus, which is located in northeast Seattle (see **Figure 2-1**).

The Seattle campus encompasses an area of approximately 639 acres[1]. As shown in **Figure 2-2**, the north-south boundaries of the campus extend approximately one mile, essentially from NE 45th Street on the north to Portage Bay and Lake Washington Ship Canal on the south. The University's east-west boundaries extend approximately 1.5 miles, from 6th Avenue NE on the west (between the University Bridge and the I-5 Ship Canal Bridge) to Union Bay and 35th Avenue NE to the east.

2.2 PROJECT SUMMARY

The Proposed Action is a new master plan for the University of Washington's Seattle campus. As described in detail in **Chapter 3** of this Draft EIS (Historic and Cultural Resources), the University has an approximately 125-year tradition of campus master planning at the Seattle campus. Each of the previous master plans that have been prepared for the University over this timeframe have influenced campus decision-making in terms of the siting of buildings, location of open space, and provision of circulation systems.

[1] The boundaries of the University of Washington Seattle campus contain approximately 639 acres, which includes properties owned by the University of Washington, public rights-of-way and properties not owned by the University. The University of Washington owns approximately 579 acres within the campus boundaries; the balance is owned by the City of Seattle (streets rights-of-way and one property) and four other private property ownerships.



Source: Sasaki Associates, Inc. and Bing Maps, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-1
Vicinity Map

University of Washington 2018 Seattle Campus Master Plan
Draft Environmental Impact Statement

Source: University of Washington, 2015.

EA Engineering, Science, and Technology, Inc.

Figure 2-2

Campus Map

More recent master planning efforts have been directed by a City-University Agreement that was adopted in 1983 by the University of Washington Board of Regents and the Seattle City Council and subsequently updated; the Agreement is the GMA development regulation applicable to University development on campus. The Agreement also specifies that the master plan and EIS include boundaries surrounding the University identified as Primary and Secondary Impact Zones. The Agreement further indicates that the Primary and Secondary Impact Zones will be used to assess and monitor the direct, indirect and cumulative impacts resulting from all proposed University development (see **Figure 2-3**).

In 2003, the University of Washington Master Plan Seattle Campus (*CMP Seattle 2003*) was adopted. The *CMP Seattle 2003* includes guidelines and policies for developing up to three (3) million gross square feet (gsf) on the Seattle campus.[2] While a 10-year planning period was used in its formulation, the *CMP Seattle 2003* remains in effect until the development of the approved three million gsf is complete. As of 2015, approximately 2.8 million gsf of development has been developed under the *CMP Seattle 2003*.[3]

Consistent with the City-University Agreement, the University of Washington is proposing a new master plan to accommodate both the increase in the number of students, faculty and staff, as well as the continued growth in the areas of research and service on the Seattle campus through approximately 2028 (reflecting a 10-year planning horizon; although the master plan will remain in effect until all the authorized development is used). The Campus Master Plan guides development on the Seattle campus, and will include guidelines and policies for new development. An aim of the *2018 Seattle Campus Master Plan* is to maintain and enhance the mission of the University, its multiple important roles in undergraduate and professional education, and its dedication to research and public service. The scope of the *2018 Seattle Campus Master Plan* includes defining future planned open spaces, circulation patterns, building sites and campus physical capacity to accommodate growth necessary to fulfill the University's mission.

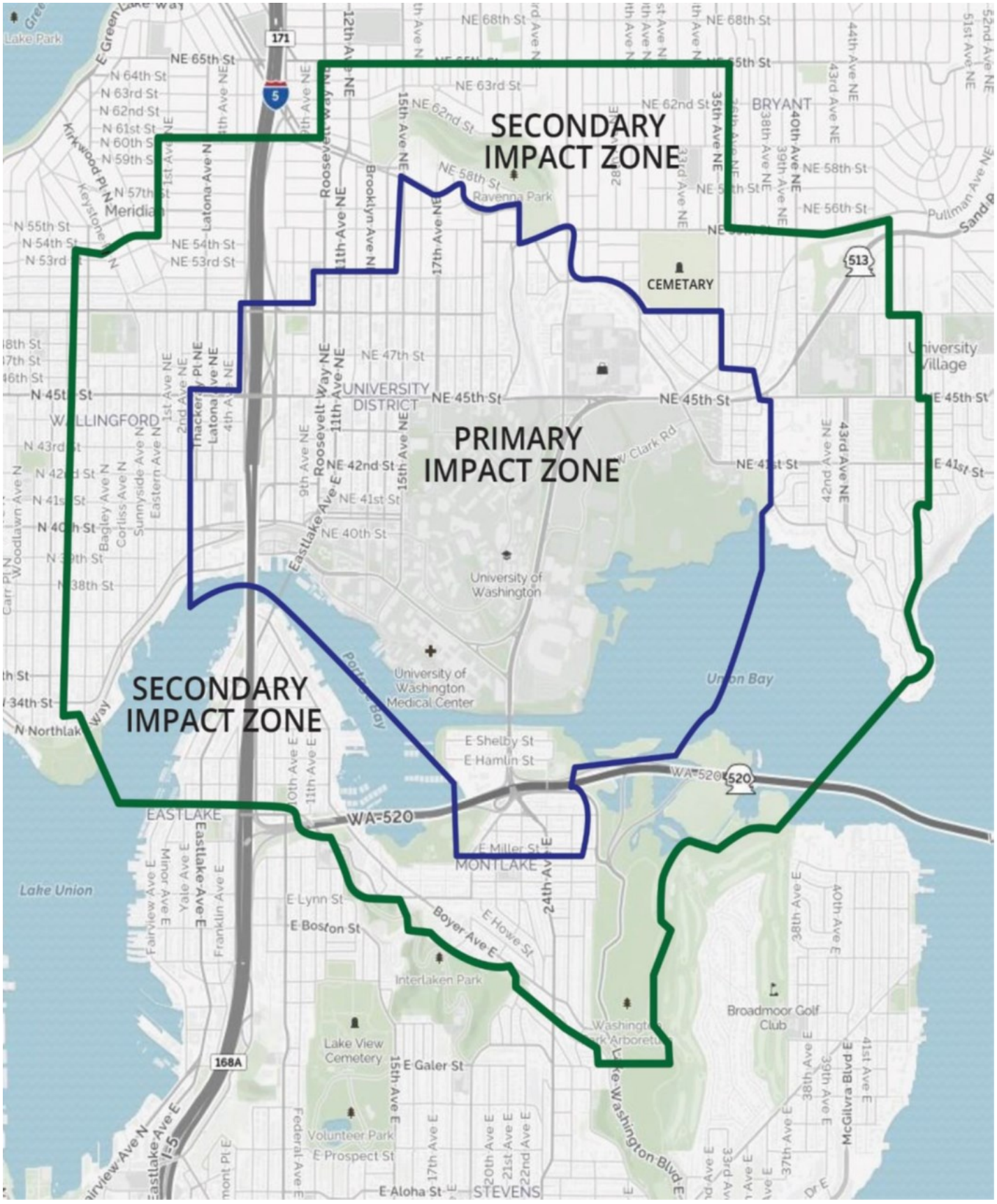
2.3 ENVIRONMENTAL REVIEW AND PURPOSE

Consistent with the provisions of the State Environmental Policy Act (SEPA) (RCW 43.21C and WAC 197-11-050) and the City-University Agreement, the University of Washington is serving as the lead agency under SEPA (WAC 478-324-010 through -230).

In October 2015, the University of Washington began the formal environmental review process for the *2018 Seattle Campus Master Plan*. As lead agency under SEPA, the University of Washington initiated the process by gathering public and agency input regarding specific topics and issues that should be analyzed as part of this EIS.

[2] The CMP Seattle 2003 identifies 68 development sites with approximately 8.2 million gsf of development capacity on the Seattle campus of which up to three million gsf was approved to be developed.

[3] The University of Washington will rely on the CMP Seattle 2003 until all of the proposed development is used.



Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-3

Surrounding Area Impact Zones Map

On October 5, 2015, the University of Washington issued a Determination of Significance and initiated the scoping process for this EIS. From October 5 through October 26, the University conducted the scoping comment period during which the public, public agencies and tribes were encouraged to provide input regarding the scope of the EIS. During the scoping period, 15 comment letters and emails were received. The University also held two public scoping meetings on October 14 and 15, during which three members of the public provided input.

Based in part on the input received during the scoping period, the scope of the EIS was defined by the University of Washington. The EIS scope was identified in the *Executive Summary of Public EIS Scoping Process*. The following environmental elements were identified for analysis in the EIS[4].

- *Earth*
- *Air Quality*
- *Water Resources*
- *Plants and Animals*
- *Energy and Natural Resources*
- *Environmental Health*
- *Land and Shoreline Use*
- *Population*
- *Housing*
- *Light, Glare and Shadows*
- *Aesthetics*
- *Recreation*
- *Historic Resources*
- *Cultural Resources*
- *Public Services/Utilities*
- *Transportation*

This EIS is intended to address the probable significant adverse impacts that could occur as a result of approval of the *2018 Seattle Campus Master Plan* by the University of Washington Board of Regents and the City of Seattle. A range of alternatives are analyzed in this EIS (see **Section 2.8** later in this chapter) that are intended, in part, to: **1)** encompass a range of focuses for campus development that can reasonably accommodate the projected building space needs; **2)** meet the identified master plan goals and objectives; and **3)** allow for the evaluation of conditions if certain identified *2018 Seattle Campus Master Plan* guiding principles and frameworks were not met (i.e., allowable building height increases). The alternatives function to provide representative levels and locations of campus development for analysis in this EIS. Although the location (i.e., the specific potential development sites) and timing of campus development under the *2018 Seattle Campus Master Plan* cannot be specifically defined, Alternative 1 matches the preferred distribution of building development in the 2018 *Seattle Campus Master Plan.*

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for

[4] Conditions associated with construction and operations of development under the EIS Alternatives are analyzed.

detail); the EIS includes detailed information and analysis through the use of sensitivity maps, transportation modeling, building massing simulations, etc.

As the SEPA lead agency, the University of Washington is responsible for ensuring SEPA compliance.

2.4 BACKGROUND

The following overview of the University of Washington includes a brief historical perspective of the campus; a description of enrollment/staffing; and, an overview of the master planning process.

History of the University of Washington Campus

The University of Washington was established by the State Legislature in 1861, as the first public university in the state. The campus was originally sited on a ten-acre parcel of land in what is now downtown Seattle. In 1895, the campus was moved to its present site, and Denny Hall, originally known as the Administration Building, was completed that year. The Observatory was also constructed nearby. A drill hall, gymnasium, dressing rooms, and two dormitories followed within the next four years. Meanwhile, the University Regents sought some type of campus plan to guide the location of future buildings. In 1898, engineering professor A.H. Fuller developed a plan known as the Oval Plan, which included only the northern portion of the university site. Remaining buildings from the 1890s include two early dormitories, later named Lewis and Clark Halls, in addition to Denny Hall and the Observatory. All four of these buildings are located in the north campus area.

In 1903, the Board of Regents hired the Olmsted Brothers, renowned landscape architects, to prepare a design for a general campus plan. However, this 1904 Olmsted Plan was never realized, and the present campus plan descends from the subsequent 1906 Olmsted Beaux-Arts design for the Alaska Yukon Pacific Exposition (AYP). Similar to other expositions that occurred around the turn of that century, the 1909 AYP was inspired by Chicago's Columbia Exposition of 1893, which influenced town planning and architectural design. The focus of Seattle's Exposition was to "showcase Seattle as an ambitious port city, an up-and-coming commercial center of the Pacific coast and a gateway to Alaska.

Looking south toward Rainier Vista, AYP Exposition, 1909.

Following AYP, the grounds reverted back to the University in 1909, providing the central axis of Rainier Vista and an emphasis on landscaping. Structures that were retained after the fair closed included Cunningham Hall, Architecture Hall, the Engineering Annex, the Forestry Building, Frosh Pond/Drumheller Fountain, and the statue of George Washington.

Henry Suzzallo was the University of Washington's fifteenth president with a tenure lasting eleven years (1915-1926). He worked closely with architect Carl Gould in the physical planning of the campus and its buildings. The Regents Plan of 1915, adopted during Suzzallo's first year as president, became the University's guiding planning document. It reaffirmed the Olmsted's AYP grounds while adapting a symmetry and formality in the design for the upper campus. The Regents Plan proposed grouping Liberal Arts programs on the upper campus, administrative and library facilities at its core on the Central Quadrangle, and the Science programs along Rainier Vista and the southern portion of Stevens Way. The plan placed Suzzallo Library clearly beside the intersecting axis from Liberal Arts Quadrangle and Rainier Vista, and the main axis of the Science Quadrangle. Major athletic facilities were later located along the eastern edge of the campus near Lake Washington. This plan served as the basis for subsequent construction, and set the Collegiate Gothic character for architectural design.

Following the Second World War, enrollment increased at the University of Washington with the influx of students who benefited from "G.I. Bill" college loans for war veterans. From a low of 5,200 during the war to 14,600 by 1950 and over 18,000 in 1960, these increases resulted in a great demand for inexpensive housing near the University. Single family homes were converted to boarding houses, and apartment buildings. In addition, dormitories were developed to further meet the need.

The increased enrollment also caused the University to expand beyond its original campus boundaries, especially in the light industrial and commercial district along the Portage Bay and Lake Union waterfront to the south and southwest of the main campus. The early residential and commercial neighborhood south of NE 45th Street and west of University Way NE also experienced the effects of expansion as the University began purchasing land in anticipation of future growth outlined in the revised campus plan of 1948. This plan recommended acquisitions in the area south of NE 41st Street to Portage Bay and west of 15th Avenue NE to the University Bridge. The plan also called for the development of the long-proposed formal west entry to the campus. Dedicated in 1950 and completed in 1953, NE Campus Parkway cut across the center of five blocks bounded by NE 41st Street on the north and NE 40th Street on the south and provided improved vehicle connections between the campus and the University Bridge.

Planning for the Magnuson medical complex began directly after World War II on the site of the former golf course and training facilities. In 1949, the University opened the Health Sciences Building, the first of the sprawling medical complex. In 1959, the University Hospital was opened. The complex was renamed the Magnuson Health Sciences Center in 1978.

Magnuson Health Sciences Center site, 1949

Buildings on the campus constructed after World War II were designed in a variety of Modern styles that emphasized new materials and expressive structural qualities. In the

1950s, a University Architectural Commission was established and a University architect appointed. Collegiate Gothic was replaced by modern architecture as the preferred style for new buildings. The 1962 General Development Plan was prepared by the University architect, with input from consultants including alumnus Paul Thiry.

While development in the southern campus was still sparse, the Northern Pacific Rail Road (NPRR), owners of the segment of line within the campus, continued heavy use of the line until 1963. The NPRR merged with two other railroad companies, Burlington and The Great Northern, in 1970. The new company, the Burlington Northern Railroad, abandoned the line that would become the Burke-Gilman Trail in 1971.

University of Washington Programs, Enrollment and Staffing

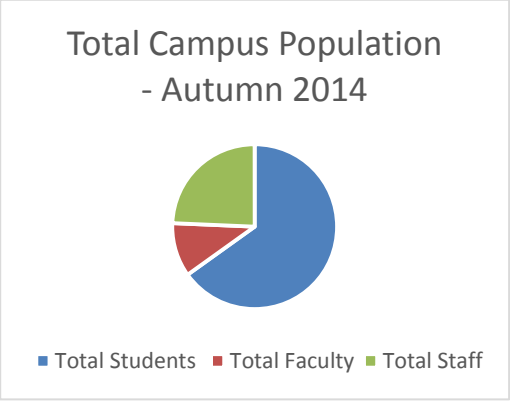
The University of Washington is a fully accredited, publicly-funded regional institution of higher education. The University's academic program is divided into 14 schools and colleges (containing approximately 125 academic departments and degree programs), which include:

- *College of Arts and Sciences*
- *College of Built Environments*
- *Foster School of Business*
- *School of Dentistry*
- *College of Education*
- *College of Engineering*
- *College of the Environment*
- *Evans School of Public Policy & Governance*
- *The Information School*
- *School of Medicine*
- *School of Nursing*
- *School of Pharmacy*
- *School of Public Health*
- *School of Social Work*
- *The Graduate School*

The University's Libraries system is one of the largest research libraries in North America, with over five million annual users. The Libraries system is comprised of Suzzallo, Odegaard and Allen Libraries, together with branch libraries.

As of 2014, the Seattle campus full-time equivalent (FTE) population was **67,155**, consisting of the following:

- **Total student enrollment – 43,724**
- **Total Staff – 16,324**
- **Total Faculty – 7,107**



The University of Washington is the oldest state institution of higher education on the West Coast, the largest university in the Pacific Northwest, and is consistently ranked as one of the top public universities in the nation. The University of Washington research budget consistently ranks among the top five in both public and private universities in the United States, and the University is one of the largest recipients of federal research funding. In addition, the University serves as a hub for cultural resources and events, and a recreational center for the community and the region.

University of Washington Master Planning Process

The following provides an overview of the University of Washington's existing and current master planning processes:

Existing Master Planning

- In 1983, a City-University Agreement was adopted by the University of Washington Board of Regents and the Seattle City Council that set out the process for the University to prepare a comprehensive master plan and EIS for future campus development. The Agreement specified that the master plan and EIS include boundaries surrounding the campus and Primary and Secondary Impact zones. Consistent with the 1983 Agreement, the University of Washington adopted the General Physical Development Plan in 1992.

- In 1998, a new, amended, City-University Agreement was adopted; the Agreement is the GMA development regulation applicable to University development on campus. The 1998 Agreement recognized that a substantial amount of growth was projected and that a new master plan would be prepared.

  Consistent with the 1998 City-University Agreement, the University of Washington initiated a master planning process, including visioning, establishment of goals and objectives and community outreach. In 2003, the University of Washington Master Plan Seattle Campus (*CMP Seattle 2003*) was adopted. The *CMP Seattle 2003* includes guidelines and policies for developing up to three (3) million gross square feet (gsf) on the Seattle campus[5]. While a 10-year planning period was used in its formulation, the *CMP Seattle 2003* remains in effect until the development of the authorized three million gsf is complete[6]. As of 2015, approximately 2.8 million gsf of development has been developed under the *CMP Seattle 2003*. Approximately 211,000 gsf of development capacity remains under the *CMP Seattle 2003*.

[5] The CMP Seattle 2003 identifies 68 development sites with approximately 8.2 million gsf of development capacity of which up to three million gsf would be developed.

[6] The University of Washington will rely on the CMP Seattle 2003 until all of the development capacity is used.

Along with authorizing development capacity, the *CMP Seattle 2003* established allowable building heights. As indicated in **Figure 2-4**, current allowable building heights under the *CMP Seattle 2003* are as follows:

- West Campus – 37 feet to 105 feet;
- South Campus – 37 feet to 240 feet; Central Campus – 50 feet to 160 feet; and,
- East Campus – 37 feet to 160 feet.

Current Master Planning

Since 2003, development on the University of Washington Seattle Campus has occurred under the *CMP Seattle 2003*. The University of Washington is now proposing a new master plan, the *2018 Seattle Campus Master Plan*, to account for projected growth on the Seattle campus, including enrollment growth, increased teaching and research demands, and needs of the University community. In preparation for the *2018 Seattle Campus Master Plan*, primary planning studies included:

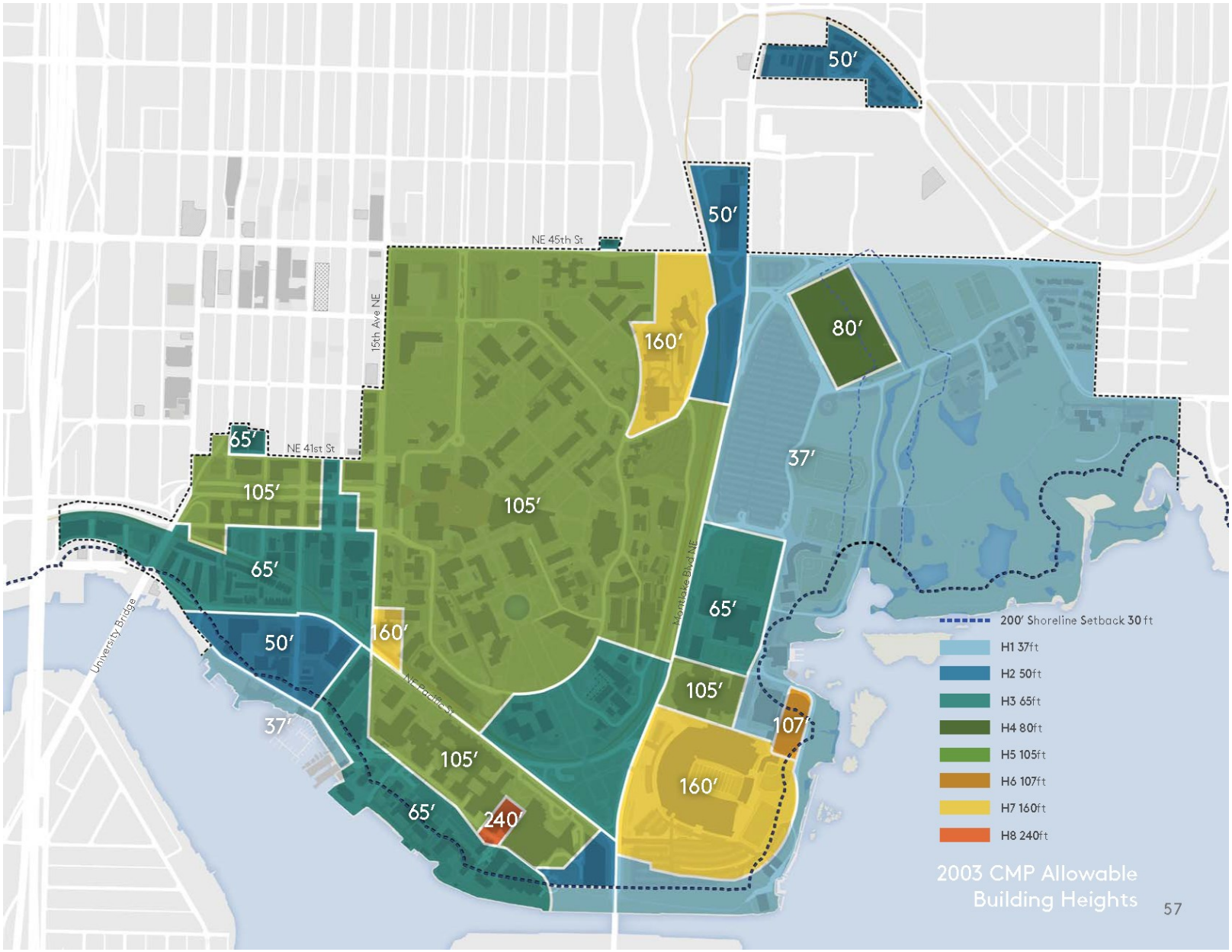
- South Campus Study: Phase II/Space Analysis (April 2015);
- West Campus Development Framework (April 2015);
- Campus Landscape Framework (June 2015); and,
- Campus Mobility Framework (in progress).

The *2018 Seattle Campus Master Plan,* which is published in conjunction with this EIS*,* addresses the need to conserve and enhance the valued historic environment on the Seattle campus while supporting future development to ensure the University's mission of "preservation, advancement, and dissemination of knowledge" is met. Major aspects of the plan include: planning for large areas of open space for active and passive recreation, providing transportation circulation improvements, and encouraging sustainability in the construction and operation of University facilities.

2.5 EXISTING SITE CONDITIONS

Existing Campus

The University of Washington Seattle campus extends slightly over one mile in a north-south direction and approximately 1.5 miles in an east-west direction, and encompasses approximately 639 acres within the campus boundary. Of the 639 acres of campus area, approximately 579 acres are owned by the University of Washington, approximately 60 acres are owned by other public entities (including land owned by the City of Seattle as street rights-of-way) and approximately three acres are in private ownership. Approximately 75 acres in the eastern portion of the campus consists of submerged land and unstable peat islands.



Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-4
Campus Master Plan Existing Building Height Map

The University of Washington Seattle campus reflects a variety of built and natural environments, including buildings, roads, paved and unpaved walkways, parking areas, landscaping, natural open space, and bulkhead and natural shoreline.

Seattle Campus Arial Map

Within the campus boundaries, the University of Washington has approximately 307 permanent and temporary buildings[7] that total an estimated 17 million gross square feet (gsf). These buildings vary in size from approximately 300 gsf to 500,000 gsf. They also vary in age from 121 years (Denny Hall and the Observatory) to the present. The buildings on campus contain University uses including: classrooms, research, manufacturing and fabrication, medical, athletic, housing and office uses.

The University of Washington currently (2015-16 academic year) maintains 19 student housing facilities on the Seattle Campus, including 11 residence halls and 8 student apartment buildings. The majority of the housing facilities are located in West Campus and Central Campus. In total, there are approximately 8,930 beds provided within the existing student housing facilities on campus, including 6,422 operating capacity single student beds and 2,508 family apartment beds.

The University of Washington campus is, in part, defined by significant landscaped open space. The existing primary significant landscapes identified in the *2018 Seattle Campus Master Plan* are listed below.

- Burke-Gilman Trail
- Center for Urban Horticulture
- Denny Field
- Denny Yard
- Drumheller Fountain
- Forest Resources Courtyard
- Grieg Garden
- Hansee Hall Courtyards
- HUB Yard
- Island Grove
- Liberal Arts Quad
- Medicinal Herb Garden
- Memorial Gateway
- Memorial Way
- Parrington Lawn
- Physics Courtyard
- Portage Bay Vista
- Rainier Vista
- Red Square
- Sakuma Viewpoint
- Sol Katz Memorial Garden
- Sylvan Theater
- Union Bay Natural Area
- Whitman Court/Woodland Walk

For descriptive and planning purposes, the campus has been divided into four (4) campus sectors (West, South, Central, and East Campus), as illustrated in **Figure 2-5** and described in **Table 2-1**. Each of these campus sectors is described further below.

[7] The University of Washington also operates approximately 0.7 million gsf of building area outside of the campus boundaries in the Primary and Secondary Impact zones.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-5
Campus Sector Map

TABLE 2-1
EXISTING CAMPUS SECTORS SUMMARY

Campus Sector	Acreage	Number of Buildings	Building GSF	Percent of Campus Building Total
West Campus	68	69	3,846,213	23%
South Campus	56	42	4,178,537	25%
Central Campus	227	111	7,153,521	43%
East Campus	288	85	1,461,961	9%
Total	**639**	**307**	**16,640,232**	

Source: University of Washington, 2016.

West Campus

The West Campus sector is generally bounded by NE 41st Street to the north, 15th Avenue NE to the east, NE Pacific Street to the south, and the University Bridge and Roosevelt Way NE to the west. This sector of campus has the strongest connection with the adjacent University District neighborhood and, as such, University uses reflect that relationship. University uses primarily include classrooms and administrative uses, as well as several recently constructed student housing buildings. Instructional and administrative uses are generally located south of NE Pacific Street and along 15th Avenue NE and University Way NE. Student housing uses are generally located west of University Way NE and north of NE Pacific Street.

South Campus

The South Campus sector is bounded by NE Pacific Street to the north, Montlake Boulevard NE to the east, Portage Bay to the south, and 15th Avenue NE to the west. This sector is generally characterized by development associated with the University of Washington Medical Center and the Magnuson Health Sciences Center; instructional uses, including William H. Foege Hall, Hitchcock Hall and the Ocean Sciences Building, are also located near 15th Avenue NE. To the south of Columbia Road, the sector also includes administrative and research uses, as well as shoreline open space and piers associated with the University's Oceanography and Marine Sciences programs.

Central Campus

The Central Campus sector represents the original core and surrounding perimeter of the University of Washington campus, and is generally bounded by NE 45th Street to the north, Montlake Boulevard NE to the east, NE Pacific Street to the south, and 15th Avenue NE to the west. The sector is comprised of numerous significant buildings, including instructional and research buildings (i.e., Denny Hall, Architecture Hall, Bagley Hall, Parrington Hall, etc.);

Denny Hall

administrative buildings (i.e., Gerberding Hall, the UW Club); student housing (i.e., McMahon Hall, Hansee Hall, etc.); and student support uses (i.e., Suzzallo Library, Odegaard Library, the HUB, etc.). It is also characterized by several important open spaces, including: the Liberal Arts Quadrangle, Denny Yard, Memorial Way, Rainier Vista, the HUB Yard, Parrington Lawn, and the Central Plaza (Red Square).

East Campus

The East Campus sector is generally bounded by NE 45th Street to the north, Union Bay to the east, the Lake Washington Ship Canal to the south, and Montlake Boulevard NE to the west. The character of East Campus is primarily defined by athletic facilities/recreational uses, surface parking and open space/natural areas. Development is primarily located in the south portion of the sector, along Montlake Boulevard NE, and includes Husky Stadium, Alaska Airlines Arena, the Intermural Activities Building, the golf driving range, and several sports fields; the existing E1 parking area also comprises a large portion of the area along Montlake Boulevard NE. Instructional and research uses are located along the eastern boundary of the area, as well as student housing (Laurel Village) and the Union Bay Natural Area.

Surrounding Area

The University of Washington campus is situated in a designated Urban Center, the University Community Urban Center. Urban Centers are unique areas of concentrated employment and housing with direct access to high-capacity transit, and a wide range of supportive uses. The area surrounding the campus contains a variety of single-family and multifamily residential, as well as commercial, educational, service and semi-industrial uses. The University of Washington is a dominant land use in the area.

The land use pattern of the area surrounding the University of Washington campus is reflective of both natural and built features. The primary natural features in the area are Union Bay, Portage Bay and the Lake Washington Ship Canal that form the southern and eastern boundaries of the campus. These waterways also separate the University of Washington campus, the University District and the Laurelhurst neighborhood from the communities to the south (Montlake, Broadmoor and Capitol Hill neighborhoods). The neighborhoods to the north of the Ship Canal and Portage Bay (University of Washington, University District and Laurelhurst) are connected to the neighborhoods to the south (Montlake, Broadmoor and Capitol Hill) by the Montlake Bridge and University Bridge.

University Way NE

Prominent built features that influence the land use character of the area consist primarily of transportation routes, including Interstate 5 (I-5) and State Route 520. Interstate 5, the major north/south vehicular travel corridor west of Lake Washington, effectively separates

the communities in the vicinity of the University of Washington on the east side of I-5 from the communities of Wallingford, Fremont and Green Lake on the west side of I-5. State Route 520, a major east/west vehicle travel corridor across Lake Washington, provides an additional separation between the areas immediately north and south of the Ship Canal and Portage Bay. The Sound Transit U District Light Rail Station on Brooklyn Avenue NE between NE 43rd Avenue and NE 45th Avenue is currently under construction with opening anticipated in 2021. The Station is also anticipated to influence the land use character of the area.

Area Adjacent to West Campus

The area adjacent to the West Campus sector is generally characterized by retail/commercial uses within the University District neighborhood, including retail shops/restaurants, offices, churches, multifamily residences, and hotels. Due to its proximity to the University of Washington campus and the amount of street-level retail, the area maintains an active streetscape environment, particularly during the daytime hours. Buildings in the area generally range from one to four stories in height, with several high-rise structures such as the 22-story UW Tower, the 14-story Hotel Deca, and several multifamily residential structures ranging from 7 to 11 stories.

Area Adjacent to South Campus

Immediately to the south of the South Campus sector is the Lake Washington Ship Canal and Portage Bay. Further to the south are SR 520 and the Montlake Bridge, and Montlak, Broadmoor, and Madison Park neighborhoods, which are primarily comprised of low density single family residences. Several parks are located in this area, including the Washington Park Arboretum, Montlake Park and Playground, Interlaken Park, Louisa Boren Park and Volunteer Park; the Broadmoor Golf Club is also located in the area.

Montlake Bridge

Area Adjacent to Central Campus

The area to the north of the Central Campus sector, is primarily comprised of residential uses, including multifamily apartment buildings, fraternity and sorority houses, and single family residences (many of which are rented to University of Washington students). Several churches are also located within this area, including the University Presbyterian Church, the University Congregational United Church of Christ, the University Christian Church, and the Prince of Peace Catholic Newman Center. Buildings in this area are generally two to four stories in height. To the north/northeast of the Central Campus sector is the University Village shopping center which includes retail and restaurant uses and structured parking; additional commercial uses (retail, hotels, offices, etc.) are also located surrounding the shopping center. Buildings are generally two to five stories in height in this area.

Area Adjacent to East Campus

The area to the east of the East Campus sector includes Lake Washington/Union Bay and the Laurelhurst neighborhood. The Laurelhurst neighborhood generally consists of low density single family residences and park uses (Laurelhurst Park and Laurelhurst Community Center). Buildings in this area are generally two to three stories in height.

Primary and Secondary Impact Zones

Primary and secondary impact zones are identified in the City-University Agreement and the Agreement indicates that these zones are to be utilized to assess and monitor direct, indirect, and cumulative impacts from all University development (refer to **Figure 2-3** for a map illustrating the Primary and Secondary Impact Zones). The University of Washington campus is centrally located within the **Primary Impact Zone**. Other existing land uses within the Primary Impact Zone include retail/commercial uses, multifamily residential uses (generally associated with the University District area), and I-5 in the western portion of the Primary Impact Zone (adjacent to the West Campus sector and west of 15th Avenue NE). The northern portion (adjacent to Central Campus and north of NE 45th Street) is generally comprised of residential uses (multifamily apartment buildings, fraternity/sorority houses and single family residences) and commercial uses (University Village area). The eastern portion (adjacent to the East Campus sector) consists of Lake Washington/Union Bay and the Laurelhurst neighborhood. The southern portion of the Primary Impact Zone (south of the Montlake Cut) generally consists of the Montlake neighborhood and SR-520.

Existing land uses in the western portion of the **Secondary Impact Zone** (west of I-5) are generally comprised of single family/multifamily residential uses, with some retail/commercial and industrial uses adjacent to Lake Union. The northern portion (generally north of NE 55th Street) consists of single family/multifamily residential uses, retail/commercial uses and Ravenna Park. The eastern portion (generally east of 35th Avenue NE) is comprised of the Laurelhurst neighborhood (including Children's Hospital, and retail/commercial uses along Sand Point Way NE). The southern portion of the Secondary Impact Zone (generally south of Portage Bay and SR-520) is comprised of single family/multifamily residential uses, Montlake Park, the Washington Park Arboretum and retail/commercial uses (primarily near Eastlake Avenue.

2.6 MISSION STATEMENT AND PROJECT GUIDING PRINCIPLES (OBJECTIVES)

The following presents the overall mission statement of the University of Washington and the guiding principles of the *2018 Seattle Campus Master Plan*.

Mission Statement

The primary mission of the University of Washington is the preservation, advancement, and dissemination of knowledge.

Guiding Principles

As indicated earlier in this chapter, the University of Washington is proposing a new master plan to accommodate both the anticipated increased growth in the number of students, faculty and staff, as well as the continued growth in the areas of research and service over the 10-year planning horizon (through approximately 2028; although the 2018 Seattle Campus Master Plan would remain in effect until all the proposed development authorized is used). The University of Washington has identified the following Guiding Principles for the proposed *2018 Seattle Campus Master Plan*.

- **Flexible Framework** – Create a lasting and flexible planning framework to identify potential development sites and development guidelines and standards in support of the University of Washington's education, research and service missions.

- **Learning-Based Academic and Research** – Support and catalyze academic and research partnership with allied industries, contribute to a highly livable innovation district, and stimulate job growth and economic development.

- **Sustainable Development** – Extend University of Washington's commitment to sustainable land use to maximize the utilization of its existing property and balance development with public spaces.

- **Connectivity** – Extend the University of Washington's commitment to better connect the University internally and with its broader context.

- **Stewardship of Historic and Cultural Resources** – Continue responsible and proactive stewardship of University of Washington's campus assets through preservation of its historic and cultural resources and managed strategy of property development.

- **City-University Agreement** – Prepare a Master Plan consistent with the City-University Agreement, including addressing the following areas:

  - *MIO Boundary.*
  - *Non-Institutional Zones.*
  - *Height and location of Existing Facilities.*
  - *Existing and Proposed Open Space.*
  - *General Land Use and Location of Proposed Development.*
  - *Institutional Zone/Development Standards.*
  - *Existing and proposed Circulation Network.*
  - *Transportation Management Plan.*
  - *Future Energy and Utility Needs.*
  - *Alt. Proposals for Physical Development.*
  - *Proposed Development Timetable.*
  - *Proposed Street, Alley and Aerial Vacations.*

The Guiding Principles form the basis for the Master Plan Frameworks, which are described in detail in the Draft *2018 Seattle Campus Master Plan*. These principles are broad guidelines that are reflected in the various Master Plan Frameworks, including: Public Realm, Circulation and Parking, Built Environment, Sustainability, Innovation, and Utilities. Refer to the *2018 Seattle Campus Master Plan* for detail on the frameworks.

2.7 PROPOSED ACTION(S)

Introduction

As described earlier in this chapter, consistent with the City-University Agreement, the University of Washington is proposing the *2018 Seattle Campus Master Plan* to guide development on the Seattle campus. The *2018 Seattle Campus Master Plan* is being formulated to maintain and enhance the mission of the University, its multiple important roles in undergraduate and professional education, and its dedication to research and public service.

To accommodate both the increase in the number of students, faculty and staff, as well as the continued growth in the areas of research and service, it has been determined that an additional six (6) million gsf of net new development[8] will be required during the 10-year planning horizon.

The long-range growth potential of the Seattle Campus was a fundamental starting point for the master planning process. Through this process, a total of 85 potential development sites were identified with a development potential of approximately 12.9 million gsf of net new development. However, during the 10-year planning horizon of the Campus Master Plan, the University would only build a total of six (6) million net new gsf (assuming funding is available) to meet the anticipated growth in demand for building space; thus, only a portion of the identified 85 potential development sites would be developed. Identification of specific sites and phasing to accommodate the six million net new gsf would be determined through the University's annual capital planning and budgeting process.

In summary, the Proposed Action is a new Campus Master Plan for the University of Washington's Seattle Campus. Consistent with the current City-University Agreement, the proposed *2018 Seattle Campus Master Plan* is intended to accommodate both the increase in the number of students, faculty and staff, as well as accommodate the evolving nature of instruction and continued growth in the areas of research and service. Among other items, the proposed *2018 Seattle Campus Master Plan* includes provisions for the following:

- **Guiding Principles** – Principals to guide campus conservation and development during the plan planning horizon, which is expected to be the 10-year period

[8] Net increase over existing gsf (i.e., net increase does not include new development replacing an equivalent amount of demolished space).

between 2018 and 2028, or until the six (6) million gsf of campus development capacity is used. See the list of Guiding Principles provided earlier in this chapter.

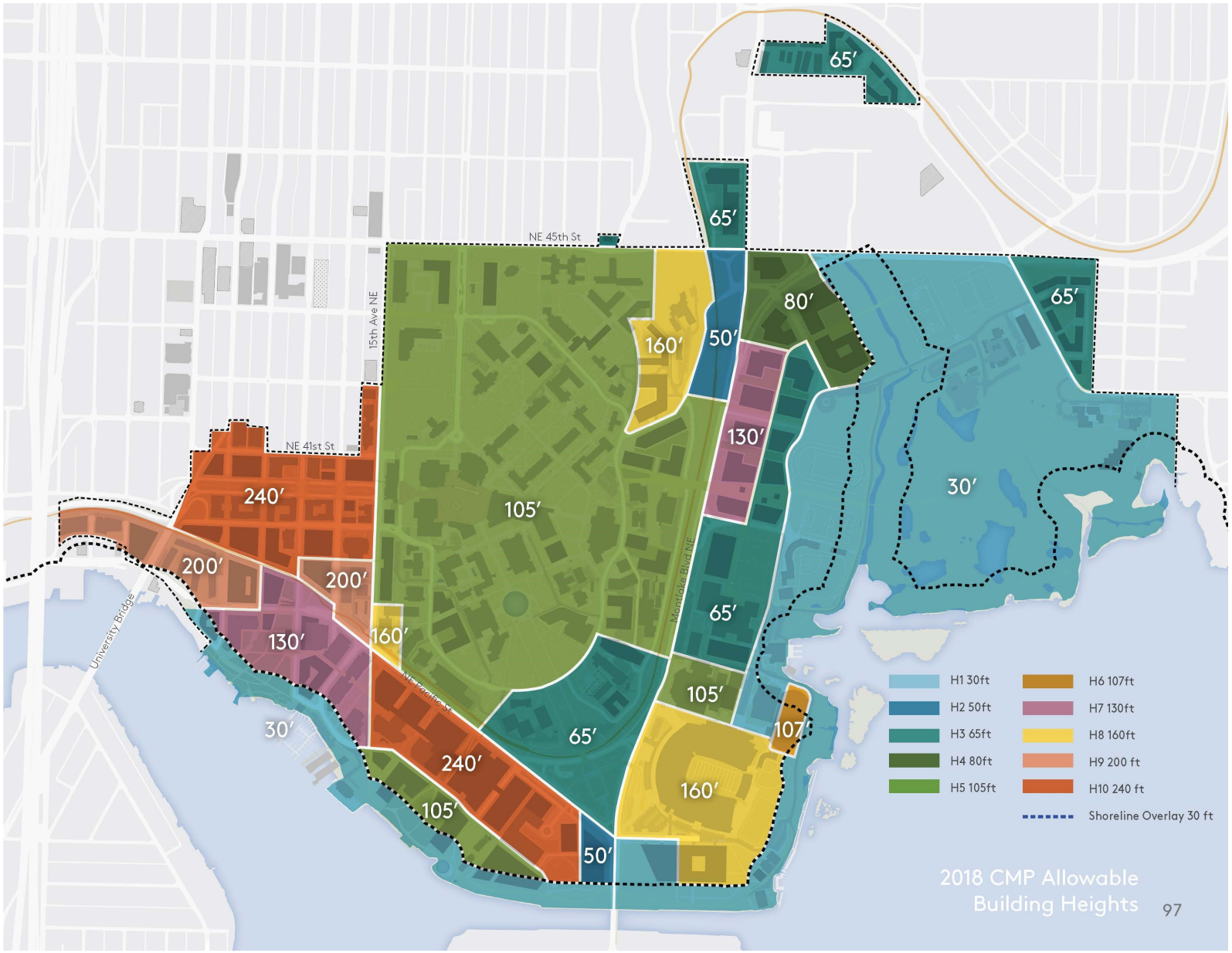
- **Maximum Allowable Building Heights** – The *2018 Seattle Campus Master Plan* identifies 10 building height zones that range from 30 feet along the shoreline to 240 feet in portions of the West and South Campus sectors (see **Figure 2-6**). The proposed maximum building height limits for Central Campus maintain the existing *CMP 2003 Seattle* heights, while the proposed maximum heights in portions of the South, West and East Campus sectors are increased to support diversity of functions.

- **Potential Development Sites** - The *2018 Seattle Campus Master Plan* identifies 85 potential development sites throughout campus (see **Figure 2-7**). As indicated in **Table 2-2**, 18 potential development sites are located in West Campus, 20 potential development sites are located in South Campus, 20 potential development sites are located in Central Campus,[9] and 27 potential development sites are located in East Campus. As also indicted in **Table 2-2**, full development of all potential development sites would result in a total of approximately 12.9 million gsf of net new building development capacity[10] on the Seattle Campus, with approximately 3.2 million gsf of building capacity in West Campus, approximately 2.9 million gsf of building capacity in South Campus; approximately 2 million gsf of building capacity in Central Campus; and, approximately 4.7 million gsf of building capacity in East Campus.

- **Proposed Building Development –** As indicated above, the proposed *2018 Seattle Campus Master Plan* identifies a total of 85 potential development sites with a total development capacity of approximately 12.9 million gsf of net building area. To meet the anticipated growth for building space during the assumed 10-year planning horizon of the Campus Master Plan, the University would need to build a total of six (6) million net new gsf, and only a portion of the identified 85 potential development sites would be developed. Identification of specific sites and phasing to accommodate the six million net new gsf would be determined through the University's annual capital planning and budgeting process. As SEPA lead agency, the University of Washington is responsible for ensuring SEPA compliance for future projects as they are proposed.
- **Open Space Opportunities** – The *2018 Seattle Campus Master Plan* includes the identification of areas reserved for potential new open spaces, including:

    - <u>*West Campus Green*</u> – The *2018 Seattle Campus Master Plan* includes provisions to allow for a new approximately five (5)-acre West Campus Green that would tie into the existing two (2)-acre Portage Bay Park, and would connect the West Campus sector and the University District to the waterfront. The vacation of a

[9] Three of the identified Potential Development Sites in Central campus (Sites C5, C6 and C15) are currently approved as projects and their square footage has been accounted for in the 2003 CMP total development capacity.
[10] Net increase over existing gsf (i.e. new building development minus demolished space).



Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-6
Campus Master Plan Proposed Building Height Map

Note: This map represents a conceptual plan for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific project locations.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-7

2018 Seattle Campus Master Plan Potential Development Sites

Table 2-2
2018 SEATTLE CAMPUS MASTER PLAN POTENTIAL DEVELOPMENT SITES

CENTRAL CAMPUS

	Site Description	Total GSF	Demolish GSF	Total Net GSF	Prop. Zoning
C1	West of Memorial Way / N1 Parking Lot	200,000	68,916	131,084	105
C2	East of Memorial Way / N5 Parking Lot	190,000		190,000	105
C3	Mackenzie Replacement / N3 Parking Lot	150,000	43,099	106,901	105
C4	Intellectual House Phase 2	5,000		5,000	105
C5	North Campus Housing 1 (Building A)	105,000		105,000	105
C6	North Campus Housing 2 (Building E) / Haggett Hall Site / N9, 10, 11 Prk. Lots	270,000	206,114	63,886	160
C7	McMahon Hall Site / N13, 14, 15 Parking Lots	400,000	288,352	111,648	160
C8	Padelford Garage North Site / N16, 18, 20, 21	245,000	138,555	106,445	105
C9	Padelford Hall South Site	155,000		155,000	105
C10	Padelford Garage South Site	145,000		145,000	105
C11	Facility Serv. Admin Bldg / Uni. Facilities Bldg & Annex 1	90,000	20,125	69,875	105
C12	Plant Op Annexes 2-6 / University Facilities Annex 2 / C23 Parking Lot	115,000	18,860	96,140	105
C13	Sieg Hall Replacement	130,000	57,180	72,820	105
C14	Mechanical Eng / Eng Annex / C15 Parking Lot	225,000	125,896	99,104	105
C15	CSE II Building / More Annex / Plant Op Annex 7	140,000	10,676	129,324	65
C16	Wilcox / Wilson Ceramics Lab Site / Wilson Annex	60,000	50,328	9,672	65
C17	Benson Hall / C7 Parking Lot	230,000	76,271	153,729	105
C18	Chem Library Site	95,000	39,363	55,637	105
C19	Guthrie Annexes 1, 2 and 3 Site	240,000	19,310	220,690	105
C20	South of Henry Art Gallery	35,000		35,000	105
	TOTAL	**3,225,000**	**1,163,045**	**2,061,955**	

WEST CAMPUS

	Site Description	Total GSF	Demolish GSF	Total Net GSF	Prop. Zoning
W21	Schmitz Hall Site	360,000	99,691	260,309	240
W22	Staff / HR Building Site	40,000	10,831	29,169	240
W23	Condon Hall Site	390,000	132,533	257,467	240
W24	W41 Parking Lot Site	170,000		170,000	240
W25	W42 Parking Lot / Henderson Hall Site	250,000	106,340	143,660	240
W26	W10 Parking Lot	390,000		390,000	240
W27	Child Care / Brooklyn Trail /SW Maintenance / W11 Parking Lot	305,000	23,497	281,503	240
W28	CDC / Ethnic Cultural Center Theater Site	410,000	32,999	377,001	240
W29	Purchasing Accounting / W12, 13 Parking Lots	305,000	39,576	265,424	200
W30	West of Commodore Duchess Site	40,000		40,000	240
W31	Stevens Court East (A, B, C, H) / W29 Parking Lot	195,000	79,104	115,896	130
W32	Stevens Court West (D, J, K, L, M) / W32, 33 Parking Lots	440,000	138,340	301,660	200
W33	W35 Parking Lot Site Pavilion	20,000		20,000	130
W34	Wallace Hall Pavilion/ Marine Studies/ Fish Teaching & Research	15,000	96,546	-81,546	130
W35	Ocean Research 2 / NOAA / W24, 28 Parking Lots	240,000	11,267	228,733	130
W36	Portage Bay Parking Garage Wrapper	65,000		65,000	130
W37	Fisheries Parking Lot (PUDA)	95,000		95,000	130
W38	Northlake Building / W40 Parking Lot Site	310,000	22,077	287,923	200
	TOTAL	**4,040,000**	**792,801**	**3,247,199**	

SOUTH CAMPUS

	Site Description	Total GSF	Demolish GSF	Total Net GSF	Prop. Zoning
S39	SCSII B	100,000		100,000	240
S40	SCSII C / Hitchcock Hall Site	310,000	116,416	193,584	240
S41	SCSII D / J Wing	415,000	170,719	244,281	240
S42	SCSII E / I Wing and G Wing	290,000	215,620	74,380	240
S43	SCSII F / T Wing	315,000	493,496	-178,496	240
S44	SCSII G / A Wing and C Wing	360,000	101,489	258,511	240
S45	SCSII H	370,000		370,000	240
S46	SCSII I / F Wing	160,000	122,767	37,233	240
S47	SCSII J / D Wing	320,000	183,975	136,025	240
S48	SCSII K / B Wing	350,000	117,619	232,381	240
S49	SCSII L / RR Wing, BB Wing, SW Wing	505,000	454,692	50,308	240
S50	SCSII M / Ocean Teaching / S5, S6 Parking Lot	105,000	51,552	53,448	105
S51	SCSII N / S1 Parking Garage	240,000		240,000	105
S52	SCSII O / Harris Hydraulics Lab / South Campus Center / S7, S12	130,000	92,785	37,215	105
S53	SCSII P	315,000		315,000	105
S54	SCSII Q / Portage Bay Bldg / Oceanography Bldg, Dock, & Shed / S8 Prk. Lot	145,000	128,712	16,288	105
S55	SCSII R / CHDD Clinic and School / S9 Parking Lot	395,000	115,943	279,057	105
S56	SCSII S / CHDD South Building	25,000	12,378	12,622	30
S57	SCSII T / NN Wing	395,000	122,217	272,783	240
S58	SCSII U / EA Wing and EB Wing	465,000	275,885	185,115	240
	TOTAL	**5,710,000**	**2,776,265**	**2,933,735**	

EAST CAMPUS

	Site Description	Total GSF	Demolish GSF	Total Net GSF	Prop. Zoning
E59	South of the WAC	10,000		10,000	30
E60	Pavilion Pool Site	60,000	27,045	32,955	105
E61	Tennis Court Site	150,000		150,600	65
E62	Tennis Court Site West of IMA Field	290,000		290,000	65
E63	E18 Parking Lot - SW Site	215,000		215,000	130
E64	E1 Site 1	100,000		100,000	65
E65	E1 Site 2	320,000		320,000	130
E66	E1 Site 3	105,000		105,000	65
E67	E1 Site 4	255,000		255,000	130
E68	E1 Site 5	100,000		100,000	65
E69	E1 Site 6	310,000		310,000	130
E70	E1 Site 7	145,000		145,000	65
E71	E1 Site 8	290,000		290,000	130
E72	E1 Site 9	180,000		180,000	65
E73	E1 Site 10	190,000		190,000	80
E74	Golf Driving Range Site North	370,000		370,000	80
E75	Golf Driving Range Site South	330,000		330,000	80
E76	E2 Parking Lot Site	160,000		160,000	80
E77	Plant Services Site / N26 Parking Lot	270,000	144,198	125,802	65
E78	Blakeley Village West	105,000	84,390	20,610	65
E79	Blakeley Village East	120,000		120,000	65
E80	Laurel Village North	95,000	88,536	6,464	65
E81	Laurel Village Central	220,000		220,000	65
E82	Laurel Village South	30,000		30,000	65
E83	Ceramic and Metal Arts	90,000	16,946	73,054	30
E84	Urban Horticulture Site	80,000		80,000	30
E85	E12 Parking Lot	480,000		480,000	160
	TOTAL	**5,070,000**	**361,115**	**4,708,885**	

portion of NE Boat Street is identified to increase the connectivity between the West Campus Green and Portage Bay Park.

- *South Campus Green Corridor* – The *2018 Seattle Campus Master Plan* includes provisions to allow for a new open space located between the existing Magnuson Health Sciences Center pedestrian bridge over NE Pacific Street and Portage Bay. Associated with the redevelopment strategy for the South Campus sector, the Green Corridor would enhance the existing pedestrian bridge and visually and spatially connect South and Central Campus Areas to the waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the Continuous Waterfront Trail on the south.

- *East Campus Land Bridge* – The *2018 Seattle Campus Master Plan* includes provisions to allow for a land bridge across Montlake Boulevard NE connecting the HUB to the existing E1 parking lot. The Bridge would enhance connection between the Central and East Campus Areas and the Union Bay Natural Area. The land bridge is envisioned as a pedestrian pathway connecting active ground floor uses in the Central and East Campus sectors.

- *Continuous Waterfront Trail* – The *2018 Seattle Campus Master Plan* includes provisions to allow for an approximately 2.5-mile Continuous Waterfront Trail following the University's shoreline (Portage Bay, Ship Canal and Union Bay) and connecting the Portage Bay/ potential West Campus Green on the west to the Union bay natural area on the east. The trail would provide numerous connections to the waterfront and other open spaces, including Sakuma Viewpoint, proposed South Campus Event Lawn, Hospital Glade, Waterfront Activity Center, and the Union Bay Natural Area.

- **Transportation System Improvements** - The *2018 Seattle Campus Master Plan* includes the identification of future potential transportation system improvements including

  - Additional opportunities for improvements to modes of travel to and from the University;
  - Pedestrian, bicycle and vehicular circulation improvements;
  - Maintaining the current 12,300 parking space cap (replacement parking would be calibrated with demand as development is planned) and,
  - Maintaining an AM and PM single occupant vehicle cap.

- **Street, Alley and Aerial Vacations** – The *2018 Seattle Campus Master Plan* identifies potential future street, alley and aerial vacations that may occur during the planning horizon of the Master Plan. All of the vacations are potential; none are imminent and development under the Master Plan could occur without the vacations (refer to the Alternative 5 analysis presented in **Chapter 3** of the Draft EIS for analysis of

campus development without the identified vacations). The Master Plan indicates that the vacations are intended to create a better campus design and improve open spaces and improve circulation conditions. The vacations are not intended to increase development capacity. Each of the potential future vacations are included in the Master Plan for disclosure and SEPA compliance purposes and are intended to identify the range of alternatives that may be pursued during the life of the plan; no petitions or applications are pending.

At such time as a specific vacation is proposed, a vacation petition package would be prepared[11]. The petition package would identify opportunities for public participation with regard to the vacation, traffic/circulation analysis, utilities analysis, project-specific design, landscape plans, and identification of public benefits that could be derived from the proposed vacation. Once finalized, the petition package to vacate the street would be submitted to the City of Seattle, consistent with City of Seattle ordinances and procedural guidelines. No Master Plan amendment would be required unless a vacation proposal is made which is outside the range of alternatives discussed in the *2018 Seattle Campus Master Plan* and in this EIS.

The following lists the vacations that may occur during the planning horizon of the Master Plan.

- *Street Vacation* – NE Boat Street west of Brooklyn Avenue NE. This vacation is identified to allow the City of Seattle Portage Bay Park to merge with the potential West Campus Park to the north, allowing the creation of a large continuous park from the water to NE Pacific Street.

- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE. This vacation is identified to allow for improved layout of Potential Development Sites.

- *Aerial Vacation* – Montlake Boulevard NE to allow for the potential East Campus Land Bridge, an ADA-accessible bridge to East Campus sector development from the E1 parking lot.

- **Development Standards** - Chapter 6 of the *2018 Seattle Campus Master Plan* identifies proposed modifications and/or clarifications concerning applicable development standards and the University's internal review process (design and environmental) for development that is contemplated on campus to meet anticipated growth. A list of the Development Standards addressed in the *2018 Seattle Campus Master Plan* is provided below. For a detailed discussion on each of

[11] *SEPA compliance for street and aerial vacation petitions consistent with the 2018 Seattle Campus Master Plan is provided by this EIS.*

the proposed Development Standards, see **Section 3.7** Land Use – Relationship to Plans and Policies) of this Draft EIS.

- Boundaries
- Demolitions
- Development
- Gross Square Footage
- Historic Preservation
- Leasing and Acquisitions
- Light and Glare
- Modulation
- Noise
- Odors
- Parking
- Review Process
- Setbacks
- Shorelines
- Signs and Banners
- Structure Height
- Telecommunications Equipment
- Temporary Facilities and Uses
- Transportation
- Trees
- Uses

2.8 EIS ALTERNATIVES

EIS Alternatives Summary

As indicated earlier in this chapter, the proposed *2018 Seattle Campus Master Plan* identifies a total of 85 potential development sites with a total development capacity of approximately 12.9 million gsf of net building area. To meet the anticipated growth for building space during the 10-year planning horizon of the Campus Master Plan, the University would need to build a total of six (6) million net new gsf and only a portion of the identified 85 potential development sites would be developed. Identification of specific sites and phasing to accommodate the six (6) million net new gsf would be determined through the University's annual capital planning and budgeting process. As SEPA lead agency, the University of Washington is responsible for ensuring SEPA compliance for future projects as they are proposed.

As background, previous University of Washington's master plans prior to 2003 attempted to define specific projects and timelines; however, this approach resulted in a mismatch between master plan assumptions and actual development proposals, requiring the need for numerous plan amendments. To address the inefficiencies associated with this approach, the *CMP Seattle 2003* did not match specific projects to specific sites on a specific timeline. This Campus Master Plan continues this approach.

In order to conduct a comprehensive environmental review, five development alternatives (the Action Alternatives) and a No Action Alternative have been developed for analysis in this EIS. The No Action Alternative is intended to reflect conditions on the Seattle campus if no new master plan were to be approved, and improvements to address increased campus student, faculty and staff populations were not implemented.

Alternative 1 reflects the *2018 Seattle Campus Master Plan* assumptions regarding the preferred allocation of future development that would be consistent with the guiding principles and frameworks defined by the University of Washington for the campus. The *2018 Seattle Campus Master Plan* proposes increases in the allowable building height limits in the West, South and East Campus sectors, and these height increases are assumed under Alternative 1. Although the timing and location (specific potential development sites) of campus development cannot be specifically defined, Alternative 1 matches the preferred allocation of building development in the *2018 Seattle Campus Master Plan*.

Alternative 2 is intended to reflect a level of campus development generally reflected under the *2018 Seattle Campus Master Plan* with retention of the existing building height limits (i.e., building height limits under the *2003 CMP*). This alternative does not match the guiding principles and some of the frameworks for the campus set out in the *2018 Seattle Campus Master Plan*.

Alternative 3 and 4 represent campus development distribution reflecting increased density beyond that assumed under Alternative 1 in certain campus sectors consistent with provisions identified in the *2018 Seattle Campus Master Plan* for allowing increased density to be allocated in certain campus sectors while maintaining the overall amount of net new development for the campus.

Alternative 5 is intended to highlight conditions with campus development without proposed street and aerial vacations.

None of the alternatives involve changes to the University's existing MIO boundary. See **Table 2-2** for a summary of the range of development assumption under the EIS Alternatives.

The EIS Alternatives are formulated to create an envelope of potential development scenarios (without having specific building plans) and allow for the analysis of probable significant environmental impacts under SEPA. As indicated above, the alternatives analyzed in this EIS include:

- ***No Action Alternative*;**
- **Alternative 1** – *CMP Proposed Allocation with Requested Height Increases* ;
- **Alternative 2** – *Campus Development with Existing Height Limits*;
- **Alternative 3** – *Campus Development Reflecting Increased West and South Campus Density*;
- **Alternative 4** – *Campus Development Reflecting Increased West and East Campus Density; and,*

- **Alternative 5 –** *No Street, Alley and Aerial Vacations*.

Alternatives 1, 3, 4 and 5 reflect implementation of the *2018 Seattle Campus Master Plan* overall frameworks for campus development and improvements to meet anticipated increased demands associated with growth in student, faculty and staff populations over the 10-year planning horizon of the master plan. Alternative 2 reflects development to meet anticipated demand but without the requested allowed height increases, which would not meet certain *2018 Seattle Campus Master Plan* frameworks (including Public Realm and Built Environment Frameworks). The No Action Alternative reflects conditions with no master plan. The overall development assumptions under the EIS Alternatives are summarized in **Table 2-3** and include: **1)** campus population growth; **2)** total potential development sites; **3)** total development capacity associated with 85 sites; **4)** assumed level of building development; **5)** identified open space opportunities; **6)** street, alley and aerial vacations; **7)** maintaining parking cap; and, **8)** maximum building height limit increases.[12]

No Action Alternative

Under the No Action Alternative it is assumed that the demand for increased instructional, research and public service needs in the state of Washington would continue. However, this Alternative would not result in the physical improvements that are proposed as part of the *2018 Seattle Campus Master Plan* (as analyzed under Alternatives 1 through 5), including the addition of six (6) million net new gsf of on-campus building development; potential improvements to open space, vehicle/pedestrian/bicycle circulation and parking improvements would also not occur. It is anticipated that the approximately 211,000 gsf of remaining campus building capacity under the *2003 Seattle CMP* would be developed, which would accommodate approximately four (4) percent of anticipated demand for building space over the 10-year planning horizon of the *2018 Seattle Campus Master Plan*.

This alternative would not meet the University's Guiding Principles.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 represents a level of development and improvements on the University of Washington campus deemed sufficient to meet the forecasted growth in student, faculty and staff over the 10-year planning horizon of the master plan, including six (6) million gsf of net new building development. Alternative 1 reflects the Guiding Principles and Planning Frameworks of the *2018 Seattle Campus Master Plan*, including the Built Environment Framework proposed allowable building heights. Alternative 1 also matches the preferred allocation of building development in the *2018 Seattle Campus Master Plan,* and reflects

[12] Height increases proposed for the West, South and East campus areas; Master Plan conditions with and without the height increase in West Campus analyzed under Alternative 1.

TABLE 2-3
SUMMARY OF EIS ALTERNATIVES ASSUMPTIONS

	No Action Alternative	**Alternative 1** ***CMP Proposed Allocation with Requested Height Increases***	**Alternative 2** ***Campus Development with Existing Height Limits***	**Alternative 3** ***Campus Development Reflecting Increased West and South Campus Density***	**Alternative 4** ***Campus Development Reflecting Increased West and East Campus Density***	**Alternative 5** ***No Street, Alley or Aerial Vacations***
10-year Population Growth	*422*	*13,324*	*13,324*	*13,324*	*13,324*	*13,324*
Potential Dev. Sites	*0*	*85*	*88*	*85*	*85*	*85*
Total Dev. Capacity (gsf[13])	211,000[14]	12.9 million	12.9 million	12.9 million	12.9 million	12.9 million
Assumed Dev. (gsf)	211,000[14]	6 million *3.0 West* *1.35 South* *0.9 Central* *0.75 East*	6 million *2.4 West* *1.35 South* *0.9 Central* *1.35 East*	6 million *3.2 West* *1.65 South* *0.9 Central* *0.25 East*	6 million *3.0 West* *0.2 South* *1.1 Central* *1.7 East*	6 million (*Same as Alts. 1 and 2*)
New Open Space Opportunities (acres)	0	9	4	9	9	4-9
Street/Aerial Vacations	0	3	3	3	3	0
Maintain Parking Cap	Yes	Yes	Yes	Yes	Yes	Yes
Building Height Limit Increase	No	Yes	No	Yes	Tes	Yes

Source: University of Washington, 2016.

[13] In net new building space
[14] Remaining building capacity under CMP Seattle 2003.

development of the six (6) million gsf of net new development throughout the campus as follows:

- West Campus: 3.0[15] million gsf
- South Campus: 1.35[6] million gsf
- Central Campus: 0.9[6] million gsf
- East Campus: 0.75 million gsf

Under Alternative 1, the allowable building heights on the campus would be amended as follows:

- West Campus - from the current 37 to 105 feet[16] to a range from 30 feet to 240 feet[17].
- South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased;
- Central Campus – the current 50 foot to 160 foot range would be maintained[18]; and
- East Campus – the current 37 foot to 160 foot[19] range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet.

The increase in allowable building height is intended to allow for a level of building development on the Seattle campus sufficient to meet forecasted population growth, allow for area reserved for proposed open space improvements (including the planned West Campus Green and other open spaces), allow for view corridors, allow for pedestrian-scaled streetscape, and allow for building heights reflecting potential future development in the University District.

Figure 2-8 illustrates Alternative 1 development with proposed building height increases.

As indicated in **Table 2-2** and illustrated in **Figure 2-7**, a total of 85 potential development sites have been identified on the University of Washington Seattle campus, with a development capacity of approximately 12.9 million gsf of net new development[20]. This amount of development is based on the proposed allowable height limits and assumed building footprint associated with each site; new construction that is located below-grade or new construction replacing an equivalent amount of building demolition is not included in the development total.

[15] Net increase over existing gsf (i.e., net increase does not include new development replacing an equivalent amount of demolished space).
[16] Maximum building height limit of 37 feet along the shoreline to 105 feet in the area north of NE 40th Street.
[17] Maximum limit of 30 feet along the shoreline to 240 feet in the area north of NE Pacific Street.
[18] The height limit in the area of Central Campus located north of NE 45th Street would increase from 50 feet to 65 feet.
[19] The current 160-foot allowable height is primarily limited to Husky Stadium.
[20] I.e., development of all 85 potential sites to the maximum extent identified would total the 12.9 million gsf of net new building space.

Although 12.9 million gsf of net new building development capacity is available in the 85 potential development sites, the *2018 Seattle Campus Master Plan* identifies an increase of six (6) million net new gsf beyond existing development[21] will be required to meet the anticipated growth in demand for building space during the 10-year planning horizon of the master plan. As illustrated in **Figure 2-8**, under Alternative 1 the majority of new building development would occur in the West Campus and South Campus sectors, with more limited development in the Central Campus and East Campus sectors.

Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Master Plan* would be preserved and up to nine (9) acres would be reserved for potential new primary open spaces. New open spaces would include:

- West Campus Green, an approximately 5-acre area in West Campus;
- South Campus Green, an approximately 3-acre area in South Campus;
- East Campus Land Bridge, an approximately 1-acre area in East Campus; and,
- Additional plazas and landscaped area associated with certain individual development projects would be created.

The existing parking cap of 12,300 parking spaces would remain unchanged, all new parking would be provided to replace spaces lost due to construction remaining within the 12,300 space cap. As development is planned, the University of Washington would annually monitor the need for parking replacement and identify the appropriate locations.

The following provides Alternative 1 development assumptions for each campus sector.

West Campus

New Building Development

Approximately 3.0 million gsf of net new development, representing 50 percent of the total six million gsf of net new development anticipated to be needed to meet the forecasted growth in demand for development, would be provided by the West Campus sector under Alternative 1. Development of 3.0 million gsf of net new development would require development of approximately 94 percent of the approximately 3.2 million gsf of net new development capacity identified for West Campus. Depending on the potential development sites developed to achieve 3.0 million gsf of net new development, up to approximately 800,000 gsf of existing building space could be demolished.

Consistent with the *2018 Seattle Campus Master Plan*, Alternative 1 assumes that the maximum building height limits would be increased in West Campus from the current range

[21] Existing development consists of existing buildings plus the approximately 211,000 gsf of building area capacity remaining under the 2003 CMP.

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-8

Alternative 1 —Conceptual Campus Plan and Massing

of 30 to 105 feet to the proposed range of 30 to 240 feet; the assumed maximum building height assumed would be highest north of NE Pacific Street, and would step down to the south toward Portage Bay. As illustrated in **Figure 2-8,** the increase in maximum building height limit in West Campus is intended to allow for the 3.0 million gsf of net new development to be accommodated by compact higher density development balanced with public open spaces. This building height increase is also intended to allow for development on fewer potential development sites allowing for the accommodation of room for planned open space improvements like the West Campus Green and other public spaces, staggered towers to allow view corridors and light access, and podiums (up to three-stories) with towers set back above to provide pedestrian-scaled streetscapes.

Open Space

The primary open space opportunity identified for West Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 is the West Campus Green, an approximately 5-acre open space that would tie into the existing 2-acre Portage Bay Park. This open space would connect the West Campus sector and the University District to the waterfront.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

Circulation and Parking – Circulation and parking improvements identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for West Campus includes the following vehicular, bicycle and pedestrian improvements.

Vehicular	
	• Removal of UW NE Cowlitz Road
	• Extensions of 11th and 12th Avenues
Bicycle	
	• Connection between West Campus Green and Burke-Gilman Trail
	• Improved bike parking facilities
Pedestrian	
	• Mid-block connections south of Gould Hall
	• Walkways adjacent to West Campus Green
	• Improvements along NE Campus Pkwy
	• Mid-block connector east from West Campus Green

Street, Alley and Aerial Vacations – Street, alley and aerial vacations identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for West Campus includes:

- *Street Vacation* – NE Boat Street west of Brooklyn Avenue NE. This vacation would allow the City of Seattle Portage Bay Park to merge with the planned West Campus Green to the north, allowing opportunity for the creation of a large continuous park from the water to NE Pacific Street.

- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE. This vacation would allow for improved layout of Potential Development Sites.

South Campus

New Building Development

Approximately 1.35 million gsf of net new development, representing approximately 23 percent of the total six (6) million gsf of development anticipated to be needed to meet the forecasted growth in demand for development, would be provided by the South Campus sector under Alternative 1. Development of 1.35 million gsf of net new development would require development of approximately 47 percent of the approximately 2.9 million gsf of net new development capacity identified for South Campus. An approximately 3-acre area would be reserved for the potential South Campus Green Corridor open space.

Because South Campus is a highly developed area (including the University of Washington Medical Center and Magnuson Health Sciences Center) a substantial amount of demolition of existing buildings would be required. Depending on the potential sites developed to achieve 1.35 million gsf of net new development, up to approximately 2.8 million gsf of existing building space could be demolished.

Open Space

The primary open space opportunity identified for South Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 is the South Campus Green Corridor, an approximately 3-acre open space located between the existing Magnuson Health Sciences Center pedestrian bridge over NE Pacific Street and Portage Bay. The South Campus Green Corridor is intended to enhance the existing pedestrian bridge, and visually and spatially connect the South and Central Campus sectors to the waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the proposed Continuous Waterfront Trail on the south.

Transportation

Circulation and Parking – Circulation and parking improvements identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for South Campus includes the following vehicular, bicycle and pedestrian improvements.

Vehicular	
	• Removal of UW NE San Juan Road
	• New UW roadway connection between NE Columbia/NE Pacific
	• Enhanced access for Marine Sciences from NE Columbia Road
Bicycle	
	• Improved bike parking facilities
Pedestrian	
	• Connection between Central Campus & waterfront along South Campus Lawn
	• Connection along Continuous Waterfront Trail

Street, Alley and Aerial Vacations – There are no street, alley or aerial vacations identified in the *2018 Seattle Campus Master Plan* for South Campus and Alternative 1 assumes no vacations.

Central Campus

New Building Development

Approximately 0.9 million gsf of net new development, representing approximately 15 percent of the total six (6) million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by Central Campus under Alternative 1. Development of 0.9 million gsf of net new development would require development of approximately 45 percent of the approximately 2.0 million gsf of net new development capacity identified for Central Campus. Depending on the Potential Development Sites developed to achieve the 0.9 million gsf of net new development, up to approximately 1.1 million gsf of existing building space could be demolished in Central Campus.

Open Space

Central Campus represents the historic core of the University of Washington, and contains many of the most important open spaces on campus. The primary open space concept identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 is the preservation and incorporation of primary open spaces in Central Campus such as Memorial

Way, Rainier Vista, Liberal Arts Quad, Parrington Lawn, Denny Yard, Denny Field, HUB Lawn and Greg Garden.

Central Campus access to the Union Bay Natural Area in East Campus would also be enhanced by the construction of the potential East Campus Land Bridge across Montlake Boulevard NE.

Transportation

Circulation and Parking – Circulation and parking improvements identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for Central Campus include the following vehicular, bicycle, and pedestrian improvements.

Bicycle	
	• Improved bike parking facilities
Pedestrian	
	• Connection between Central Campus & waterfront along South Campus Lawn
	• Connection between Central Campus and East Campus via East Campus Land Bridge

Street, Alley and Aerial Vacations – There are no street, alley or aerial vacations identified in the *2018 Seattle Campus Master Plan* for Central Campus and Alternative 1 assumes no vacations.

East Campus

New Building Development

Approximately 0.75 million gsf of net new development, representing approximately 13 percent of the total six (6) million gsf of development anticipated to be needed to meet the anticipated growth in demand for building space, would be provided by the East Campus sector under Alternative 1. Development of 0.75 million gsf of net new development would require development of approximately 16 percent of the approximately 4.6 million gsf of net new development capacity identified for East Campus. Given the relatively undeveloped nature of East Campus, and the relatively small amount of development assumed, little to no building demolition in East Campus is anticipated under Alternative 1.

Open Space

The primary open space opportunity identified for East Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 is the potential East Campus Land Bridge which would include approximately one acre of open space area. The East Campus Land

Bridge would enhance connection between the Central and East Campus sectors, including connection to the Union Bay Natural Area in East Campus.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

Circulation and Parking – Circulation and parking improvements identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for East Campus include the following vehicular, bicycle and pedestrian improvements.

Vehicular	
	• New roadway linking Montlake Boulevard NE with Walla Walla Road
	• New internal road network at Laurel Village
Bicycle	
	• Improved bike parking facilities
Pedestrian	
	• Connection associated with the East Campus Land Bridge
	• Connection between Golf Driving Range and IMA

Street, Alley and Aerial Vacations – Street, alley and aerial vacations identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 for East Campus include:

- *Aerial Vacation* – Montlake Boulevard NE. This vacation would allow an ADA accessible land bridge to East Campus sector development at E1.

This alternative would meet the University's Guiding Principles.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 is intended to reflect a level and distribution of preferred campus development allocation reflected under the *2018 Seattle Campus Master Plan* with retention of the existing allowable building heights (i.e., allowable building heights under the *CMP Seattle 2003*). As discussed below, without the requested increase in allowable building height, the preferred allocation of campus development presented in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1 cannot be achieved.

Under Alternative 2 the existing CMP Seattle 2003 allowable building heights would be retained as follows:

- West Campus – retention of the current 37 to 105 feet range;
- South Campus – retention of the current 37 foot to 240 foot range;
- Central Campus – retention of the current 50 foot to 160 foot range; and,
- East Campus – retention of the current 37 foot to 160 foot range.

Without the requested increase in allowable building heights, the identified potential development sites would not provide the capacity to achieve the preferred allocation of building development identified in the *2018 Seattle Campus Master Plan* and evaluated under Alternative 1. For example, without the increased allowable building height in the West Campus sector, the overall development capacity in that Sector would total 2.4 million gsf of net new development compared to the approximately 3.2 million gsf of net new development capacity identified in the *2018 Seattle Campus Master Plan*. Therefore, allocation of 3.0 million gsf evaluated under Alternative 1 cannot be achieved and the 0.6 million gsf of net new development not accommodated in the West Campus sector would be transferred to East Campus under Alternative 2. The allocation of campus development under Alternative 2 is as follows (see **Figure 2-9**):

- West Campus: 2.4 million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 1.35 million gsf

Under Alternative 2 it is assumed that the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved, as assumed under Alternative 1. Without the proposed *2018 Seattle Campus Master Plan* proposed increase in allowable building heights assumed under Alternative 1, however, area reserved for certain potential new primary open spaces would not be accommodated, including the approximately 5-acres reserved for the West Campus Green. Under Alternative 2, a total of 4 acres would be assumed to be reserved for planned open space across all campus sectors compared to 9 acres assumed under Alternative 1. Potential new open spaces assumed under Alternative 2 include:

- South Campus Green, an approximately 3-acre area in South Campus;
- East Campus Land Bridge, an approximately 1-acre area in East Campus; and,
- Additional plazas and landscaped area associated with certain individual development projects.

Alternative 2 is presented in this EIS to allow for an analysis of environmental conditions without the proposed increase in allowable building heights, and to allow for a comparison with the environmental conditions with the proposed increase in allowable building heights

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-9

Alternative 2 —Conceptual Campus Plan and Massing

presented in Alternative 1. Alternative 2 would not meet certain *2018 Seattle Campus Master Plan* frameworks (including Public Realm and Built Environment Frameworks) and would not meet the University's Guiding Principles.

The following provides Alternative 2 development assumptions for each campus sector.

West Campus

New Building Development

Approximately 2.4 million gsf of net new development, representing 40 percent of the total six (6) million gsf of net new development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the West Campus sector under Alternative 2. Development of 2.4 million gsf of net new development would require development of 17 potential development sites (representing 100 percent of the approximately 2.4 million gsf of net new development capacity identified for the West Campus Sector with retention of existing allowable building height) compared to development of 14 potential development sites to achieve three (3) million gsf of net new development under Alternative 1 with proposed allowable building height increase. Approximately 800,000 gsf of existing building space is assumed to be demolished to achieve the 2.4 million gsf of net new development.

Figure 2-9 illustrates how the 2.4 million gsf of net new building development in West Campus could be accomplished without the proposed increase in allowable building heights. As indicated in **Figure 2-9**, providing 2.4 million gsf of net new development under the current 30 to 105 foot building height limits would require development of more potential development sites than with the proposed *2018 Seattle Campus Master Plan* allowable building height increases assumed under Alternative 1, resulting in the corresponding loss of potential for the creation of the West Campus Green and other public open spaces. The potential for view corridors and pedestrian-scaled streetscape would also be less than with the proposed *2018 Seattle Campus Master Plan* height increases assumed under Alternative 1.

Open Space

In order to achieve the 2.4 million gsf of net new developemt in West Campus under existing allowable building height, the area reserved for the primary open space opportunity in West Campus assumed under Alternative 1 (the approximately 5-acre West Campus Green) would be developed as buildings and would not be reserved for open space. The ability of this open space to connect the West Campus sector and the University District to the waterfront would not be available under Alternative 2.

As under Alternative 1, the Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus is assumed.

Transportation

Circulation and Parking – Circulation and parking improvements identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 2 for West Campus would be similar to those assumed under Alternative 1 and include the following vehicular, bicycle and pedestrian improvements.

Vehicular	
	• Removal of UW NE Cowlitz Road
	• Extensions of 11th and 12th Avenues
Bicycle	
	• Connection between West Campus Park and Burke-Gilman Trail
	• Improved bike parking facilities
Pedestrian	
	• Mid-block connections south of Gould Hall
	• Improvements along NE Campus Pkwy
	• Mid-block connector east from West Campus Green

Street, Alley and Aerial Vacations – The *2018 Seattle Campus Master Plan* identified street vacation associated with NE Boat Street to allow for a large continuous park with Portage Bay Park is not assumed. Street, alley and aerial vacations identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 2 for West Campus include:

- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE. This vacation would allow for improved layout of Potential Development Sites.

South Campus

New Building Development

As under Alternative 1, Alternative 2 assumes the development of 1.35 million gsf of net new development would be provided by the South Campus sector, representing approximately 23 percent of the total 6 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space. Development of 1.35 million gsf of net new development would require development of approximately 47 percent of the approximately 2.9 million gsf of net new development capacity identified for South Campus. An approximately 3-acre area would be reserved for the potential South Campus Green Corridor open space.

As indicated in **Figure 2-9**, providing 1.35 million gsf of net new development under the current allowable building height limits would require development of the same number of potential development sites as proposed in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1. However, achieving the 1.35 million gsf of net new development while retaining the current allowed building heights in South Campus under Alternative 2 would provide little to no ability for building modulation or building setbacks, and less potential to provide pedestrian-scaled streetscapes.

Open Space

As identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1, Alternative 2 assumes reservation of 3 acres of the South Campus Green Corridor and the establishment of the Continuous Waterfront Trail.

Transportation

South Campus vehicular, bicycle and pedestrian improvements under Alternative 2 would be the same as under Alternative 1. As under Alternative 1, no street, alley or aerial vacations are assumed for South Campus under Alternative 2.

Central Campus

The amount of net new development and allowable building heights in Central Campus assumed under Alternative 2 are the same as assumed under Alternative 1. New building development, open space and transportation features under Alternative 2 are therefore the same as described under Alternative 1.

East Campus

New Building Development

As indicated earlier, the building area assumed under Alternative 1 that is not able to be accommodated in West Campus with retention of current allowable building heights under Alternative 2 is assumed to be transferred to East Campus.

Approximately 1.35 million gsf of net new development, representing approximately 23 percent of the total six (6) million gsf of net new development anticipated to be needed to meet the anticipated growth in demand for building space, would be provided by the East Campus sector under Alternative 2. Development of 1.35 million gsf of net new development would require development of approximately 42 percent of the approximately 3.2 million gsf of net new building space capacity identified for East Campus with current allowable building heights. Given the relatively undeveloped nature of East Campus, little

to no building demolition in East Campus would be anticipated under Alternative 2 in East Campus.

Open Space

The primary open space opportunity identified for East Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 2 is the East Campus Land Bridge which would include approximately one acre of open space area. The East Campus Land Bridge would also be intended to enhance connection between the Central and East Campus sectors, including connection to the Union Bay Natural Area in East Campus.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

East Campus vehicular, bicycle, pedestrian improvements and aerial vacation under Alternative 2 would be the same as under Alternative 1.

This alternative would not achieve certain 2018 Seattle Campus Master Plan frameworks (including Public Realm and Built Environment Frameworks) and would not meet the University's Guiding Principles.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. This density under Alternative 3 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and South Campus Sectors, as follows:

- West Campus: 3.2 million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

The proposed increase in allowable building heights in the West, South and East Campus sectors, as assumed under Alternative 1, are assumed under Alternative 3.

As illustrated in **Figure 2-10**, under Alternative 3 the majority of new building development would occur in the West Campus and South Campus sectors, with more limited development in the Central Campus and East Campus sectors.

Similar to that assumed under Alternative 1, under Alternative 3 the existing significant landscaped open spaces identified in the *2018 Seattle Master Plan* would be preserved and up to nine (9) acres would be reserved for potential new primary open spaces. Plans for new open spaces would include:

- West Campus Green, an approximately 5-acre area in West Campus;
- South Campus Green, an approximately 3-acre area in South Campus;
- East Campus Land Bridge, an approximately 1-acre area in East Campus; and
- Additional plazas and landscaped area associated with certain individual development projects.

The following provides Alternative 3 development assumptions for each campus sector.

West Campus

New Building Development

Approximately 3.2 million gsf of net new development, representing 53 percent of the total six million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the West Campus sector under Alternative 3. Development of 3.2 million gsf of net new development would require development of 100 percent of the approximately 3.2 million gsf of net new development capacity identified for West Campus. Approximately 800,000 gsf of existing building space is assumed to be demolished.

As under Alternative 1, the assumed increase in allowable building height would permit the 3.2 million gsf of net new development to be accommodated by compact higher density development balanced with areas reserved for public open spaces. This building height increase is also intended to allow for development on fewer potential development sites allowing room for potential open space improvements like the West Campus Green and other public spaces, staggered towers to allow view corridors and light access, and podiums (up to three-stories) with towers set back above to provide pedestrian-scaled streetscapes.

Open Space

The primary open space opportunity identified for West Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 3 is the West Campus Green, an

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-10

Alternative 3 —Conceptual Campus Plan and Massing

approximately 5-acre open space that would tie into the existing 2-acre Portage Bay Park. This open space would also act to connect the West Campus sector, and the University District, to the waterfront.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

West Campus vehicular, bicycle, pedestrian improvements and street vacations assumed under Alternative 3 would be the same as those assumed under Alternative 1.

South Campus

New Building Development

Approximately 1.65 million gsf of net development, representing approximately 28 percent of the total six (6) million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the South Campus sector under Alternative 3. Development of 1.65 million gsf of net new development would require development of approximately 57 percent of the approximately 2.9 million gsf of net new development capacity identified for South Campus. An approximately 3-acre area would be reserved for the potential South Campus Green Corridor open space.

Because South Campus is a highly developed area (including the University of Washington Medical Center and Magnuson Health Sciences Center) a substantial amount of demolition of existing buildings would be required. Depending on the potential sites developed to achieve 1.65 million gsf of net new development, up to approximately 2.8 million gsf of existing building space could be demolished, the same as under Alternative 1.

Open Space

As under Alternative, the approximately 3-acre area located between the existing Magnuson Health Sciences Center pedestrian bridge over NE Pacific Street and Portage Bay would be retained for the South Campus Green Corridor. The South Campus Green Corridor is intended to enhance the existing pedestrian bridge, and visually and spatially connect South and Central Campus sectors to the waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the proposed Continuous Waterfront Trail on the south.

Transportation

South Campus vehicular, bicycle, pedestrian improvements assumed under Alternative 3 would be the same as those assumed under Alternative 1. As under Alternative 1, no street, alley or aerial vacations are assumed for South Campus under Alternative 3.

Central Campus

Given that the amount of new building development and allowable building heights in Central Campus assumed under Alternative 3 are the same as assumed under Alternative 1, new building development, open space and transportation features under Alternative 3 would be as described under Alternative 1.

East Campus

New Building Development

Compared to Alternative 1, substantially less building development is assumed for East Campus under Alternative 3.

Approximately 0.25 million gsf of net new development, representing approximately 4 percent of the total six (6) million gsf of development anticipated to be needed to meet the anticipated growth in demand for building space, would be provided by the East Campus sector under Alternative 3. Development of 0.25 million gsf of net new development would require development of approximately 5 percent of the approximately 4.6 million gsf of net new development capacity identified for East Campus. Given the relatively undeveloped nature of East Campus, and the relatively small amount of development assumed, little to no building demolition in East Campus would be anticipated under Alternative 3.

Open Space

As under Alternative 1, the primary open space opportunity identified for East Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 3 is the East Campus Land Bridge which would include approximately one acre of open space area. The East Campus Land Bridge would also be intended to enhance connection between the Central and East Campus sectors, including connection to the Union Bay Natural Area in East Campus.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

Vehicular, bicycle and pedestrian circulation improvements for East Campus under Alternative 3 would be assumed under Alternative 1. As under Alternative 1, Alternative 3 assumes the aerial vacation over Montlake Boulevard NE for the proposed East Campus Land Bridge.

This alternative would meet the University's Guiding Principles.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 represents a focus of development in the West and East Campus sectors, with more density than assumed under Alternative 1 in the Central and East Campus sectors. This increased density in the Central and East Campus sectors would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing density to be transferred between campus sectors while maintaining the overall six (6) million gsf of net new development for the campus during the planning horizon. Alternative 4 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and East Campus sectors, as follows:

- West Campus: 3.0 million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf
- East Campus: 1.7 million gsf

The proposed increase in allowable building heights in the West, South and East Campus sectors, as assumed under Alternative 1, are assumed under Alternative 4.

As illustrated in **Figure 2-11**, under Alternative 4 the majority of new building development would occur in the West Campus, Central Campus and East Campus sectors, with more limited development in the South Campus sector.

Similar to under Alternative 1, under Alternative 4 the existing significant landscaped open spaces identified in the *2018 Seattle Master Plan* would be preserved and up to nine (9) acres would be reserved for potential new primary open spaces. Plans for new open spaces would include:

- West Campus Green, an approximately 5-acre area in West Campus;
- South Campus Green, an approximately 3-acre area in South Campus;
- East Campus Land Bridge, an approximately 1-acre area in East Campus; and

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

Figure 2-11

Alternative 4 —Conceptual Campus Plan and Massing

- Additional plazas and landscaped area associated with certain individual development projects.

The following provides Alternative 4 development assumptions for each campus sector.

West Campus

New Building Development

As under Alternative 1, approximately 3.0 million gsf of net new development, representing 50 percent of the total six (6) million gsf of net new development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the West Campus sector under Alternative 1. Development of three (3) million gsf of net new development would require development of approximately 94 percent of the approximately 3.2 million gsf of net new development capacity identified for West Campus. Depending on the potential development sites developed to achieve 3.0 million gsf of net new development, up to approximately 800,000 gsf of existing building space could be demolished.

Consistent with the *2018 Seattle Campus Master Plan*, Alternative 4 assumes that the maximum building height limits would be increased in West Campus from the current range of 30 to 105 feet to the proposed range of 30 to 240 feet.

Open Space

As under Alternative 1, the primary open space opportunity assumed under Alternative 4 in West Campus sector is the West Campus Green, an approximately 5-acre open space that would tie into the existing 2-acre Portage Bay Park. This open space would also act to connect the West Campus sector and the University District to the waterfront.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

West Campus vehicular, bicycle, pedestrian improvements and street vacations assumed under Alternative 4 are assumed to be the same as those under Alternative 1.

South Campus

New Building Development

Compared to Alternative 1, substantially less building development is assumed for South Campus under Alternative 4.

Approximately 0.2 million gsf of net new development, representing approximately 3 percent of the total six (6) million gsf of net new development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the South Campus sector under Alternative 4. Development of 0.2 million gsf of net new development would require development of approximately 7 percent of the approximately 2.9 million gsf of net new development capacity identified for South Campus. As under Alternative 1, an approximately 3-acre area would be reserved for the planned South Campus Green Corridor open space.

Because South Campus is a highly developed area (including the University of Washington Medical Center and Magnuson Health Sciences Center) a substantial amount of demolition of existing buildings would be required. Even with the relatively low level of assumed building development, depending on the potential sites developed to achieve 0.2 million gsf of net new development, up to approximately 2.8 million gsf of existing building space could be demolished.

Open Space

The primary open space opportunity identified for South Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 4 is the approximately 3-acre South Campus Green Corridor. The South Campus Green Corridor is intended to enhance the existing pedestrian bridge, and visually and spatially connect South and Central Campus sectors to the waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the proposed Continuous Waterfront Trail on the south.

Transportation

South Campus vehicular, bicycle, pedestrian improvements assumed under Alternative 4 would be the same as assumed under Alternative 1. As under Alternative 1, no street, alley or aerial vacations are assumed for South Campus under Alternative 4.

Central Campus

New Building Development

Alternative 4 reflects an approximately 20 percent increase in development density in Central Campus compared to the *2018 Seattle Campus Master Plan* preferred allocation reflected in Alternative 1.

Approximately 1.1 million gsf of net new development, representing approximately 18 percent of the total six (6) million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by Central Campus Area under Alternative 1. Development of 1.1 million gsf of net new development would require development of approximately 55 percent of the approximately 2.0 million gsf of net new development capacity identified for Central Campus. Depending on the Potential Development Sites developed to achieve the 1.1 million gsf of net new development, up to approximately 1.1 million gsf of existing building space could be demolished in Central Campus.

Open Space

Central Campus represents the historic core of the University of Washington, and contains many of the most important open spaces on campus. As under Alterantive 1, a primary open space concept identified in the *2018 Seattle Campus Master Plan* and assumed under Alternative 4 is the preservation and incorporation of primary open spaces in Central Campus (e.g., Memorial Way, Rainier Vista, Liberal Arts Quad, Parrington Lawn, Denny Yard, Denny Field, HUB Lawn and Greg Garden).

Central Campus access to the Union Bay Natural Area in East Campus would also be enhanced by the potential East Campus Land Bridge across Montlake Boulevard.

Transportation

Central Campus vehicular, bicycle, and pedestrian improvements under Alternative 4 would be the same as those assumed under Alternative 1. As under Alternative 1, no street, alley or aerial vacations are assumed in Central Campus under Alternative 4.

East Campus

New Building Development

Alternative 4 reflects an approximately 40 percent increase in development density in East Campus compared to the *2018 Seattle Campus Master Plan* preferred allocation reflected in Alternative 1.

Approximately 1.7 million gsf of net new development, representing approximately 28 percent of the total six (6) million gsf of development anticipated to be needed to meet the anticipated growth in demand for development, would be provided by the East Campus sector under Alternative 1. Development of 1.7 million gsf of net new development would require development of approximately 37 percent of the approximately 4.6 million gsf of net new development capacity identified for East Campus. Depending on the potential development sites developed to achieve the 1.7 million gsf of net new development, demolition of up to 250,000 gsf of existing buildings in East Campus could occur under Alternative 4.

Open Space

As under Alternative 1, the primary open space opportunity identified for East Campus in the *2018 Seattle Campus Master Plan* and assumed under Alternative 4 is the East Campus Land Bridge which would include approximately one acre of open space area. The East Campus Land Bridge would also be intended to enhance connection between the Central and East Campus sectors, including connection to the Union Bay Natural Area in East Campus.

The Continuous Waterfront Trail identified to follow the University's shoreline would connect the Portage Bay/West Campus Green in West Campus to the Union Bay Natural Area in East Campus.

Transportation

Vehicular, bicycle and pedestrian circulation improvements for East Campus under Alternative 4 would be as assumed under Alternative 1. As under Alternative 1, Alternative 4 assumes the aerial vacation over Montlake Boulevard NE for the proposed East Campus Land Bridge.

This alternative would meet the University's Guiding Principles.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, none of the identified street or aerial vacations would occur. As noted earlier in this Chapter, all identified vacations are intended to improve circulation and open space conditions under the *2018 Seattle Campus Master Plan* and no potential development sites are dependent on any identified vacations. The vacations identified under the *2018 Seattle Campus Master Plan* include:

- *Street Vacation* – Portion of NE Boat Street west of Brooklyn Avenue NE.;
- *Street Vacation* – Portion of NE Northlake Place east of 8th Avenue NE.; and

- *Aerial Vacation* – Portion of Montlake Boulevard NE.

Under Alternative 5, none of the identified street of aerial vacations would occur, and the existing street system associated with the identified vacations would remain (see **Figure 2-12)**. The *2018 Seattle Campus Master Plan* features that would not occur under Alternative 3 include:

- The vacation of a portion of NE Northlake Place east of 8th Avenue NE would not occur and while the resultant layout of development sites would not be optimal, the overall development capacity would not change.

- The retained portion of NE Boat Street would act to separate the Portage Bay Park from the identified area to be retained for the planned West Campus Green. The park area associated with Portage Bay Park and the planned West Campus Green would not reflect the character of a continuous open space linking the waterfront with NE Pacific Street as under Alternatives 1, 3 and 4.

- The aerial vacation of a portion of Montlake Boulevard NE would not occur and the proposed ADA accessible connection and open space associated with the potential East Campus Land Bridge would not occur. Separated pedestrian and bike access opportunities between the Central Campus and East Campus sectors under Alternatives 1 through 4 would not be provided.

Because the proposed street and aerial vacations are not intended to increase the amount of building development capacity of the campus, the assumed amount of building area under Alternative 5 is six (6) million gsf, as under Alternatives 1 through 4.

This alternative would generally meet the University's Guiding Principles, although overall campus connectivity would not be as efficient under Alternative 1.

Cumulative Effects

The State Environmental Policy Act (SEPA) requires that cumulative effects be considered in an EIS (WAC 197-11-792). Although SEPA does not specifically define the term cumulative effects, the term is defined under the National Environmental Policy Act (NEPA) as "the impact on the environment which results from the incremental impact of the action when added to other reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The *City-University Agreement* also requires study of cumulative effects on the Primary and Secondary Impact zones.

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 2-12

Alternative 5 —Conceptual Campus Plan and Massing

This Draft EIS includes discussion of the cumulative effects to which the EIS Alternatives could contribute. The primary foreseeable action in the vicinity of the University of Washington campus is the University District Urban Design Project. The *University District Urban Design EIS* identifies three primary alternatives for the zoning and development character of the U District, including: Alternative 1, medium tower heights with a more dispersed development pattern; Alternative 2, taller towers with a focused development pattern; and, Alternative 3, current zoning with most dispersed development pattern.

2.9 BENEFITS AND DISADVANTAGES OF DEFERRING IMPLEMENTATION OF THE PROPOSAL

The benefits of deferring approval of the Proposed Action and implementation of development of the *2018 Seattle Campus Master Plan* include the deferral of:

- Temporary construction-related impacts associated with vibration, noise, air pollution and traffic.
- No expenditure of funds to create new open spaces.

The disadvantages of deferring the approval of the Proposed Action and development of the *2018 Seattle Campus Master Plan* include:

- Inability to develop new instructional, research, office and housing facilities to meet the growth in students, faculty and staff forecast for the University of Washington.
- Inability to provide new facilities to support the research and service mission of the University of Washington.
- Inability to provide substantial open spaces and park features to serve the University and broader communities.
- Continued cost associated with maintaining aging facilities.
- Missed opportunities to provide an innovation district.
- Continued decline of campus from over-use of existing facilities.
- Inability to assist in facilitating the vision of the University District Urban Village.
- Inability to support the vision or infrastructure investment of light rail.

Deferral would not meet the University's Guiding Principles and Master Plan Frameworks.

CHAPTER 3

Affected Environment, Impacts, Mitigation Measures, and Significant Unavoidable Adverse Impacts

CHAPTER 3
AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

This chapter describes the affected environment, impacts of the alternatives, mitigation measures and any significant unavoidable adverse impacts on the environment that are anticipated with construction and operation of development under the *University of Washington 2018 Seattle Campus Master Plan* through the 10-year planning horizon, as assumed under the Draft EIS alternatives.

3.1 EARTH

This section of the Draft EIS describes the existing geologic and geologic-related critical area conditions on the University of Washington campus and in the site vicinity, and evaluates the potential impacts that could occur as a result of the *2018 Seattle Campus Master Plan*.

3.1.1 Affected Environment

Campus Background

The University of Washington campus can generally be characterized as consisting of two primary topographic settings, the hill and slope area of the campus west of Montlake Boulevard NE and the "flats" east of Montlake Boulevard NE. The Central, South and West Campus sectors are generally located on the south and west slopes of a hill that rises approximately 230 feet above the shores of Union Bay and Portage Bay. This topography is typical in the system of gently sloping, elongated hills that dominate the land forms of the central Puget Sound area. Soils in most of the Central, West and South Campus sectors are primarily composed of glacial till.

The "flats" of East Campus were originally made up of stream and lake deposits. After construction of the Hiram M. Chittenden Locks and Lake Washington Ship Canal was completed in 1916, the level of Lake Washington was lowered by approximately eight (8) feet (at high water), and much of the delta area became marsh. In 1926, the City of Seattle began to use this area as a land fill. Filling spread onto the marsh, reaching its greatest extent in 1964. Major filling operations ceased in the mid-1960s, but a series of surface covering, grading and seeding operations altered the landscape until 1971, when all but minimal maintenance activities ended. Currently, the delta is mantled almost entirely with construction fill, rubble, and solid waste with natural vegetation above.

The previous landfill use in the East Campus sector has resulted in the generation of methane gas from the decomposition of landfill debris. Methane is also produced at East Campus naturally because the landfill is constructed over a peat bog. A quarterly landfill gas monitoring program was conducted in East Campus between 2005 – 2011; the frequency of monitoring was reduced to semi-annually starting in 2012.

Since its origin, the University of Washington campus has been little modified by natural soil deposition. Small-scale slumping and small creeping landslides have had minor effects on the steeper northeast and east-central slopes of campus. The steepest slopes on campus generally occur in the northeast corner of Central Campus, generally between Whitman Court on the west, Pend Oreille Road on the south, Burke-Gilman Trail on the east, and NE 45th Street on the north. Steep slopes are also located along the Lake Washington Ship Canal in the South and East Campus sectors.

Groundwater depths vary across the campus, with groundwater encountered at relatively shallow depths in East Campus (approximately 3 to 10 feet below ground surface), and with groundwater typically encountered at greater depths in the Central, West and South Campus sectors.

Because of differential subsidence and settlement issues, much of East Campus (primarily the area east of Canal Road and west of the Center for Urban Horticulture) results in very expensive building construction techniques and currently remains in a natural state. The goal is for potential future structures in this area of campus to be designed to avoid accumulation of methane gas within enclosed spaces, and withstand subsidence and strong ground motions associated with earthquakes.

City of Seattle Environmentally Critical Areas

City of Seattle Municipal Code (SMC) Chapter 25.09 provides regulations for environmentally critical areas, including critical areas related to geologic and soil conditions. Geologic and soils related critical areas designations include: Liquefaction-prone Area; Landslide-prone Area; Peat Settlement-prone Area; Seismic Hazard Area; Volcanic Hazard Area; Steep Slope Area; and, Abandoned Landfills. The University of Washington campus contains geologic hazard areas, as defined in the City of Seattle Municipal Code, including Landslide-Prone Area, Steep Slope Area, Liquefaction-Prone Area, and Peat Settlement-Prone Area, as well as area within 1,000 feet of methane-producing landfill. As indicated in the discussion and figures below, the majority of the geologic and soils related critical areas are located in the East Campus sector.

The following provides a brief definition of the City of Seattle designated geologic and soils critical areas applicable to the University of Washington campus. The University of

Washington follows existing critical areas regulations to avoid adverse environmental impacts.

- **Steep Slope Area** – Defined as slopes with an average incline of 40 percent or steeper with an elevation change of at least 10 feet. An extensive area of Steep Slope Critical Area is located in Central Campus sector, primarily associated with the Kincaid Ravine in the northern portion of Central Campus, and the area in the vicinity of Pend Oreille Road. Steep Slope Critical Areas are also located along the Burke-Gilman Trail, east of the Graves Building in East Campus, and near the Montlake Cut (see **Figure 3.1-1** for Steep Slope Area as contained on the advisory City mapping system[1]).

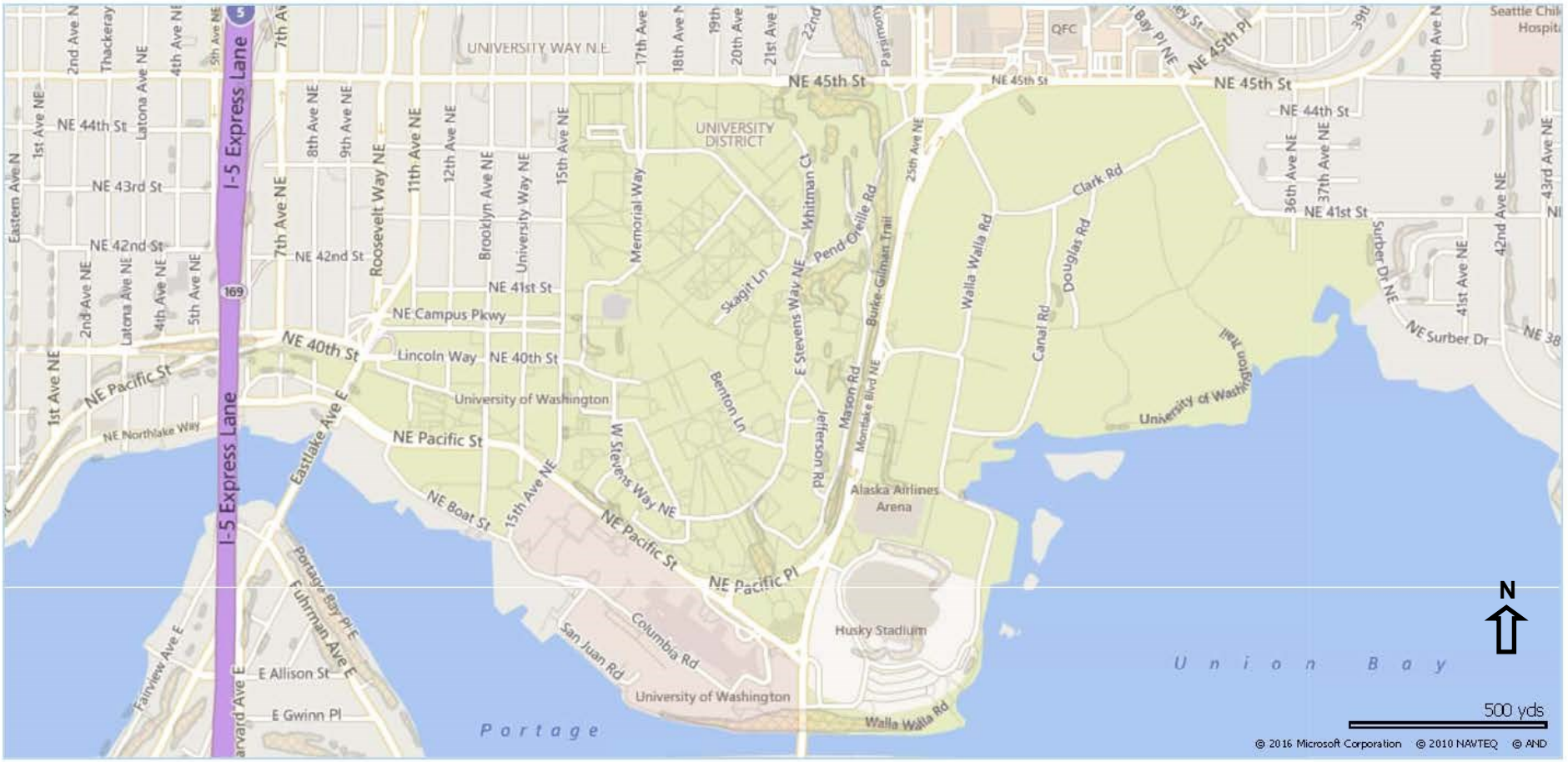
- **Liquefaction-Prone Area** – Defined as area typically underlain by cohesionless soils of low density. The Liquefaction-Prone Area on the University of Washington campus is primarily located on the East Campus sector and encompasses much of this campus sector (see **Figure 3.1-2,** which shows the general area of Liquefaction-Prone area as contained on the advisory City mapping system).

- **Abandoned Landfill Area** – Refers to abandoned solid waste landfills identified by the Seattle-King County Health Department. Identified Abandoned Landfill Area on the University of Washington campus is located in the East Campus sector, primarily east of Walla Walla Road (identified landfill area extends to approximately 100 feet west of Walla Walla Rd.) and south of NE 45th Street to Union Bay. The abandoned landfill in this area is known to generate methane gas, and the Environmentally Critical Area includes the area within 1,000 feet of this landfill (see **Figure 3.1-3** Abandoned Landfill Area as contained on the advisory City mapping system).

- **Peat-Settlement-Prone Area** – The Peat-Settlement Area refers to areas typically containing unconsolidated, organic rich saturated soils. The Peat-Settlement Area on the University of Washington campus encompasses the East, Central and South campus areas; however, peat soils are primarily located in the East Campus sector. (See **Figure 3.1-4** for City of Seattle Environmental Critical Areas mapping for Peat-Settlement Prone Area).

The following provides a discussion on City of Seattle identified earth environmentally critical areas as they relate to the campus sectors.

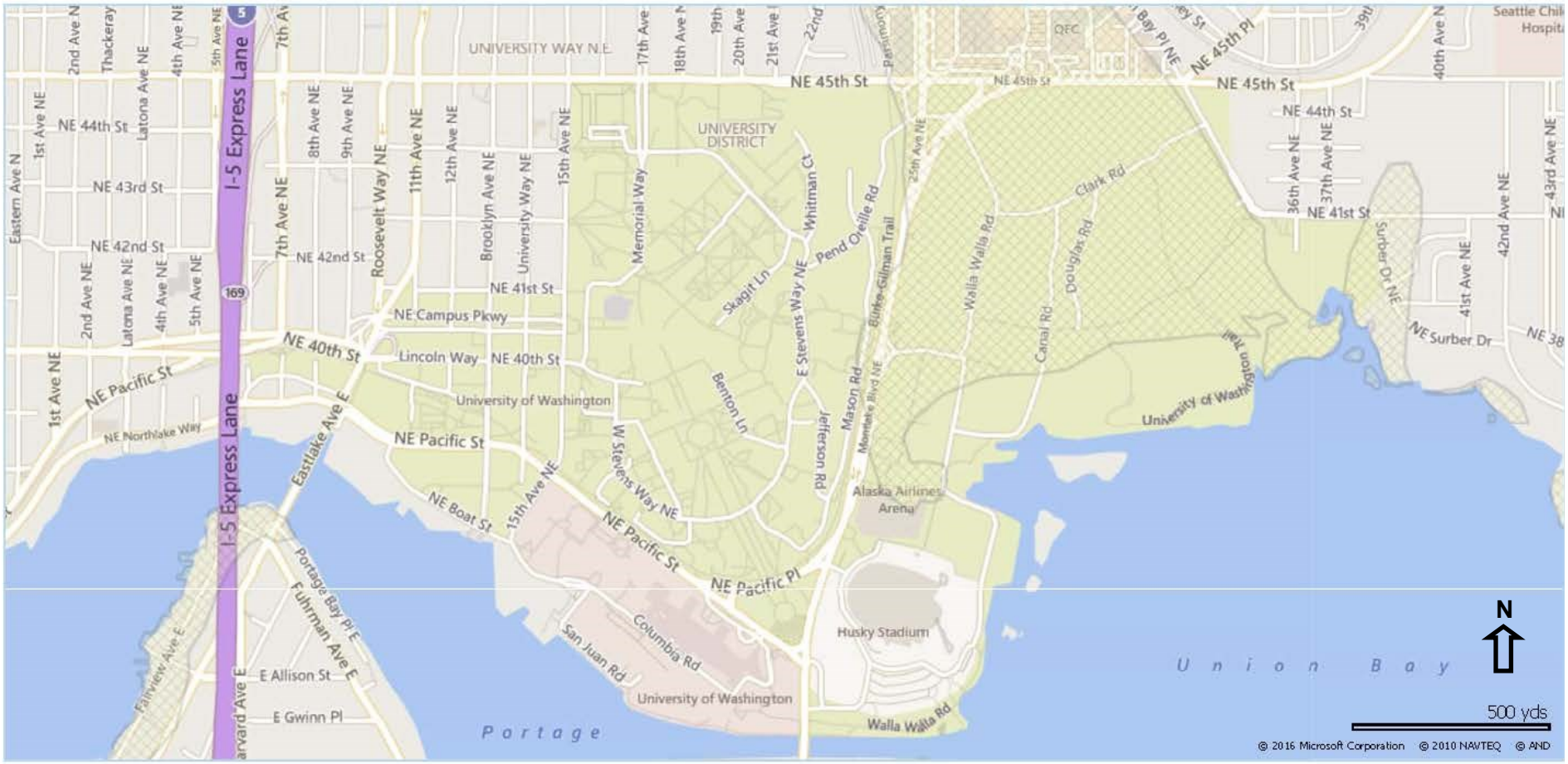
[1] *The advisory City mapping system includes a mapping unit for Steep Slope Critical Area, but the mapping system may not show all of this critical area – the area is best depicted by surveys that show the topography.*



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

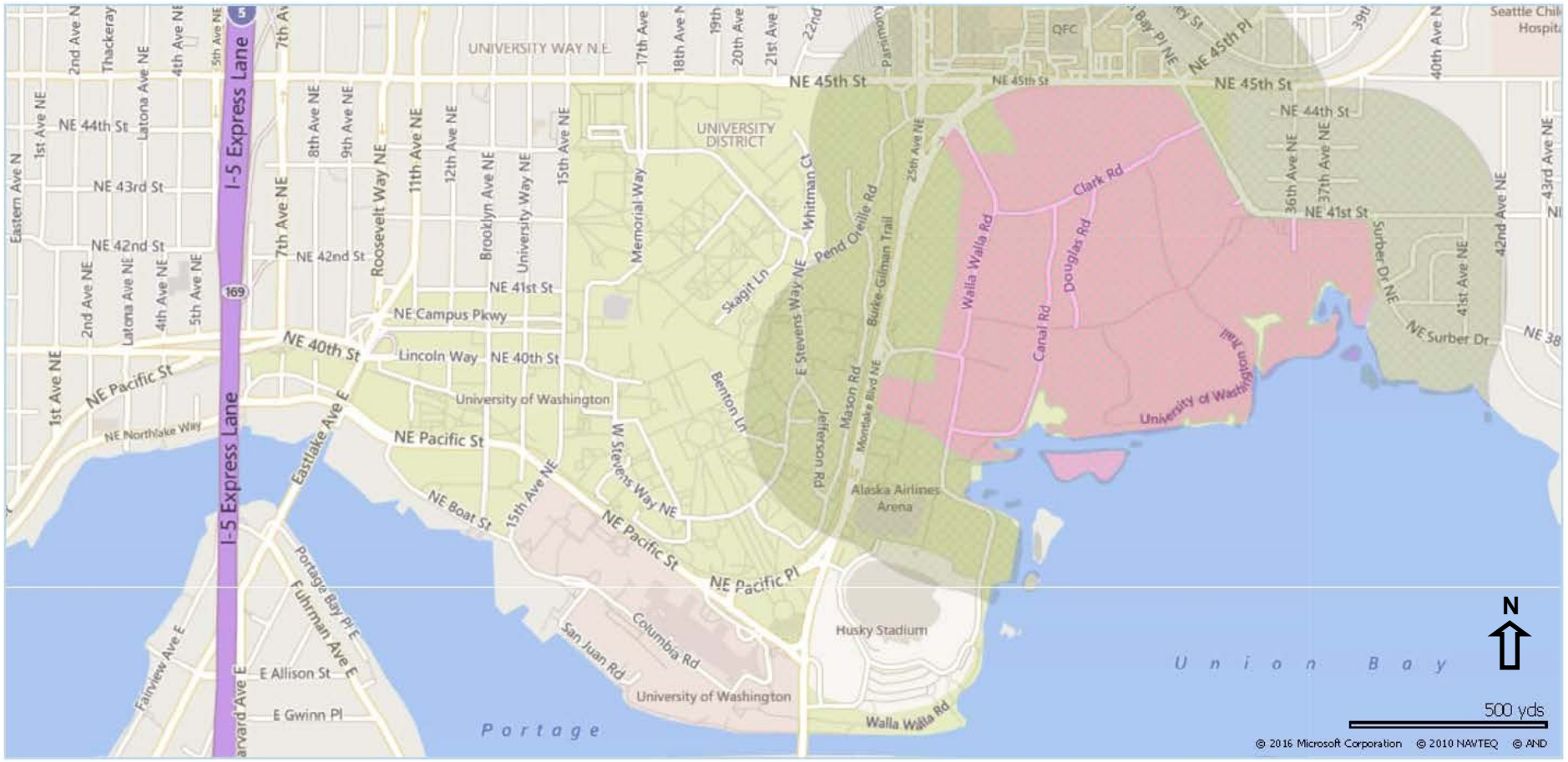
Figure 3.1-1
Steep Slope Area Map



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

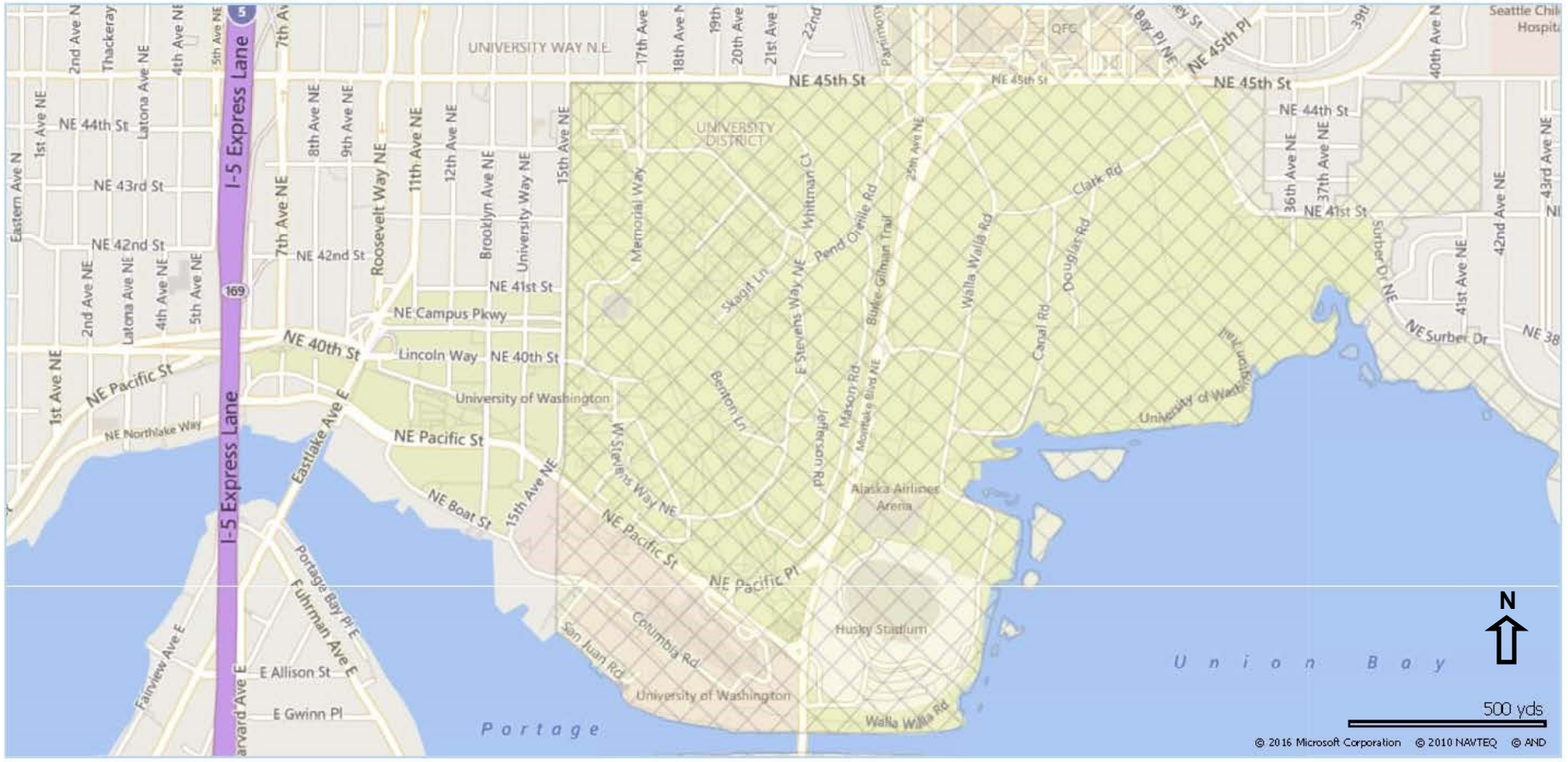
Figure 3.1-2
Liquefaction-Prone Area Map



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.1-3
Abandoned Landfill Area Map



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.1-4
Peat-Settlement-Prone Area Map

West Campus

- **Steep Slope Area** – Identified Steep Slope Area in the West Campus sector is generally limited to the area west of the University Bridge along the southern edge of the Burke-Gilman Trail (north of Benjamin Hall and the Creative Communications Building), along the northern edge of NE Northlake Place (south of Benjamin Hall and the Creative Communications Building), and along north of NE Northlake Way (under the University Bridge).

- **Liquefaction/Abandoned Landfill/Peat-Settlement Area** – The West Campus sector does not contain any identified Liquefaction, Abandoned Landfill or Peat-Settlement Area.

South Campus

- **Steep Slope Area** – Identified Steep Slope Area in the South Campus sector is limited to the shoreline area north of the Ship Canal, generally from the Montlake Bridge on the east to approximately Ferry Place to the west.

- **Liquefaction and Abandoned Landfill Area** – The South Campus sector does not contain any identified Liquefaction or Abandoned Landfill Area.

- **Peat-Settlement Area** – The entire South Campus is identified as Peat-Settlement Area. However, the presence of peat soils is generally limited to the East Campus sector. Peat soils are not anticipated to be encountered in the South Campus sector.

Central Campus

- **Steep Slope Area** – The Central Campus sector contains the majority of the identified Steep Slope Area on the University of Washington campus. Identified Steep Slope Area in the Central Campus sector is located in the Kincaid ravine in the northeast portion of Central Campus, along the Burke-Gilman Trail (generally between NE 45th on the north to the Power Plant on the south), south of Pend Oreille Road in the vicinity of Padelford Parking Garage, west and east of Meany Hall, and north and south of the Burke-Gilman Trail south of Kincaid Hall.

- **Liquefaction Area** – Identified Liquefaction Area in the Central Campus sector is limited to the eastern edge of Central Campus, primarily the area east of the Burke-Gilman Trail and north of Fluke Hall.

- **Abandoned Landfill Area** – The Central Campus sector does not contain any identified Abandoned Landfill Area. The approximate eastern 30 percent of Central

Campus (approximately E Stevens Way NE on the west[2], NE 45th on the north, Montlake Boulevard NE on the east, and Manson Road on the south) is identified as Abandoned Landfill Area Buffer.

- **Peat-Settlement Area** – The entire Central Campus is identified as Peat-Settlement Area. However, the presence of peat soils is generally limited to the East Campus,. Peat soils are not anticipated to be encountered in Central Campus

East Campus

- **Steep Slope Area** – Identified Steep Slope Area in the East Campus sector is limited to isolated areas north and south of Husky Stadium, the vicinity of the Graves Building, the vicinity of the Golf Driving Range, and within the natural open space area.

- **Liquefaction Area** – Identified Liquefaction Area on the University of Washington campus is primarily restricted to the East Campus sector and encompasses the majority of East campus north of Alaska Airlines Arena.

- **Abandoned Landfill Area** - Identified Abandoned Landfill Area on the University of Washington campus is located in the East Campus sector, primarily east of Walla Walla Road (identified landfill area extends to approximately 100 feet west of Walla Walla Rd.) and south of NE 45th Street to Union Bay. A 1,000 foot buffer from the Abandoned Landfill Area is also identified, and this buffer extends east to Central Campus and off-campus to the north and east.

- **Peat-Settlement Area** – The Peat-Settlement Area on the University of Washington campus encompasses the East, Central and South campus sectors; however, peat soils are primarily located in East Campus. Peat Settlement Area is identified over the majority of the East Campus sector.

Surrounding Primary and Secondary Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS.

City of Seattle earth-related critical areas identified within the **Primary Impact Zone** include: Abandoned Landfill Area buffer identified immediately north of the Central and East Campus sectors, and immediately east of the East Campus sector; Known Slide Area identified north of Central Campus; Peat Settlement Area identified immediately north and east of the East Campus sector, and immediately south of the Ship Canal in the Montlake

[2] A portion of the area west of E Stevens Way NE is identified as Abandoned Landfill Area Buffer.

neighborhood; and identified Steep Slope Area north of Central Campus associated with Ravenna ravine, and immediately east of East Campus in the Laurelhurst neighborhood.

City of Seattle earth related critical areas identified in the **Secondary Impact Zone** include: Abandoned Landfill Area identified on Foster Island at the southern edge of Union Bay, and Abandoned Landfill Area buffer immediately east of East Campus; Known Slide Area associated with Ravenna Park north of Central Campus, in the Laurelhurst neighborhood east of East Campus, south of SR520 in the Montlake neighborhood, in the Eastlake neighborhood south and west of Portage Bay, and along NE Pacific Street west of I-5 in the Wallingford neighborhood; Peat Settlement Area associated with the Arboretum south of Union Bay; and, Steep Slope Area at Ravenna Park, distributed throughout the Ravenna neighborhood north of campus, distributed throughout the Laurelhurst neighborhood east of campus, distributed throughout the Arboretum south of Union Bay, and distributed throughout the Montlake neighborhood south of SR-520.

3.1.2 Impacts

This section of the Draft EIS identifies potential effects that the existing earth environment on the campus may have on development under the EIS Alternatives, and discusses how development under the EIS Alternatives would relate to the earth environment during construction and under long-term operations.

No Action Alternative

Under the No Action Alternative, earth-related impacts would primarily be related to the approximately 211,000 net new gsf of building development that would be constructed under the current *2003 Seattle CMP*. The approximately 211,000 gsf of building development would result in approximately 53,000 cubic yards of excavation, and the potential for earth related impacts on the University of Washington campus would be substantially less than under Alternatives 1, 2 and 3. In addition, because the remaining development under the *2003 Seattle CMP* would likely not be located in the East Campus sector, the potential for construction to encounter earth related conditions associated with peat settlement, abandoned landfill or liquefaction is low.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1, which matches the preferred allocation of building development in the *2018 Seattle Campus Master Plan,* reflects 6.0 million gsf of building area throughout the campus with a focus of this development in the West and South Campus sectors. Depending on the building sites, this level of development could require the excavation of up to approximately

1,500,000 cubic yards of earth over the 10-year planning horizon[3] for the *2018 Seattle Campus Master Plan*. The anticipated excavation amounts by campus area under Alternative 1 are estimated as follows:

- **West Campus** – approximately 750,000 cubic yards
- **South Campus** – approximately 337,500 cubic yards
- **Central Campus** – approximately 225,000 cubic yards
- **East Campus** – approximately 187,500 cubic yards

A portion of the excavated material, approximately 20 percent, could be reused on campus as backfill on individual sites. It is anticipated that the remaining approximately 80 percent would be transported to undetermined approved off-campus disposal sites. In addition, fill material for site preparation and landscaping could be imported to the campus during development of the potential development sites.

Construction-related earth impacts could result in erosion. Compliance with existing regulations and codes would minimize potential impacts.

As indicated earlier, the University of Washington contains areas identified as environmentally critical areas in SMC 25.09, including critical areas related to geologic and soils conditions. Because the East Campus sector contains the majority of the campus area identified as critical areas related to soils, the potential to encounter identified earth-related critical areas is greatest in the East Campus sector. The University of Washington follows existing critical areas requirements and potential impacts would be mitigated through compliance with codes and regulations.

West Campus

As indicated in Chapter 2 of this Draft EIS, Alternative 1 assumes that West Campus would contain 3.0 million gsf of net new development with proposed maximum building height increases, and the area reserved for the potential West Campus Green and other open spaces. As indicated above, the 3.0 million gsf of net new development in West Campus would result in approximately 750,000 cubic yards of excavation, which would relate to the construction associated with development of approximately 16 Potential Development Sites and approximately 5 acres of potential open spaces.

Construction-related earth impacts include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts in West Campus.

[3] Estimated excavation volumes based on an average cubic yards excavated of 0.25 cubic yards per square foot included in the 2003 CMP Seattle.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Seattle Municipal Code identified steep slope areas in the West Campus sector are limited to areas south of the Burke-Gilman Trail and south of the Benjamin Hall and Creative Communications buildings. Given the isolated nature of steep slope area in West Campus, the potential for earth impacts related to steep slopes in this sector is low.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The West Campus sector does not contain any Seattle Municipal Code identified Liquefaction, Abandoned Landfill, or Peat Settlement areas, and therefore, earth related impacts related to encountering identified Liquefaction, Abandoned Landfill, or Peat Settlement areas in the West Campus sector under Alternative 1 are not anticipated.

South Campus

Alternative 1 assumes that the South Campus would contain 1.35 million gsf of net new development, with a resulting amount of up to 337,500 cubic yards of excavation related to the construction associated with building development and approximately 3 acres of potential open spaces.

Construction-related earth impacts include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts in South Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the South Campus is limited to the southeast edge of this sector, along the Ship Canal immediately west of the Montlake Bridge. Potential development in this area would be limited to a portion of the potential Continuous Waterfront Trail, and the potential for earth impacts related to steep slopes in the South Campus is considered low.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The South Campus Sector does not contain any identified Liquefaction or Abandoned Landfill Areas, and the potential to for earth related impacts to related to identified liquefaction or Abandoned Landfill in the South Campus is low.

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily in the East Campus sector and development in the South campus under Alternative 1 would not be anticipated to encounter peat settlement issues.

Central Campus

Alternative 1 assumes that the Central Campus sector would contain 0.9 million gsf of net new development, with a resulting amount of up to 225,000 cubic yards of excavation related to the construction associated with building development.

Construction-related earth impacts include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts in Central Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Areas – Identified Steep Slope Areas on the campus are primarily located in the Central Campus sector, and are primarily associated with Kincaid Ravine in the northern portion of Central Campus, along the Burke-Gilman Trail (primarily between the Trail and Montlake Boulevard, and between the Trail and NE Pacific), and along 15th Avenue NE. Given the isolated nature of steep slopes to small portion of Central Campus, the potential for development under Alternative 1 to encounter steep slopes is low. Development located in proximity to steep slopes would consider slopes in the design process, and all development would be conducted in compliance with City of Seattle Environmental Critical Areas Regulations related to slopes.

Liquefaction/Abandoned Landfill/Peat Settlement Areas –Abandoned Landfill Area Buffer is identified on the approximately eastern third of the Central Campus sector, and liquefaction Zone Area is identified on the eastern edge of Central Campus. Given the topography and soil conditions in these areas west of Montlake Boulevard NE, it is assumed that liquefaction and abandoned landfill (including presence of methane gasses) conditions would not be encountered during construction assumed under Alternative 1. Any development located within identified Liquefaction or Abandoned Landfill Buffer Areas would be conducted in compliance with applicable City of Seattle Environmental Critical Areas Regulations.

As indicated earlier in this section, the East, Central and South Campus Sectors are identified as Peat Settlement Areas. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to the East Campus sector and development in Central Campus under Alternative 1 would not be anticipated to encounter peat settlement issues.

East Campus

Alternative 1 assumes that the East Campus would contain 0.75 million gsf of net new development, with a resulting amount of up to 187,500 cubic yards of excavation associated with building development and approximately 1 acre of potential open space over the planning horizon.

Construction-related earth impacts include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts in East Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in East Campus is located north and south of Husky Stadium, in the vicinity of the Graves Building, in the vicinity of the Golf Driving Range, and within the natural open space area. Given the isolated nature of the identified steep slopes and the limited amount of development under Alternative 1 in East Campus, the potential to encounter steep slopes in East Campus under Alternative 1 is low.

Liquefaction Area - The identified Liquefaction Area on the University of Washington campus is restricted to the East Campus sector. Given that Alternative 1 assumes the majority of campus development would occur in the West and South Campus sectors, with limited development in the Central and East Campus sectors, the potential for earth impacts related to liquefaction is low. Any proposed development in the East Campus sector would be required to prepare soils engineering studies consistent with Seattle Municipal Code (25.09.100), and other applicable requirements, in order to determine the physical properties of soils and the liquefaction potential (see Section 3.1.3 for mitigation measures related to liquefaction).

Abandoned Landfill Area - The identified Abandoned Landfill Area on the University of Washington campus is primarily restricted to a portion of the East Campus sector. Alternative 1 assumes the development of 0.75 million gsf of development in East Campus. Alternative 1 assumed development in East Campus that is located within the identified Abandoned Landfill Area would be subject to Seattle-King County Health Department requirements related to the prevention of damage from methane gas buildup, ground subsidence, and seismic events consistent with SMC 25.09.220(A).

Additionally, according to SMC 25.09.220(B), areas within 1,000 feet of methane-producing landfills may be susceptible to accumulations of hazardous levels of methane gas in enclosed spaces and may be required to include methane barriers or other appropriate ventilation measures. East Campus development within the buffer may require methane barriers or other ventilation measures.[4]

Peat Settlement Area - Other than the West Campus sector, the entire University of Washington campus is included within the identified Peat-Settlement Area. However, given campus topography and soil conditions, only the East Campus sector has the potential to contain peat settlement issues. Accordingly, all Potential Development Sites in East Campus would be subject to development standards for peat-settlement-prone areas specified in

[4] Although the 1,000 foot Abandoned Landfill Buffer extends to the Central Campus sector to the west, given that Central Campus is located on a glacial till hill area, methane gas and other earth conditions associated with the landfill are not anticipated to be encountered in Central Campus.

SMC 25.09.110, including limitations on increased total impervious surface and identification of construction methods to limit modifications to the groundwater regime.

Summary of Impacts in Primary and Secondary Impact Zones

Development under Alternative 1 would contribute to the amount of overall construction and associated earthwork in the area. Construction-related earth impacts associated with campus development could include short-term localized erosion.

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), a greater amount of earthwork would occur in these campus sectors, and would occur in proximity to portions of the **Primary Impact Zone** located adjacent to the West and South Campus sectors, including the University District (adjacent to West Campus) and portion of the Montlake neighborhood (across the Ship Canal from South Campus). The portion of the Primary Impact Zone in proximity to the West and South Campus does not contain any identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas.

Although less development is assumed to occur in the Central and East Campus sectors under Alternative 1, assumed development in these sectors would occur in proximity to Abandoned Landfill buffer area, and identified Steep Slope area identified immediately east of East Campus and in the Ravenna Ravine immediately north of Central Campus.

Given the distance of land uses and identified earth-related critical areas in the **Secondary Impact Zone** from development assumed under Alternative 1, construction activities associated with Alternative 1 development would not be anticipated to occur in proximity to identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas in the Secondary Impact Zone.

Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize the potential for impacts in the Primary and Secondary Impact Zones.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 reflects accommodation of the requested 6 million gsf of building area with the existing *2003 Seattle CMP* height limits. Without the Alternative 1 proposed height increases, the development capacity of the West Campus sector is limited and additional development sites would be required to approach the 3.0 million gsf of net new development in West Campus identified in the *2018 Seattle Campus Master Plan* and analyzed under Alternative 1. Given the developed nature of West Campus, the opportunity for additional development sites in this sector is limited, and Alternative 2

assumes additional development sites in the area reserved for the potential West Campus Green under Alternative 1. The development capacity in the West Campus sector without the requested height increases is 2.4 million gsf of net new development The approximately 0.6 million gsf of the net new development not accommodated by the West Campus sector development capacity is shifted to East Campus under Alternative 2. The anticipated excavation amounts by campus area under Alternative 2 are estimated as follows:

- **West Campus** – approximately 600,000 cubic yards
- **South Campus** – approximately 337,500 cubic yards
- **Central Campus** – approximately 225,000 cubic yards
- **East Campus** – approximately 337,500 cubic yards

Compared to anticipated excavation amounts under Alternative 1, Alternative 2 includes less excavation in West Campus (600,000 cubic yards compared to 750,000 cubic yards under Alternative 1), the same amount of excavation in the South Campus, the same amount of excavation in Central Campus, and substantially more excavation in East Campus (337,500 cubic yards compared to 187,000 cubic yards under Alternative 1).

As under Alternative 1, construction-related earth impacts could include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts.

Below is discussion on earth conditions and critical areas requirements as they relate to the campus sectors.

West Campus

To accommodate 2.4 million gsf of net new development in the West Campus sector, approximately 600,000 cubic yards of excavation would be required. Excavation would primarily relate to construction associated with potential development sites and only limited potential open space improvements. The total amount of excavation would be less than under Alternative 1. The excavation activities would be primarily associated with building construction as opposed to the construction of both buildings and the potential open space identified under Alternative 1. As a result, the potential construction earth-related impacts (erosion) are anticipated to be less than under Alternative 1 in West Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified steep slope areas in the West Campus sector are limited to areas south of the Burke-Gilman Trail, Benjamin Hall, and the Creative Communications buildings.

The additional potential development sites under Alternative 2 would be located in the area assumed to be reserved for the potential West Campus Green under Alternative 1. Because the area containing the additional development sites does not contain identified steep slope area, the potential for earth impacts related to steep slopes under Alternative 2 would be low as described for Alternative 1.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The West Campus sector does not contain any identified Liquefaction, Abandoned Landfill, or Peat Settlement areas and there is no potential for earth-related impacts related to encountering identified Liquefaction, Abandoned Landfill, or Peat Settlement areas in the West Campus sector under Alternative 2.

South Campus

As under Alternative 1, Alternative 2 assumes that the South Campus sector would contain 1.35 million gsf of net new development, with a resulting amount of up to 337,500 cubic yards of excavation over the planning horizon, which would relate to the construction associated with building development and approximately 3 acres of potential open spaces. Given the same amount of grading activities, the potential construction earth-related impacts (erosion) are anticipated to be similar under Alternative 2 in the South Campus as described for Alternative 1.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – SMC identified Steep Slope Area in the South Campus sector is limited to the southeast edge of this sector, along the Ship Canal immediately west of the Montlake Bridge. Potential development in this area would be limited to a portion of the potential Continuous Waterfront Trail and, as under Alternative 1, the potential for earth impacts related to steep slopes in the South Campus is considered low.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The South Campus sector does not contain any identified Liquefaction or Abandoned Landfill Areas, and there is no potential to for earth related impacts to related to identified Liquefaction or Abandoned Landfill areas in South Campus.

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to East Campus and development in the South Campus sector under Alternative 2 would not be anticipated to encounter peat settlement issues.

Central Campus

As under Alternative 1, Alternative 2 assumes that the Central Campus sector would contain 0.9 million gsf of net new development, with a resulting amount of up to 225,000 cubic yards of excavation over the planning horizon, which would relate to the construction associated with building development. As a result, the potential for construction earth-related impacts in Central Campus (erosion) is anticipated to be the same under Alternative 2 as that described under Alternative 1.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Areas – Identified Steep Slope Areas on the campus are primarily located in the Central Campus sector, and are primarily associated with Kincaid Ravine in the northern portion of Central Campus, along the Burke-Gilman Trail (primarily between the Trail and Montlake Boulevard, and between the Trail and NE Pacific), and along 15th Avenue NE. As under Alternative 1, given the isolated nature of steep slopes to a portion of Central Campus, the potential for development under Alternative 2 to encounter steep slopes is low. Development located in proximity to steep slopes would consider slopes in the design process, and all development would be conducted in compliance with City of Seattle Environmental Critical Areas Regulations (SMC 25.09) related to slopes.

Liquefaction/Abandoned Landfill/Peat Settlement Areas –Abandoned Landfill Area Buffer is identified on the approximately eastern third of the Central Campus sector, and Liquefaction Zone Area is identified on the eastern edge of the sector. Given the topography and soil conditions in these areas west of Montlake Boulevard NE, it is assumed that liquefaction and abandoned landfill (including presence of methane gasses) conditions would not be encountered during construction in the sector assumed under Alternative 2. Any development located within identified Liquefaction or Abandoned Landfill Buffer Areas would be conducted in compliance with applicable City of Seattle Environmental Critical Areas Regulations (SMC 25.09).

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to East Campus and development in the Central Campus sector under Alternative 2 would not be anticipated to encounter peat settlement conditions.

East Campus

Alternative 2 assumes that East Campus would contain 1.35 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 337,500 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). As a result, the potential for

construction earth-related impacts (erosion) could be greater under Alternative 2 than under Alternative 1 in East Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the East Campus sector is located north and south of Husky Stadium, in the vicinity of the Graves Building, in the vicinity of the Golf Driving Range, and within the natural open space area. Given the isolated nature of the identified steep slopes and the limited amount of development under Alternative 2 in East Campus, the potential to encounter steep slopes in East Campus under Alternative 2 is low.

Liquefaction Area - Identified Liquefaction Area on the University of Washington campus is restricted to the East Campus sector. Given that Alternative 2 assumes approximately 1.35 gsf of net new development (0.6 million gsf more than assumed under Alternative 1) the potential to encounter earth conditions associated with liquefaction is greater under Alternative 2 than under Alternative 1. Any proposed development in East Campus would be required to prepare soils engineering studies consistent with SMC 25.09.100, and other applicable requirements, to determine the physical properties of soils and the liquefaction potential (see Section 3.1.3 for mitigation measures related to liquefaction).

Abandoned Landfill Area - The identified Abandoned Landfill Area on the University of Washington campus is primarily restricted to a portion of the East Campus sector. Compared to the 0.75 million gsf of net new development assumed for East Campus under Alternative 1, Alternative 2 assumes development of 1.35 million gsf of net new development in East Campus and the potential to encounter earth conditions associated with abandoned landfill area would be greater under Alternative 2 than under Alternative 1. Alternative 2 assumed development in the northwest portion of the East Campus sector that is located within the identified Abandoned Landfill Area would be subject to Seattle-King County Health Department requirements related to the prevention of damage from methane gas buildup, ground subsidence, and seismic events (consistent with SMC 25.09.220(A)).

Additionally, according to SMC 25.09.220(B), areas within 1,000 feet of methane-producing landfills may be susceptible to accumulations of hazardous levels of methane gas in enclosed spaces and may be required to include methane barriers or other appropriate ventilation measures. East Campus development within the buffer may require methane barriers or other ventilation measures.

Peat Settlement Area - Other than the West Campus sector, the entire University of Washington campus is included within the identified Peat-Settlement Area. However, given campus topography and soil conditions, only the East Campus sector has the potential to

contain peat settlement issues. Accordingly, all potential development sites in the East Campus sector would be subject to development standards for peat-settlement-prone areas specified in SMC 25.09.110, including limitations on increased total impervious surface and identification of construction methods to limit modifications to the groundwater regime. Alternative 2 assumes development in the East Campus sector would total 1.35 million gsf, and this level of campus development would be subject to Peat Settlement regulations. Alternative 2 assumes 0.6 million more gsf of net new development in East Campus than under Alternative 1, and the potential to encounter earth conditions associated with peat settlement would be greater under Alternative 2 than under Alternative 1.

Summary of Impacts in Primary and Secondary Impact Zones

As under Alternative 1, development under Alternative 2 would contribute to the amount of overall construction in the area. Construction-related earth impacts associated with campus development could include short-term localized erosion.

With campus development more evenly distributed throughout campus under Alternative 2 than under Alternative 1, earthwork activities in the West, South and East Campus sectors have a greater potential to occur in proximity to portions of the **Primary Impact Zone** located adjacent to the West, South and East Campus sectors, including the University District (adjacent to West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus), and a portion of the Laurelhurst neighborhood east of the East Campus sector. The portion of the Primary Impact Zone in proximity to the West and South Campus does not contain any identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas. The portion of the Primary Impact Zone in proximity to the East Campus contains Abandoned Landfill buffer area and Steep Slope area.

Although a lower level development is assumed to occur in Central Campus sector compared to other campus sectors under Alternative 2 (same amount of development assumed in Central Campus as under Alternative 1), assumed development in this sector would occur in proximity to the identified Steep Slope Area in the Ravenna Ravine immediately north of Central Campus, across NE 45th Street.

As under Alternative 1, given the distance of land uses and identified soils-related critical areas in the **Secondary Impact Zone** from development assumed under Alternative 2, construction activities associated with Alternative 2 development would not be anticipated to occur in proximity to identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas in the Secondary Impact Zone.

Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize the potential for impacts in the Primary and Secondary Impact Zones.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. Alternative 3 is intended to reflect conditions with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with increased development in the West and South Campus Sectors. The anticipated excavation amounts by campus area under Alternative 3 are estimated as follows:

- **West Campus** – approximately 800,000 cubic yards
- **South Campus** – approximately 412,500 cubic yards
- **Central Campus** – approximately 225,000 cubic yards
- **East Campus** – approximately 62,500 cubic yards

Compared to anticipated excavation amounts under Alternative 1, Alternative 3 includes more excavation in the West Campus sector (800,000 cubic yards compared to 750,000 cubic yards under Alternative 1), more excavation in the South Campus (412,000 cubic yards compared to 337,000 cubic yards under Alternative 1), the same amount of excavation in Central Campus, and substantially less excavation in East Campus (62,500 cubic yards compared to 187,000 cubic yards under Alternative 1).

As under Alternative 1, construction-related earth impacts could include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts.

Below is discussion on earth conditions (including SMC Critical Areas Regulations) as they relate to the campus sectors.

West Campus

Alternative 3 assumes that the West Campus sector would contain 3.2 million gsf of net new development (compared to 3.0 million gsf of net new development under Alternative 1), with a resulting amount of up to 800,000 yards of excavation over the planning horizon (compared to 750,000 under Alternative 1). The potential construction earth-related impacts (erosion) are anticipated to be somewhat greater under Alternative 3 than under Alternative 1 in West Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in West Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the West Campus sector is limited to areas south of the Burke-Gilman Trail, Benjamin Hall, and Creative Communications buildings.

Alternative 3 includes 0.2 million gsf of additional net building development compared to Alternative 1, and the potential for encountering steep slope conditions would be greater than under Alternative 1. As under Alternative 1, given the isolated nature of steep slope area in the West Campus sector, the potential for earth impacts related to steep slopes in West Campus is low. All development on the University of Washington campus would be conducted consistent with applicable regulations, including Seattle Municipal Code Chapter 25.09.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The West Campus sector does not contain any identified Liquefaction, Abandoned Landfill, or Peat Settlement areas and there is no potential for earth-related impacts related to encountering identified Liquefaction, Abandoned Landfill, or Peat Settlement areas in the West Campus sector under Alternative 3.

South Campus

Alternative 3 assumes that the South Campus sector would contain 1.65 million gsf of net new development (compared to 1.35 million gsf of net new development under Alternative 1), with a resulting amount of up to 412,500 yards of excavation over the planning horizon (compared to 337,500 under Alternative 1). The potential construction earth-related impacts (erosion) are anticipated to be greater under Alternative 3 than under Alternative 1 in South Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in South Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – SMC identified Steep Slope Area in the South Campus sector is limited to the southeast edge of this sector, along the Ship Canal immediately west of the Montlake Bridge. Potential development in this area under Alternative 3 is assumed to be limited to a portion of the Continuous Waterfront Trail and, as under Alternative 1, the potential for earth impacts related to steep slopes in South Campus is considered low.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The South Campus sector does not contain any identified Liquefaction or Abandoned Landfill Areas, and there is no potential to for earth-related impacts to identified Liquefaction or Abandoned Landfill areas in South Campus.

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to the East Campus and development in the South Campus under Alternative 3 would not be anticipated to encounter peat settlement conditions.

Central Campus

As under Alternative 1, Alternative 3 assumes that Central Campus would contain 0.9 million gsf of net new development, with a resulting amount of up to 225,000 cubic yards of excavation over the planning horizon. Potential construction earth-related impacts (erosion) are anticipated to be the same in Central Campus under Alternative 3 as are assumed under Alternative 1.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Areas – Identified Steep Slope Areas on the campus are primarily located in the Central Campus sector, and are primarily associated with Kincaid Ravine in the northern portion of Central Campus, along the Burke-Gilman Trail (primarily between the Trail and Montlake Boulevard, and between the Trail and NE Pacific), and along 15th Avenue NE. As under Alternative 1, given the isolated nature of steep slopes in Central Campus, the potential for development under Alternative 3 to encounter steep slopes is low. Development located in proximity to steep slopes would consider slopes in the design process, and all development would be conducted in compliance with City of Seattle Environmental Critical Areas Regulations (SMC 25.09) related to slopes.

Liquefaction/Abandoned Landfill/Peat Settlement Areas –Abandoned Landfill Area Buffer is identified on the approximately eastern third of the Central Campus sector, and Liquefaction Zone Area is identified on the eastern edge of Central Campus. Given the topography and soil conditions in these areas west of Montlake Boulevard NE, it is assumed that liquefaction and abandoned landfill (including presence of methane gasses) conditions would not be encountered during construction assumed under Alternative 3. However, any development located within identified Liquefaction or Abandoned Landfill Buffer Areas would be conducted in compliance with applicable City of Seattle Environmental Critical Areas Regulations (SMC 25.09).

As indicated earlier in this section, the East, Central and South Campus Sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to the East Campus and development in the Central Campus sector under Alternative 3 would not be anticipated to encounter peat settlement issues.

East Campus

Alternative 3 assumes that the East Campus sector would contain 0.25 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 62,500 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). The potential for construction earth-related impacts (erosion) could be lower in the East Campus sector under Alternative 3 than under Alternative 1. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the East Campus sector is located north and south of Husky Stadium, in the vicinity of the Graves Building and the Golf Driving Range, and within the natural open space area. Given the isolated nature of the identified steep slopes and the limited amount of development in the East Campus under Alternative 3, the potential to encounter steep slopes in the East Campus under Alternative 3 is low. Any development located in or proximate to steep slope areas would be designed consistent with City of Seattle Environmental Critical Areas regulations (SMC 25.09)

Liquefaction Area - Identified Liquefaction Area on the University of Washington campus is restricted to the East Campus sector. Given that Alternative 3 assumes approximately 0.25 gsf of net new development in the sector (compared to 0.75 million gsf assumed under Alternative 1) the potential to encounter earth conditions associated with liquefaction in the East Campus is lower under Alternative 3 than under Alternative 1.

Abandoned Landfill Area - Identified Abandoned Landfill Area on the University of Washington campus is primarily restricted to a portion of the East Campus sector. Compared to the 0.75 million gsf of net new development assumed for East Campus under Alternative 1, Alternative 3 assumes development of 0.25 million gsf of net new development in East Campus and the potential to encounter abandoned landfill area would be lower under Alternative 3 than under Alternative 1.

Peat Settlement Area - Other than West Campus, the entire University of Washington campus is included within the identified Peat-Settlement Area. Given campus topography and soil conditions, the East Campus sector has the greatest potential to contain peat settlement conditions. Accordingly, all potential development sites in East Campus would be subject to development standards for peat-settlement-prone areas specified in SMC 25.09.110, including limitations on increased total impervious surface and identification of construction methods to limit modifications to the groundwater regime. Alternative 3 assumes development in the East Campus sector would total 0.25 million gsf (compared to

0.75 million gsf under Alternative 1), and the potential to encounter earth conditions associated with peat settlement would be less under Alternative 3 than under Alternative 1.

Summary of Impacts in Primary and Secondary Impact Zones

Conditions in the Primary and Secondary Impact Zones would be generally as described under Alternative 1. Compared to Alternative 1 conditions in the **Primary Impact Zone**, more development would occur in the West Campus and South Campus sectors under Alternative 3, with a corresponding increase in the potential for earthwork activities. Earthwork activities in the West and South Campus sectors to occur in proximity to the Primary Impact Zone adjacent to West Campus and Central Campus. The portion of the Primary Impact Zone in proximity to the West and South Campus sectors does not contain any identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas.

Although less development is assumed to occur in the Central and East Campus sectors under Alternative 3 than assumed under Alternative 1, assumed development in these sectors would occur in proximity to Abandoned Landfill buffer area and identified Steep Slope area immediately east of East Campus, and the identified Steep Slope area in the Ravenna Ravine immediately north of Central Campus.

Given the distance of identified soils-related critical areas in the **Secondary Impact Zone** from development assumed under Alternative 3, construction activities associated with Alternative 3 development would not be anticipated to occur in proximity to identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas in the Secondary Impact Zone.

Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize the potential for impacts in the Primary and Secondary Impact Zones.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 represents campus development with a focus in the West and East Campus sectors, with more density in the Central and East Campus sectors than assumed under Alternative 1. Alternative 4 is intended to reflect conditions with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon. Alternative 4 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the Central and East Campus sectors. The anticipated excavation amounts by campus area under Alternative 4 are estimated as follows:

- **West Campus** – approximately 750,000 cubic yards
- **South Campus** – approximately 50,000 cubic yards
- **Central Campus** – approximately 275,000 cubic yards
- **East Campus** – approximately 425,000 cubic yards

Compared to anticipated excavation amounts under Alternative 1, Alternative 4 includes the same amount of excavation in West Campus, substantially less excavation in the South Campus (50,000 cubic yards compared to 337,000 cubic yards under Alternative 1), more excavation in Central Campus (275,000 cubic yards compared to 225,000 under Alternative 1), and substantially more excavation in East Campus (425,000 cubic yards compared to 187,000 cubic yards under Alternative 1).

As under Alternative 1, construction-related earth impacts could include short-term localized erosion. Compliance with existing regulations and codes would minimize potential impacts.

Below is discussion on earth conditions (including SMC Critical Areas Regulations) as they relate to the campus sectors.

West Campus

As under Alternative 1, Alternative 4 assumes that the West Campus sector would contain 3.0 million gsf of net new development, with a resulting amount of up to 750,000 cubic yards of excavation over the planning horizon of the *2018 Seattle Campus Master Plan*. The potential construction earth-related impacts (erosion) are anticipated to be the same under Alternative 4 as are assumed under Alternative 1 in the West Campus sector.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the West Campus sector is limited to isolated areas south of the Burke-Gilman Trail, Benjamin Hall, and the Creative Communications buildings. Alternative 4 includes the same amount of development as under Alternative 1, and the potential for encountering steep slope conditions would be the same under Alternative 4 as under Alternative 1.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The West Campus sector does not contain any identified Liquefaction, Abandoned Landfill, or Peat Settlement areas and there is no potential for earth related-impacts related to encountering identified Liquefaction, Abandoned Landfill, or Peat Settlement areas in the West Campus sector under Alternative 4.

South Campus

Alternative 4 assumes that the South Campus would contain 0.2 million gsf of net new development (compared to 1.35 million gsf of net new development under Alternative 1), with a resulting amount of up to 50,000 yards of excavation over the planning horizon (compared to 337,500 under Alternative 1). Potential construction earth-related impacts (erosion) in South campus are anticipated to be less under Alternative 4 than under Alternative 1.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the South Campus sector is limited to the southeast edge of this sector, along the Ship Canal immediately west of the Montlake Bridge. Potential development in this area would be limited to a portion of the potential Continuous Waterfront Trail and, as under Alternative 1, the potential for earth impacts related to steep slopes in the South Campus sector is considered low.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – The South Campus sector does not contain any identified Liquefaction or Abandoned Landfill Areas, and there is no potential for earth-related impacts related to identified Liquefaction or Abandoned Landfill areas in South Campus.

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to the East Campus and development in the South Campus under Alternative 4 would not be anticipated to encounter peat settlement issues.

Central Campus

Alternative 4 assumes that the Central Campus sector would contain 1.1 million gsf of net new development (compared with 0.9 million gsf under Alternative 1), with a resulting amount of up to 275,000 cubic yards of excavation over the planning horizon. The potential construction earth-related impacts (erosion) under Alternative 4 are anticipated to be greater than under Alternative 1 in Central Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Areas –As under Alternative 1, given the isolated nature of steep slopes in Central Campus, the potential for development under Alternative 4 to encounter steep slopes is low. Development located in proximity to steep slopes would consider slopes in

the design process, and all development would be conducted in compliance with City of Seattle Environmental Critical Areas Regulations (SMC 25.09) related to slopes.

Liquefaction/Abandoned Landfill/Peat Settlement Areas – Abandoned Landfill Area Buffer is identified on the approximately eastern third of the Central Campus sector, and Liquefaction Zone Area is identified on the eastern edge of the sector. Given the topography and soil conditions in these areas west of Montlake Boulevard NE, it is assumed that liquefaction and abandoned landfill (including presence of methane gasses) conditions would not be encountered during construction assumed under Alternative 4. However, any development located within identified Liquefaction or Abandoned Landfill Buffer Areas would be conducted in compliance with applicable City of Seattle Environmental Critical Areas Regulations (SMC 25.09).

As indicated earlier in this section, the East, Central and South Campus sectors are identified as Peat Settlement Area. Given campus topography and soil conditions, Peat Settlement conditions are assumed to be primarily applicable to the East Campus and development in the Central Campus sector under Alternative 4 would not be anticipated to encounter peat settlement conditions.

East Campus

Alternative 4 assumes that the East Campus sector would contain 1.7 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 425,000 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). The potential construction earth-related impacts (erosin) are anticipated to be greater under Alternative 4 than under Alternative 1 in East Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Relationship to Identified City of Seattle Environmentally Critical Areas

Steep Slope Area – Identified Steep Slope Area in the East Campus sector is located north and south of Husky Stadium, in the vicinity of the Graves Building and the Golf Driving Range, and within the natural open space area. Given the isolated nature of the identified steep slopes in the East Campus sector, the potential to encounter steep slopes in the East Campus under Alternative 4 is low. Any development located in or proximate to steep slope areas would be conducted consistent with City of Seattle Environmental Critical Areas regulations (SMC 25.09).

Liquefaction Area - The identified Liquefaction Area on the University of Washington campus is restricted to the East Campus sector. Alternative 4 assumes approximately 1.7 gsf of net new development (compared to 0.75 million gsf assumed under Alternative 1)

and the potential to encounter earth conditions associated with liquefaction is greater under Alternative 4 than under Alternative 1. Any proposed development in the East Campus would be required to prepare soils engineering studies consistent with Seattle Municipal Code 25.09.100, and other applicable requirements, to determine the physical properties of soils and the liquefaction potential (see Section 3.1.3 for mitigation measures related to liquefaction).

Abandoned Landfill Area - The identified Abandoned Landfill Area on the University of Washington campus is primarily restricted to a portion of the East Campus sector. Compared to the 0.75 million gsf of net new development assumed for East Campus under Alternative 1, Alternative 4 assumes development of 1.7 million gsf of net new development in East Campus and the potential to encounter earth conditions associated with abandoned landfill area would be greater under Alternative 4 than under Alternative 1. Alternative 4 assumes development in the northwest portion of the East Campus that are located within the identified Abandoned Landfill Area would be subject to Seattle-King County Health Department requirements related to the prevention of damage from methane gas buildup, ground subsidence and seismic events (consistent with SMC 25.09.220(A)).

Additionally, according to SMC 25.09.220(B), areas within 1,000 feet of methane-producing landfills may be susceptible to accumulations of hazardous levels of methane gas in enclosed spaces and may be required to include methane barriers or other appropriate ventilation measures. East Campus development within the buffer may require methane barriers or other ventilation measures, consistent with applicable regulations.

Peat Settlement Area - Other than the West Campus sector, the entire University of Washington campus is included within the identified Peat-Settlement Area. Given campus topography and soil conditions, only the East Campus sector has the potential to contain peat settlement issues. Accordingly, all potential development sites in the East Campus sector would be subject to development standards for peat-settlement-prone areas specified in SMC 25.09.110, including limitations on increased total impervious surface and identification of construction methods to limit modifications to the groundwater regime. Alternative 4 assumes development in the East Campus sector would total 1.7 million gsf, and this level of campus development would be subject to Peat Settlement regulations. Alternative 4 assumes a greater amount of development in East Campus than under Alternative 1, and the potential to encounter earth conditions associated with peat settlement would be greater under Alternative 4 than under Alternative 1.

Summary of Impacts in Primary and Secondary Impact Zones

Under Alternative 4, conditions in the Primary and Secondary Impact Zones would be generally as described under Alternative 1. Compared to Alternative 1 conditions in the **Primary Impact Zone**, more development would occur in the Central Campus and East

Campus sectors, with a corresponding increase in earthwork activities. Earthwork activities in the Central and East Campus sectors could occur in proximity to the Primary Impact Zone adjacent to Central and East Campus. The portion of the Primary Impact Zone in proximity to the East Campus contains identified Abandoned Landfill buffer area and identified Steep Slope area. The portion of the Primary Impact Zone in proximity to the Central Campus sector contains identified Steep Slope in the Ravenna Ravine.

Given the distance of land uses and identified soils related critical areas in the **Secondary Impact Zone** from development assumed under Alternative 4, construction activities associated with Alternative 4 development would not be anticipated to occur in proximity to identified Abandoned Landfill, Known Slide, Peat Settlement or Steep Slope areas in the Secondary Impact Zone.

Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize the potential for impacts in the Primary and Secondary Impact Zones.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1, 2, 3 and 4; although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in East Campus, would occur. Because substantial amounts of excavation would not be required for campus improvements associated with the street vacations in West Campus or the land bridge over Montlake Boulevard in East Campus, earth conditions under Alternative 5 would be similar to Alternatives 1, 2, 3 and 4 for all campus sectors.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall construction in the area and, in combination with future new development in the area, would contribute to indirect construction-related earth impacts including short-term, localized traffic congestion, noise, dust, erosion and increased street maintenance requirements associated with the removal of dirt tracked onto area streets (see Section 3.2 **Air Quality**, Section 3.5 **Environmental Health**, and Section 3.15 **Transportation**). To the extent that increased campus population and development increase the pressure for supporting development in the area (primarily in the University District), campus growth could contribute to earth-related impacts in the area. Any development outside of the MIO boundary would comply with City of Seattle code requirements.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the building development necessary to accommodate increased campus population, thus, potentially transferring a portion of the earth-related impacts from the University of Washington campus to surrounding areas.

Potential changes in the zoning and development capacity of the University District could result in increased development and construction in the vicinity of the University of Washington campus. Although the level, timing, and specific location(s) of future development in the University District is not defined, it is possible that some level of concurrent development and associated earthwork activities, would occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan,* especially given the proposed focus of development in West Campus under Alternatives 1 through 5. There would be the potential for indirect cumulative earth-related impacts (i.e., truck traffic, noise, dust, etc.) associated with concurrent construction activities on the University of Washington campus and in the University District.

All construction activities in the area, both on the University of the Washington campus and in the campus vicinity, would be required to follow applicable regulations, and significant impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.1-5**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For example, areas of campus designated by the City of Seattle as geologic environmental critical areas are identified as having a "High" potential to encounter

sensitive earth conditions, while areas of campus located at a distance from geologic critical areas are identified as having a "Low" potential to encounter sensitive earth conditions.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter

sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

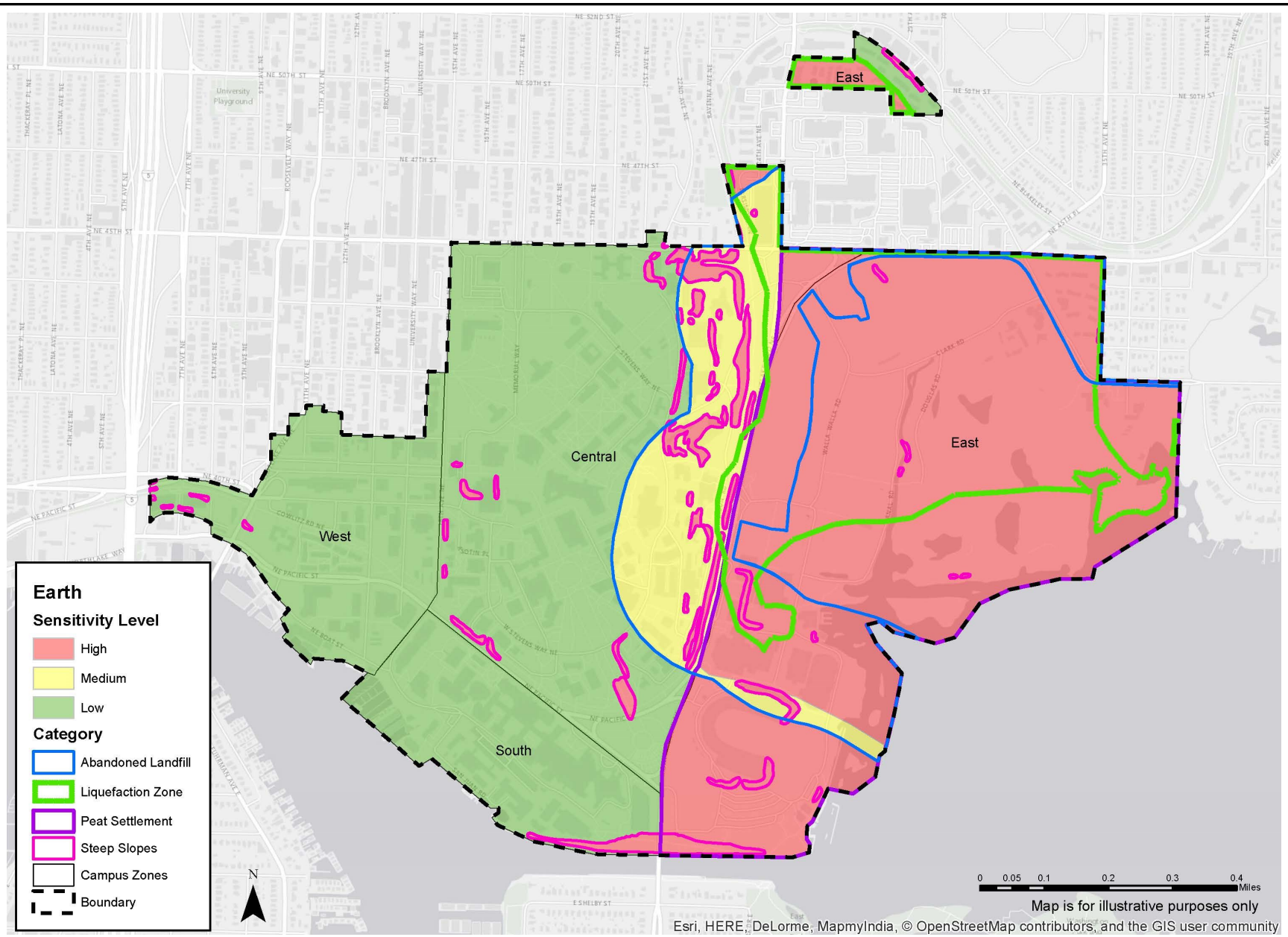
3.1.3 Mitigation Measures

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- All earthwork and site preparation on the University of Washington Seattle Campus would be conducted in compliance with relevant grading criteria of the Seattle Municipal Code (Sections 22.170 and 22.802).

- The following Temporary Erosion and Sedimentation Control (TESC) measures would be implemented, as appropriate for the individual sites, as part of code compliance to reduce the risk of construction-related erosion:

    - The ground surface in the construction area would be sloped and sealed to reduce water infiltration, to promote rapid runoff, and to prevent water ponding.
    - To prevent soil disturbance, the size or type of construction equipment may have to be limited.
    - No soil would be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, would be used to seal the ground surface.
    - Work areas and soil stockpiles would be covered with plastic. Bales of straw and/or geotextile silt fences would be used as appropriate to control soil erosion.
    - During periods of wet weather, excavation and fill placement would be observed on a full-time basis by a geotechnical engineer (or engineer's representative) experienced in wet weather earthwork to determine that unsuitable materials are removed and that suitable compaction and site drainage is achieved.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.1-5
Earth Sensitivity Map

- Excavation slopes would be protected from infiltration and erosion by directing water away from excavations and covering slopes with impermeable membranes, such as plastic sheeting.
- Excavated materials, stockpiles, and equipment would be placed away from the top edge of excavations a distance equal to at least the depth of the excavation.
- To prevent an accumulation of dust and/or mud on campus during construction activities, the tires of construction equipment and trucks could be washed before they leave construction sites and streets could be swept as necessary.

- Site specific geotechnical recommendations would be provided as individual projects are proposed. Typical measures that could be implemented as part of code compliance, based on the specific conditions at the individual sites, include:
  - Excavations greater than four feet in height would be adequately sloped or braced to prevent localized sloughing and spalling.
  - Temporary shoring would be implemented during construction and would consist of a conventional soldier pile and lagging system.
  - All soil excavated from the site would be tested for contamination. All soil would be disposed of consistent with applicable University of Washington, State and local regulations.
  - Soldier piles and/or other slope stability techniques could be used as necessary in areas of unstable soils.
  - Structures could be designed with structural systems capable of supporting code-required floor loading and resisting lateral forces generated by earthquakes and wind.
- Whenever possible, construction could be scheduled to minimize overlapping of excavation periods for projects planned for construction in the same biennium.
- As individual projects are proposed, coordination with educational or research uses in the immediate vicinity that could be sensitive to vibration during construction would be conducted to determine appropriate measures to minimize the potential for disruption (see Section 3.5 **– Environmental Health**-for additional discussion and mitigation).

Additional Measure Applicable to Medium and High Campus Areas

- Construction activities conducted in portions of the campus identified as containing earth-related environmentally critical areas (primarily in the East Campus) identified by the City of Seattle Municipal Code (SMC) would comply with applicable development standards for: Liquefaction-Prone Areas (SMC 25.09.100); Peat Settlement-Prone Areas (SMC 25.09.110); Steep Slope Areas (SMC 25.09.180); and, Abandoned Landfills (SMC 25.09.220)

3.1.4 Significant Unavoidable Adverse Impacts

With implementation of the identified mitigation measures, significant earth related impacts are not anticipated.

3.2 AIR QUALITY AND GREENHOUSE GAS

This section of the Draft EIS describes the existing air quality conditions on the University of Washington campus and in the site vicinity and evaluates the potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.2.1 Affected Environment

Climate

The Puget Sound region has a winter-wet, summer-dry climate. Winters are moderate in temperature with few cold periods below 32 degrees Fahrenheit, and summers are relatively cool with short spells between 85 degrees and 100 degrees Fahrenheit. Annual precipitation, concentrated in the winter months, averages 35 inches. Winds generally range south to southwest in the winter, and west to northwest in warmer periods.

In winter, inversions with very stable atmospheric conditions occur for periods of one to several days. Climate affects air quality in regards to wind conditions and temperatures; both factors influence ambient concentrations of pollutants. Due to low solar heating of the land in winter, temperature inversions may occur, accompanied by stagnant atmospheric conditions. In most cases, these pollutant-trapping inversions have an upper 'lid' at altitudes between 1,000 and 6,000 feet, and break up by early afternoon daily. In cases where the inversions do not break up on a daily basis, stagnated atmospheric conditions can result in the degradation of air quality. During such stagnated atmospheric conditions, the local air quality authorities (identified below) can issue impaired air quality burn bans that limit the use of wood burning devices.

Air Quality

Air Quality Regulatory Overview

Air quality is generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards set to protect human health and welfare. Ambient air quality standards are set for what are referred to as "criteria" pollutants (e.g., carbon monoxide - CO, particulate matter, nitrogen dioxide - NO_2, and sulfur dioxide - SO_2). Three agencies have jurisdiction over the ambient air quality in the campus area: the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). These agencies establish regulations that govern both the concentrations of pollutants in the outdoor air and rates of contaminant emissions from air pollution sources. Although their regulations are similar in stringency, each agency has established its own standards. Unless the state or local

jurisdiction has adopted more stringent standards, EPA standards apply. These standards have been set at levels that EPA and Ecology have determined will protect human health with a margin of safety, including the health of sensitive individuals like the elderly, the chronically ill, and the very young.

Ecology and PSCAA maintain a network of air quality monitoring stations throughout the Puget Sound area. In general, these stations are located where there may be air quality problems, and so are usually in or near urban areas or close to specific large air pollution sources. Other stations located in more remote areas provide indications of regional or background air pollution levels. Based on monitoring information for criteria air pollutants collected over a period of years, Ecology and EPA designate regions as being "attainment" or "nonattainment" areas for particular pollutants. Attainment status is, therefore, a measure of whether air quality in an area complies with the federal health-based ambient air quality standards for criteria pollutants. Once a nonattainment area achieves compliance with the National Ambient Air Quality Standards (NAAQSs), the area is considered an air quality "maintenance" area. The campus area is considered an air quality maintenance area for CO, and there has not been a violation of the CO standards in the area in many years.

Existing Air Quality Overview

Existing sources of air pollution in the area include a variety of institutional and commercial sources, along with and dominated by local traffic sources. With typical vehicular traffic, the air pollutant of concern is CO. Other pollutants include ozone precursors (hydrocarbons and nitrogen oxides – NOx), coarse and fine particulate matter (PM10 and PM2.5), and SO_2. The amounts of particulate matter generated by well-maintained individual vehicles are minimal compared with other sources (e.g., a wood-burning stove), and concentrations of SO_2 and NOx are usually not high except near large industrial facilities. Existing air quality in the area is generally considered good.

Following is a description of existing sources of air pollution for each of the campus sectors.

West Campus

Vehicular traffic currently has the greatest influence on air quality in West Campus. Major roadways in and around West Campus that carry pollutant-emitting traffic include: NE Pacific Street and NE Campus Parkway, which pass through the sector; the University Bridge, which passes over a portion of the sector; and the I-5 Ship Canal Bridge and 15th Avenue NE, which form the western and eastern edges of the sector respectively (see **Figure 2-2** in Chapter 2 of this Draft EIS).

South Campus

Vehicular traffic currently has the greatest influence on air quality in South Campus. Major roadways in and around South Campus that carry pollutant-emitting traffic include: 15th Avenue NE, which forms the western edge of the sector; NE Pacific Avenue, which forms the the northern edge of the sector; and Montlake Boulevard NE, which forms the eastern edge of the sector (see **Figure 2-2** in Chapter 2 of this Draft EIS).

Central Campus

Vehicular traffic currently has the greatest influence on air quality in Central Campus. Major roadways in and around Central Campus that carry pollutant-emitting traffic include: University Way NE and Stevens Parkway, which pass through the sector; and 15th Avenue NE, NE 45th Avenue, Montlake Boulevard NE, and NE Pacific Avenue, which form the edges of the sector (see **Figure 2-2** in Chapter 2 of this Draft EIS).

East Campus

Vehicular traffic currently has the greatest influence on air quality in East Campus. Major roadways in and around East Campus that carry pollutant-emitting traffic include: Montlake Boulevard NE, which forms the western edge of the sector; and 45th Avenue NE, which forms the northern edge of the sector (see **Figure 2-2** in Chapter 2 of this Draft EIS).

Greenhouse Gas Emissions

Earth's Natural Climate and Human Influence on Climate

The global climate is continuously changing, as evidenced by repeated episodes of warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. Scientists have observed, however, an unprecedented increase in the rate of warming in the past 150 years. This recent warming has coincided with the global Industrial Revolution, which resulted in widespread deforestation to accommodate development and agriculture, and an increase in the use of fossil fuels which has released substantial amounts of greenhouse gases (GHGs) into the atmosphere.

GHGs, such as carbon dioxide, methane and nitrous oxide, trap heat in the atmosphere and are emitted by both natural processes and human activities. The accumulation of GHG in the atmosphere affects the earth's temperature. While research has shown that earth's climate has natural warming and cooling cycles, evidence indicates that human activity has elevated the concentration of GHG in the atmosphere beyond the level of naturally

occurring concentrations resulting in more heat being held within the atmosphere. The Intergovernmental Panel on Climate Change (IPCC), an international group of scientists from 130 governments has concluded that it is "very likely" (a probability listed at more than 90 percent) that human activities and fossil fuels explain most of the warming over the past 50 years.[1]

The IPCC predicts that under current human GHG emission trends, the following results could be realized within the next 100 years:[2]

- global temperature increases between 1.1 – 6.4 degrees Celsius;
- potential sea level rise between 18 to 59 centimeters or 7 to 22 inches;
- reduction in snow cover and sea ice;
- potential for more intense and frequent heat waves, tropical cycles and heavy precipitation; and
- impacts to biodiversity, drinking water, and food supplies.

The Climate Impacts Group (CIG), a Washington-state based interdisciplinary research group which collaborates with federal, state, local, tribal, and private agencies, organizations, and businesses, studies impacts of natural climate variability and global climate change on the Pacific Northwest. CIG research and modeling indicates the following possible impacts of human-based climate change in the Pacific Northwest:[3]

- changes in water resources such as decreased snowpack; earlier snowmelt; decreased water for irrigation, fish and summertime hydropower production; increased conflict over water; and increased urban demand for water;
- changes in salmon migration and reproduction;
- changes in forest growth and species diversity and increases in forest fires; and
- changes along the coast such as increased coastal erosion and beach loss due to rising sea levels; increased landslides due to increased winter rainfall, permanent inundation in some areas; and increased coastal flooding due to sea level rise and increased winter streamflow.

Regulatory Context for Global Climate Change

There are no specific emission reduction requirements or targets applicable to potential future campus development, nor are there any generally accepted emission level "impact" thresholds with which to assess potential localized or global impacts related to GHG emissions. Instead, there are State and local policies and programs intended to consider

[1] IPCC, Fifth Assessment Report, November 2014.

[2] IPCC, Summary for Policymakers, November 2014.

[3] Climate Impacts Group, Climate Impacts in Brief, accessed February 7, 2008, http://www.cses.washington.edu/cig/pnwc/ci.shtml.

and reduce GHG emissions over time, as described below. The University of Washington is also considered a leader in global climate change and performs critical research on the issue.

Western Regional Climate Action Initiative

On February 26, 2007, the Governors of Arizona, California, New Mexico, Oregon, and Washington signed the Western Climate Initiative (WCI) to develop regional strategies to address climate change. WCI is identifying, evaluating, and implementing collective and cooperative ways to reduce GHGs in the region. Subsequent to this original agreement, the Governors of Utah and Montana, as well as the Premiers of British Columbia and Manitoba joined the Initiative. The WCI objectives include setting an overall regional reduction goal for GHG emissions, developing a design to achieve the goal and participating in The Climate Registry, a multi-state registry to enable tracking, management, and crediting for entities that reduce their GHG emissions.

On September 23, 2008, the WCI released their final design recommendations for a regional cap-and-trade program. This program would cover GHG emissions from electricity generation, industrial and commercial fossil fuel combustion, industrial process emissions, gas and diesel consumption for transportation, and residential fuel use. The first phase of the program began January 1, 2012, and regulates electricity emissions and some industrial emission sources not present on the campus. Thus, this program is not applicable to the proposed *2018 Campus Master Plan*, per se.

State of Washington

In February of 2007, Executive Order No. 07-02 established goals for Washington regarding reductions in climate pollution, increases in jobs, and reductions in expenditures on imported fuel (Washington, Office of the Governor, 2007). The goals for reducing GHG emissions were as follows: to reach 1990 levels by 2020 and to reduce emissions 25 percent below 1990 levels by 2035 and 50 percent below 1990 levels by 2050. This order was intended to address climate change, grow the clean energy economy, and move Washington toward energy independence. The Washington Legislature in 2007 passed SB 6001, which among other things, adopted the Executive Order No. 07-02 goals into statute.

In 2008, the Washington Legislature built on SB 6001 by passing the Greenhouse Gas Emissions Bill (E2SHB 2815). While SB 6001 set targets to reduce emissions, the E2SHB 2815 made those state-wide requirements (RCW 70.235.020) and directed the state to submit a comprehensive GHG reduction plan to the Legislature by December 1, 2008. As part of the plan, the Department of Ecology was mandated to develop a system for reporting and monitoring GHG emissions within the state and a design for a regional multi-sector, market-

based system to reduce statewide GHG emissions, consistent with the requirements in RCW 70.235.020.

In 2008, Ecology issued a memorandum stating that climate change and GHG emissions should be included in all State Environmental Policy Act (SEPA) analyses and committed to providing further clarification and analysis tools (Manning, 2008). Ecology direction on SEPA and GHG emissions indicates that SEPA cannot be relied upon exclusively or even primarily for achieving GHG reductions, and that the state is pursuing many actions to reduce GHGs.

In 2009, Executive Order 09-05 ordered Washington State agencies to reduce climate-changing GHG emissions, to increase transportation and fuel-conservation options for Washington residents, and protect the State's water supplies and coastal areas. This Executive Order directs state agencies to develop a regional emissions reduction program; develop emission reduction strategies and industry emissions benchmarks to make sure 2020 reduction targets are met; work on low-carbon fuel standards or alternative requirements to reduce carbon emissions from the transportation sector; address rising sea levels and the risks to water supplies; and increase transit options (e.g., buses, light rail, and ride-share programs) and give Washington residents more choices for reducing the effect of transportation emissions.

On December 1, 2010, Ecology adopted Chapter 173-441 WAC – *Reporting of Emission of Greenhouse Gases*. This rule aligns the State's GHG reporting requirements with EPA regulations, and requires facilities and transportation fuel suppliers that directly emit 10,000 metric tons carbon dioxide equivalents ($MTCO_2e$) or more per year, to report their GHG emissions to Ecology. Requirements for reporting began on January 1, 2012.

City of Seattle

The Seattle City Council adopted Comprehensive Plan goals and policies in 2007 related to achieving reductions in GHG emissions. To carry out these goals and policies, assessment of GHG emissions from proposed development is required. Under this assessment, developers for projects that trigger environmental review are required to identify the climate change impact of their proposals as shown by calculating the GHG emissions. In April 2011, the City Council adopted Ordinance No. 123575, which amended the City's *Comprehensive Plan* (Section E on Environment) to provide that a forthcoming Climate Action Plan would identify strategies for reducing GHG emissions and would include methods for reducing Vehicle Miles Traveled. The Office of Sustainability & Environment has since developed a new Climate Action Plan to meet the goal of carbon neutrality by 2050; the plan was adopted by the Seattle City Council on June 17, 2013.

University of Washington

The University of Washington is a signatory on the American College and University Presidents Climate Commitment. The University is also one of the founding partners of the Seattle Climate Partnerships and has prepared an initial quantitative estimate of the University's GHG emissions profile. In October 2007, the University of Washington also released the "2005 Inventory of Greenhouse Gas Emissions Ascribable to the University of Washington," which provided a quantitative estimate of the total GHG emissions produced on the University of Washington Campus. In 2008, the University of Washington also established the Environmental Stewardship and Sustainability Office to support the University's Campus Sustainability Fund, coordinate University initiatives such as the Climate Action Plan, and promote campus projects that encourage resource conservation.

Existing Greenhouse Gas Emissions

In order to provide a context for GHG emissions associated with the *2018 Seattle Campus Master Plan*, it is useful to consider the existing estimated overall emissions on the University of Washington campus. For the purposes of discussion of climate change impacts in this EIS*,* the *SEPA Greenhouse Gas Emissions Worksheet* formulated by King County (see **Appendix B** for the completed worksheet) was used to estimate the emissions that are currently generated by existing development on campus[4] **Table 3.2-1** summarizes the existing lifespan and annual emissions generated by existing campus development[5].

Table 3.2-1
GREENHOUSE GAS EMISSIONS – 2015 EXISTING CONDITIONS

	Square Feet (thousands of sq. ft.)	Lifespan Emissions ($MTCO_2e$)[6]	Anticipated Lifespan	Estimated Annual Emissions ($MTCO_2e$)
West Campus	3,846.2	4,021,126	62.5	64,338
South Campus	4,178.5	4,368,539	62.5	69,897
Central Campus	7,153.5	7,478,843	62.5	119,661
East Campus	1,462.0	1,528,492	62.5	24,456
Total 2015 Existing Campus	16,640.2	17,397,035	62.5	278,353

Source: EA Engineering, Science, and Technology, 2016.
Note: any inconsistencies in this table are due to rounding.

[4] The King County worksheet was utilized rather than the Washington State Department of Ecology form because the King County Worksheet calculation characteristics most closely reflect those of the Proposed Action

[5] It should be noted that the calculation of existing GHG emissions on-campus represent a conservative estimate of emissions as the King County worksheet includes emissions associated with the construction of buildings and these emissions would have already occurred as part of the previous development of the existing campus buildings.

[6] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent which is a standard measure of amount of CO_2 emissions reduced or sequestered.

In order to provide context for GHG emissions associated with development under the EIS Alternatives, following is a description of existing GHG emissions from each of the campus sectors.

West Campus

As shown in **Table 3.2-1**, the estimated current lifespan emissions in West Campus are 4,021,126 $MTCO_2e$ and annual emission are 64,338 $MTCO_2e$.

South Campus

As shown in **Table 3.2-1**, the estimated current lifespan emissions in South Campus are 4,368,539 $MTCO_2e$ and annual emission are 69,897 $MTCO_2e$.

Central Campus

The Central Campus sector currently generates the most GHG emissions of the campus sectors. As shown in **Table 3.2-1**, the estimated current lifespan emissions in Central Campus are 7,478,843 $MTCO_2e$ and annual emission are 69,897 $MTCO_2e$. These emissions are the highest of any of the sectors due to the amount of existing development in this sector.

East Campus

The East Campus sector currently generates the least GHG emissions of the campus sectors. As shown in **Table 3.2-1**, the estimated current lifespan emissions in East Campus are 1,528,492 $MTCO_2e$ and annual emission are 24,456 $MTCO_2e$. These emissions are the lowest of any of the sectors due to the amount of existing development in this area.

Surrounding Primary & Secondary Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement. These zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

The major sources of air quality pollutants and GHG emissions within the Primary and Secondary Impact Zones include: commercial and residential development, and major roadways. Within the **Primary Impact Zone**, these sources include: commercial and residential development in the University District, Wallingford, Laurelhurst and Montlake neighborhoods; commercial development at University Village; and emissions from traffic on I-5, SR-520, NE 50th Street, NE 45th Street, NE Pacific Street, Roosevelt Way NE, 11th Avenue NE, University Way NE, 25th Avenue NE, and Montlake Boulevard NE. Within the **Secondary Impact Zone**, all of the same sources of air quality pollutants and GHG emissions

are present, except University Village. Additional roadway sources in this zone include: Eastlake Avenue E, 24th Avenue NE, NE 35th Street, Sandpoint Way NE, NE 65th Street and NE Ravenna Boulevard

3.2.2 Impacts

This section of the Draft EIS identifies how development under the EIS Alternatives would relate to air quality and GHG emissions during construction and long-term operations.

No Action Alternative

Under the No Action Alternative, air quality and GHG emissions would primarily be related to the approximately 211,000 gsf of building development remaining under the current *CMP Seattle 2003*. The approximately 211,000 gsf of building development would represent approximately three percent of the amount of development on campus assumed under Alternatives 1 - 5, and the potential for air quality and GHG-related impacts on the University of Washington campus would be substantially less than under Alternatives 1 - 5. For example, the amount of estimated lifespan and annual emissions related to the development that would occur under the No Action Alternative would be 220,596 $MTCO_2e$ and 3,530 $MTCO_2e$, respectively; compared to 6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$ under Alternatives 1 - 5. GHG emissions from building development under the No Action Alternative have not been estimated by campus sector because building development has not been allocated by sector under this alternative.

However, to the extent that the No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the development necessary to accommodate increased campus population, the No Action Alternative could result in increased air quality and GHG-related impacts on surrounding areas.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1, which matches the preferred distribution of building development in the *2018 Seattle Campus Master Plan*, includes approximately 6.0 million net new gsf of development throughout the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors. Development on the campus under Alternative 1 would result in air quality and GHG impacts as described below.

Air Quality

General Construction

The development of 6.0 million gsf of building development on the University of Washington Seattle campus would result in localized short-term increases in particulates (dust) and equipment emissions (carbon monoxide) in the vicinity of construction sites. Key construction activities causing potential impacts include: removal of existing pavement and/or buildings, excavation, grading, stockpiling of soils, soil compaction, and operation of diesel-powered trucks and equipment (i.e., generators and compressors) on the individual potential development sites.

Demolition of existing structures would require the removal and disposal of building materials, some of which could contain asbestos. If this proves to be the case, demolition contractors would be required to comply with EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing materials.

Construction would require the use of heavy trucks, excavators, graders, cranes, pile drivers, and a range of smaller equipment such as generators, pumps, and compressors. Emissions from existing transportation sources (primarily vehicular traffic) around the development areas would very likely outweigh any emissions resulting from construction equipment. Pollution control agencies are nonetheless now urging that emissions from diesel equipment be minimized to the extent practicable to reduce potential health risks. Construction contractors would minimize emissions from diesel-powered construction equipment to the extent practicable by taking steps such as those discussed in **Section 3.2.3**.

With appropriate code and regulation compliance, construction-related diesel emissions would not be likely to substantially affect air quality in the vicinity of any potential development site.

Although some construction could cause odors, particularly during paving operations that involve the using tar and asphalt, any odors related to construction would be short-term and localized (and in some areas located within a busy traffic area where such odors would likely go unnoticed). Construction contractor(s) would be required to comply with PSCAA regulations that prohibit the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

With implementation of the controls required for the various aspects of construction activities and consistent use of best management practices (BMPs) to minimize emissions,

construction activities under Alternative 1 would not be expected to significantly affect air quality.

Construction Traffic

During construction, on-campus activity and periodic traffic delays on adjacent streets could contribute to slightly greater vehicle emissions. Under Alternative 1, West Campus and South Campus sectors would have a higher potential to incur increased activity and traffic delays, and associated increases in vehicle emissions, compared to the Central and East Campus sectors.

Operations

Overall campus population growth during the planning horizon would increase the consumption of electricity, fossil fuel, and natural gas in the central power plant which would contribute to cumulative air quality impacts. Emissions from the plant would be managed to comply with the standards and methodology associated with the University's Air Quality Operation Permit issued by the Puget Sound Clean Air Agency.

Operation of certain uses on the campus could result in direct exhaust emissions from enclosed/interior truck loading areas, research and medical operations, and other exhaust venting sources. Exhaust vents would likely be located either near ground level or at elevated positions on building (including on the roof). Research fume hoods are also provided within University laboratory areas and are regulated and inspected by the University's Environmental Health and Safety Department. Emissions from any vents near ground level could have the greatest potential to be perceived by pedestrians and users of nearby buildings. While such emissions could, at times, be noticeable, these emissions would be unlikely to result in air quality impacts. Any emissions would be subject to applicable requirements of the University of Washington and the Puget Sound Clean Air Agency.

Greenhouse Gas Emissions

Climate change is a global problem and it is not possible to discern the impact that GHG emissions from a single campus master plan may have on global climate change.

Neither the EPA, State of Washington, nor City of Seattle currently have regulations in place to provide guidance on analysis of the impacts of climate change and associated GHG emissions. For the purposes of discussion of the climate change impacts of the Proposed Action for this EIS, the *SEPA Greenhouse Gas Emissions Worksheet* formulated by King

County was used to estimate the emissions footprint of the Proposed Action for the lifecycle of the development,[7] specifically:

- the extraction, processing, transportation, construction and disposal of materials and landscape disturbance (embodied emissions);
- energy demands created by the development after it is completed (energy emissions); and
- transportation demands created by the development after it is completed (transportation emissions) (see **Appendix B** for the completed worksheet).

It is estimated that assumed development under Alternative 1 would generate GHG emissions associated with construction activities (including demolition), production/extraction of construction materials, energy consumption from construction and operation, and vehicle emissions from associated vehicle trips. **Table 3.2-2** shows the anticipated lifespan GHG emissions and estimated annual GHG emissions associated with development under the *2018 Seattle Campus Master Plan* under Alternative 1 (6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$, respectively).

Table 3.2-2
GREENHOUSE GAS EMISSIONS – ALTERNATIVE 1

	Square Feet (thousands of sq. ft.)	Lifespan Emissions ($MTCO_2e$)[8]	Anticipated Lifespan	Estimated Annual Emissions ($MTCO_2e$)
West Campus	3,000	3,136,441	62.5	50,183
South Campus	1,350	1,411,398	62.5	22,582
Central Campus	900	940,932	62.5	15,055
East Campus	750	784,110	62.5	12.546
Alternative 1 Total	6,000	6,272,882	62.5	100,366

Source: EA Engineering, Science, and Technology, 2016.
Note: any inconsistencies in this table are due to rounding.

Following is a discussion of air quality and GHG impacts under Alternative 1 by campus sector.

West Campus

Air Quality **-** One of the focus areas of Alternative 1 development is in West Campus (3.0 million gsf of building area). As a result, existing uses sensitive to dust and equipment

[7] The King County worksheet was used rather than the Washington State Department of Ecology form because the King County Worksheet calculation characteristics most closely reflect those of the Proposed Action

[8] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent which is a standard measure of amount of CO2 emissions reduced or sequestered.

emissions generated during construction in this sector could be affected in the short-term, including student housing and academic uses.. Demolition activities in West Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material. Significant air quality impacts associated with demolition would not be anticipated.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-2**, assumed new development under Alternative 1 is estimated to generate an additional 3,136,441 $MTCO_2e$ of lifespan and 50,183 $MTCO_2e$ of annual GHG emissions in West Campus (beyond the 4,021,126 $MTCO_2e$ lifespan and 64,338 $MTCO_2e$ annual GHG emissions in this sector under existing conditions, and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). The additional GHG emissions from new development in West Campus would be the greatest of all of the campus sectors, given the amount of new development assumed in this area under Alternative 1.

South Campus

Air Quality **–** The South Campus sector is another one of the focus areas of Alternative 1 development (1.35 million gsf of building area). As a result, existing uses sensitive to dust and equipment emissions generated during construction in this area could be affected in the short-term, including medical and dental uses. Demolition activities in the South Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material. Significant air quality impacts associated with demolition would not be anticipated.

Greenhouse Gas Emissions **–** As shown in **Table 3.2-2**, assumed new development under Alternative 1 is estimated to generate an additional 1,411,398 $MTCO_2e$ of lifespan and 22,582 $MTCO_2e$ of annual GHG emissions in South Campus (beyond the 4,368,539 $MTCO_2e$ lifespan and 69,897 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative).

Central Campus

Air Quality **-** Dust and equipment emissions associated with construction under Alternative 1 in Central Campus would have the potential to impact academic and student housing uses. However, given the lower amount of construction assumed for Central Campus (0.9 million gsf of building area) the potential for air quality impacts would be less than in the West and South Campus sectors.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-2**, assumed new development under Alternative 1 is estimated to generate an additional 940,932 $MTCO_2e$ of lifespan and 15,055 $MTCO_2e$ of annual GHG emissions in Central Campus (beyond the 7,478,843 $MTCO_2e$

lifespan and 119,661 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative).

East Campus

Air Quality **-** Given the relatively limited amount of construction assumed for East Campus under Alternative 1 (0.75 million gsf of building area) and relative lack of existing sensitive uses (i.e., limited academic and housing uses), the potential for air quality impacts during construction in East Campus would be low.

With implementation of the controls required for the various aspects of construction activities (i.e., EPA, PSCAA and University of Washington Environmental Health and Safety requirements and standards) and consistent use of best management practices to minimize emissions, construction under Alternative 1 would not be expected to significantly affect air quality.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-2**, assumed new development under Alternative 1 is estimated to generate an additional 784,110 $MTCO_2e$ of lifespan and 12,546 $MTCO_2e$ of annual GHG emissions in East Campus (beyond the 1,528,492 $MTCO_2e$ lifespan and 24,456 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). Additional GHG emissions from East Campus would be the least of all the campus sectors, given the amount of new development assumed in this area under Alternative 1.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential air quality impacts on land uses in the Primary and Secondary Impact Zones would largely be due to dust, equipment emissions, and localized traffic congestion. During operation, potential air quality impacts on land uses would largely be due to localized traffic congestion.

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), more air quality emissions would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. As a result, there would be less air quality emissions that would impact adjacent land uses in the Primary Impact Zone adjacent to these sectors.

Compliance with existing regulations and codes, including air quality regulations, would minimize the potential for impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, construction and operational activities associated with Alternative 1 development would not be anticipated to result in air quality impacts in the Secondary Impact Zone.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West, South and East Campus sectors, and a lesser level of development in the Central Campus sector. Existing building height limits would be retained under this alternative.

Air Quality

As under Alternative 1, the development of 6.0 million gsf of building development on the University of Washington Seattle campus under Alternative 2 would result in localized short-term increases in particulates (dust) and equipment emissions (CO) in the vicinity of construction sites. On-campus activity and periodic traffic delays on adjacent streets could contribute to slightly greater vehicle emissions during construction. With implementation of the controls required for the various aspects of construction activities and consistent use of BMPs to minimize emissions, construction under Alternative 2 would not be expected to significantly affect air quality.

Overall campus population growth during the planning horizon (10 years) under Alternative 2 would increase the consumption of electricity, fossil fuel, and natural gas in the central power plant which would contribute to cumulative air quality impacts, as described under Alternative 1. Emissions from the plant would be managed to comply with standards and methodology associated with the University's Air Quality Operation Permit issued by the Puget Sound Clean Air Agency.

Similar to under Alternative 1, operation of certain uses on the campus under Alternative 2 could result in direct exhaust emissions from enclosed/interior truck loading areas, research and medical operations, and other exhaust venting sources. Any emissions would be subject to applicable requirements of the University of Washington and the Puget Sound Clean Air Agency.

Greenhouse Gas Emissions

As described for Alternative 1, climate change is a global problem and it is not possible to discern the impact that GHG emissions from a single campus master plan may have on global climate change. The total amount of estimated annual and lifetime GHG emissions from Alternative 2 would be the same as for Alternative 1 (6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$, respectively) because the same amount of total building area (approximately 6.0 million gsf) is assumed throughout the University of Washington Seattle campus (see **Table 3.2-3**).

Table 3.2-3
GREENHOUSE GAS EMISSIONS – ALTERNATIVE 2

	Square Feet (thousands of sq. ft.)	Lifespan Emissions ($MTCO_2e$)[9]	Anticipated Lifespan	Estimated Annual Emissions ($MTCO_2e$)
West Campus	2,400	2,509,153	62.5	40,146
South Campus	1,350	1,411,398	62.5	22,582
Central Campus	900	940,932	62.5	15,055
East Campus	1,350	1,411,398	62.5	22,582
Alternative 2 Total	6,000	6,272,882	62.5	100,366

Source: EA Engineering, Science, and Technology, 2016.
Note: any inconsistencies in this table are due to rounding.

Following is a discussion of air quality and GHG impacts under Alternative 2 by campus sector.

West Campus

Air Quality **-** Given that one of the focus areas of Alternative 2 development and associated construction is the West Campus sector, existing uses sensitive to dust and equipment emissions in this sector (primarily student housing and academic uses) could be affected in the short-term.

Assumed development of 2.4 million gsf of net new building space in West Campus under Alternative 2 is slightly less than under Alternative 1 and resultant air quality conditions during construction would be slightly less as well. To accommodate 2.4 million gsf of net new development in the West Campus sector without the proposed allowable building height increases, 3 additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2 without the proposed

[9] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent which is a standard measure of amount of CO_2 emissions reduced or sequestered.

allowable building height increases, the potential for air quality impacts associated with demolition and site preparation would be slightly greater than Alternative 1 with the maximum height increases.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-3**, assumed new development under Alternative 2 is estimated to generate an additional 2,509,153 $MTCO_2e$ of lifespan and 40,146 $MTCO_2e$ of annual GHG emissions in West Campus (beyond the 4,021,126 $MTCO_2e$ lifespan and 64,338 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual the GHG emissions in this sector under the No Action Alternative). Alternative 2 would generate slightly less additional GHG emissions in West Campus than Alternative 1 because of the amount of new development assumed to occur in this area. However, new development in West Campus would generate more additional GHG emissions than any of the other campus sectors under Alternative 2.

South Campus

Air Quality **–** Air quality emissions under Alternative 2 would be the same as under Alternative 1, because the assumed level of development is the same (1.35million gsf). A substantial amount of demolition of existing buildings could occur. As under Alternative 1, demolition activities at South Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-3**, assumed new development under Alternative 2 is estimated to generate an additional 1,411,398 $MTCO_2e$ of lifespan and 22,582 $MTCO_2e$ of annual GHG emissions in South Campus (beyond the 4,368,539 $MTCO_2e$ lifespan and 69,897 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). Given that assumed new building development in South Campus is the same as under Alternative 1, Alternative 2 is estimated to generate the same amount of additional GHG emissions in South Campus as Alternative 1.

Central Campus

Air Quality **–** Air quality emissions under Alternative 2 would be the same as under Alternative 1, because the assumed level of development is the same. As under Alternative 1, dust, equipment emissions, and vehicular emissions associated with Alternative 2 construction and operation in Central Campus would have the potential to impact academic and student housing uses.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-3**, assumed new development under Alternative 2 is estimated to generate an additional 940,932 $MTCO_2e$ of lifespan and 15,055 $MTCO_2e$ of annual GHG emissions in Central Campus (beyond the 7,478,843 $MTCO_2e$

lifespan and 119,661 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). Given that assumed new building development in Central Campus is the same as under Alternative 1, Alternative 2 is estimated to generate the same amount of additional GHG emissions in Central Campus as Alternative 1. New development in Central Campus would generate less additional GHG emissions than any of the other campus sectors under Alternative 2.

East Campus

Air Quality **-** Development of approximately 1.35 million gsf of building area in East Campus would represent more development than under Alternative 1 (0.75 million gsf assumed under Alternative 1), and would result in greater potential for localized increases in dust and equipment measures. However, given the relatively low number of existing sensitive uses (i.e., housing, academic, research uses) in the East Campus sector, the potential for air quality impacts during construction in East Campus is low.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-3**, assumed new development under Alternative 2 is estimated to generate an additional 1,411,398 $MTCO_2e$ of lifespan and 22,582 $MTCO_2e$ of annual GHG emissions in East Campus (beyond the 1,528,492 $MTCO_2e$ lifespan and 24,456 annual GHG emissions in this sector under existing conditions and beyond the GHG emissions in this sector under the No Action Alternative). Given that assumed new building development in East Campus is greater than under Alternative 1, Alternative 2 is estimated to generate more additional GHG emissions in East Campus than Alternative 1.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential air quality impacts on land uses in the Primary and Secondary Impact Zones would largely be due to dust, equipment emissions, and localized traffic congestion. During operation, potential air quality impacts on land uses would largely be due to localized traffic congestion.

With the focus of development in the West, South and East Campus sectors (85 percent of development under Alternative 2), more construction activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to East Campus).

Compliance with existing regulations and codes, including air quality regulations, would minimize the potential for impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, construction and operational activities associated with Alternative 2 development would not be anticipated to result in air quality impacts in the Secondary Impact Zone.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

Air Quality

As under Alternative 1, the development of 6.0 million gsf of building development on the University of Washington Seattle campus under Alternative 3 would result in localized short-term increases in particulates (dust) and equipment emissions (CO) in the vicinity of construction sites. On-campus activity and periodic traffic delays on adjacent streets could contribute to slightly greater vehicle emissions during construction. With implementation of the controls required for the various aspects of construction activities and consistent use of BMPs to minimize emissions, construction under Alternative 3 would not be expected to significantly affect air quality.

Overall campus population growth during the planning horizon under Alternative 3 would increase the consumption of electricity, fossil fuel, and natural gas in the central power plant which would contribute to cumulative air quality impacts, as described under Alternative 1. Emissions from the plant would be managed to comply with standards and methodology associated with the University's Air Quality Operation Permit issued by the Puget Sound Clean Air Agency.

Similar to under Alternative 1, operation of certain uses on the campus under Alternative 3 could result in direct exhaust emissions from enclosed/interior truck loading areas, research and medical operations, and other exhaust venting sources. Any emissions would be subject to applicable requirements of the University of Washington and the Puget Sound Clean Air Agency.

Greenhouse Gas Emissions

As indicated for Alternative 1, climate change is a global problem and it is not possible to discern the impact that GHG emissions from a single campus master plan may have on

global climate change. The total amount of estimated annual and lifetime GHG emissions from Alternative 3 (6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$, respectively) would be the same as for Alternative 1 because the same total amount of building area (approximately 6.0 million gsf) is assumed throughout the University of Washington Seattle campus (see **Table 3.2-4**).

Table 3.2-4
GREENHOUSE GAS EMISSIONS – ALTERNATIVE 3

	Square Feet (thousands of sq. ft.)	Lifespan Emissions ($MTCO_2e$)[10]	Anticipated Lifespan	Estimated Annual Emissions ($MTCO_2e$)
West Campus	3,200	3,345,537	62.5	53,529
South Campus	1,650	1,725,043	62.5	27,601
Central Campus	900	940,932	62.5	15,055
East Campus	250	261,370	62.5	4,182
Alternative 3 Total	6,000	6,272,882	62.5	100,366

Source: EA Engineering, Science, and Technology, 2016.
Note: any inconsistencies in this table are due to rounding.

Following is a discussion of air quality and GHG impacts under Alternative 3 by campus sector.

West Campus

Air Quality **–** Given that one of the focus areas of Alternative 3 is development in the West Campus sector, existing uses sensitive to dust and equipment emissions in this area (primarily student housing and academic uses) could be affected in the short-term.

Assumed development of 3.2 million gsf of net new building space under Alternative 3 is slightly more than under Alternative 1 and resultant air quality conditions during construction would be slightly more as well.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-4**, assumed new development under Alternative 3 is estimated to generate an additional 3,345,537 $MTCO_2e$ of lifespan and 53,529 $MTCO_2e$ of annual GHG emissions in West Campus (beyond the 4,021,126 $MTCO_2e$ lifespan and 64,338 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 3 is estimated to generate slightly more additional GHG emissions in West Campus than Alternative 1 because slightly more new development is assumed to occur in this area. New development in West Campus would

[10] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent which is a standard measure of amount of CO2 emissions reduced or sequestered.

generate more additional GHG emissions than new development in any of the other campus sectors under Alternative 3.

South Campus

Air Quality **–** Assumed South Campus development under Alternative 3 would be slightly more than under Alternative 1 (1.65 million gsf compared to 1.35 million gsf under Alternative 1). A substantial amount of demolition of existing buildings could occur. As under Alternative 1, demolition activities at South Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-4**, assumed new development under Alternative 3 is estimated to generate an additional 1,725,043 $MTCO_2e$ of lifespan and 27,601 $MTCO_2e$ of annual GHG emissions in South Campus (beyond the 4,368,539 $MTCO_2e$ lifespan and 69,897 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 3 is estimated to generate slightly more additional GHG emissions in South Campus than Alternative 1 because of the amount of new development assumed to occur in this area.

Central Campus

Air Quality **–** As under Alternative 1, given that only 0.9 million gsf of net new development is assumed for Central Campus under Alternative 3, the amount of air quality emissions in South Campus would be less than compared to other campus sectors and would generally reflect current conditions.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-4**, assumed new development under Alternative 3 is estimated to generate an additional 940,932 $MTCO_2e$ of lifespan and 15,055 $MTCO_2e$ of annual GHG emissions in Central Campus (beyond the 7,478,843 $MTCO_2e$ lifespan and 119,661 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 3 is estimated to generate the same additional GHG emissions in Central Campus as Alternative 1 because the same amount of new development is assumed to occur in this area.

East Campus

Air Quality **–** Development of approximately 0.25 million gsf of building area in East Campus would result in the potential for localized increases in dust and equipment measures. However, given the relatively low number of existing sensitive uses (i.e., housing, academic, research) and much less development in the East Campus sector than in the other sectors

under Alternative 3, the potential for air quality impacts during construction in East Campus is low.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-4**, assumed new development under Alternative 3 is estimated to generate an additional 261,370 $MTCO_2e$ of lifespan and 4,182 $MTCO_2e$ of annual GHG emissions in East Campus (beyond the 1,528,492 $MTCO_2e$ lifespan and 24,456 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). Given that assumed new building development in East Campus is less than under Alternative 1, Alternative 3 is estimated to generate less additional GHG emissions in East Campus than Alternative 1. New development in East Campus would generate much less additional GHG emissions than any of the other campus sectors under Alternative 3.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential air quality impacts on land uses in the Primary and Secondary Impact Zones would largely be due to dust, equipment emissions. and localized traffic congestion. During operation, potential air quality impacts would largely be due to localized traffic congestion.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), more construction and operational activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to the these sectors, including the University District (adjacent to West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3 than under Alternative 1. As a result, there would be less air quality emissions that would impact adjacent land uses in the Primary Impact Zone adjacent to these sectors.

Compliance with existing regulations and codes, including air quality regulations, would minimize the potential for impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, construction and operational activities associated with Alternative 3 development would not be anticipated to result in air quality impacts in the Secondary Impact Zone.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

Air Quality

As under Alternative 1, the development of 6.0 million gsf of building development on the University of Washington Seattle campus under Alternative 4 would result in localized short-term increases in particulates (dust) and equipment emissions (CO) in the vicinity of construction sites. On-campus activity and periodic traffic delays on adjacent streets could contribute to slightly greater vehicle emissions during construction. With implementation of the controls required for the various aspects of construction activities and consistent use of BMPs to minimize emissions, construction under Alternative 4 is not expected to significantly affect air quality.

Overall campus population growth during the planning horizon under Alternative 4 would increase the consumption of electricity, fossil fuel, and natural gas in the central power plant which would contribute to cumulative air quality impacts, as described under Alternative 1. Emissions from the plant would be managed to comply with standards and methodology associated with the University's approved Air Quality Operation Permit by the Puget Sound Clean Air Agency.

Similar to under Alternative 1, operation of certain uses on the campus under Alternative 4 could result in direct exhaust emissions from enclosed/interior truck loading areas, research and medical operations, and other exhaust venting sources. Any emissions would be subject to applicable requirements of the University of Washington and the Puget Sound Clean Air Agency.

Greenhouse Gas Emissions

As indicated for Alternative 1, climate change is a global problem and it is not possible to discern the impact that GHG emissions from a single campus master plan may have on global climate change. The total amount of estimated annual and lifetime GHG emissions (6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$, respectively) from Alternative 4 would be the same as for Alternative 1 because the same amount total of building area (approximately 6.0 million gsf) is assumed throughout the University of Washington Seattle campus (see **Table 3.2-5**).

Table 3.2-5
GREENHOUSE GAS EMISSIONS – ALTERNATIVE 4

	Square Feet (thousands of sq. ft.)	Lifespan Emissions ($MTCO_2e$)[11]	Anticipated Lifespan	Estimated Annual Emissions ($MTCO_2e$)
West Campus	3,000	3,136,441	62.5	50,183
South Campus	200	209,096	62.5	3,346
Central Campus	1,100	1,150,028	62.5	18,400
East Campus	1,700	1,777,317	62.5	28,437
Alternative 4 Total	6,000	6,272,882	62.5	100,366

Source: EA Engineering, Science, and Technology, 2016.
Note: any inconsistencies in this table are due to rounding.

Following is a discussion of air quality and GHG impacts under Alternative 4 by campus sector.

West Campus

Air Quality **–**Given that one of the focus areas of Alternative 4 is development in the West Campus sector, existing uses sensitive to dust and equipment emissions in this area (primarily student housing and academic uses) could be affected in the short-term.

Assumed development of 3.0 million gsf of net new building space under Alternative 4 is the same as under Alternative 1 and resultant air quality conditions during construction would be the same as well.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-5**, assumed new development under Alternative 4 is estimated to generate an additional 3,136,441 $MTCO_2e$ of lifespan and 50,183 $MTCO_2e$ of annual GHG emissions in West Campus (beyond the 4,021,126 $MTCO_2e$ lifespan and 64,338 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 4 is estimated to generate the same additional GHG emissions in West Campus as Alternative 1 because the same amount of new development is assumed to occur in this area. New development in West Campus would generate more additional GHG emissions than any of the other campus sectors under Alternative 4.

South Campus

Air Quality **–** Given that only 0.2 million gsf of net new development is assumed for South Campus under Alternative 4 (compared to 1.35 million gsf of net new development under

[11] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent which is a standard measure of amount of CO2 emissions reduced or sequestered.

Alternative 1) the amount of exhaust emissions in South Campus would be less than under Alternative 1 and would generally reflect current conditions.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-5**, assumed new development under Alternative 4 is estimated to generate an additional 209,096 $MTCO_2e$ of lifespan and 3,346 $MTCO_2e$ of annual GHG emissions in South Campus (beyond the 4,368,539 $MTCO_2e$ lifespan and 69,897 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 4 is estimated to generate much less additional GHG emissions in South Campus than under Alternative 1 because of the amount of new development assumed to occur in this area. New development in South Campus would generate less additional GHG emissions than any of the other campus sectors under Alternative 4.

Central Campus

Air Quality **–** As under Alternative 1, dust, equipment emissions and vehicular emissions associated with Alternative 4 construction and operation in Central Campus would have the potential to impact academic and student housing uses. Slightly more net new development is assumed for Central Campus under Alternative 4 than under Alternative 1 (1.1 million gsf under Alternative 4 compared to 0.9 million gsf under Alternative 1). As a result, the air quality emissions would be slightly more under Alternative 4 than under Alternative 1.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-5**, assumed new development under Alternative 4 is estimated to generate an additional 1,150,028 $MTCO_2e$ of lifespan and 18,400 $MTCO_2e$ of annual GHG emissions in Central Campus (beyond the 7,478,843 $MTCO_2e$ lifespan and 119,661 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). New development under Alternative 4 is estimated to generate slightly more additional GHG emissions in Central Campus than Alternative 1 because of the amount of new development assumed to occur in this area.

East Campus

Air Quality **–** Development of approximately 1.7 million gsf of building area in East Campus under Alternative 4 would be more development than assumed under Alternative 1 (0.75 million gsf assumed under Alternative 1), and would result in greater potential for localized increases in dust and equipment measures. However, given the relatively low number of existing sensitive uses (housing, academic, research) in the East Campus sector, the potential for air quality impacts during construction in East Campus would be low.

Greenhouse Gas Emissions **-** As shown in **Table 3.2-5**, assumed new development under Alternative 4 is estimated to generate an additional 1,777,317 $MTCO_2e$ of lifespan and 28,437 $MTCO_2e$ of annual GHG emissions in East Campus (beyond the 1,528,492 $MTCO_2e$ lifespan and 24,456 $MTCO_2e$ annual GHG emissions in this sector under existing conditions and beyond the lifespan and annual GHG emissions in this sector under the No Action Alternative). Alternative 4 is estimated to generate more additional GHG emissions in East Campus than Alternative 1 because of the amount of new development assumed to occur in this area.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential air quality impacts on land uses in the Primary and Secondary Impact Zones would largely be due to dust, equipment emissions and localized traffic congestion. During operation, potential air quality impacts would largely be due to localized traffic congestion.

With the focus of development in the West, Central and East Campus sectors (97 percent of development under Alternative 4), construction and operational activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West and Central Campus), a portion of the residential neighborhood to the north of 45th Street NE (adjacent to Central Campus), and University Village and the Laurelhurst neighborhood (adjacent to the East Campus sector).

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less air quality emissions that would impact adjacent land uses in the Primary Impact Zone adjacent to this sector.

Compliance with existing regulations and codes, including air quality regulations, would minimize the potential for impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, construction and operational activities associated with Alternative 4 development would not be anticipated to result in air quality impacts in the Secondary Impact Zone.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street or aerial vacations would occur. Thus, neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge

over Montlake Boulevard NE in East Campus, would occur. Because a substantial amount of air quality or GHG emissions would not be anticipated to be generated by construction or operations associated with street or aerial vacations, air quality and GHG conditions under Alternative 5 would be similar to those identified under the other Alternatives.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 – 5 would contribute to the amount of overall construction in the area and, in combination with future new development in the area, would contribute to indirect construction-related air quality impacts including short-term, dust, equipment emissions and localized traffic congestion. To the extent that increased campus population and development increase the pressure for supporting development in the area (primarily in the University District), campus growth could contribute to air quality related impacts in the area, but compliance with current air quality requirements (i.e., Puget Sound Clean Air Agency) would prevent any potential significant air quality impacts.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the building development necessary to accommodate increased campus population, thus, potentially transferring a portion of the air quality and GHG emission-related impacts from the University of Washington campus to surrounding areas.

Potential changes in the zoning and development capacity of the University District could result in increased development and construction in the vicinity of the University of Washington campus. Although the level, timing, and specific location(s) of future development in the University District is not defined, under a worst-case scenario some level of concurrent development and associated construction activities, could occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan*, especially given the proposed focus of development in West Campus under Alternative 1 - 5. Thus, there is a potential for cumulative air quality-related impacts associated with concurrent construction activities on the University of Washington campus and in the University District. The concurrent construction and operation of buildings on the University of Washington campus and University District would result in cumulative increases in GHG emissions; however, given the global nature of climate change, it is difficult to discern the cumulative effect of GHG emissions on both the University of Washington and University District. All construction activities in the area would be required to follow applicable regulations, and significant adverse impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in **Chapter 2** of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

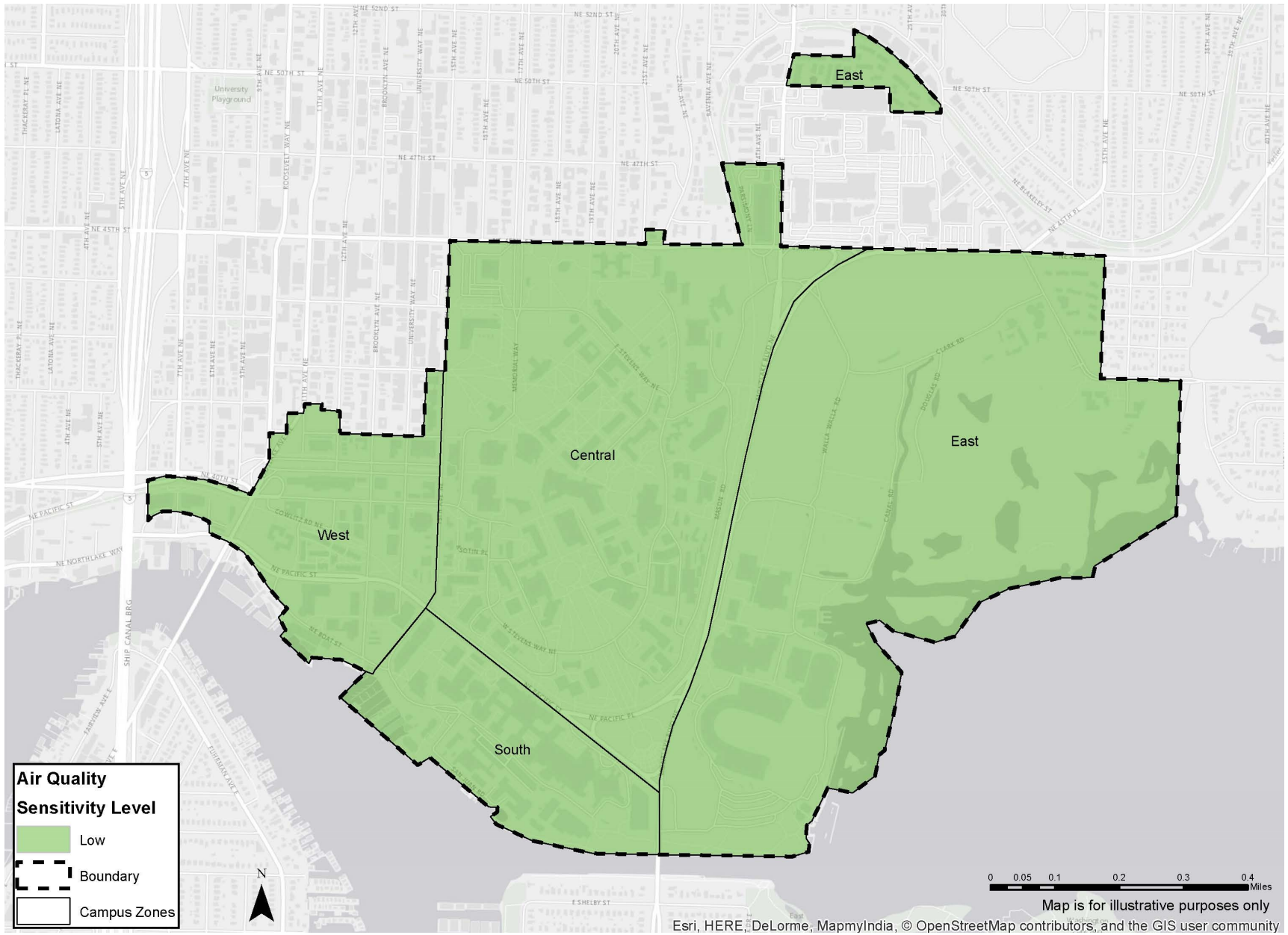
The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.2-1**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For air quality and GHG emissions, the entire University of Washington campus is identified as having a "Low" potential to encounter sensitive air quality or GHG emissions conditions, or result in impacts to sensitive receivers.

For areas of campus identified as having a **"Low"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate.

3.2.3 Mitigation Measures

The proposed *2018 Seattle Campus Master Plan* includes sustainability framework goals to create a more sustainable campus environment. These goals would, in part, guide future campus development and would indirectly relate to the overall air quality and GHG environment. In addition to compliance with applicable regulations related to construction and operations (including EPA, PSCAA and City of Seattle regulations), the following potential measures are intended to further reduce the potential for air quality and GHG impacts.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.2-1
Air Quality Sensitivity Map

Measures Applicable to All Campus Areas (Low Potential)

Air Quality - Construction

During construction, applicable best management practices (BMPs) to control dust, vehicle and equipment emissions would be implemented. The University of Washington would coordinate with adjacent sensitive users to temporarily duct and protect air intakes to minimize the potential for the intake of fugitive dust and exhaust fumes.

- Building construction and demolition would be conducted in compliance with Seattle Municipal Code Section 15.22.060B which provides criteria related to suppression of dust-generating activities.

- Where appropriate, temporary asphalt roadways would be provided on Potential Development Sites to reduce the amount of dust and dirt that would be generated.

- As applicable, a Construction Management Plan would be prepared for each individual construction project to establish parking areas, construction staging areas, truck haul routes, and provisions for maintaining pedestrian and vehicle routes. These measures are intended to, among other things, minimize traffic delays and associated vehicle idling.

- As applicable, control measures in the Washington Associated General Contractors *Guide to Handling Fugitive Dust form Construction Projects* would be used, including:

    - using only equipment and trucks that are maintained in optimal operational condition;
    - requiring all off-road equipment to have emission reduction equipment (e.g., require participation in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel, by project sponsors and contractors);
    - implementing restrictions on construction truck and other vehicle idling (e.g., limit idling to a maximum of 5 minutes);
    - spraying exposed soil with water or other suppressant to reduce emissions of PM and deposition of particulate matter;
    - covering all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM emissions and deposition during transport;
    - providing wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles in order to decrease deposition of particulate matter on area roadways; and

- covering dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

Air Quality - Operations

- Implementation of the proposed Transportation Management Plan would reduce vehicle trips and associated vehicle emissions.

- Research fume hoods would be provided within University laboratory areas and would be regulated and inspected by the University's Environmental Health and Safety Department.

Greenhouse Gas Emissions

- Implementation of the proposed Transportation Management Plan would reduce vehicle trips and associated GHG emissions.

- The University of Washington would embrace sustainability as an objective for all development on campus, including LEED provisions. Key measures that could be explored include:

  - installation of high performance glazing with low-E coatings to further reduce heat gain;
  - considering use of reflective roof surface treatments to reduce 'heat island effect' on building roofs;
  - planting of drought resistant and tolerant planting in landscaped areas to minimize irrigation requirements;
  - maximizing use of outside air for heating, ventilating, and air conditioning;
  - installation of efficient light fixtures, including occupancy and daylight sensors, as well as nighttime sweep controls;
  - use of low flow plumbing fixtures, which could result in a 30 percent reduction of water consumption;
  - use of low VOC emitting materials for finishes, adhesives primers and sealants;
  - incorporation of recycled content and rapidly renewable materials into project designs, including: concrete, steel and fibrous materials (bamboo, straw, jute, etc.);
  - salvage of demolished material and construction waste for recycling; and

- Commitment to the Seattle 2030 District pilot program to reduce energy and water consumption, as well as CO_2 emissions from auto and freight traffic.

3.2.4 Significant Unavoidable Adverse Impacts

With implementation of the mitigation measures identified above, no significant unavoidable adverse impacts on air quality would be anticipated under all of the Alternatives. Climate change and other issues associated with GHG emissions is a global issue, and it is not possible to discern the impacts of the GHG emissions from a single campus master plan.

3.3 WETLANDS AND PLANTS/ANIMALS

This section of the Draft EIS describes the existing wetland resources, plant and animal conditions on the University of Washington campus and in the site vicinity, and evaluates the potential impacts that could occur as a result of development under the *2018 Seattle Campus Master Plan*. Refer to **Appendix C**, for the Natural Resources Report prepared by Raedeke Associates, Inc.

3.3.1 Affected Environment

The University of Washington campus contains upland wooded areas, wetlands, ponds, sloughs and shoreline vegetation, educational planting, recreational and lawn areas, and developed space. Existing wetlands, plant and animal conditions are described in detail below.

Wetland Resources

Overview

The University of Washington is located within the approximately 600-square mile Lake Union drainage basin. The campus is bounded on the east by Union Bay (a portion of Lake Washington) and on the south by the Lake Washington Ship Canal and Portage Bay. The drainage basin is urban in character and dominated by impervious surfaces. In general, surface water from the basin flows from the east (Lake Washington), through the Ship Canal and Lake Union, and eventually outlets to Puget Sound via the Hiram Chittendon Locks to the west.

Several established artificial water bodies are present on the campus including the University Slough, Frosh Pond and a fisheries holding pond. The University Slough was constructed to drain stormwater from East Campus. Frosh Pond, an artificial body of water with a decorative fountain (Drumheller Fountain), was created as a dominant water feature for the 1909 Alaska-Yukon-Pacific Exposition. The pond is located in Rainier Vista within the Central Campus. In the South Campus, a fisheries holding pond was developed by impounding a small inlet on Portage Bay.

Wetlands

A total of 15 wetlands have been identified and rated on the University of Washington campus, the majority of which are associated with the Union Bay Natural Area in the East Campus sector. Most of the wetlands are small (under 0.5 acres), and have a simple vegetation structure and composition, and low to moderate levels of habitat function (see

Figure 3.3-1, Wetlands Map, and **Table 3.3-1**). Each of the wetlands meet the criteria to be regulated as

Category II, III or IV wetlands with associated buffers ranging from 60 to 110 feet, depending on habitat function score, consistent with Washington Department of Ecology's Wetland Rating System for Western Washington[1].

Table 3.3-1
EXISTING WETLANDS

Wetland	Size (acres)[1]	Rating Category	Buffer (ft)
Yesler Swamp	>5	II	110
Shoveler's Pond	0.5	III	60
Central Pond	0.5	III	60
South Pond	0.25	III	60
Wetland A	1	II	100
Wetland B	0.5	II	100
Wetland C	0.25	III	60
Wetland D	0.01	IV	50
Wetland E	0.01	IV	50
University Slough	>2	II	100
Boat House	0.5	III	60
Baseball Field	0.25	III	60
Soccer Stadium	0.01	III	60
Wetland 1	0.01	III	60
Wetland 2	0.01	III	60

Source: Raedeke, 2016.

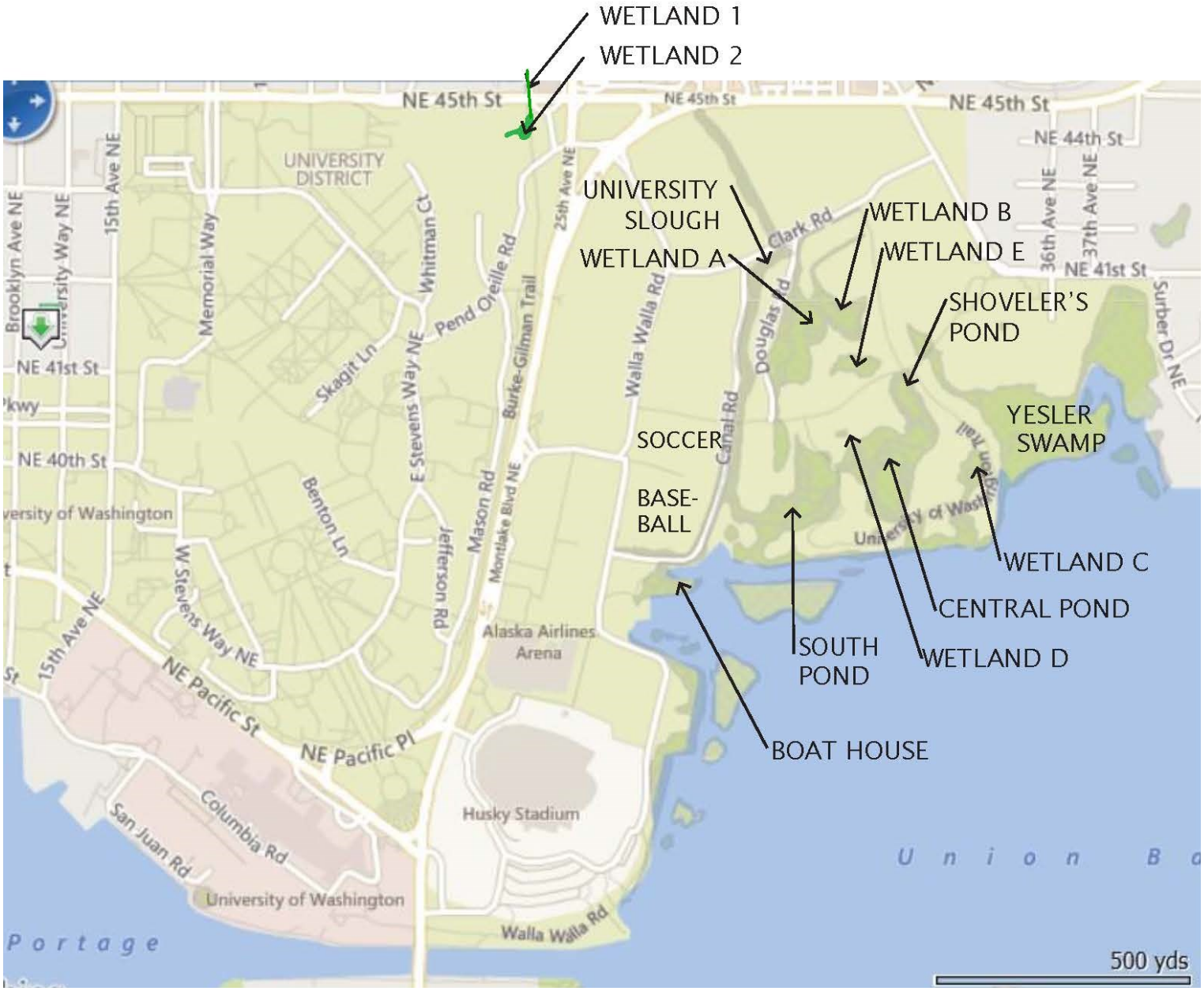
[1] Wetland acreage estimated from aerial photo interpretation and rating based on WDOE 2004 System

Wetland Plant Communities

The majority of the wetlands identified on the campus contain only one or two vegetation cover types, most commonly palustrine, scrub-shrub, broad-leaved deciduous and palustrine, forested, broad-leaved deciduous. Plant species diversity is moderate within each of the wetlands, and is dominated by native plant species that are common in wetlands in the Puget Sound region. The most diverse wetland on the campus is the Yesler Swamp in the East Campus sector near the Center for Urban Horticulture. This wetland contains several cover types including forested cover, aquatic bed, and a portion of Lake Washington.

Given their small size (most are under 0.5 acres each) and the fairly simple vegetation structure and composition, the value of many of the wetland plant communities on the campus is relatively low. The plant communities within Yesler Swamp and the University

[1] *The Wetland Rating System classifies wetlands from I (highest functional value) to IV (lowest functional value).*



Source: Raedeke Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.3-1
Existing Wetlands Map

Slough are considered to be of moderate to high value. Yesler Swamp is considered to be the highest value wetland community on the campus.

Wetland Fish and Wildlife Habitat

Many species of wildlife (e.g., waterfowl and freshwater and saltwater fish) require certain types of wetland habitat to breed, nest, rear young, and acquire nutrient stores for winter and during migration.

Most of the identified wetlands on the University of Washington campus are relatively small and isolated, and contain only one cover type composed of relatively common wetland species, most of which are deciduous (or die back during the winter). Deciduous plants are generally of modest value as food producers for wildlife. With the exception of Yesler Swamp, most of the wetlands on the campus do not contain trees and have limited habitat features such as large downed logs, snags, cavities, and natural brush piles. Therefore, the overall habitat value of the smaller wetlands is considered relatively low. Yesler Swamp which is relatively large and contains several cover types, is of the highest value for wildlife habitat and may harbor more species.

Wetland Special Habitat Features

Wetlands can provide special habitat features that are important to a wide variety of wildlife species. These features may include edges, snags (standing dead or partially dead trees), and dead-and-down material. Edges are areas where different plant communities or successional stages meet. These areas tend to be rich in wildlife as wildlife has access to more than one environmental and vegetation type.

The wetlands on the University of Washington campus contain relatively few snags, and most of these are small to medium diameter red alder. The relatively paucity of snags in the wetlands (and elsewhere on site) is a result of the urban nature of the campus as a whole. The wetlands contain variable, modest amounts of downed logs. The most diverse wetland on campus (Yesler Swamp) provides considerable edge habitat between forest and non-forest cover. The remaining wetlands on site have limited edge habitat.

West Campus

No wetlands are known to be located in the West Campus sector.

South Campus

No wetlands are known to be located in the South Campus sector.

Central Campus

Two wetlands are located in the Central Campus sector. Wetland 1 is located within a ditch abutting the west side of the Burke-Gilman Trail. Wetland 2 is located immediately south the NE 45th Street viaduct within a shallow swale that extends up the slope from the west side of the Burke-Gilman Trail into a narrow ravine (Kincaid Ravine) that runs parallel to the viaduct. A seasonal stream flows from the ravine into the wetland and meanders eastward through the wetland to the ditch on the west side of the Burke-Gilman Trail. The ditch flows northward during periods of heavy rainfall to Wetland 1 (see **Figure 3.3-1**).

East Campus

Thirteen wetlands are located in the East Campus sector. Nine of these wetlands are situated in the Union Bay Natural Area and include small isolated pockets and pools, wetlands fringing Lake Washington, and a riverine wetland. The wetlands in this area generally have low vegetative diversity and a hydrologic regime controlled by runoff from surrounding uplands during storm events (see **Figure 3.3-1**).

Yesler Swamp, located in the Union Bay Natural Area, is a diverse area featuring forested wetland, scrub-shrub wetland, emergent wetland, aquatic bed wetland, as well as open water associated with Lake Washington. This large wetland area is considered to be a Category II wetland (see **Figure 3.3-1**).

The shoreline of Lake Washington supports three Category III wetlands to the west of the University Slough and east of the athletic facilities in the eastern portion of campus (see **Figure 3.3-1**).

Plants

The University has identified "Unique and Significant Landscapes" that are considered to be primary open spaces with cultural and historical value, and that are to be conserved. These landscapes are listed in **Table 3.3-2**, and described in the *2018 Seattle Campus Master Plan*.

Table 3.3-2
UNIQUE AND SIGNIFICANT CAMPUS LANDSCAPES

• Burke-Gilman Trail	• Memorial Gateway
• Center for Urban Horticulture	• Memorial Way
• Denny Field	• Parrington Lawn
• Denny Yard	• Physics Courtyard
• Drumheller Fountain	• Portage Bay Vista
• Forest Resources Courtyard	• Rainier Vista
• Grieg Garden	• Red Square
• Hansee Hall Courtyards	• Sakuma Viewpoint
• Hospital Glade	• Sol Katz Memorial Garden

Table 3.3-2 Cont.

• HUB Yard • Island Grove • Liberal Arts Quad • Medicinal Herb Garden	• Sylvan Theater • Union Bay Natural Area • Whitman Court/Woodland Walk

Threatened and Endangered Plant Species

Review of endangered, threatened, and sensitive plants in King County by the Washington Natural Heritage Program indicated that no listed species are likely to occur in the habitats on the University of Washington campus.[2] The largely urbanized and disturbed habitats in the University of Washington campus are not likely refuges for any of the listed plant species.

West Campus

The West Campus sector is highly developed and contains limited habitat in a natural state, and no Unique or Significant Landscapes or primary open spaces. Most of the vegetation in the West Campus sector consists of lawns and ornamental trees and shrubs in a park-like urban landscape. The most notable landscape area is the International Friendship Grove, a remnant of a mixed planting of trees in the median of NE Campus Parkway.

South Campus

The South Campus sector comprises an area of limited landscaping. Sakuma Viewpoint provides public access to the waterfront and Portage Bay Vista provides an open lawn area with views of the waterfront. Vegetation in the South Campus sector primarily consists of ornamental trees, shrubs, and lawn. The most notable landscape characteristics include Sakuma Viewpoint, waterfront open space near the Fisheries Center, the Aquatic and Fishery Sciences courtyard and viewpoints/pathways along the Ship Canal.

Central Campus

The Central Campus consists primarily of buildings and open areas. Key open spaces include Denny Field, Parrington Lawn, Denny Yard, the Liberal Arts Quad, Hub Lawn, Grieg Garden, Drumheller Fountain, the Medicinal Herb Garden, Rainier Vista, and Sylvan Theater. These open areas are landscaped with both native and non-native plant species. Tree species include Western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), several species of cherry (*Prunus spp*.), bigleaf maple (*Acer macrophyllum*), hawthorn (*Crataegus sp*.) plum (*Prunus spp*.), and crabapple (*Malus sp.*). Landscaped shrubs include roses (*Rosa*

sp.), English holly (*Ilex aquifolium*), and Japanese maple (*Acer palmatum*). Some small, isolated patches of native trees and shrubs, such as Western red cedar, Douglas fir, and salal (*Gaultheria shallon*), can be found in a natural condition on the periphery of the Central Campus.

There are several notable landscaped areas in Central Campus. Rainier Vista is a tree-lined view corridor central to the character and form of the campus's overall open space system. The HUB Lawn is an open tree-lined lawn area to the northwest of the HUB. Denny Yard includes clusters of large, mature trees within the lawn area. The Liberal Arts Quadrangle ("The Quad") is a formal open space that is notable for its spring show of flowering cherry trees. The Engineering Quadrangle, which includes Drumheller Fountain, is a formal open space containing rose gardens.

East Campus

The East Campus sector includes upland, wetland, riparian (slough), shoreline (Lake Washington), and playfield-related vegetation. The eastern portion of the East Campus sector is located on a terrace of fill capped by soil. This fill was placed in the large cattail marsh that formed in Union Bay after construction of the Lake Washington Ship Canal in 1916 (refer to Section 3.1, **Earth**, for further information). The most significant landscape feature in East Campus is the Union Bay Natural Area and associated wetlands, established over the fill area.

Upland plant communities in the Union Bay Natural Area are dominated by European pasture grasses and perennial, herbaceous weeds, such as wild carrot (*Daucus carota*), thistle (*Cirsium sp.*), chicory (*Cichorium intybus*), and hairy cats ear (*Hypochaeris radicata*). Scots broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus discolor*), two aggressive exotic species, also dominate patches of the natural area. Other vegetative species occurring in the East Campus include Garry oak (*Quercus garryana*), one-seed hawthorn (*Crataegus monogyna*), and common snowberry (*Symphoricarpos albus*). Yesler Swamp is forested with black cottonwood (*Populus balsamifer* subsp. Trichocarpa) and willow species (*Salis spp*.).

Animals

West Campus

Fish and Fish Habitat

A small portion of the West Campus sector borders Portage Bay. Primary fish species inhabiting these waters include large-mouth and small-mouth bass (*Micropterus salmonids* and *M. dolomieui*), northern pikeminnow (*Ptychocheilus oregonensis*), peamouth chub (*Mylocheilus caurinus*), crappie (*Pomoxis sp*.), yellow perch (*Perca flavescens*), threespine

stickleback (*Gasterosteus aculeatus*). These fish are tolerant of warmer water temperatures in summer (typically higher than 18 degrees Celsius). Less common species include coastal cutthroat (*Oncorhynchus clarki clarki*), rainbow trout (*Oncorhynchus kisutch*), sockeye salmon (*Oncorhynchus nerka*, native, cultured, and introduced stocks), and steelhead (*Oncorhynchus mykiss*).

The shoreline along Portage Bay is almost completely modified with vertical bulkheads, riprap, overwater structures, stormwater outfalls, and landscaping. Most of the nearshore area is comprised of mixed fine sediments and mud. Natural shoreline and associated riparian vegetation is nearly non-existent. However, riparian vegetation does exist behind modified shoreline.

Terrestrial Species and Habitat

The West Campus sector generally provides limited foraging and nesting habitat for small mammals and for both resident and migratory songbirds common to the region. Wildlife in this area is primarily disturbance-tolerant or invasive species, such as European starling (*Sturnus vulgaris*), American robin, black-capped chickadee, mice, Eastern gray squirrel, and opossum.

Threatened and Endangered Animal Species

Native, introduced and transient fish species have access to shoreline areas in Portage Bay. Priority Habitats and Species data from the Washington Department of Fish and Wildlife indicate that none of the commonly occurring resident species, other than salmonids, are species of concern.

Threatened terrestrial species which may be present in West Campus include the streaked horned lark (*Eremolphila alepstris strigata*) and the yellow-billed cuckoo (*Coccyzus americanus*). According to the Endangered Species Act, a threatened species is one that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

South Campus

Fish and Fish Habitat

The South Campus sector borders Portage Bay and the Ship Canal (Montlake Cut). Primary fish species inhabiting these waters are the same as those in Portage Bay described for the West Campus.

Similar to West Campus, the shoreline along Portage Bay and the Ship Canal along the South Campus sector is almost completely modified with vertical bulkheads, riprap, overwater structures, stormwater outfalls, and landscaping. Most of the nearshore area is comprised

of mixed fine sediments and mud. Natural shoreline and associated riparian vegetation is nearly non-existent. However, riparian vegetation does exist behind modified shoreline. Some vegetation remains from the golf course fairways that once existed in this part of campus and on the side slope of the Montlake Cut. This vegetation can contribute litter fall and insect fallout to the shoreline and in-water areas, but is minimally functional.

Terrestrial Species and Habitat

Similar to the West Campus, the South Campus sector provides limited foraging and nesting habitat for small mammals and for both resident and migratory songbirds common to the region. Wildlife in this area is primarily disturbance-tolerant or invasive species.

Threatened and Endangered Animal Species

Native, introduced, and transient fish species have access to shoreline areas in Portage Bay and the Ship Canal along the South Campus. Priority Habitats and Species data from the Washington Department of Fish and Wildlife indicates that none of the commonly occurring resident species, other than salmonids, are species of concern.

The same threatened terrestrial species which may be present in West Campus (i.e., streaked horned lark and yellow-billed cuckoo) may be present in South Campus.

Central Campus

Fish and Fish Habitat

No fish and fish habitat are present in the Central Campus sector.

Terrestrial Species and Habitat

Similar to the West and South Campus, the Central Campus sector provides limited foraging and nesting habitat for small mammals and for both resident and migratory songbirds common to the region. Wildlife in this area is primarily disturbance-tolerant or invasive species.

Threatened and Endangered Animal Species

The same threatened terrestrial species that may be present in the West and South Campus (i.e., streaked horned lark and yellow-billed cuckoo) may be present in Central Campus.

East Campus

Fish and Fish Habitat

The East Campus sector borders Union Bay and the Ship Canal. Primary fish species inhabiting these waters are similar to those in Portage Bay described for the West Campus, and include large-mouth and small-mouth bass, northern pikeminnow, peamouth chub, crappie, yellow perch, and threespine stickleback. Less common species include coastal cutthroat, rainbow trout, sockeye salmon, and steelhead.

The shoreline in Union Bay along the East Campus has been modified by riparian and shoreline development, but the majority of the shoreline is primarily natural. Riparian vegetation provides shading, litter fall, and insect production and fallout to the shoreline area. In marsh and wetland areas, numerous small sloughs provide edge complexity, refuge, and foraging opportunities for many fish species. One slough or canal extends north to Montlake Boulevard NE at NE 45th Street. No fluvial drainage or habitat currently exists in this canal or in other parts of Union Bay bordering the campus. As described previously, the shoreline along the Ship Canal is almost completely modified with vertical bulkheads, riprap, overwater structures, stormwater outfalls, and landscaping.

Terrestrial Species and Habitat

The East Campus sector contains the highest value wildlife habitat on the University of Washington campus, particularly in the Union Bay Natural Area. High quality foraging and breeding habitat for several species of birds, small mammals, reptiles, and amphibians is available in this natural area.

Birds likely to be present in East Campus include songbirds, waterfowl, shorebirds, raptors, and woodpeckers. Songbird species likely to occur in the Union Bay Natural Area include American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceous*), orange-crowned warbler (*Vermivora celata*), song sparrow (*Melospiza melodia*), black-capped chickadee (*Parus atricapillus*), marsh wren (*Telmatodytes palustris*), violet-green swallow (*Tachycineta thalassina*), and common yellowthroat (*Geothlypis trichas*) (Aanerud, 1989). Many species of waterfowl, both resident and wintering, are also likely to occur in the East Campus, including wood duck (*Aix sponsa*), green-winged teal (*Anas carolinesis*), mallard (*Anas platyrhynchos*), Canada goose (*Branta Canadensis*), Northern shoveler (*Spatula clypeata*), canvasback (*Aythya valisineria*), common goldeneye (*Bucephala clangula*), American pigeon (*Mareca americana*), greater scaup (*Aythya marila*), and lesser scaup (*Aythya affinis*) (Aanerund, 1989). In addition to songbirds and waterfowl, upland game birds, such as California quail (*Lophortyx californicus*) and ring-necked pheasant (*Phasianus colchicus*), live in the Union Bay Natural Area. Because East Campus lies along the shoreline, shorebirds such as great blue heron (*Ardea Herodias*), spotted sandpiper (*Actitus*

macularia), lesser yellowlegs (*Totanus flavipes*), and dunlin (*Erolia alpine*) are also known to occur here.

The uplands in the Union Bay Natural Area provide foraging and nesting habitat and are contiguous with other habitats that provide escape cover. The species likely to occur here include rodents (mice, voles and shrews) and raptors (peregrine falcon [*Falco peregrinus*], red-tailed hawk [*Buteo jamaicensis*], and bald eagle [*Haliaeetus leucocephalus]*). Other mammals likely to frequent the Union Bay Natural Area include coyote (*Canis latrans*), opossum (*Didelphis virginiana*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and Eastern gray squirrels (*Sciurus carolinesis*).

Threatened and Endangered Animal Species

Federally listed threatened fish species that are found in Lake Washington in the vicinity of the East Campus sector include bull trout (*Salvelinus confluentus*), chinook salmon (*Oncorhynchus tshawytscha*) and steelhead/rainbow trout (anadromous/resident).

The same threatened terrestrial species which may be present in the West Campus (i.e., streaked horned lark and yellow-billed cuckoo) may be present in East Campus. In addition, bald eagle nests have periodically been found south of the Union Bay Natural Area and east of the Union Bay Natural Area. Bald eagles have been observed on the campus, particularly around Yesler Swamp and the Union Bay Natural Area. Although they were removed from the federal list of threatened and endangered species in 2007, bald eagles are still protected under the Migratory Bird Treaty Act, the Lacey Act, and the Bald and Golden Eagle Protection Act.[3]

Surrounding Primary & Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

The **Primary Impact Zone** includes commercial (e.g. the University District and University Village) and residential areas, major highways (e.g., I-5 and WA 520), and water features (e.g., Portage Bay, the Ship Canal, and Union Bay). Plants and animals in much of this zone are those associated with developed, urbanized settings; more natural plant and animal habitat and wetlands are found within and adjacent to the water features. Within the Primary Impact Zone, the City of Seattle has identified wetlands in the Washington Park Arboretum and Montlake Playfield; and has identified wildlife habitat in these same areas, as well as at the Talaris Conference Center in the Laurelhurst neighborhood.

[3] U.S. Fish and Wildlife Service. http://www.fws.gov/midwest/eagle/.

The **Secondary Impact Zon**e includes commercial (e.g., in Wallingford) and residential areas, major highways (e.g., I-5 and WA 520), water features (e.g., Lake Union, Portage Bay, the Ship Canal, and Union Bay), and open space (e.g., Ravenna/Cowen Park, Cavalry Cemetery, Laurelhurst Park, Foster Island, the Arboretum, and Montlake Playfield). Similar to the Primary Impact Zone, plants and animals in much of this zone are those associated with developed, urbanized settings; more natural plant and animal habitat are found within and adjacent to the water features and in Ravenna/Cowen Park, on Foster Island, and in the Arboretum. Within the Secondary Impact Zone, City of Seattle has identified wetlands: in Ravenna/Cowen Park, to the north of Sand Point Way N at about 43rd Avenue NE, at the Talaris Conference Center, on Foster Island, in the Arboretum, along the northern edge of the Broadmoor neighborhood, and in Montlake Playfield; riparian corridors: along Ravenna Creek, through the Bryant and Laurelhurst neighborhoods along 40th Avenue NE, and through the Arboretum along Lake Washington Boulevard E; and wildlife habitat: in Ravenna/Cowen Park, on Foster Island, in the Arboretum, and in Montlake Playfield (special habitat features, including bald eagle nests, have been identified at the Talaris Conference Center, on Foster Island, in the Arboretum, and in the Broadmoor neighborhood).

3.3.2 Impacts

This section of the Draft EIS identifies how development under the EIS Alternatives would affect wetland, plants, and animals resources on the University of Washington campus.

No Action Alternative

Under the No Action Alternative, water, plant, and animal impacts would be related to the construction and operation of approximately 211,000 gsf of building space under the *2003 Seattle CMP*. The approximately 211,000 gsf of building development would result in only minor amounts of land disturbance and excavation, and the potential for indirect water resources, plant, and animal-related impacts on the University of Washington campus (i.e. increased human activity, noise, etc.) would be substantially less than under Alternatives 1 through 5. In addition, because the remaining development under the 2003 CMP would likely not be located in the East Campus, the potential for construction and operation of buildings to affect existing wetlands in that area would be low.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1, which matches the preferred allocation of building development in the *2018 Seattle Campus Master Plan,* includes 6.0 million gsf of net new development throughout the campus, with a focus of this development in the West and South Campus sectors and lesser amounts of development in the Central and East Campus sectors. Development on

the campus under Alternative 1 would result in the potential for wetland, plant and animal impacts as described below.

West Campus

Wetland Resources

Because there are no wetlands known to be located in the West Campus sector , no impacts to wetlands and their buffers are expected with assumed development under Alternative 1.

Plants

Constructon of potential future development in the West Campus sector under Alternative 1 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and up to 9 acres reserved for potential new primary open spaces (including the West Campus Green, and Continuous Waterfront Trail).

On an overall basis, the amount of vegetated open space on the campus would increase under Alternative 1, and significant impacts to the plant communities on the University of Washington campus would not be anticipated.

Animals

Fish and Fish Habitat - Potential for impacts to fish habitat in Portage Bay adjacent to the West Campus sector relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. A limited amount of potential development in West Campus could be located in proximity to the shoreline, and has the potential to generate impacts to fish habitat. New stormwater discharges under Alternative 1 would be generated from new impervious surfaces in West Campus, including building footprints, sidewalks and other building approaches, roads, loading areas and parking. Impacts to water quality include temperature changes, changes in nutrient content, chemical contamination, petroleum contamination, sedimentation associated with erosion, and changes in dissolved oxygen and oxygen demand. With implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures (e.g., such as Salmon-Safe provisions and LID practices), it is not anticipated that fish habitat adjacent to West Campus in Portage Bay would be significantly affected by development under Alternative 1.

Terrestrial Species and Habitat - Trees, shrubs, buildings, and open space on the developed and urbanized majority of the West Campus sector provide limited habitat for disturbance-

tolerant birds and small mammals such as the American crow, American robin, European starling, black-capped chickadee, and small mammals, mainly the Eastern gray squirrels.

Most of the potential development sites in the West Campus include existing surface parking lots, existing buildings, and landscaped areas, which generally include limited vegetative communities with relatively low habitat values. The West Campus sector provides very little natural habitat, and is characterized by isolated, landscaped urban areas. Development assumed under Alternative 1 would have minimal impacts on terrestrial species and habitat in West Campus. Because the shoreline adjacent to the West Campus is primarily developed, any proposed new construction in this vicinity is not anticipated to result in permanent adverse impacts on waterfowl.

Threatened and Endangered Species

No listed plant species are likely to occur in the habitats in the West Campus sector. Threatened terrestrial animal species, which may be present in West Campus include the streaked horned lark and the yellow-billed cuckoo. ESA-listed fish species, which could occur in Portage Bay adjacent to the West Campus include Bull trout, chinook salmon and steelhead/rainbow trout. Development activities under Alternative 1 would be planned and implemented in a manner that would avoid or mitigate to these species impacts through compliance with federal, state, and local regulation, and no significant impacts to threatened or endangered animal species in the West Campus sector are anticipated under Alternative 1.

South Campus

Wetland Resources

Because no wetlands are known to be located in the South Campus sector, no impacts to wetlands and their buffers are expected with assumed development under Alternative 1.

Plants

Construction of potential future development in the South Campus sector under Alternative 1 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and area reserved for potential new primary open space (including the South Campus Event Lawn). The potential Continuous Waterfront Trail would also enhance existing open space areas in South Campus.

Animals

Fish and Fish Habitat - Similar to the West Campus, the potential for impacts to fish and fish habitat in Portage Bay and the Ship Canal adjacent to the South Campus sector relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Potential development in South Campus could be located in proximity to the shoreline, and have the potential to generate impacts to fish habitat. New stormwater discharges under Alternative 1 would be generated from new impervious surfaces under Alternative 1. Impacts to water quality include temperature changes, changes in nutrient content, chemical contamination, petroleum contamination, sedimentation associated with erosion, and changes in dissolved oxygen and oxygen demand. With implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay and the Ship Canal adjacent to South Campus would be significantly affected by development assumed under Alternative 1.

Terrestrial Species and Habitat - As described for the West Campus, trees, shrubs, buildings, and open space on the developed and urbanized majority of the South Campus sector provide limited habitat for disturbance-tolerant birds and small mammals.

Most of the potential development sites in the South Campus sector include existing surface parking lots, existing buildings, and landscaped areas, which generally include limited vegetative communities with relatively low habitat values. The South Campus sector provides very little natural habitat, and is generally characterized by isolated, landscaped urban areas. Assumed development under Alternative 1 would have minimal impacts on terrestrial species and habitat in South Campus. Because the shoreline along the South Campus sector is primarily developed, new construction in this vicinity is not anticipated to result in permanent adverse effects on waterfowl.

Threatened and Endangered Species

No listed plant species are likely to occur in the habitats in the South Campus sector. Threatened terrestrial animal species, which may be present in South Campus include the streaked horned lark and the yellow-billed cuckoo. ESA-listed fish species, which could occur in Portage Bay and the Ship Canal adjacent to the South Campus include Bull trout, chinook salmon and steelhead/rainbow trout.

In general, development activities that have the potential to impact ESA listed salmon and trout and their critical habitat include: elimination of functional riparian habitat, direct and indirect effects of new (increased) stormwater discharges, direct and indirect effects of soil erosion (sedimentation and turbidity) from development, and direct and indirect effects on water quality from development (e.g., petroleum or chemical spill, or leaching).

Under Alternative 1, development activities in the South Campus sector would be planned and implemented in a manner that would avoid or mitigate impacts through compliance with federal, state, and local regulation, and no significant impacts to threatened or endangered fish species are anticipated.

Central Campus

Wetland Resources

There are two wetlands located along the west side of the Burke Gilman Trail in the north portion of the Central Campus sector. No direct impacts to these existing wetlands or their buffers would occur with development assumed under Alternative 1.

Hydrology - The clearing of vegetation, grading and construction of impervious surfaces, underground utilities and stormwater management facilities in the vicinity of wetlands under Alternative 1 would modify the surface hydrologic conditions. These changes, if unmitigated, could alter the hydrologic conditions within existing wetlands in the Central Campus sector, including greater annual variation in water levels of the wetlands, as well as greater and more frequent water level fluctuations in response to individual storm events. Additionally, changes in the hydrologic conditions resulting from new development on the campus could adversely affect plant and animal species richness, and diversity within wetlands.

Given that much of the area identified within potential development sites in the Central Campus sector are currently impervious surfaces, the overall increase in impervious surface under Alternative 1 compared to 2015 conditions would be approximately 9 acres (reflecting an approximately 2 percent increase on campus). The potential for changes in the hydrologic condition on the University of Washington campus to impact the wetlands in the Central Campus is low.

Construction associated with potential development in proximity to Wetlands 1 and 2 (wetland along Burke-Gilman Trail) would have the potential to result in indirect impacts (i.e., erosion and sedimentation) to these wetlands. The potential for impacts during construction would be limited through implementation of Best Management Practices (BMPs) and temporary erosion and sedimentation control (TESC measures) and significant impacts would not be anticipated.

Habitat - Existing wetlands and their buffers would be retained under Alternative 1. Construction activities and operation of proposed new development under this Alternative would result in the potential for both short-term and long-term indirect disturbance (i.e., noise and human activity) to wildlife inhabiting the wetlands and their buffers. With the proposed retention of wetlands and associated buffers, the potential for these indirect impacts would not be considered significant.

Plants

Construction of potential future development in the Central Campus sector under Alternative 1 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in Central Campus would be preserved and area reserved for potential new primary open space.

Animals

Fish and Fish Habitat - Because no fish or fish habitat are present in the Central Campus sector, no alteration of fish habitat is expected with development that could occur under Alternative 1. However, impacts to fish/fish habitat could result from stormwater discharge to the Ship Canal and/or Portage Bay from new impervious surfaces in Central Campus, as described for South Campus. With implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and fish habitat in the Ship Canal and Portage Bay would be significantly affected by development that could occur in the Central Campus sector under Alternative 1.

Terrestrial Species and Habitat - As described for West and South Campus, trees, shrubs, buildings, and open space on the developed and urbanized majority of the Central Campus sector provide limited habitat for disturbance-tolerant birds and small mammals.

Most of the potential development sites in Central Campus include existing surface parking lots, existing buildings, and landscaped areas which generally include limited vegetative communities with relatively low habitat values. The Central Campus provides very little natural habitat, and isolated, landscaped urban areas. Development assumed under Alternative 1 would not be anticipated to result in significant impacts to terrestrial species and habitat in the Central Campus sector.

Threatened and Endangered Species

No listed plant species are likely to occur in the habitats in the Central Campus. Threatened animal species, which may be present in the Central Campus include the streaked horned lark and the yellow-billed cuckoo. Development activities under Alternative 1 would be planned and implemented in a manner that would avoid or mitigate impacts through compliance with federal, state, and local regulation, and no significant impacts to threatened or endangered animal species are anticipated.

East Campus

Wetlands Resources

There are 13 wetlands located in the East Campus in the Union Bay Natural Area, Yesler Swamp, and along the Lake Washington shoreline. Because development in East Campus sector would occur primarily in previously disturbed and developed area (including parking lot E1), no direct impacts to these existing wetlands or their buffers would occur with development under Alternative 1.

Hydrology - The clearing of vegetation, grading and construction of impervious surfaces, underground utilities and stormwater management facilities in the vicinity of wetlands under Alternative 1 in the East Campus sector would modify the surface hydrologic conditions. These changes, if unmitigated, could alter the hydrologic conditions within the existing wetlands in East Campus. Additionally, changes in the hydrologic conditions resulting from new development on the campus could adversely affect plant and animal species richness, and diversity within wetlands. Given that the overall increase in impervious surfaces would be minimal, however, the potential for changes in the hydrologic condition impacting the wetlands in East Campus is low.

Construction associated with potential development in proximity to the wetlands in the East Campus would have the potential to result in indirect impacts (i.e., erosion and sedimentation) to these wetlands. The potential for impacts during construction would be limited through implementation of BMPs and TESC measures and significant impacts would not be anticipated.

Operation of Alternative 1 could result in indirect impacts associated with increased human activity. However, the majority of development would be directed to the West and South sectors under this Alternative. Therefore, indirect impacts related to additional activity levels would be minimal.

Habitat - Existing wetlands and their buffers would be retained under Alternative 1. Larger wetlands (i.e., Yesler Swamp) would be contained within larger buffers while the smaller, isolated wetlands and their buffers would be retained within the Union Bay Natural Area. Linkage of these areas would help provide some limited avenues of movement for wildlife between habitat areas. Construction activities and operation of proposed new development under Alternative 1 would result in the potential for both short-term and long-term indirect disturbance (i.e., noise and human activity) to wildlife inhabiting the wetlands and their buffers. With the proposed retention of wetlands and associated buffers, and implementation of BMPs and TESC measures, the potential for indirect impacts would not be considered significant.

Plants

Because the majority of potential development sites are located within surface parking lot areas, assumed construction of future development in the East Campus sector under Alternative 1 would have little potential to plants. Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and area reserved for potential new primary open space. The potential Continuous Waterfront Trail would also enhance existing open space areas in the East Campus areas. Considering the new landscape open space opportunities are planned on currently impervious parking lot area, the overall amount of area in plant materials on East Campus could increase from existing conditions.

Animals

Fish and Fish Habitat - Potential for impacts to fish habitat in Union Bay and the Ship Canal adjacent to the East Campus sector relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Potential development in the East Campus sector could be located in proximity to the shoreline, and have the potential for generating impacts to fish habitat. New stormwater discharges under Alternative 1 would be generated from new impervious surfaces in the East Campus, as described for the other campus sectors. With implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and fish habitat in Union Bay and the Ship Canal adjacent to East Campus would be significantly affected by development under Alternative 1.

Terrestrial Species and Habitat – The urbanized portions of the East Campus sector provide limited habitat for disturbance-tolerant birds and small mammals. Bird habitat in the East Campus would not be anticipated to be displaced as a result of construction; primarily given that the majority of East Campus potential development sites are located on existing parking lot E1,

Threatened and Endangered Species

No listed plant species are likely to occur in the habitats in the East Campus sector. Threatened animal species, which may be present in the East Campus include the streaked horned lark and the yellow-billed cuckoo. ESA-listed fish species that could occur in Union Bay adjacent to the East Campus include Bull trout, chinook salmon and steelhead/rainbow trout.

In general, development activities that have the potential to impact ESA-listed salmon and trout and their critical habitat include: elimination of functional riparian habitat, direct and indirect effects of new (increased) stormwater discharges, direct and indirect effects of soil

erosion (sedimentation and turbidity) from development, and direct and indirect effects on water quality from development (e.g., petroleum or chemical spill, or leaching).

Under Alternative 1, development activities in the East Campus sector would primarily occur in previously disturbed urban area (including parking lot E1) and would not directly impact species habitat. Additionally, development would be planned and implemented in a manner that avoids or mitigates impacts through compliance with federal, state, and local regulations, and no significant impacts to threatened or endangered species are anticipated.

Summary of Impacts in Primary & Secondary Impact Zone Area

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction and operation, potential impacts on wetlands, plants, and animals in the Primary and Secondary Impact Zones would largely be due to pollutants in stormwater runoff entering water features that contain plant and animal habitat and increased human activity levels (including traffic) disturbing wildlife.

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), more construction and operational activities would occur in proximity to water features and critical areas adjacent to these campus sectors in the **Primary Impact Zone**. The portion of the Primary Impact Zone in proximity to the West Campus Sector contains Portage Bay; the portion in proximity to the South Campus contains Portage Bay and the Ship Canal, and environmentally critical areas identified by the City (wetlands, wildlife habitat) in Montlake Playfield and the Arboretum.

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. Assumed development in Central Campus would occur in proximity to developed, urbanized areas; development in East Campus would occur in proximity to the Ship Canal and Union Bay and critical areas in the Arboretum (wetlands, wildlife habitat) and the Laurelhurst neighborhood (wildlife habitat) in the Primary Impact Zone.

Compliance with existing regulations and codes, including stormwater regulations, would minimize the potential for impacts on wetlands, plants, and animals in the Primary Impact Zone.

Given the distance of water features and critical areas in the **Secondary Impact Zone** from development assumed under Alternative 1, construction and operational activities associated with this alternative would not be anticipated to affect wetlands, plants, and animals in the Secondary Impact Zone. Construction activities required for Alternative 1 would not occur in close proximity to wetlands, riparian corridors, and wildlife habitat identified by the City.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, approximately 6.0 million net new gsf of development would be developed on the University of Washington Seattle campus, with a focus of development in the West, South, and East Campus sectors, and lesser development in the Central Campus sector. Existing building heights listed in the *2003 Seattle CMP* would be retained under this Alternative.

West Campus

Wetland Resources

Because there are no wetlands known to be located in the West Campus sector, no impacts to wetlands and their buffers are expected with possible development under Alternative 2.

Plants

Similar to Alternative 1, construction of potential future development in the West Campus sector under Alternative 2 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. The existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the West Campus would be preserved and area reserved for new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay adjacent to the West Campus relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay adjacent to the West Campus would be significantly affected by development assumed under Alternative 2.

A majority of the potential development sites in the West Campus sector would consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in the West Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the

West Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 2.

South Campus

Wetland Resources

Because there are no wetlands known to be located in the South Campus sector, no impacts to wetlands and their buffers are expected with assumed development under Alternative 2.

Plants

Similar to Alternative 1, construction of potential future development in the South Campus sector under Alternative 2 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 2, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the South Campus would be preserved and area reserved for potential new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay and the Ship Canal adjacent to the South Campus relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay and the Ship Canal adjacent to the South Campus would be significantly impacted by development that could occur under Alternative 2.

A majority of the potential development sites in the South Campus sector consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in South Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the South Campus sector would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 2.

Central Campus

Wetland Resources

As with Alternative 1, all existing wetlands and associated buffers in the Central Campus sector would be retained under Alternative 2. Clearing, grading, and construction of impervious surfaces, underground utilities and stormwater management facilities in the vicinity of wetlands under Alternative 2 would modify the surface hydrologic conditions and could impact the wetlands. Construction activities could also result in short-term indirect impacts to the wetlands (e.g., from erosion and sedimentation) and operation of Alternative 2 could result in long-term indirect impacts to the wetlands. With implementation of BMPs and TESP measures during construction, and implementation of a permanent stormwater management system, significant impacts to wetlands are not expected.

Plants

Similar to Alternative 1, construction of potential future development in the Central Campus under Alternative 2 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 2, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the Central Campus sector would be preserved and area reserved for potential new primary open space.

Animals

A majority of the potential development sites in the Central Campus sector consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in Central Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened terrestrial animal species that may be present in Central Campus (i.e., streaked horned lark and the yellow-billed cuckoo) would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 2.

East Campus

Wetland Resources

As with Alternative 1, all existing wetlands and associated buffers would be retained under Alternative 2. Compared to Alternative 1, Alternative 2 assumes substantially more development in the East Campus sector where the majority of the existing wetlands are located. However, because the majority of potential development sites in the East Campus sector are currently impervious surface area (primarily parking lot E1), hydrologic impacts and water quality impacts are anticipated to be similar to Alternative 1, and with the implementation of appropriate stormwater controls, BMPs, and erosion and sedimentation controls, no significant impacts to wetlands are anticipated.

Potential development under Alternative 2 could utilize development sites that are in closer proximity to identified wetlands; however, these areas are well buffered from existing wetlands by roads and large open space areas (athletic fields). Increased development in the East Campus would result in an increase in construction activities, which would result in short-term impacts to habitat areas; long-term disturbance could also occur due to an increase in human activity associated with potential development in the East Campus. The potential for impacts during construction would be limited through implementation of BMPs and TESC measures, and significant impacts would not be anticipated.

Plants

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus sector would be preserved under Alternative 2, and the overall amount of area available for vegetated open space on the University of Washington campus would increase. Significant impacts to plant communities under Alternative 2 would not be anticipated.

Animals

A majority of the potential development sites in the East Campus would consist of existing surface parking lots, existing buildings, and some landscaped areas. The increased development assumed for the East Campus under Alternative 2 would primarily occur on currently developed area (parking lot E1) and would not directly impact animal communities. Construction in the East Campus would result in increased potential for short-term impacts to habitat areas associated with construction activities. Increased long-term disturbance could also occur due to increase in human activity in the East Campus.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the East Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 2.

Summary of Impacts in Primary & Secondary Impact Zone Area

Similar to Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction and operation, potential impacts on wetlands, plants, and animals in the Primary and Secondary Impact Zones would largely be due to pollutants in stormwater runoff entering water features that contain plant and animal habitat and increased human activity levels disturbing wildlife.

With the focus of development in the West, South, and East Campus sectors (85 percent of development under Alternative 2), more construction and operational activities would occur in proximity to water features and environmentally critical areas adjacent to these sectors in the **Primary Impact Zone**. The portion of the Primary Impact Zone near the West Campus contains Portage Bay; the portion near South and East Campus contains Portage Bay, the Ship Canal, and Union Bay, and critical areas identified by the City in Montlake Playfield and in the Arboretum (wetlands, wildlife habitat) and in the Laurelhurst neighborhood (wildlife habitat).

Less development is assumed to occur in the Central Campus sector under Alternative 2. Development in Central Campus would occur in proximity to developed, urbanized areas in the Primary Impact Zone.

Compliance with existing regulations and codes, including stormwater regulations, would minimize the potential for impacts on wetlands, plants, and animals in the Primary Impact Zone.

Given the distance of water features and critical areas in the **Secondary Impact Zone** from development assumed under Alternative 2, construction and operational activities associated with this alternative would not be anticipated to affect wetlands, plants, and animals in the Secondary Impact Zone. Construction activities required for Alternative 2 would not occur in close proximity to wetlands, riparian corridors and wildlife habitat identified by the City.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with an increase in assumed development in the West and South Campus sectors compared to Alternative 1.

West Campus

Wetland Resources

Because there are no wetlands known to be located in the West Campus sector, no impacts to wetlands and their buffers are expected with anticipated development under Alternative 3.

Plants

Similar to Alternative 1, construction of potential future development in the West Campus under Alternative 3 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. The existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the West Campus would be preserved and area reserved for potential new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay adjacent to the West Campus relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay adjacent to the West Campus would be significantly affected by development assumed under Alternative 3.

A majority of the potential development sites in the West Campus sector would consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in West Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the West Campus would be similar to under Alternative 1. By complying with federal, state, and

local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 3.

South Campus

Wetland Resources

Because there are no wetlands known to be located in the South Campus sector, no impacts to wetlands and their buffers are expected with anticipated development under Alternative 3.

Plants

Similar to Alternative 1, construction of potential future development in the South Campus sector under Alternative 3 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 3, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the South Campus would be preserved and area reserved for potential new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay and the Ship Canal adjacent to the South Campus relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay and the Ship Canal adjacent to the South Campus sector would be significantly impacted by development that could occur under Alternative 3.

A majority of the potential development sites in the South Campus sector consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in the West Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to South Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 3.

Central Campus

Wetland Resources

As with Alternative 1, all existing wetlands and their associated buffers in the Central Campus sector would be retained under Alternative 3. Clearing, grading, and construction of impervious surfaces, underground utilities and stormwater management facilities in the vicinity of wetlands under Alternative 3 would modify the surface hydrologic conditions, which could impact the wetlands. Construction activities could also result in short-term indirect impacts to the wetlands (e.g., from erosion and sedimentation) and operation of Alternative 2 could result in long-term indirect impacts to the wetland. With implementation of BMPs and TESP measures during construction, and a permanent stormwater management system, significant impacts are not expected.

Plants

Similar to Alternative 1, construction of potential future development in the Central Campus under Alternative 3 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 3, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the Central Campus would be preserved and area reserved for new primary open space.

Animals

A majority of the potential development sites in the Central Campus sector consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in the Central Campus sector would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo), which may be present in Central Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 3.

East Campus

Wetland Resources

As with Alternative 1, all existing wetlands and their associated buffers would be retained under Alternative 3. Compared to Alternative 1, Alternative 3 assumes considerably less development in the East Campus where the majority of the existing wetlands on campus are located. Because the majority of potential development sites in the East Campus are currently impervious surface area (primarily parking lot E1), hydrologic impacts and water quality impacts are anticipated to be similar to Alternative 1, and with the implementation of appropriate stormwater controls, BMPs and erosion and sedimentation controls, no significant impacts to wetlands are anticipated.

Development in the East Campus would result in an increase in construction activities which would result in short-term impacts to habitat areas; long-term disturbance could also occur due to an increase in human activity associated with potential development in the East Campus; however, these impacts would be less than under Alternative 1 due to less assumed development. The potential for impacts during construction would be limited through implementation of BMPs and TESC measures and significant impacts would not be anticipated.

Plants

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus would be preserved under Alternative 3, and considering that potential new landscape open space opportunities would be provided in currently impervious area, the overall amount of area available for vegetated open space on the University of Washington campus would increase. Significant impacts to plant communities under Alternative 3 would not be anticipated.

Animals

A majority of the potential development sites in the East Campus sector would consist of existing surface parking lots, existing buildings, and some landscaped areas. The increased development assumed for East Campus under Alternative 3 would primarily occur on currently developed area (parking lot E1) and would not directly impact animal communities. Construction in the East Campus would result in increased potential for short-term impacts to habitat areas associated with construction activities. Increased long-term disturbance could also occur due increase in human activity in the East Campus sector. However, this long-term disturbance would be less under Alterantive 3 due to substantially less development under this alternative compared to Alternative 1.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to East Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 3.

Summary of Impacts in Primary & Secondary Impact Zone Area

Similar to Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction and operation, potential impacts on wetlands, plants, and animals in the Primary and Secondary Impact Zones would largely be due to pollutants in stormwater runoff entering water features that contain plant and animal habitat and due to increased human activity levels disturbing wildlife.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), more construction and operational activities would occur in proximity to water features and environmentally critical areas in these sectors in the **Primary Impact Zone**. The portion of the Primary Impact Zone in proximity to West Campus contains Portage Bay; the portion in proximity to South Campus contains Portage Bay and the Ship Canal, and critical areas identified by the City in Montlake Playfield and the Arboretum (wetlands, wildlife habitat).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3. Development in Central Campus would occur in proximity to developed, urbanized areas; development in the East Campus would occur in proximity to the Ship Canal and Union Bay and critical areas identified by the City in the Arboretum (wetlands, wildlife habitat) and in the Laurelhurst neighborhood (wildlife habitat) in the Primary Impact Zone.

Compliance with existing regulations and codes, including stormwater regulations, would minimize the potential for impacts on wetlands, plants, and animals in the Primary Impact Zone.

Given the distance of water features and critical areas in the **Secondary Impact Zone** from development assumed under Alternative 3, construction and operational activities associated with Alternative 3 development would not be anticipated to affect wetlands, plants, and animals in the Secondary Impact Zone. Construction activities associated with Alternative 3 would not occur in close proximity to wetlands, riparian corridors and wildlife habitat identified by the City.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

West Campus

Wetland Resources

Because there are no wetlands known to be located in the West Campus, no impacts to wetlands and their buffers are expected with possible development under Alternative 4.

Plants

Similar to Alternative 1, construction of potential future development in the West Campus sector under Alternative 4 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. The existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the West Campus would be preserved and area reserved for new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay adjacent to the West Campus relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay adjacent to the West Campus sector would be significantly affected by development assumed under Alternative 4.

A majority of the potential development sites in the West Campus would consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in West Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to

West Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 4.

South Campus

Wetland Resources

Because there are no wetlands known to be located in the South Campus, no impacts to wetlands and their buffers are expected with possible development under Alternative 4.

Plants

Similar to Alternative 1, constructon of potential future development in the South Campus under Alternative 4 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. However, these impacts to vegetation would be much less than under Alternative 1, as substantially less development is assumed under Alternative 4. As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the South Campus sector would be preserved and area reserved for potential new primary open space.

Animals

Potential for impacts to fish habitat in Portage Bay and the Ship Canal adjacent to the South Campus sector relate to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Similar to Alternative 1, with implementation of appropriate erosion and sedimentation controls, and stormwater management mitigation measures, it is not anticipated that fish and habitat in Portage Bay and the Ship Canal adjacent to the South Campus sector would be significantly impacted by development that could occur under Alternative 4.

A majority of the potential development sites in South Campus consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in the South Campus would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the South Campus sector would be similar to under Alternative 1. By complying with federal,

state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 4.

Central Campus

Wetland Resources

As with Alternative 1, all existing wetlands and associated buffers in the Central Campus sector would be retained under Alternative 4, and the potential for impacts to wetlands in Central Campus would be as described under Alternative 1.

Plants

Similar to Alternative 1, construction of potential future development in the Central Campus sector under Alternative 4 could result in temporary impacts such as removal of lawns, trees, and shrubs; replanting would subsequently occur in certain areas. Under Alternative 4, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the Central Campus would be preserved and area reserved for potential new primary open space.

Animals

A majority of the potential development sites in the Central Campus sector consist of existing surface parking lots, existing buildings, and some landscaped areas. Potential impacts to animals and their habitat in the Central Campus sector would generally be similar to those described for Alternative 1, and are not expected to be significant.

Threatened and Endangered Species

The potential for development to impact threatened terrestrial animal species (i.e., streaked horned lark and yellow-billed cuckoo), which may be present on the Central Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 4.

East Campus

Wetland Resources

As with Alternative 1, all existing wetlands and their associated buffers would be retained under Alternative 4. Compared to Alternative 1, Alternative 4 assumes substantially more development in the East Campus sector where the majority of the existing wetlands on campus are located. Because the majority of potential development sites in East Campus are currently impervious surface area (primarily parking lot E1), hydrologic impacts and

water quality impacts are anticipated to be similar to Alternative 1, and with the implementation of appropriate stormwater controls, BMPs and erosion and sedimentation controls, no significant impacts to wetlands are anticipated.

Potential development under Alternative 4 could utilize development sites that are in closer proximity to identified wetland; however, these areas are well buffered from existing wetlands by roads and large open space areas (athletic fields). Increased development in the East Campus sector would result in an increase in construction activities, which would result in short-term impacts to habitat areas; long-term disturbance could also occur due to an increase in human activity associated with potential development in East Campus. The potential for impacts during construction would be limited through implementation of BMPs and TESC measures and significant impacts would not be anticipated.

Plants

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus would be preserved under Alternative 4, and considering that new potential landscaped open space opportunities would be provided in currently impervious area, the overall amount of area available for vegetated open space on the University of Washington campus would increase. Significant impacts to plant communities under Alternative 4 would not be anticipated.

Animals

A majority of the potential development sites in the East Campus would consist of existing surface parking lots, existing buildings, and some landscaped areas. The increased development assumed for the East Campus under Alternative 4 would primarily occur on currently developed area (parking lot E1) and would not directly impact animal communities. Construction in the East Campus would result in increased potential for short-term impacts to habitat areas associated with construction activities. Increased long-term disturbance could also occur due to increased human activity in East Campus.

Threatened and Endangered Species

The potential for development to impact threatened or endangered terrestrial animal species (i.e., streaked horned lark and the yellow-billed cuckoo) and fish species (i.e., Bull trout, chinook salmon and steelhead/rainbow trout), which could occur on/adjacent to the East Campus would be similar to under Alternative 1. By complying with federal, state, and local regulations, no significant impacts to threatened or endangered animal species are anticipated under Alternative 4.

Summary of Impacts in Primary & Secondary Impact Zone Area

Similar to Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction and operation, potential impacts on wetlands, plants, and animals in the Primary and Secondary Impact Zones would largely be due to pollutants in stormwater runoff entering water features that contain plant and animal habitat and increased human activity levels disturbing wildlife.

With the focus of development in the West, Central and East Campus sectors (97 percent of development under Alternative 4), more construction and operational activities would occur in proximity to developed, urbanized areas adjacent to the Central Campus, and to water features and critical areas adjacent to the West and East Campus sectors in the **Primary Impact Zone**. The portion of the Primary Impact Zone in proximity to West Campus contains Portage Bay; the portion in proximity to East Campus contains the Ship Canal and Union Bay, and critical areas in the Arboretum (wetlands, wildlife habitat) and in the Laurelhurst neighborhood (wildlife habitat).

Less development is assumed to occur in the South Campus sector under Alternative 4. Assumed development in South Campus would occur in proximity to Portage Bay, the Ship Canal, and critical areas in the Montlake Playfield and the Arboretum (wetlands, wildlife habitat).

Compliance with existing regulations and codes, including stormwater regulations, would minimize the potential for impacts on wetlands, plants, and animals in the Primary Impact Zone.

Given the distance of water features and critical areas in the **Secondary Impact Zone** from development assumed under Alternative 4, construction and operational activities associated with Alternative 4 development would not be anticipated to affect wetlands, plants, and animals in the Secondary Impact Zone. Construction activities associated with Alternative 4 would not occur in close proximity to wetlands, riparian corridors, and wildlife habitat identified by the City.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 - 4, although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation for the land bridge over Montlake Boulevard NE in East Campus, would occur. Because only minor amounts of construction activity would be associated with campus improvements associated with the street vacations in the West Campus or the land bridge over Montlake Boulevard in East Campus, wetland, plant and

animal resource impacts under Alternative 5 would be similar to Alternatives 1 - 4 for all of the campus sectors.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 - 5 would contribute to the overall amount of impervious surface and stormwater discharge in the area, as well as the overall amount of short-term (construction activity) and long-term (building operation and human activity) disturbances to wetlands, plants, and animals.

Potential changes in the zoning and development capacity of the University District could result in increased development and construction in the vicinity of the University of Washington campus. Although the level, timing, and specific location(s) of future development in the University District is not defined, it is possible that some level of concurrent development, and associated construction activities, would occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan*, especially given the proposed focus of development in the West Campus sectors under Alternatives 1 - 5. This could result in the potential for cumulative water resource and plants/animal-related impacts associated with concurrent construction activities on the University of Washington campus and in the University District. Given the developed urban nature of the University District neighborhood and of the University of Washington West Campus, significant impacts to wetland, plants and animals resources associated with cumulative development would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Seattle Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental

conditions is identified as "High", "Medium" or "Low" (see **Figure 3.3-2**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For plants and animals, development sites located within or adjacent to the shoreline are identified as having a "Medium" potential to encounter sensitive plants and animals conditions. For wetlands, the wetland areas and associated buffers are identified as having a "High" potential to encounter sensitive wetland conditions, and areas located in proximity to wetlands and associated buffers are identified as having a "Medium" potential to encounter sensitive wetland conditions.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

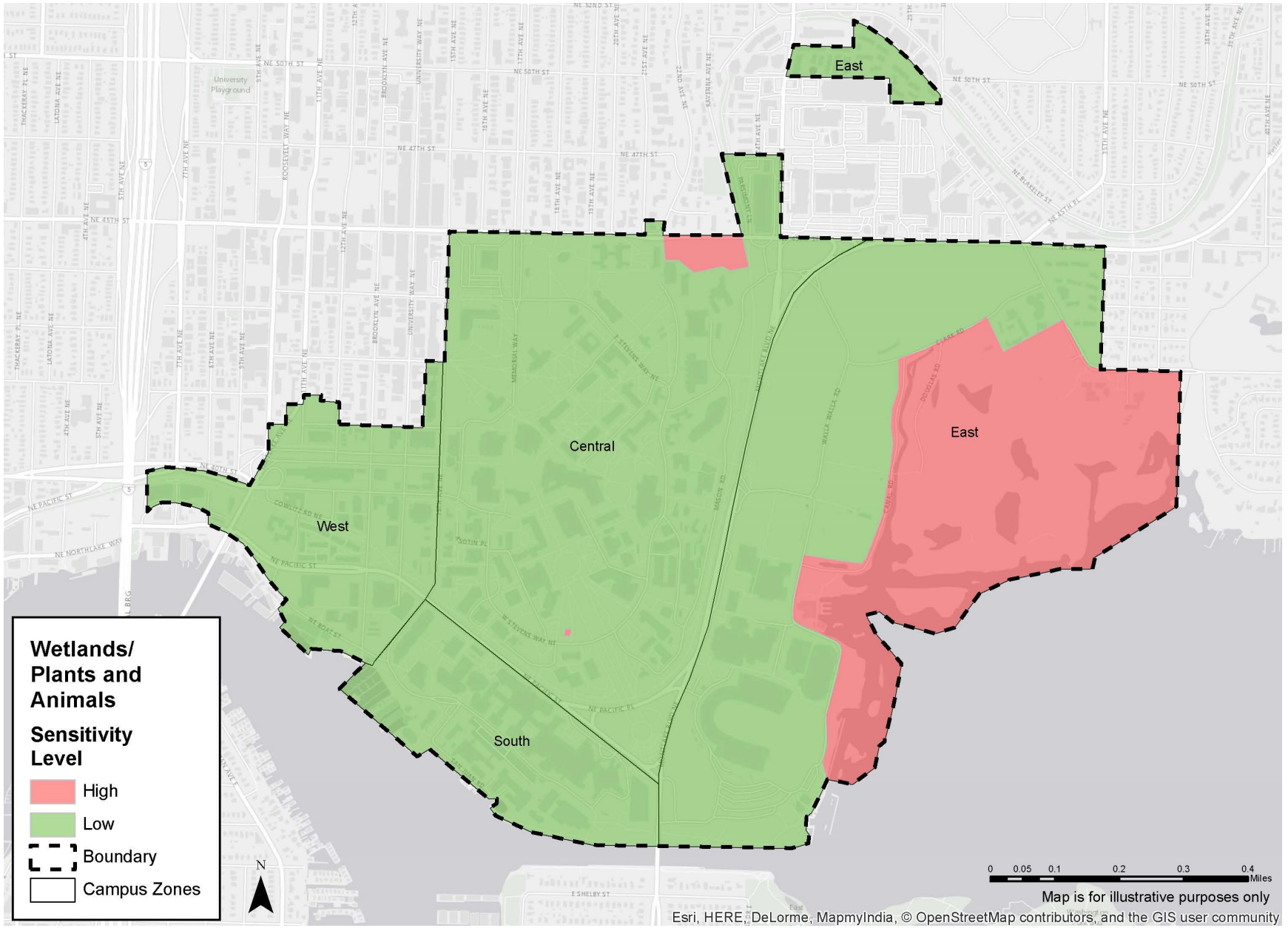
3.3.3 Mitigation Measures

The proposed *2018 Seattle Campus Master Plan Update* includes goals and objectives to create a more sustainable environment and retain existing, significant campus open spaces, landscapes and natural features to the extent feasible. No development would occur within wetlands or associated buffer areas. In addition to compliance with applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for wetland, plant or animal impacts.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- All development would comply with federal, state and local regulatory standards (including SMC 25.09.020 regulations related to wetlands) for development and mitigation BMPs could include: site disturbance controls, construction staging, erosion and spill control, drainage control (water quantity and quality), vegetation retention and re-vegetation plans, and BMP training and monitoring

- Plant and animal mitigation opportunities include impact avoidance (e.g., working when fish species are not particularly sensitive to disturbance or avoiding identified terrestrial habitats), stormwater drainage control, site and construction best management practices (BMP), site design (including vegetation retention and landscaping), and habitat enhancement or restoration, as feasible. Planned development would be sensitive to the existing shoreline.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.3-2
Plants, Animal and Wetland Sensitivity Map

- Stormwater controls would be applied during construction activities and over the long term. These controls and BMPs would control on-site erosion and transport of sediment and pollutants off site, by minimizing disturbance, stabilizing unworked materials, applying vegetative or mulch controls, and implementing other controls to reduce and treat contaminants in drainage water.

- Vegetation controls could continue to include an Integrated Pest Management Plan and a revegetation plan that emphasizes the propagation of native scrub-shrub and mixed coniferous species along shoreline areas. The development of new campus vistas or pedestrian viewpoints could be designed to not compromise opportunities to revegetate shoreline areas.

- Shoreline areas could be enhanced or restored through the retention or placement of shoreline-associated large woody debris for cover and forage production.

- Interpretative or education materials could be developed or made available to foster an appreciation of campus wetlands to help limit unnecessary disturbance or destruction of native vegetation or wildlife.

Additional Measure Applicable to Medium and High Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located on development sites that are within or proximate to the shoreline jurisdictional area could require additional analysis and mitigation measures (if necessary).

3.3.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to wetland resources, plants or animals are anticipated under all of the Alternatives. Potential development under the *2018 Seattle Campus Master Plan c*ould include some clearing of native vegetation and construction of impervious surfaces which would increase stormwater runoff and change site recharge patterns. Some additional sediment deposition and water quality impacts could also occur. Impacts to vegetation and animals/habitat would also occur due to increased construction activity and human activities on the campus. With implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

3.4 ENERGY RESOURCES

This section of the Draft EIS describes the existing energy conditions on the University of Washington campus and in the vicinity and evaluates the potential for impacts.

3.4.1 Affected Environment

Overview

Energy demand at the University of Washington campus is primarily met by a combination of electrical power and fossil fuel. Electrical power is primarily utilized for University building lighting, operation of office equipment/computers, operation of laboratory equipment and other uses. Fossil fuel use on the campus primarily relates to natural gas utilized to power the Central Power Plant for building heating (steam).

Based on University of Washington 2015 data, the approximate total annual energy consumption for the campus was $2{,}500 \times 10^9$ Btu (British thermal unit) per year (see **Table 3.4-1**). Between the years 2000-2015, the amount of total combined electricity and fossil fuels use on the University of Washington campus was reduced by approximately three percent, even with the construction of approximately 3.0 million gsf of net new building space, indicating the effectiveness of University measures to increase building efficiency.

Table 3.4-1
ENERGY CONSUMPTION SUMMARY YEARS 2000 - 2015

Year	Central Plant Fossil Fuel Use ($Btux10^9$)	Electricity ($Btux10^9$)	Total Use ($Btux10^9$)
2000	1,644	842	2,486
2001	1,647	793	2,440
2002	1,535	797	2,332
2003	1,455	829	2,284
2004	1,484	899	2,383
2005	1,496	895	2,392
2006	1,602	928	2,530
2007	1,591	974	2,565
2008	1,676	936	2,612
2009	1,663	941	2,604
2010	1,509	956	2,465
2011	1,574	951	2,525
2012	1,511	997	2,509
2013	1,564	942	2,506
2014	1,561	982	2,543
2015	1,412	987	2,399

Source: University of Washington 2016

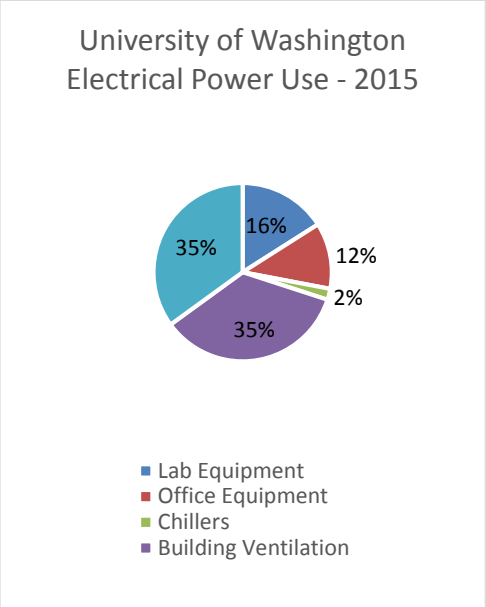
Electric Power

Seattle City Light (SCL) provides electrical power to Seattle and portions of King County. The primary energy source for SCL electricity is hydropower, along with other sources including wind-power, nuclear-power, natural gas and coal[1].

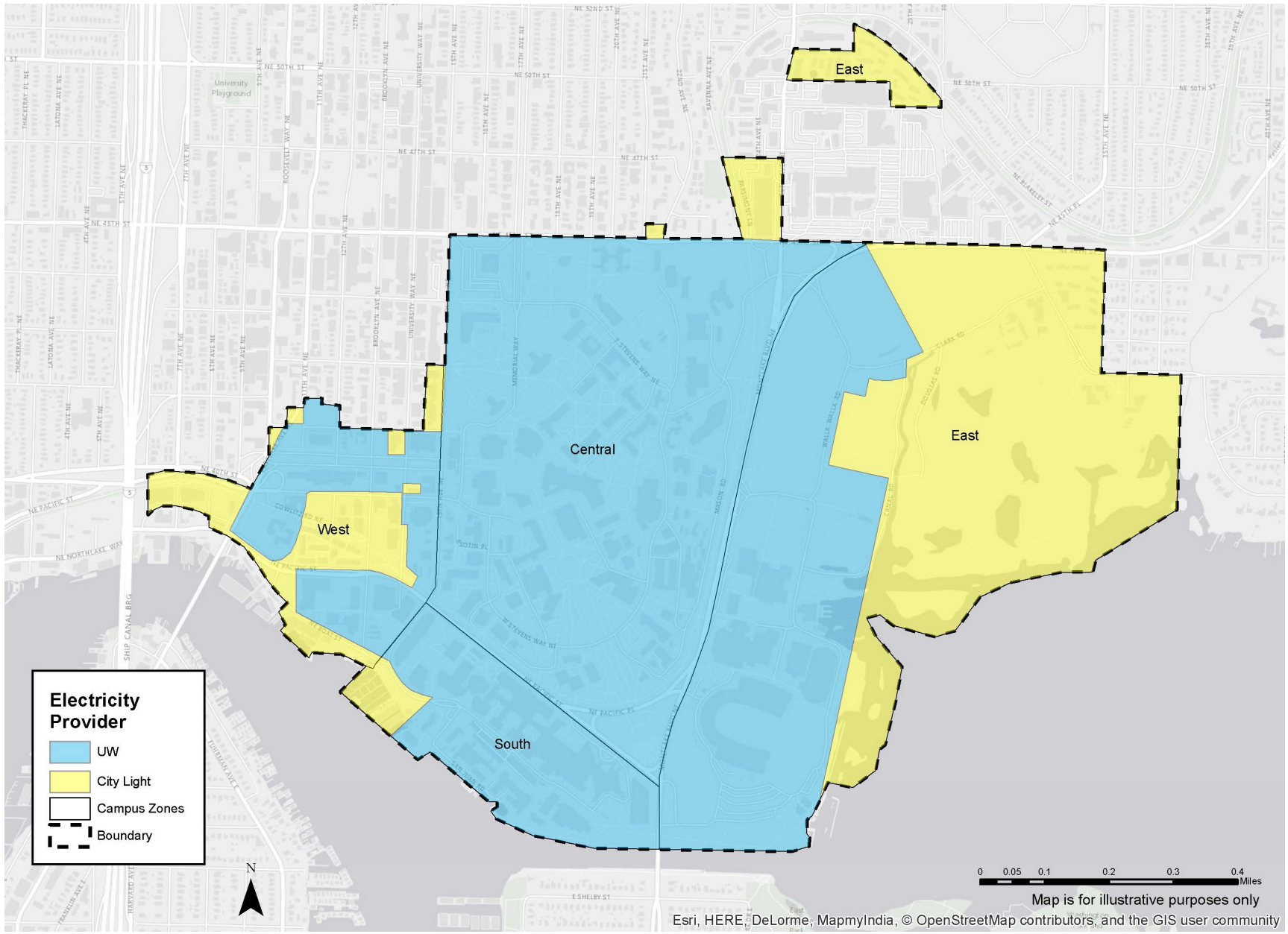
The University of Washington receives power from SCL at two University-owned receiving stations: the East Receiving Station located adjacent to Central Power Plant on the east side of Central Campus; and the West Receiving Station in West Campus. Electrical power to the majority of the campus is distributed from these receiving stations via the University distribution system.

The University of Washington 13.8kV electrical distribution system distributes electricity to Central and South Campus, and to the majority of West and East Campus. However, the campus electric distribution does not presently extend west of the University Bridge or near Union Bay Place NE. SCL owns and maintains the electric distribution in these areas and electricity in these areas is provided directly by SCL; **Figure 3.4-1** illustrates the electricity distribution system on campus.

The major consumption of electrical power is for lighting and building fans (approximately 35 percent each). Operation of chillers to supply air conditioning makes up approximately two percent of consumption. Electrical power for laboratory and process equipment represents approximately 16 percent of total consumption, and electrical power for office equipment (including computers) represents approximately the remaining 12 percent of total consumption.



[1] Approximately six (6) percent of SCL power comes from non-renewable sources such as natural-gas and coal. As an off-set to the SCL non-renewable sources, the University of Washington purchases approximately six (6) percent additional wind-power sources for electricity.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.4-1
Campus Electricity Service Provider Map

As indicated in **Table 3.4-1**, the total amount of electricity used on the University of Washington campus increased approximately 15 percent between the years 2000 and 2015. Considering the approximately 21 percent increase in building square footage and increased use of equipment and computers on campus during this timeframe, the amount of electricity use increase reflects University of Washington efforts to increase building and operations efficiencies.

The current peak electrical power capacity for the University of Washington campus is 66 megavolt amperes (MVA), with current peak load demand of approximately 55 MVA. Peak hours of electrical use on campus are generally from 9:30AM to 3:30PM on weekdays. The University maintains an Energy Resource Conservation Management Program that works with local public utilities to strive for energy conservation in new projects and existing buildings. The Energy Resource Conservation Management Program plans, prioritizes, implements and administers energy and natural resource conservation efforts for the campus' infrastructure, facilities, and grounds. The Program also provides support, information and leadership in the areas of sustainability, greenhouse gas reduction and energy and resource conservation to the University community and its partners. Conservation measures that have been implemented by the University of Washington have included:

- Retrofitting lighting in existing buildings to provide increased energy efficiency.
- Lowering heating thermostats and water heating thermostats in most campus buildings.
- Raising cooling thermostats in most air conditioned buildings.
- Minimizing the production of steam and redundant systems in the Power Plant during Spring, Summer, and Fall.
- Adjusting building ventilation systems to operate at lower speeds.
- Adjusting building chillers, sterilizers and air compressors at UW Medical Center.
- Operating Husky Stadium lighting at 25 percent of capacity.
- Monitoring energy consumption, utility costs, and energy conservation information.
- Establishing an Energy Conservation Team to review conservation measures and develop projects to conserve energy.
- Continuing efforts under a long-term partnership with Seattle City Light to identify cost-effective conservation measures.

Emergency and standby power systems (i.e. power supply when the primary electrical power system is unavailable) on the University of Washington campus serve life/safety and optional standby power purposes. Emergency power is primarily generated by diesel generators located at the Central Power Plant and at the West Campus Utility Plant (WCUP). The current emergency and standby power generation capacity of the Central Power Plant

and WCUP is 22 MVA, which is considered adequate to serve existing campus demands during power outages.

The following provides a discussion on electrical power distribution by campus sector.

West Campus

The West Campus sector currently (2015) contains approximately 3.8 million gsf of building space which equates to approximately 23 percent of the overall building space on campus (approximately 16.6 million gsf); accordingly, West Campus is assumed to comprise approximately 23 percent of the current electricity demand on campus.[2]

As illustrated in **Figure 3.4-1**, the majority of the West Campus sector is served by the University of Washington electrical distribution system, with isolated portions of West Campus served by the SCL system. West Campus areas currently served by SCL include the area generally north of NE Pacific Street and west of Brooklyn Avenue NE (including Stevens Court), the area immediately west of 15th Avenue NE and north of NE 41st Street (containing the Social Work/Speech and Hearing Services building), and the area west of the University Bridge.

South Campus

The South Campus sector currently contains approximately 4.2 million gsf of building space which equates to approximately 25 percent of the overall building space on campus. Accordingly, the South Campus is assumed to comprise approximately 25 percent of the current electricity demand on campus.

As illustrated in **Figure 3.4-1**, the majority of the South Campus sector is served by the University of Washington electrical distribution system, with an isolated portion of South Campus between Columbia Road and the waterfront served by the SCL system.

Central Campus

The Central Campus sector currently contains approximately 7.1 million gsf of building space which equates to approximately 43 percent of the overall building space on campus. Accordingly, Central Campus is assumed to comprise approximately 43 percent of the current electricity demand on campus.

As illustrated in **Figure 3.4-1**, the entire Central Campus sector is served by the University of Washington electrical distribution system, with the exception of the isolated portions of Central Campus located north of NE 45th Street.

[2] This estimate is based on building area and does not include operational conditions and land uses that could increase or reduce the electrical power demand. A high proportion of research and laboratory space could result in a greater demand for space cooling and associated electricity.

East Campus

The East Campus sector currently contains approximately 1.5 million gsf of building space which equates to approximately nine percent of the overall building space on campus. Accordingly, East Campus is assumed to comprise approximately nine percent of the current electricity demand on campus.

As illustrated in **Figure 3.4-1**, the East Campus is served by both the University of Washington and SCL systems. The University of Washington system generally serves the western half of the East Campus sector, including the athletic facilities and Parking Lot E1. The SCL system generally serves the eastern half of the East Campus sector, including the golf driving range, the Environmental Safety Storage building, Ceramic Metal Arts building, the Urban Horticultural Center, and Laurel Village.

Fossil Fuel

Fossil fuel (primarily natural gas and diesel fuel) consumed at the Central Power Plant is used to generate heat, steam, and emergency backup power. The steam system boilers are powered by natural gas (approximately 97 percent) and diesel fuel oil (approximately 3 percent). Puget Sound Energy provides natural gas service to the University. Steam is distributed to most buildings on the campus through utility tunnels, and is primarily used for building heat and domestic hot water.

Natural gas service is provided through a metering station in the South Campus for that area and at the Central Power Plant. From the Central Power Plant, a University-maintained system distributes gas to a number of campus buildings.

Diesel fuel oil for the Central Power Plant is provided by an approximately 1,300,000 gallon underground tank below Jefferson Road immediately southwest of the Central Power Plant. The fuel oil provides backup heating oil for the power plant and fuel for the emergency power generators. The Central Plant fuel oil tank is periodically filled by container tank trucks. An underground tank is also provided at the WCUP.

Several smaller fuel oil storage tanks are located on campus to provide fuel for emergency backup power generators for certain individual buildings and uses. The fuel storage tank sizes associated with these individual emergency backup generators generally range in capacity from approximately 75 to 40,000 gallons. All fuel storage tanks are maintained and inspected in accordance with applicable safety regulations and University requirements.

Primary & Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement. These zones are included for discussion and analysis in this EIS. The University

of Washington is centrally located within the Primary and Secondary Impact Zones (see **Figure 2-3**).

Electricity service to the area within the **Primary Impact Zone** is provided by SCL, with no area within the Primary Impact Zone outside of the University of Washington campus boundary served by the University of Washington electrical distribution system. Fossil fuel distribution in the Primary Impact Zone is likewise not associated with the University of Washington system.

Within the **Secondary Impact Zone**, electricity is provided by SCL, with no area within the Secondary Impact Zone outside of the University of Washington campus boundary served by the University of Washington electrical of fossil fuel distribution systems.

3.4.2 Impacts

Development under the action alternatives (Alternatives 1-5) would result in additional demands for energy. This section of the Draft EIS identifies how development under the EIS Alternatives would relate to electric power and fossil fuels.

No Action Alternative

Under the No Action Alternative, energy-related conditions associated with electricity and fossil fuel would primarily be related to the approximately 211,000 gsf of building development under the current *2003 CMP-Seattle*. The approximately 211,000 gsf of building development would represent approximately three percent of the amount of development on campus assumed under Alternatives 1-5, and the potential for energy-related impacts on the University of Washington campus would be substantially less than under those Alternatives. For example, the electric power demand increase under the No Action Alternative compared to 2015 conditions would be approximately one percent compared to an approximately 24 percent increase under Alternative 1-5.

Alternative 1 – CMP Proposed Allocation with requested Height Increases

Under Alternative 1, which reflects the preferred allocation of building development in the *2018 Seattle Campus Master Plan*, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors. Development on the campus under Alternative 1 would result in additional demands for energy as discussed below.

Electric Power

Campus growth under Alternative 1 would increase demand for energy, including electrical power energy. The increased demand for electrical power is assumed to generally follow historic trends and would primarily be related to building lighting and ventilation (fans), and operation of laboratory and process equipment, office-type equipment such as computers, and chillers for air conditioning.

As under current conditions, it is assumed that building lighting and ventilation would represent the largest demands for electrical power (approximately 70 percent), followed by demands associated with operation of laboratory and office equipment (approximately 30 percent). Because of intermittent demand, electric power demand associated with chiller operation would be relatively minor compared to the other demands.

With the assumed development of 6.0 million gsf of new development on campus (an approximately 35 percent increase in building square footage over 2015 conditions), and based on historic trends, it is assumed that electricity demand on the campus would increase by approximately 24 percent over 2015 demand[3].

Electrical power receiving stations have the capacity and switch gear necessary to serve a portion of the electrical loads for the development under Alternative 1. It is anticipated that the existing system has the capacity to serve approximately 1.5 to 2.0 million gsf of additional building area (depending on the types of facilities constructed and operational use). Accommodating additional growth beyond 1.5 to 2.0 million square feet (up to the total 6.0 million gsf of building space identified in the *2018 Seattle Campus Master Plan*) would require improvements to the existing system. Options for providing increased capacity include a combination of the following:

- Provision of an additional substation on campus.
- Upgrades to the existing East and West Receiving Stations.
- Serving additional buildings directly from the existing SCL grid where available.

Because much of the existing distribution system and building electrical service equipment is aged and may require replacement and expansion to serve new facilities, new circuits could be installed in conjunction with new development which would assist in upgrading the overall University of Washington system.

For the West Campus sector located west of the University Bridge and East Campus sector located near Union Bay Place NE, new electrical service could be provided directly from the SCL grid.

[3] This estimate is based on historic trends and does not include building design and operational measures that could reduce the electrical power demand. A high proportion of new research and laboratory space could require a greater demand for space cooling and associated electricity.

Although the amount of electricity required to operate chillers (for building cooling) is relatively low, accommodating all the development allocation in the 2018 CMP could require additional capacity for chilled water capacities at the Central Power Plant and WCUP, as those facilities only have the capacity to accommodate approximately 4.0 million to 6.0 million gsf of additional building space. Options for providing increased capacity, if necessary, include a combination of the following:

- Additional capacity at the Central Power Plant
- A single new chilled water plant
- Multiple new "regional" chilled water plants
- Local chillers installed in new buildings as constructed.

The current emergency power capacity of 22 MVA would be sufficient to meet back-up power requirements of all 6.0 million gsf of new new building space. Depending on if a large percentage of new buildings house technical/research uses that typically have larger emergency back-up power requirements than standard academic uses, however, accommodating the full load growth could require additional capacity. Accordingly, improvements to the emergency power capacity may be required. Options for increasing capacity include:

- Provision of additional capacity at the Central Power Plant.
- Provision of a new emergency/standby power plant.
- Provision of new "regional" emergency/standby power plants
- Inclusion of local generation facilities at individual projects.

Fossil Fuel

Increased demand for fossil fuel would primarily be related to the generation of steam for building heat and emergency backup power. Based on historic trends, it is assumed that demand for fossil fuel would remain relatively stable.

The steam generation capacity and distribution system for the campus is considered adequate to handle the addition of 6.0 million gsf of building space. The Central Power Plant has a capacity of 870 million Btu/hour (MMBtuh) and a capacity of 620 MMBtuh with its largest boiler out of service. With a current peak load of approximately 300 MMBtuh, an increase of up to approximately 175 MMBtuh with development under the *2018 Seattle Campus Master Plan* would be accommodated by the current plant capacity. Given that the age of the existing boilers and piping systems, it is possible that replacement of current boiler(s) and pipes could be necessary at some point in the future. Replacement of these systems would likely be necessary at some point without increased development under Alternative 1, however, the increased use associated with the additional demand could increase the rate of deterioration.

The following provides a discussion on anticipated electricity and fossil fuel conditions under Alternative 1 by campus sector.

West Campus

With assumed development under Alternative 1, approximately 3.0 million gsf of net new development would be added to the West Campus sector. This sector would contain a total of approximately 6.8 million gsf of building space, which would equate to approximately 30 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 1, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for electricity and fossil fuel.

As indicated above, full development of 3.0 million gsf of new building development in West Campus would require improvements to the existing electrical system to provide adequate service to serve all of the new building area (University of Washington electrical system assumed to have capacity to serve 1.5 to 2.0 million gsf of new building space). The University of Washington would coordinate with SCL regarding implementation of system improvements to increase electrical service capacity, including coordination with SCL regarding those areas of West Campus considered best for continued service from SCL and those best to be added to the University of Washington system (refer to **3.4.3 – Mitigation Measures** for details).

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve West Campus development under Alternative 1.

South Campus

Approximately 1.35 million gsf of development would be included in the South Campus sector under Alternative 1. In total, this sector would contain approximately 5.55 million gsf of building space, which would equate to approximately 25 percent of the overall building space on campus. Under Alternative 1, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for electricity and fossil fuel.

Full development of 1.35 million gsf of new building development in the South Campus sector could be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington system could be required.

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve South Campus development under Alternative 1.

Central Campus

With potential development under Alternative 1, approximately 0.9 million gsf of new development would be added to the Central Campus sector. This sector would have a total of approximately 8.0 million gsf of building space which would equate to approximately 35 percent of the overall building space on campus.

Full development of 0.9 million gsf of new building development in the Central Campus sector could be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington system could be required.

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve Central Campus development under Alternative 1.

East Campus

Approximately 0.75 million gsf of new development would be added to the East Campus sector under Alternative 1. In total, this sector would contain approximately 2.25 million gsf of building space, which would equate to approximately 10 percent of the overall building space on campus. Under Alternative 1, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for electricity and fossil fuel.

Full development of 0.75 million gsf of new building development in the East Campus sector could be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington system could be required. The University of Washington would coordinate with SCL regarding those areas of East Campus considered best for continued service from SCL and those best to be added to the University of Washington system

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve East Campus development under Alternative 1.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

With the focus of development in the West and South Campus sectors (73 percent of development) under Alternative 1, these sectors would have the greatest increase in development and associated increase in demand for energy on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus). Development associated with Alternative 1 could temporarily affect electrical system connections in the immediate area.

Less development is assumed to occur in the Central and East Campus sector under Alternative 1. As a result, there would be less potential for increased demand for energy in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, system connection issues associated with increased energy demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for energy impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, consistent with the proposed CMP allocation without height increases proposed in the *2018 Seattle Campus Master Plan*; thus the existing height limits are assumed. Without the proposed height increases, the amount of development capacity in the West Campus sector is limited and some development that was assumed for the West Campus sector under Alternative 1 is shifted to the East Campus sector under Alternative 2.

West Campus

With potential development under Alternative 2, approximately 2.4 million gsf would be added to the West Campus. This sector would contain a total of approximately 6.2 million gsf of building space which would equate to approximately 27 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 2, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for electricity and fossil fuels.

As under Alternative 1, full development of 2.4 million gsf of new building development in West Campus under Alternative 2 would require improvements to the existing electrical system to provide adequate service to serve all of the new building area (University of Washington electrical system assumed to have capacity to serve 1.5 to 2.0 million gsf of new building space). The University of Washington would coordinate with SCL regarding implementation of system improvements to increase electrical service capacity (refer to **3.4.3 – Mitigation Measures** for details).

South Campus

The amount of potential development in the South Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in electricity and fossil fuel demand would also be the same as under Alternative 1.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in electricity and fossil fuel demand would also be the same as under Alternative 1.

East Campus

Approximately 1.35 million gsf of potential new development would be added to the East Campus sector under Alternative 2. In total, this sector would contain approximately 2.85 million gsf of building space, which would equate to approximately 13 percent of the overall building space on campus. Under Alternative 2, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for electricity and fossil fuel. However, the potential increase in demand for energy resources in the East Campus sector would be greater than under Alternative 1 due to the increased amount of development.

Full development of 1.35 million gsf of new building development in the East Campus sector could be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity,

although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington electrical system could be required.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, South, and East Campus sectors (85 percent of development under Alternative 2), these sectors would have the greatest increase in development and associated potential increase in demand for energy on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to the East Campus). Development associated with Alternative 2 could temporarily affect electrical system connections in the immediate area.

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for increased demand for energy in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, connection issues associated with increased energy demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

West Campus

With potential development under Alternative 3, the approximately 3.2 million gsf would be added to the West Campus. This sector would contain a total of approximately 7.0 million gsf of building space which would equate to approximately 31 percent of the overall building space on campus. Under Alternative 3, the West Campus sector would have the

second highest percentage of building space on campus and would be anticipated to have the second highest demand for energy resources. The increase in energy demand is anticipated to be greater than under Alternative 1 due to additional development density assumed in this sector under Alternative 3.

As under Alternative 1, full development of 3.2 million gsf of new building development in West Campus would require improvements to the existing electrical system to provide adequate service to serve all of the new building area (University of Washington electrical system assumed to have capacity to serve 1.5 to 2.0 million gsf of new building space). The University of Washington would coordinate with SCL regarding implementation of system improvements to increase electrical service capacity (refer to **3.4.3 – Mitigation Measures** for details).

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve West Campus development under Alternative 3.

South Campus

Approximately 1.65 million gsf of development would be included in the South Campus sector under Alternative 3. In total, this sector would contain approximately 5.85 million gsf of building space, which would equate to approximately 26 percent of the overall building space on campus. Under Alternative 3, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for energy resources. However, the increase in energy demand under Alternative 3 would be greater than Alternative 1 due to additional development density assumed in this sector under Alternative 3.

Similar to under Alternative 1, full development of 1.65 million gsf of new building development in the South Campus sector could likely be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington system could be required.

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve South Campus development under Alternative 3.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 3 would be the same as Alternative 1. Potential increases in electricity and fossil fuel demand would also be the same as under Alternative 1.

East Campus

Approximately 0.25 million gsf of potential new development would be added to the East Campus sector under Alternative 3. In total, this sector would contain approximately 1.75 million gsf of building space, which would equate to approximately eight percent of the overall building space on campus. Under Alternative 3, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for utilities. The potential increase in energy demand in the East Campus sector would be lower than under Alternative 1 due to the lower amount of development density assumed for this sector under Alternative 3.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), these sectors would have the greatest increase in development and associated potential increase in demand for energy on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus). Development associated with Alternative 3 could temporarily affect electrical system connections in the immediate area.

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3. As a result, there would be less potential for increased demand for energy in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, connection issues associated with increased energy demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West and

East Campus sectors. Alternative 4 reflects an increase in development in the Central and East Campus sectors compared to Alternative 1.

West Campus

The amount of potential development in the West Campus sector under Alternative 4 would be the same as Alternative 1. Potential increases in energy demand would also be the same as under Alternative 1.

South Campus

Approximately 0.2 million gsf of development is assumed in the South Campus sector under Alternative 4. In total, this sector would contain approximately 4.4 million gsf of building space, which would equate to approximately 20 percent of the overall building space on campus. Under Alternative 4, the South Campus sector would still have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for utilities. However, the increase in demand for energy under Alternative 4 would be less than under Alternative 1 due to the lower amount of potential development assumed for this sector under Alternative 4.

Central Campus

With potential development under Alternative 4, approximately 1.1 million gsf of new development would be added to the Central Campus sector. This sector would have a total of approximately 8.2 million gsf of building space which would equate to approximately 36 percent of the overall building space on campus. Under Alternative 4, the Central Campus sector would have the highest percentage of building space on campus and would be anticipated to have the highest demand for energy. The potential increase in demand for energy would also be greater than under Alternative 1 due to increased amount of development density in this sector under Alternative 4.

Full development of 1.1 million gsf of new building development in the Central Campus sector could be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington system could be required.

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve Central Campus development under Alternative 4.

East Campus

Approximately 1.7 million gsf of potential new development would be added to the East Campus sector under Alternative 4. In total, this sector would contain approximately 3.2 million gsf of building space, which would equate to approximately 14 percent of the overall building space on campus. Under Alternative 4, the East Campus sector would still have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for energy resources. However, the potential increase in demand for energy in the East Campus sector would be greater than under Alternative 1 due to the increased development density under Alternative 4.

Full development of 1.7 million gsf of new building development in the East Campus sector would likely be accommodated by the 1.5 to 2.0 million gsf of available electrical system capacity, although in combination with development in other campus sectors, improvements to increase the capacity of the University of Washington electrical system could be required.

Capacity of emergency electrical power and fossil fuel systems is anticipated to be adequate to serve East Campus sector development under Alternative 4.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, Central, and East Campus sectors (97 percent of development under Alternative 4), these sectors would have the greatest increase in development and associated potential increase in demand for energy on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus), the residential neighborhood north of NE 45th Street (across from the Central Campus), and the Laurelhurst neighborhood and University Village (adjacent to East Campus). Development associated with Alternative 4 could temporarily affect electrical system connections in the immediate area.

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential for increased demand for energy in the Primary Impact Zone adjacent to this sector compared to Alternative 1.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, connection issues associated with increased energy demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 - 4, although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in East Campus, would occur. Because the proposed street and aerial vacation would not result in an increase in building area compared to Alternatives 1 - 4, energy demand conditions under Alternative 5 would be similar to those identified under Alternatives 1 - 4.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall energy use (electricity and fuel) in the area and, in combination with future new development in the area, would contribute to the overall SCL power generation and distribution system. To the extent that increased campus population and development increase the pressure for supporting development in the area (primarily in the University District), campus growth could contribute to energy demands in the area.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the building development necessary to accommodate increased campus population, potentially transferring a portion of the energy demands from the University of Washington campus to surrounding areas.

Potential changes in the zoning and development capacity of the University District could result in increased development and associated electricity demand in the vicinity of the University of Washington campus. Although the level, timing and specific location(s) of future development in the University District is not defined, it is possible that some level of concurrent development, and associated energy demand, would occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan Update*, especially given the proposed focus of development in the West Campus under Alternative 1 through 5. The *University District Urban Design EIS* indicates that "the existing substation and transmission infrastructure may be adequate to meet future needs. Further studies are required to determine whether major upgrades to the substation infrastructure will be required." There is a potential for cumulative energy-related impacts associated with concurrent demand increases on the University of Washington campus and in the

University District. Continued coordination between the University of Washington and SCL will be necessary to determine the improvements required to adequately serve development on the University of Washington campus and in the University District.

All construction activities in the area, both on the University of the Washington campus and in the campus vicinity, would be required to follow applicable regulations, and significant impacts would not be anticipated.

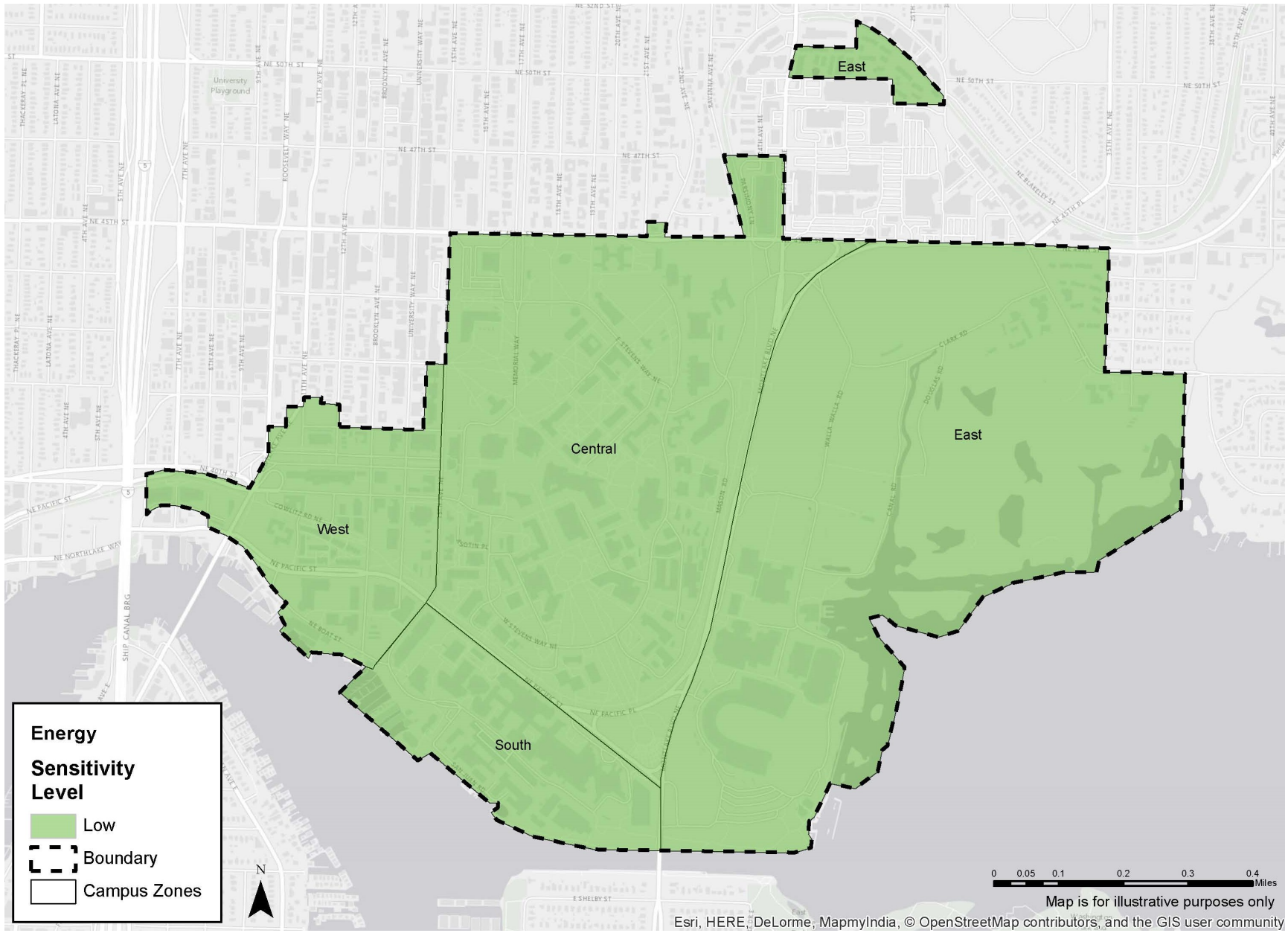
Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.4-2**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined.

For energy resources (primarily electrical power), the entire University of Washington campus is identified as having a "Low" potential to encounter sensitive electrical power conditions (i.e. demand and distribution constraints); it is noted that as new development under the *2018 Seattle Campus Master Plan* progresses, the University of Washington would monitor the relationship between campus building development and electrical power, emergency power and chiller capacities. If capacity issues arise, measures to increase capacities have been identified.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.4-2
Energy Resources Sensitivity Map

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.4.3 Mitigation Measures

The proposed *2018 Seattle Campus Master Plan* includes goals and objectives to create a more sustainable environment. These policies would guide future campus development and would indirectly relate to the overall energy demand. In addition to compliance with applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for energy demand impacts.

Measures Applicable to All Campus Areas (Low Potential)

- Centralized utilities such as the Central Power Plant and West Campus Utility Plant allow for the most efficient management of the related energy resource.

- New facilities would comply with applicable energy codes, including the Seattle Energy Code (SWC 22.700).

- Because the University of Washington must operate and maintain the facilities on a long-term basis, the economics of energy management and conservation are a primary design consideration. A standard of practicality must also be applied that assures that the building designs can be maintained properly. Sophisticated monitoring systems are available to assure efficient operations.

- Projects receiving separate service from SCL would be subject to SCL General Service Energy Efficiency Standards for new service.

- As plans for development of facilities are developed, the University Design Team could contact SCL and Puget Sound Energy customer services to confirm specific requirements for service.

- Aggressive energy conservation measures could continue to be studied and implemented on campus.

- Adopt Leadership in Energy and Environmental Design (LEED) standards for all new development to increase building sustainability in all state funded projects.

- The University of Washington would coordinate with SCL and monitor electrical demand and capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of an additional substation on campus.
    - Upgrades to the existing East and West Receiving Stations.
    - Serving additional buildings from the SCL grid where deemed appropriate.

- The University of Washington would monitor chiller capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of additional capacity at the Central Power Plant.
    - Provision of a single new chilled water plant.
    - Provision of multiple new "regional" chilled water plants.
    - Inclusion of local chillers installed in each building as constructed.

- The University of Washington would monitor emergency and standby power capacity as development under the *2018 Seattle Campus Master Plan* proceeds. Options for providing increased capacity include:
    - Provision of additional capacity at the Central Power Plant.
    - Provision of a new emergency/standby power plant.
    - Inclusion of local generation facilities at individual projects.

3.4.4 Significant Unavoidable Adverse Impacts

Overall campus building area development during the 10-year planning horizon would increase the consumption of electricity, fossil fuel, and natural gas and fuel. With implementation identified mitigation measures, significant energy demand impacts are not anticipated.

3.5 ENVIRONMENTAL HEALTH

This section of the Draft EIS describes the existing environmental health conditions on the University of Washington campus and in the site vicinity and evaluates the potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.5.1 Affected Environment

Hazardous Materials

In its role as a major research university, the University of Washington uses some material in its laboratories and medical facilities that are considered to be hazardous due to their toxicity, flammability, radioactivity, or because of contamination with infectious agents. These materials are generated in the course of conducting research and providing patient care, and are typical for medical research and hospital facilities.

The University of Washington Environmental Health and Safety (EH&S) Department is responsible for addressing environmental health issues on campus in order to provide a safe educational environment and work place. University of Washington Administrative Policy Statement 11.2 regulates the management and disposal of hazardous wastes on campus and is in compliance with all local, state and federal environmental laws and regulations, including but not limited to Washington State Department of Ecology rules for Dangerous Waste Regulations; Washington State Department of Health (DOH) – Biomedical Waste Definitions; and the King County Board of Health Code for Biomedical Waste. Hazardous materials on campus primarily include biological/infectious waste, hazardous chemical waste, and radioactive waste. The EH&S Department maintains numerous guidelines and manuals for the handling and treatment of hazardous materials on campus, and ensures that the University is in compliance with all applicable Federal and State regulations; they also offer on-going staff training opportunities for the handling of chemicals and hazardous waste management.

The University of Washington complies with the State of Washington occupational safety and health standards and local fire codes for the use of toxic and flammable materials in the campus environment. Required ventilation controls are available and maintained in work areas where toxic materials and volatile flammables are used. Code-conforming rooms and cabinets are provided for the storage and dispensing of flammable materials and chemicals.

The collection, treatment, and disposal of wastes from the operations using hazardous chemicals conform to the Washington State Department of Ecology and the U.S. Department of Transportation regulations. University of Washington personnel with special training for handling laboratory wastes are responsible for the collection and packaging of materials prior to shipping them to licensed treatment and disposal facilities.

Procedures have been established and are enforced by EH&S for decontaminating medical wastes from hospitals and laboratory operations prior to removing them from the University. Pressurized steam and disinfectants are used to sterilize those wastes that are considered to be infectious prior to disposal through normal waste channels. Locations that do not have access to these mechanisms dispose of their infectious waste via the University's contracted Infectious Waste Contractor. That company is responsible for pickup and transport of the infectious material to an approved off-site treatment facility, where it is treated and legally disposed.

Within the University, a number of research and clinical programs use radioactive materials. Research programs involving the use of small amounts of radioactive labels in tracer-type research are conducted in over 600 University laboratories. The Washington State DOH controls the uses of radioactive materials through a licensing process. The University of Washington programs are regularly inspected by EH&S and inspected annually by DOH to ensure compliance with regulations and special license conditions.

Management of radioactive waste on campus is also regulated by DOH. The primary method of disposal is through the collection and shipment of radioactive wastes to an authorized waste broker. The waste must be securely packaged at the University of Washington for transport, and is inspected and processed on campus before it is removed. Processed waste is shipped by the broker from campus to either Gainesville, Florida for destruction, or to the U.S. Ecology Low Level Radioactive Waste Site in Richland, Washington for burial.

Special attention, inspection, and maintenance are carried out to assure that no contaminated materials are accidentally introduced back in the water supply by cross connection. Backflow and cross connection prevention are an important part of the plumbing design that is included in all University research buildings. Upon installation, these devices are inspected by City of Seattle Water Department specialists, maintained by University specialists, and are subject to ongoing inspection.

West Campus

University uses in the West Campus sector primarily include classrooms and administrative uses, as well as several recently constructed student housing buildings. Uses in this sector are expected to generate minimal amounts of hazardous wastes.

South Campus

Currently, the highest concentration of research and hospital facilities that could generate hazardous materials is located in the South Campus sector, including the Magnuson Health Sciences Center and the University of Washington Medical Center. The University has instituted procedures to safely manage these materials during their use and disposal.

Clinical programs, similar to those conducted in most major hospitals, are primarily located in the University of Washington Medical Center. These programs involve the use of radioactive materials for diagnostic and therapeutic purposes. As mentioned previously, the Washington State DOH controls the use of radioactive materials through a licensing process. The University of Washington programs are regularly inspected by EH&S and inspected annually by DOH to ensure compliance with regulations and special license conditions.

Central Campus

The Central Campus sector is comprised of numerous instructional and research buildings (i.e., Denny Hall, Architecture Hall, Bagley Hall, Parrington Hall, Physics/Astronomy, and Molecular Engineering, etc.); administrative buildings (i.e., Gerberding Hall, the UW Club); student housing (i.e., McMahon Hall, Hansee Hall, etc.); student support uses (i.e., Suzzallo Library, Odegaard Library, the HUB, McMahon Hall, etc.); and utilities (Power Plant). Uses in this sector are expected to generate moderate to low amounts of hazardous wastes (primarily associated with the research and utility uses).

East Campus

The East Campus sector primarily consists of athletic facilities/recreational uses, surface parking and open space/natural areas. Development is largely located in the south portion of the sector, along Montlake Boulevard NE, and includes Husky Stadium, Alaska Airlines Arena, the Intermural Activities Building, Sound Transit's University of Washington Station, as well as the north and east portion including the Center for Urban Horticulture, the golf driving range, and several sports fields; the existing E1 parking area also comprises a large portion of the area along Montlake Boulevard NE. Instructional and research uses are located along the eastern boundary of the sector, as well as student housing (Laurel Village) and the Union Bay Natural Area. Uses in this sector are expected to generate minimal amounts of hazardous wastes.

Noise

Noise Regulations

Noise is defined as any sound that is undesirable because of speech and hearing interference or annoyance. The intensity, duration, and character of sounds can have an adverse effect on personal health and welfare. While one of the more serious consequences of noise is hearing loss, other significant effects include interference with sleep, disruption of conversation, and effect on work performance.

Sound level descriptors are ways of measuring and describing noise, including factors that account for sound duration, magnitude, frequency and pitch. Sound is measured in decibels (dB), a logarithmic ratio between pressures caused by a given sound spectrum. Environmental noise is measured as "A-weighted" sound level in decibels, symbolized as

dBA. The A-weighted scale represents noise using the scale corresponding the most closely to the range and characteristics of the human ear. Equivalent sound level, shown as Leq, is a common descriptor for measuring fluctuating sounds. The Leq is the level of a constant sound that, over a given time period, contains the same amount of sound energy as the measured fluctuating sound. People commonly experience sound levels in the range of between 5 to 90 dBA. **Table 3.5-1** identifies sound levels of typical noise sources and activities. The smallest change in sound levels that is noticeable to most people is about 3 dBA.

Table 3.5-1
TYPICAL SOUND LEVELS

Noise Source or Activity	dBA
Jet takeoff (at 200 feet)	120
Construction Site, maximums (typical: 90 dBA)	110
Shout (at 5 feet)	100
Heavy truck (passing by at 50 feet)	90
Urban street on a main arterial	80
Automobile interior – freeway at 200 feet	70
Normal conversation (at 3 feet)	60
Office, classroom (with abundant activity sounds)	40 to 50
Living room (no audio or TV in use)	40
Bedroom (at a late hour, insulated windows)	20 to 30
Broadcast studio	20
Rustling leaves	10 to 15

Source: EPA, 1978.

Ambient noise is regulated by the City of Seattle under the City's Noise Ordinance (Seattle Municipal Code, Chapter 25.08). The Noise Ordinance adopts restrictions contained in Washington State's Maximum Environmental Noise Levels (WAC 173-60). City of Seattle maximum permissible sound levels are shown in **Table 3.5-2**.

Table 3.5-2
CITY OF SEATTLE MAXIMUM PERMISSIBLE ENVIRONMENTAL SOUND LEVELS (dBA)

Land Use of Noise Source	Land Use of Receiving Property		
	Residential Day/Night	Commercial	Industrial
Residential	55/45	57	60
Commercial	57/47	60	65
Industrial	60/50	65	70

Source: City of Seattle, 2016.

While the City of Seattle's Noise Ordinance does not directly apply to University uses within the campus boundaries, it does serve to regulate noise between on-campus uses and adjacent land uses/properties (i.e., receiving properties). The City of Seattle considers major institutions to be commercial land uses for Noise Ordinance regulation purposes. As indicated by **Table 3.5-2**, the allowable noise level from a commercial source received by another commercial source is 60 dBA; the allowable noise level for residential receiving properties is 57 dBA; and the allowable noise level for industrial receiving properties is 65 dBA. For residential receiving properties, there is a 10-dBA reduction (to 47 dBA) during nighttime hours (10 PM to 7 AM on weekdays, and 10 PM to 9 AM on weekends). For commercial and industrial receiving properties, there is no nighttime 10-dBA reduction.

Certain provisions of the Noise Ordinance, namely, SMC 25.08.425, regulate construction-related noise in the City of Seattle and the University of Washington follows those applicable provisions for construction noise. Seattle's noise standards provide for temporary increases in the maximum permissible sound levels based on equipment type. During daytime hours[1], sound levels from construction equipment (e.g., tractors, dozers, loader, cranes, compactors, compressors, pneumatic equipment, etc.) are allowed a 25 dBA increase in the noise standards; portable powered equipment (e.g., chainsaws, powered hand tools, etc.) are allowed a 20 dBA increase and maintenance equipment (e.g., lawn mowers, powered hand tools, snow blowers, etc.) are allowed a 15 dBA increase. In addition, the Noise Ordinance authorizes noise from impact-type equipment (e.g., pile drivers, pavement breakers, jackhammers, etc.) to temporarily exceed the sound levels associated with other construction equipment up to a maximum of Leq 99 dBA for a period of 7½ minutes. Sounds above a Leq of 99 dBA are prohibited unless a variance is obtained from the City of Seattle.

The University of Washington also considers noise impacts on sensitive campus uses such as classrooms, hospital areas, patient rooms and student housing. As part of previous projects near noise sensitive uses on the campus, the University of Washington has implemented measures to minimize impacts on sensitive uses, such as limiting the use of higher noise equipment, limiting construction hours, ensuring properly sized mufflers and silencers, ensuring nighttime activities do not exceed allowable levels, and scheduling some activities at night (in accordance with applicable requirements) to minimize impacts to campus operations.

Existing Noise Conditions

The noise environment surrounding the University of Washington campus varies considerably, from an urban noise environment surrounding the West Campus sector to the natural noise environment (i.e., waterbodies and natural areas) surrounding much of the East Campus sector.

[1] Defined by Chapter 25.08 of the Seattle Code as 7 AM – 10 PM during weekdays and 9 AM – 10 PM on weekends.

Along major arterials surrounding the campus, maximum noise levels of 80 dB are not uncommon. The average day-night noise level on and around most major arterials is approximately 60 dB (University of Washington, 1992). Previous noise monitoring at NE 45th Street, 15th Avenue NE and along NE Campus Parkway indicated that average noise levels are 68 dBA, with peak hour levels reaching 67 dBA Leq. Noise levels were lower near Portage Bay with an Ldn of 64 dBA, and a peak hour Leq value of 62 dBA (Sound Transit, 1998).

Overall, existing noise conditions at the University campus are acceptable. Some isolated on-campus and adjoining areas, especially sensitive residential areas, experience noise impacts from periodic construction and renovation work, high traffic volumes, and temporary special campus events. Existing noise sources and affected campus areas are discussed below.

West Campus

An urban noise environment surrounds most of the West Campus sector. Noise in and around West Campus is primarily from vehicle traffic, as well as pedestrian activity. Existing noise conditions in the West Campus sector and surrounding University District area vary considerably, with generally higher noise levels toward the periphery of the campus along heavily traveled arterials. Elevated noise levels occur along 15th Avenue NE, Pacific Avenue NE, NE Campus Parkway, Roosevelt Way NE, the University Bridge and the I-5 corridor.

In the portion of the University District that is in and adjacent to West Campus, residential areas along I-5, Roosevelt Way NE, and NE Campus Parkway are subject to traffic-related noise.

South Campus

An urban noise environment is present around most of the South Campus sector. Within South Campus, the University currently experiences noise primarily from vehicle and boat traffic (e.g., along NE Pacific Street, Portage Bay, and the Ship Canal), recreation and sports programs, and periodic construction.

The Montlake neighborhood, across the Ship Canal from the South Campus sector and along the Montlake Boulevard NE corridor, experiences noise impacts during high vehicle use periods (e.g., morning and evening rush hour) and during special events (e.g. Husky football games).

Central Campus

An urban noise environment surrounds most of the Central Campus sector. Noise around Central Campus is mostly from vehicle traffic, as well as pedestrian activity. Existing noise conditions in the University District area to the west and north vary considerably, with generally higher noise levels toward the periphery of the campus along heavily traveled

arterials. Elevated noise levels occur along NE 45th Street, Montlake Boulevard NE, NE Pacific Street, and 15th Avenue NE.

Aside from periodic construction projects and intermittent traffic noise on Stevens Way NE, the core University's Central Campus has relatively low noise levels, largely limited to voice-level sounds. Traffic noise from Stevens Way NE in most areas is buffered by vegetation.

Adjacent to the northern area of Central Campus along NE 45th Street, residential buildings are subject to traffic-related noise; Central Campus is primarily insulated from noise-related disturbances.

East Campus

A natural noise environment surrounds much of the East Campus sector (i.e., waterbodies and natural areas). Vehicle traffic along Montlake Boulevard NE and University parking lots are the predominant sources of noise associated with western edge of the East Campus. Outdoor events and ingress/egress of spectators at Husky Stadium (capacity of approximately 72,500 people) and Alaska Airlines Arena at Hec Edmundson Pavilion are the most substantial sources of noise in the East Campus; events at Chaffey Field (baseball), the soccer field, and track facility also generate noise from spectators and ingress/egress, but generally at a lower level due to fewer spectators.

Residential uses in the Laurelhurst neighborhood would be sensitive to noise generated in or adjacent to East Campus, including sporting events such as Husky football games.

Vibration

Operation of heavy equipment during construction activities, such as drilling rigs, excavators, and haul trucks, can create waves that radiate along the surface and downward into the earth. As the waves travel outward from the source, they excite the particles of rock and soil through which they pass, causing them to oscillate. These surface waves can be felt as ground vibration. The waves dissipate energy with distance from the source; the amount of attenuation depends on the source, site geology and other factors. Perceptible ground-borne vibration is generally limited to areas within a couple hundred feet of construction activities.

The University of Washington campus contains several buildings that currently contain vibration-sensitive equipment or conduct activities/research that would be sensitive to vibration. These buildings are listed by campus sector below.

West Campus

As of the date of publication of this Draft EIS, the West Campus sector includes one building that contains uses that are considered to be sensitive to vibration: Henderson Hall. It is possible that existing research equipment and/or activities within this buildings could be

relocated to other facilities or be discontinued in their current location. It is also possible that new vibration-sensitive uses could be established in other buildings in the West Campus over the life of the *2018 Seattle Campus Master Plan*.

South Campus

As of the date of publication of this Draft EIS, the South Campus sector includes the 12 buildings listed below that would be sensitive to vibration. This list is intended to provide a snap shot of existing vibration-sensitive research and activities in this portion of the campus. It is possible that existing research equipment and/or activities within these buildings could be relocated to other facilities or be discontinued in their current location. It is also possible that new vibration-sensitive uses could be established in other buildings in the South Campus over the life of the *2018 Seattle Campus Master Plan*.

- William H Foege Hall
- Center on Human Development and Disability
- Fialkow Biomedical Sciences (K-Wing)
- Fisheries Center
- Fishery Sciences Building
- Fisheries Teaching and Research Center
- Magnuson Health Sciences Center (J-Wing)
- Marine Sciences Building
- Oceanography Research Building
- Ocean Sciences Building
- UW Medical Center Cyclotron
- Hitchcock Hall

Central Campus

As of the date of publication of this Draft EIS, the Central Campus sector includes the 15 buildings listed below that contain uses that are considered to be sensitive to vibration. Similar to South Campus, this list is intended to provide a snap shot of existing vibration-sensitive research and activities in this portion of the campus. It is possible that existing research equipment and/or activities within these buildings could be relocated to other facilities or be discontinued in their current location. Is it also possible that new vibration-sensitive uses could be established in other buildings in the Central Campus sector over the life of the *2018 Seattle Campus Master Plan*.

- Bagley Hall
- Benson Hall
- Burke Museum
- Chemistry Building
- Electrical Engineering Building
- Fluke Hall
- Johnson Hall
- Kincaid Hall
- Molecular Engineering Building
- Mechanical Engineering Building and Annex
- More Hall
- Physical Astronomy Building
- Roberts Hall

- Wilcox Hall
- Winkenwerder Hall

East Campus

As of the date of publication of this Draft EIS, the East Campus sector includes no buildings that contain uses that are considered to be sensitive to vibration. It is possible that new vibration-sensitive uses could be established in buildings in the East Campus over the life of the *2018 Seattle Campus Master Plan*.

Primary & Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement. These zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones (see **Figure 2-3**).

There are a few assumed sources of hazardous materials in the Primary and Secondary impact Zones; these include gas stations, auto repair shops, and printing establishments primarily located in the University District and University Village vicinity; Seattle Children's Hospital in the Secondary Impact Zone (east of East Campus) is also an assumed source of hazardous waste. These hazardous materials are required to be managed in accordance with applicable local, state and federal standards/regulations/laws. The major sources of noise within the Primary and Secondary Impact Zones include: commercial development and major roadways. Construction activities in the Primary and Secondary Impact Zones may result in vibration. There are no known uses in the Primary and Secondary Impact Zones that are sensitive to vibration.

Within the **Primary Impact Zone**, noise sources include: commercial development in the University District, Wallingford, Laurelhurst, and Montlake neighborhoods, commercial development at University Village, as well as traffic traveling on the following roadways: I-5, SR-520, NE 50th Street, NE 45th Street, NE Pacific Street, Roosevelt Way NE, 11th Avenue NE, University Way NE, 25th Avenue NE, and Montlake Boulevard NE.

Within the **Secondary Impact Zone**, all of the same sources of noise are present, except University Village. Additional roadway noise sources in this zone include: Eastlake Avenue E, 24th Avenue NE, NE 35th Street, Sandpoint Way NE, NE 65th Street and NE Ravenna Boulevard.

3.5.2 Impacts

This section of the Draft EIS identifies the potential environmental health-related impacts of the *2018 Seattle Campus Master Plan* on the University of Washington campus and in the surrounding areas that could occur with development under the EIS Alternatives.

No Action Alternative

Under the No Action Alternative, it is assumed the approximately 6.0 million gsf of new development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *CMP Seattle 2003* would be developed (approximately 211,000 gsf). Some level of increased campus population would occur under the No Action Alternative through the remaining development under the *CMP Seattle 2003*, which would result in an increase in hazardous materials, noise and vibration. However, due to the lower level of development that would occur on campus when compared to Alternatives 1 – 5, it is anticipated that environmental health-related impacts would be substantially lower under the No Action Alternative.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1, which matches the preferred allocation of building development in the *2018 Seattle Campus Master Plan*, includes 6.0 million gsf of building area throughout the campus, with a focus of this development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors. Development on the campus under Alternative 1 would result in potential environmental health-related impacts as described below.

Hazardous Materials

Under Alternative 1, to the extent that new development under the *2018 Seattle Campus Master Plan* includes research and/or medical facilities, an increase in the use of research chemicals, hazardous materials, and hazardous waste would occur. However, risks to human health would not be anticipated to increase significantly with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing policies/standards established by the University's Environmental Health and Safety Department, as well as applicable local, state and federal standards/regulations/laws.

Noise

Potential noise impacts associated with Alternative 1 would primarily occur during the construction of individual development projects under the *2018 Seattle Campus Master Plan*. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. The increase in sound levels would depend upon the type of equipment being used, the duration of such use, and the proximity of the equipment to the property line. Sound levels within 50 feet of construction equipment often exceed the levels typically recommended

for residential and institutional land uses. **Table 3.5-3** provides a summary of noise levels from various types of construction equipment.

Table 3.5-3
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Equipment	Average Noise Level (dBA measured 50 ft. from the equipment)
Dump Truck (15-20 cu.yd. capacity)	91
Scraper	88
Backhoe	85
Concrete Mixer	85
Concrete Pump	82
Air Compressor	81
Bulldozer (D-8)	80
Generator	78
Pump	76

Source: US EPA, 1971.

Depending on the location of construction activity, construction noise would result in temporary annoyance and possible increased speech interference near the potential development sites. Such noise could impact teaching and research activities or disturb student housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas would also result in temporary construction noise impacts to those adjacent land uses.

Operational noise associated with development under Alternative 1 would primarily be related to building operational systems (e.g., mechanical systems, etc.) and traffic noise. Increased traffic volumes from new development would result in an increase in traffic-related noise on-campus and on surrounding roadways. However, the campus and surrounding area is a highly developed urban area with existing traffic-related noise and the increase in traffic volumes associated with the *2018 Seattle Campus Master Plan* is not anticipated to result in significant noise impacts.

Due to the nature of instructional, research and student housing uses on campus, as well as the proximity of adjacent off-site uses along the edges of the campus (residential and commercial uses), it is anticipated that development under Alternative 1 would result in the potential for noise impacts associated with construction and operation of new uses as part of the *2018 Seattle Campus Master Plan*.

Vibration

Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites and adjacent areas. Operation of heavy construction equipment during construction, such as drilling rigs, excavators and haul trucks, would create waves that radiate along the surface and downward into the earth; the waves dissipate with distance from the source. These surface waves can be felt as ground vibration and create the potential to affect sensitive research uses that employ highly sensitive equipment.

Construction activities on potential development sites that are located in proximity to sensitive research uses (including, but not limited to, the buildings identified under Section 3.5.1 - Affected Environment above) would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the West, South and Central Campus sectors that would be located in the vicinity of existing sensitive research uses would have the potential to result in vibration impacts due to their proximity to these uses. Potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites.

The remaining development sites in the West, South, Central, and East Campus sectors would have a low potential to result in vibration impacts due to their distance from existing sensitive research uses. However, existing research equipment and/or activities could be relocated to other facilities or discontinued in their current location. It is also possible that new vibration-sensitive uses could be established in other buildings on campus over the life of the *2018 Seattle Campus Master Plan*. As such, future development projects should verify existing surrounding uses as part of the planning process to determine if new or relocated vibration-sensitive uses are in the site vicinity.

Below is a discussion of potential environmental health-related impacts under Alternative 1 by campus sector.

West Campus

Hazardous Materials **–** Under Alternative 1, areas within the West Campus sector would have a low potential for hazardous materials impacts because the typical uses within this sector (e.g., instructional, administration, and housing) generally do not use or generate great amounts of hazardous materials/waste. To the extent that new uses under Alternative 1 were to include the use or production of hazardous materials, the University of Washington would manage hazardous materials in accordance with existing University policies and standards, as well as local, state and federal regulations.

Noise **-** Potential noise impacts associated with Alternative 1 development in the West Campus sector would primarily occur during the construction of individual development

projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional, administration and/or student housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas could also result in temporary construction noise impacts to those adjacent land uses.

Operational noise associated with development under Alternative 1 in the West Campus sector would be primarily related to building operational systems and traffic noise. Increased traffic volumes from new development would result in an increase in traffic-related noise on-campus and on surrounding roadways. However, West Campus and surrounding area is a highly developed urban area with existing traffic-related noise and the increase in traffic volumes under Alternative 1 is not anticipated to result in significant noise impacts.

Because West Campus is one of the focus areas of development under Alternative 1 (3.0 million gsf of assumed development), more noise would be generated during construction and operation in this sector than in the Central and East Campus sectors.

Vibration **-** Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the West Campus sector and on adjacent areas. Construction activities on potential development sites that are located in proximity to sensitive research uses would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the West Campus sector that would be located in the vicinity of the existing sensitive research use would have the potential to result in vibration impacts due to their proximity to this use. Potential future development near sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites. Potential future development could also be designed to minimize vibration in areas near sensitive uses.

Because the West Campus sector is one of the focus areas of development under Alternative 1, more vibration would be generated during construction activities in this sector than in the Central and East Campus sectors. Only one vibration-sensitive use has been identified in this sector at this time[2]. However, additional vibration-sensitive uses could be developed in this area in the future.

South Campus

Hazardous Materials **-** Under Alternative 1, one of the focus areas of development would be the South Campus sector (1.35 million gsf of assumed development), which is comprised of the highest concentration of research and medical uses on campus, and is anticipated to

[2] Henderson Hall is currently the only identified vibration sensitive use in the West Campus.

result in an increase in hazardous materials associated with these uses. Development under the *2018 Seattle Campus Master Plan* in the South Campus sector would result in a high potential for impacts associated with this increase in hazardous materials. However, risks to human health would not be anticipated to increase substantially with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies/standards, as well as applicable local, state and federal standards/regulations/laws.

Noise **–** Potential noise impacts associated with Alternative 1 development in the South Campus sector would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional and research uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas could also result in temporary construction noise impacts to land uses in those adjacent areas.

Operational noise associated with development under Alternative 1 in South Campus would primarily be related to building operational systems and traffic noise. Increased traffic volumes from new development would result in an increase in traffic-related noise on-campus and on surrounding roadways. However, the South Campus sector and surrounding area are highly developed urban areas with existing traffic-related noise and the increase in traffic volumes under Alternative 1 is not anticipated to result in significant noise impacts.

Because the South Campus sector is one of the focus areas of development under Alternative 1, more noise would be generated during construction and operation in this sector than in the Central and East Campus sectors.

Vibration **-** Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the South Campus sector and on adjacent areas. Construction activities on potential development sites that are located close to sensitive research uses (including, but not limited to, the 12 buildings identified in Section 3.5.1 - Affected Environment above) would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in South Campus located in the vicinity of existing sensitive research uses identified in the Affected Environment section would have the potential to result in vibration impacts due to their proximity to these uses. Potential future development near sensitive uses would require project-specific coordination with adjacent vibration-sensitive users to determine potential vibration-related issues and measures to limit vibration associated with development on those sites. Potential future development could also be designed to minimize vibration in areas near sensitive uses.

Central Campus

Hazardous Materials **-** Areas within the Central Campus sector have a low potential for hazardous materials impacts because typical uses within this sector (e.g., instructional, support, administration, and housing) generally do not use or generate great amounts of hazardous materials or waste. Isolated research and utility uses in Central Campus do generate hazardous materials and waste, and new uses in Central Campus could generate hazardous materials, however. Risks to human health would not be anticipated to increase substantially with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **-** Potential noise impacts associated with Alternative 1 development in the Central Campus would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional, support, administration, and housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas would also result in temporary construction noise impacts to those adjacent land uses.

Operational noise associated with development under Alternative 1 in the Central Campus sector would be primarily related to building operational systems and traffic noise. Increased traffic volumes from new development would result in an increase in traffic-related noise on-campus and on surrounding roadways. However, the Central Campus sector and surrounding area are highly developed urban areas with existing traffic-related noise and the increase in traffic volumes under Alternative 1 is not anticipated to result in significant noise impacts.

Less noise would be generated during construction and operation of new development in the Central Campus under Alternative 1, compared the West and South Campus sectors, Because less development would occur in Central Campus (0.9 million gsf of assumed development).

Vibration **-** Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the Central Campus sector and on adjacent areas. Construction activities on potential development sites that are located in proximity to sensitive research uses (including, but not limited to, the 15 buildings identified in Affected Environment above) would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the Central Campus sector that would be located in the vicinity of the existing sensitive research uses identified in Affected Environment section would have the potential to result in vibration impacts due to their proximity to existing sensitive research uses. Potential future development near these sensitive uses would require project-specific coordination with adjacent vibration-sensitive

users to determine potential vibration-related issues and associated measures to limit vibration impacts to the sensitive uses. Potential future development could also be designed to minimize vibration in areas near sensitive uses.

Because less construction activities would occur in the Central Campus sector under Alternative 1 compared to the West and South Campus sectors, less vibration would be generated in this sector.

East Campus

Hazardous Materials **–** Under Alternative 1, areas within the East Campus sector would have a low potential for hazardous materials impacts because the typical uses within this sector (e.g., athletic facilities/recreational uses, surface parking, and open space/natural areas) generally do not use or generate great amounts of hazardous materials or waste. The University of Washington EH&S Department identifies and tests hazardous materials that are found on the campus and ensures that they disposed of in the proper manner. Any new uses in the East Campus sector would manage hazardous materials in accordance with existing University policies and standards, as well as applicable local, state, and federal standards, regulations, and laws.

Noise **-** Potential noise impacts associated with Alternative 1 development in the East Campus sector would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. However, at this time, there are no noise-sensitive uses located in East Campus sector in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas would also result in temporary construction noise impacts to those adjacent land uses (e.g., the Laurelhurst neighborhood).

Operational noise associated with development under Alternative 1 in the East Campus sector would primarily be related to building operational systems and traffic noise. Increased traffic volumes from new development would result in an increase in traffic-related noise on-campus and on surrounding roadways. However, much of the East Campus sector and surrounding area (e.g., along Montlake Boulevard NE) are highly developed urban areas with existing traffic-related noise and the increase in traffic volumes under Alternative 1 is not anticipated to result in significant noise impacts.

Because less development would occur in the East Campus sector under Alternative 1 (0.75 million gsf of assumed development) than in the South and West Campus sectors, less noise would be generated during construction and operation of new development in this sector.

Vibration **-** Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the East Campus sector and on

adjacent areas. No vibration-sensitive uses have been identified in the East Campus sector at this time. However, vibration-sensitive uses could be developed in this area in the future.

Because less construction activities would occur in the East Campus sector under Alternative 1 than in the South and West Campus sectors, less vibration would be generated in this sector.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential environmental health-related impacts on land uses in the Primary and Secondary Impact Zones would largely be due to noise and vibration from construction activities; during operation, impacts would largely be due to the use of hazardous materials and noise from traffic.

With the focus of development in the West and South Campus sectors (73 percent of development) under Alternative 1, more development and associated potential for environmental health-related impacts would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. As a result, there would be less potential for environmental health-related impacts on land uses in the Primary Impact Zone adjacent to these sectors.

Compliance with existing University regulations and codes, and those of local, state, and federal agencies, would minimize the potential for environmental health-related impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, construction and operational activities associated with Alternative 1 development would not be anticipated to result in environmental health-related impacts in the Secondary Impact Zone.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West,

South, and East Campus sectors, and lesser levels of development in the Central Campus sector. Existing building heights would be retained under this alternative.

Hazardous Materials

Similar to Alternative 1, to the extent that new development would include research and/or medical facilities, an increase in the use of research chemicals, hazardous materials and hazardous waste would occur as part of the development of Alternative 2. It is anticipated that development under Alternative 2 would result in an increase in hazardous materials, as under Alternative 1. Any new sources of hazardous materials on the campus would continue to be managed in accordance with existing policies and standards established by the University's EH&S Department, as well as applicable local, state and federal standards and regulations. No significant risks to human health or hazardous materials impacts would be anticipated.

Noise

Under Alternative 2, potential noise impacts would be primarily associated with construction of new development under the *2018 Seattle Campus Master Plan* and operational noise associated with building systems and increased traffic levels. It is anticipated that these noise impacts would be similar to those described for Alternative 1 but would occur more in the East Campus sector and less in the West Campus sector than under Alternative 1 based on the assumed distribution of development under this Alternative (same level of assumed development in the South and Central sectors as under Alternative 1.

Due to the nature of instructional, research, and student housing uses on campus, as well as the proximity of adjacent off-site uses along the edges of the campus (residential and commercial uses), it is anticipated that development under Alternative 2 would have a potential for noise impacts associated with construction and operation of new uses as part of the *2018 Seattle Campus Master Plan*, similar to that anticipated under Alternative 1.

Vibration

Construction activities associated with development of the *2018 Seattle Campus Master Plan* under Alternative 2 would generate vibration on potential development sites that could affect adjacent areas. Similar to Alternative 1, construction activities that are located in proximity to sensitive research uses (including, but not limited to those buildings identified under Affected Environment above) would generate vibration that could impact sensitive research uses and/or equipment. As described under Alternative 1, potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues and mitigation associated with development on those specific sites. Potential future development in other areas in the West, South, Central and East Campus sectors would

have a low potential to result in vibration impacts due to their distance from existing sensitive research uses.

Below is a discussion of potential environmental health-related impacts under Alternative 2 by campus sector.

West Campus

Hazardous Materials **–** As described for Alternative 1, areas within the West Campus sector would have a low potential for hazardous materials impacts with development under Alternative 2 because the typical uses within this sector (e.g., instructional, administration, and housing) generally do not use or generate great amounts of hazardous materials or waste. As under Alternative 1, to the extent that new uses under Alternative 2 were to include the use or production of hazardous materials, the University of Washington would manage hazardous materials in accordance with existing University policies and standards, as well as local, state, and federal regulations.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 2 would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the West Campus sector.

Assumed development of 2.4 million gsf of net new building space in West Campus under Alternative 2 is less than under Alternative 1 (3.0 million gsf of assumed development under Alternative 1) and the resultant noise conditions during construction would be less as well. To accommodate 2.4 million gsf of net new development in the West Campus sector without the proposed allowable building height increases, three additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2, the potential for noise impacts associated with demolition and site preparation would be similar to or greater than under Alternative 1.

Vibration - Similar to under Alternative 1, potential vibration impacts under Alternative 2 would primarily be associated with construction of new development in the West Campus sector. Only one vibration sensitive building has been identified in West Campus at this time (Henderson Hall). However, additional vibration-sensitive uses could be developed in this area in the future.

Assumed development in West Campus sector under Alternative 2 is slightly less than under Alternative 1. However, to accommodate new development in the West Campus sector without the proposed allowable building height increases, three additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2, the potential for vibration impacts associated with demolition and site preparation would be somewhat greater than under Alternative 1.

South Campus

Hazardous Materials **–** Similar to under Alternative 1, one of the focus areas of development on campus under Alternative 2 would be in the South Campus sector (1.35 million gsf of assumed development), which includes the highest concentration of research and medical uses on campus, and is anticipated to result in an increase in hazardous materials associated with these uses. Development under Alternative 2 in the South Campus sector would result in a high potential for impacts associated with this increase in hazardous materials. However, risks to human health would not be anticipated to increase significantly with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **–** Similar to under Alternative 1, under Alternative 2, potential noise impacts would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the South Campus sector.

Given that assumed building development in South Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of noise and associated potential impacts in the South Campus sector as described for Alternative 1.

Vibration **–** Similar to under Alternative 1, potential vibration impacts under Alternative 2 would primarily be associated with construction of new development in the South Campus sector. These activities could impact the 12 vibration-sensitive buildings identified in Affected Environment section above, as well as other vibration sensitive buildings constructed in this area in the future.

Given that assumed building development in South Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of vibration and associated potential impacts in the South Campus sector as described for Alternative 1.

Central Campus

Hazardous Materials **–** As under Alternative 1, areas within the Central Campus sector would have a low potential for hazardous materials impacts under Alternative 2 because the typical uses within this sector (e.g., instructional, support, administration and housing) generally do not use or generate substantial amounts of hazardous materials or waste. Isolated research and utility uses in Central Campus do generate hazardous material and waste, and new uses in Central Campus could generate hazardous materials. As under Alternative 1, risks to human health would not be anticipated to increase substantially with development, as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies/standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **–** Similar to under Alternative 1, under Alternative 2, potential noise impacts would be primarily associated with construction of new development, operation of building systems and increased traffic levels in the Central Campus sector.

Given that assumed building development in Central Campus sector is the same as under Alternative 1, Alternative 2 would generate similar amounts of noise and associated potential impacts in the Central Campus sector as described for Alternative 1.

Vibration **–** Similar to under Alternative 1, under Alternative 2, potential vibration impacts would be primarily associated with construction of new development in the Central Campus sector. These activities could impact the 15 vibration-sensitive buildings identified in Affected Environment above, as well as other vibration sensitive buildings constructed in this area in the future.

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of vibration and associated potential impacts in the Central Campus sector as described for Alternative 1.

East Campus

Hazardous Materials **–** As under Alternative 1, areas within the East Campus sector would have a low potential for hazardous materials impacts under Alternative 2 because the typical uses within this sector (e.g., athletic facilities/recreational uses, surface parking and open space/natural areas) generally do not use or generate substantial amounts of hazardous materials or waste. The University of Washington EH&S Department identifies and tests hazardous materials that are found on the campus and ensures that they disposed of in the proper manner. As under Alternative 1, any new uses in the East Campus sector would manage hazardous materials in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **-** Similar to under Alternative 1, under Alternative 2, potential noise impacts would be primarily associated with construction of new development, operation of building systems and increased traffic levels in the East Campus sector.

Given that more building development is assumed in East Campus under Alternative 2 compared to under Alternative 1 (1.35 million gsf compared to 0.75 million gsf under Alternative 1), Alternative 2 would generate more noise and associated potential impacts in this sector.

Vibration **-** Similar to under Alternative 1, under Alternative 2, potential vibration impacts would be primarily associated with construction of new development in the East Campus sector. These activities could impact vibration-sensitive uses. However, no vibration-sensitive uses have been identified in the East Campus sector at this time. Additional

vibration-sensitive uses could be developed in this area in the future, which could be impacted by Alternative 2 development.

Given that more building development is assumed in East Campus under Alternative 2 compared to under Alternative 1, Alternative 2 would generate more vibration and associated potential impacts in this sector.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential environmental health-related impacts on land uses in the Primary and Secondary Impact Zones would largely be due to noise and vibration from construction activities; during operation, potential impacts would largely be due to the use of hazardous materials and noise from traffic.

With the focus of development in the West, South, and East Campus sectors (85 percent of development under Alternative 2), more development and associated potential for environmental health-related impacts would occur in proximity to residential, commercial, and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to East Campus).

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for environmental health-related impacts adjacent to land uses in this portion of the Primary Impact Zone.

Compliance with existing University regulations and codes, and those of local, state and federal agencies, would minimize the potential for environmental health-related impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, construction and operational activities associated with Alternative 2 development would not be anticipated to result in environmental health-related impacts in the Secondary Impact Zone.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

Hazardous Materials

Similar to Alternative 1, to the extent that new development would include research and/or medical facilities, an increase in the use of research chemicals, hazardous materials and hazardous waste would occur as part of the development of Alternative 3. Under Alternative 3, it is assumed that the focus of campus development would occur in the West and South Campus sectors, with slightly more development in the South Campus sector than under Alternative 1. The South Campus sector has the highest concentration of research and medical use facilities on campus. As a result, it is anticipated that development under Alternative 3 would result in a greater increase in hazardous materials, similar to Alternative 1. Any new sources of hazardous materials on the campus would continue to be managed in accordance with existing policies and standards established by the University's EH&S Department, as well as applicable local, state, and federal standards and regulations. No significant risks to human health or hazardous materials impacts would be anticipated.

Noise

Under Alternative 3, potential noise impacts would be primarily associated with construction of new development under the *2018 Seattle Campus Master Plan* and operational noise associated with building systems and increased traffic levels. It is anticipated that these noise impacts would be similar to those described for Alternative 1, and would also occur in the West and South Campus sectors due to the focus of development in these areas.

Due to the nature of instructional, research and student housing uses on campus, as well as the proximity of adjacent off-site uses along the edges of the campus (residential and commercial uses), it is anticipated that development under Alternative 3 would have a potential for noise impacts associated with construction and operation of new uses as part of the *2018 Seattle Campus Master Plan*, similar to that anticipated under Alternative 1.

Vibration

Construction activities associated with development of the *2018 Seattle Campus Master Plan* under Alternative 3 would generate vibration on potential development sites that could affect adjacent areas. Similar to Alternative 1, construction activities that are located in proximity to sensitive research uses (including, but not limited to those buildings identified under Affected Environment above) would generate vibration that could impact sensitive research uses and/or equipment. As described under Alternative 1, potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites. Potential future development in other areas in the West, South, Central and East Campus sectors would have a low potential to result in vibration impacts due to their distance from existing sensitive research uses.

Below is a discussion of potential environmental health-related impacts under Alternative 3 by campus sector.

West Campus

Hazardous Materials **–** As under Alternative 1, areas within the West Campus would have a low potential for hazardous materials impacts under Alternative 3 because the typical uses within this sector (e.g., instructional, administration and housing) generally do not use or generate great amounts of hazardous materials or waste. As under Alternative 1, to the extent that new uses under Alternative 3 include the use or production of hazardous materials, the University of Washington would manage hazardous materials in accordance with existing University policies and standards, as well as local, state and federal regulations.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 3 would primarily be associated with construction of new development, operation of building systems and increased traffic levels in the West Campus sector.

Given that assumed building development in the West Campus under Alternative 3 is greater than under Alternative 1 (3.2 million gsf of assumed development compared to 3.0 million gsf under Alternative 1), Alternative 3 would generate more noise and associated potential impacts in the West Campus sector than Alternative 1.

Vibration - Similar to under Alternative 1, potential vibration impacts under Alternative 3 would be primarily associated with construction of new development in the West Campus sector. Only one vibration sensitive building has been identified in the West Campus sector at this time (Henderson Hall). Additional vibration-sensitive uses could be developed in this area in the future, which could be impacted by Alternative 3 development.

Given that assumed building development in West Campus is more than under Alternative 1, Alternative 3 would generate somewhat more vibration and associated potential impacts in the West Campus than Alternative 1.

South Campus

Hazardous Materials **–** One of the focuses of development on campus under Alternative 3 would be in the South Campus sector, which is comprised of the highest concentration of research and medical uses, and would result in an increase in hazardous materials associated with these uses. Development under Alternative 3 in the South Campus sector would result in a high potential for impacts associated with this increase in hazardous materials, slightly more than under Alternative 1 because of the level of assumed development is slightly greater (1.65 million gsf compared to 1.35 million gsf under Alternative 1). However, risks to human health would not be anticipated to increase significantly with development as the University of Washington would continue to manage

hazardous materials on campus in accordance with existing University policies/standards, as well as applicable local, state and federal standards/regulations/laws.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 3 would primarily be associated with construction of new development, operation of building systems and increased traffic levels in the South Campus sector.

Given that assumed building development in the South Campus is greater than under Alternative 1, Alternative 3 would generate somewhat more noise and associated potential impacts in the South Campus sector than described for Alternative 1.

Vibration **–** Similar to under Alternative 1, potential vibration impacts under Alternative 3 would primarily be associated with construction of new development in the South Campus sector. These activities could impact the 12 vibration-sensitive buildings identified in Affected Environment above, as well as other vibration sensitive buildings in the South Campus sector in the future.

Given that assumed building development in the South Campus is slightly greater than under Alternative 1, Alternative 3 would generate slightly more vibration and associated potential impacts in the South Campus sector than described for Alternative 1. As under Alternative 1, potential future development under Alternative 3 that occurs near sensitive uses would require project-specific coordination with adjacent vibration-sensitive users to determine potential vibration-related issues and measures to limit vibration associated with construction.

Central Campus

Hazardous Materials **–** As under Alternative 1, areas within the Central Campus sector would have a low potential for hazardous materials impacts under Alternative 3, because the typical uses within this sector (e.g., instructional, support, administration and housing) generally do not use or generate substantial amounts of hazardous materials or waste. Isolated research and utility uses in Central Campus do generate hazardous material and waste, and new uses in Central Campus could generate hazardous materials. As under Alternative 1, risks to human health under Alternative 3 would not be anticipated to increase substantially with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 3 would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the Central Campus sector.

Given that assumed building development in the Central Campus is the same as under Alternative 1, Alternative 3 would generate similar amounts of noise and associated potential impacts in the Central Campus sector as described for Alternative 1.

Vibration **–** Similar to under Alternative 1, potential vibration impacts under Alternative 3 would primarily be associated with construction of new development in the Central Campus sector. These activities could impact the 15 vibration-sensitive buildings identified in Affected Environment section above, as well as other vibration sensitive buildings constructed in the Central Campus sector in the future.

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 3 would generate similar amounts of vibration and associated potential impacts in the Central Campus sector as described for Alternative 1.

East Campus

Hazardous Materials **–** As under Alternative 1, areas within the East Campus sector would have a low potential for hazardous materials impacts under Alternative 3 because the typical uses within this sector (e.g., athletic facilities/recreational uses, surface parking and open space/natural areas) generally do not use or generate great amounts of hazardous materials/waste.

Noise **-** Similar to under Alternative 1, under Alternative 3, potential noise impacts would primarily be associated with construction of new development, operation of building systems and increased traffic levels in the East Campus sector.

Given that assumed building development in East Campus is considerably less than under Alternative 1 (0.25 million gsf compared to 0.75 million gsf under Alternative 1), Alternative 3 would generate much less noise and associated potential impacts in the East Campus sector than Alternative 1.

Vibration **-** Similar to under Alternative 1, under Alternative 3, potential vibration impacts would primarily be associated with construction of new development in the East Campus sector. These activities could impact vibration-sensitive buildings. However, no vibration-sensitive buildings have been identified in the East Campus sector at this time. Additional vibration-sensitive uses could be developed in this area in the future.

Given that assumed building development in East Campus is considerably less than under Alternative 1, Alternative 3 would generate much less vibration and associated potential impacts in the East Campus sector than Alternative 1.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential

environmental health-related impacts on land uses in the Primary and Secondary Impact Zones would largely be due to noise and vibration from construction activities; during operation, potential impacts would largely be due to the use of hazardous materials and noise from traffic.

With the focus of development in the West and South Campus sectors (81 percent of development) under Alternative 3, more development and potential environmental-health related impacts would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to the these sectors, including the University District (adjacent West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3 than under Alternative 1. As a result, there would be less environmental health-related impact on land uses in the Primary Impact Zone adjacent to these sectors.

Compliance with existing University regulations and codes, and those of local, state and federal agencies, would minimize the potential for environmental health-related impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, construction and operational activities associated with Alternative 3 development would not be anticipated to result in environmental health-related impacts in the Secondary Impact Zone.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors when compared to Alternative 1.

Hazardous Materials

Similar to Alternative 1, to the extent that new development would include research and/or medical facilities, an increase in the use of research chemicals, hazardous materials and hazardous waste would occur as part of the development assumed under Alternative 4. Under Alternative 4, it is assumed that the focus of campus development would occur in the West, Central, and East Campus sectors, with more development in the Central Campus and East Campus sectors than under Alternative 1. The South Campus sector has the highest concentration of research and medical use facilities on campus. As a result, it is anticipated that development under Alternative 4 would result in less increase in hazardous materials than Alternative 1, given the higher level of development assumed for that sector under

that Alternative. Any new sources of hazardous materials on the campus would continue to be managed in accordance with existing policies and standards established by the University's EH&S Department, as well as applicable local, state, and federal standards and regulations. No significant risks to human health or hazardous materials impacts would be anticipated.

Noise

Under Alternative 4, potential noise impacts would be primarily associated with construction of new development under the *2018 Seattle Campus Master Plan* and operational noise associated with building systems and increased traffic levels. It is anticipated that these noise impacts would be similar to those described for Alternative 1, but would primarily occur in the West, Central, and East Campus sectors due to the focus of development in these areas.

Due to the nature of instructional, research and student housing uses on campus, as well as the proximity of adjacent off-site uses along the edges of the campus (residential and commercial uses), it is anticipated that development under Alternative 4 would have a potential for noise impacts associated with construction and operation of new uses as part of the *2018 Seattle Campus Master Plan*, similar to that anticipated under Alternative 1.

Vibration

Construction activities associated with development of the *2018 Seattle Campus Master Plan* under Alternative 4 would generate vibration on potential development sites that could affect adjacent areas. Similar to Alternative 1, construction activities that are located in proximity to sensitive research uses (including, but not limited to those buildings identified under Affected Environment section above) would generate vibration that could impact sensitive research uses and/or equipment. As described under Alternative 1, potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites. Alternative 4 would include considerably less development in the South Campus sector where a number of vibration-sensitive uses are located than under Alternative 1. As a result, potential vibration impacts on these uses in South Campus would be much less as well. Potential future development in other areas in the West, South, Central and East Campus sectors would have a low potential to result in vibration impacts due to their distance from existing sensitive research uses.

Below is a discussion of potential environmental health-related impacts under Alternative 4 by campus sector.

West Campus

Hazardous Materials **–** As under Alternative 1, areas within the West Campus sector would have a low potential for hazardous materials impacts under Alternative 4 because the typical uses within this sector (e.g., instructional, administration and housing) generally do not use or generate great amounts of hazardous materials or waste. Any new sources of hazardous materials on the campus would continue to be managed in accordance with existing policies and standards established by the University's EH&S Department, as well as applicable local, state, and federal standards and regulations. No significant risks to human health or hazardous materials impacts would be anticipated.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 4 would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the West Campus sector.

Given that assumed development in West Campus is the same as under Alternative 1, Alternative 4 would generate similar levels of noise and associated potential impacts in the West Campus sector as described for Alternative 1.

Vibration - Similar to under Alternative 1, potential vibration impacts under Alternative 4, would primarily be associated with construction of new development in the West Campus sector. Only one vibration-sensitive building has been identified in the West Campus sector at this time (Henderson Hall). Additional vibration-sensitive uses could be developed in this area in the future, which could be impacted by Alternative 4 development.

Given that assumed development in West Campus is the same as under Alternative 1, Alternative 4 would generate similar levels of vibration and associated potential impacts in the West Campus sector as Alternative 1.

South Campus

Hazardous Materials **–** The South Campus sector is comprised of the highest concentration of research and medical uses. Development under Alternative 4 would result in an increase in hazardous materials associated with these uses; however, considerably less development is assumed in this area than under Alternative 1 (0.2 million gsf compared to 1.35 million gsf under Alternative 1). Therefore, there is much less potential for impacts from hazardous materials. Risks to human health would not be anticipated to increase significantly with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 4 would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the South Campus sector.

Given that assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much less noise and associated potential impacts in the South Campus sector than described for Alternative 1.

Vibration **–** Similar to under Alternative 1, potential vibration impacts under Alternative 4 would primarily be associated with construction of new development in the South Campus sector. These activities could impact the 12 vibration-sensitive buildings identified in Affected Environment section above, as well as other vibration sensitive buildings developed in the South Campus sector in the future.

Given that assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much less vibration and associated potential impacts in the South Campus sector than Alternative 1.

Central Campus

Hazardous Materials **–** As under Alternative 1, areas within the Central Campus sector would have a low potential for hazardous materials impacts under Alternative 4, because the typical uses within this sector (e.g., instructional, support, administration and housing) generally do not use or generate substantial amounts of hazardous materials or waste. Isolated research and utility uses in Central Campus do generate hazardous material and waste, and new uses in Central Campus could generate hazardous materials. As under Alternative 1, risks to human health would not be anticipated under Alternative 4 to increase substantially with development as the University of Washington would continue to manage hazardous materials on campus in accordance with existing University policies and standards, as well as applicable local, state and federal standards, regulations, and laws.

Noise **–** Similar to under Alternative 1, potential noise impacts under Alternative 4 would primarily be associated with construction of new development, operation of building systems, and increased traffic levels in the Central Campus sector.

Given that assumed building development in Central Campus is slightly more than under Alternative 1 (1.1 million gsf compared to 0.9 million gsf under Alternative 1), Alternative 4 would generate slightly greater noise and associated potential impacts in the Central Campus sector than described for Alternative 1.

Vibration **–** Similar to under Alternative 1, potential vibration impacts under Alternative 4 would primarily be associated with construction of new development in the Central Campus sector. These activities could impact the 15 vibration-sensitive buildings identified in Affected Environment above, as well as other vibration-sensitive buildings constructed in the Central Campus sector in the future.

Given that assumed building development in the Central Campus sector is slightly more than under Alternative 1, Alternative 4 would generate slightly greater vibration and associated potential impacts in this sector than Alternative 1.

East Campus

Hazardous Materials **–** As under Alternative 1, development within the East Campus sector under Alternative 4 would have a low potential for hazardous materials impacts because the typical uses within this sector (e.g., athletic facilities/recreational uses, surface parking and open space/natural areas) generally do not use or generate great amounts of hazardous materials/waste.

Noise **-** Similar to under Alternative 1, potential noise impacts under Alternative 4 would primarily be associated with construction of new development, operation of building systems and increased traffic levels in the East Campus sector.

Given that considerably greater building development is assumed in East Campus than under Alternative 1 (1.75 million gsf as compared to 0.75 million gsf under Alternative 1), Alternative 4 would generate more noise and associated potential impacts in this sector than described for Alternative 1.

Vibration **-** Similar to under Alternative 1, potential vibration impacts under Alternative 4 would primarily be associated with construction of new development in the East Campus sector. These activities could impact vibration-sensitive buildings. However, no vibration-sensitive buildings have been identified in the East Campus sector at this time. Additional vibration-sensitive uses could be developed in this area in the future.

Given that considerably greater building development is assumed in East Campus than under Alternative 1, Alternative 4 would generate much more vibration and associated potential impacts in the East Campus sector than Alternative 1.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential environmental health-related impacts on land uses in the Primary and Secondary Impact Zones would largely be due to noise and vibration from construction activities; during operation, potential impacts would largely be due to the use of hazardous materials and noise from traffic.

With the focus of development in the West, Central, and East Campus sectors (97 percent of development under Alternative 4), development and associated potential for environmental health-related impacts would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West and Central Campus), a portion

of the residential neighborhood to the north of NE 45th Street (adjacent to Central Campus), and University Village and the Laurelhurst neighborhood (adjacent to East Campus).

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential environmental health-related impacts on land uses in the Primary Impact Zone adjacent to this sector.

Compliance with existing University regulations and codes, and those of local, state and federal agencies, would minimize the potential for environmental health-related impacts on land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, construction and operational activities associated with Alternative 4 development would not be anticipated to result in environmental health-related impacts in the Secondary Impact Zone.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of development and associated increases in hazardous materials, noise and vibration would occur as under Alternatives 1 - 4; however, none of the assumed street or aerial vacations would occur. As a result, it is anticipated that the environmental health impacts under Alternative 5 would be similar to those analyzed under Alternatives 1 - 4.

Potential Indirect/Cumulative Impacts

To the extent that construction activities associated with development of the *2018 Seattle Campus Master Plan* under Alternatives 1 – 5 would occur in the vicinity of other construction projects, it could result in a temporary cumulative increase in noise and vibration in the surrounding site area. Noise associated with increased traffic volumes from development on the campus would also result in a cumulative increase in traffic noise when combined with existing surrounding traffic. Potential changes in zoning and development capacity in the University District could result in increased development and construction in the vicinity of the University of Washington campus.

Although the level, timing, and specific location of future development in the University District is not defined, it is possible that some level of concurrent and proximate construction would occur on the University of Washington campus and in the University District, especially given the focus of development in the West Campus sector. This could result in the potential for cumulative noise conditions associated with concurrent construction activities.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in **Chapter 2** of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

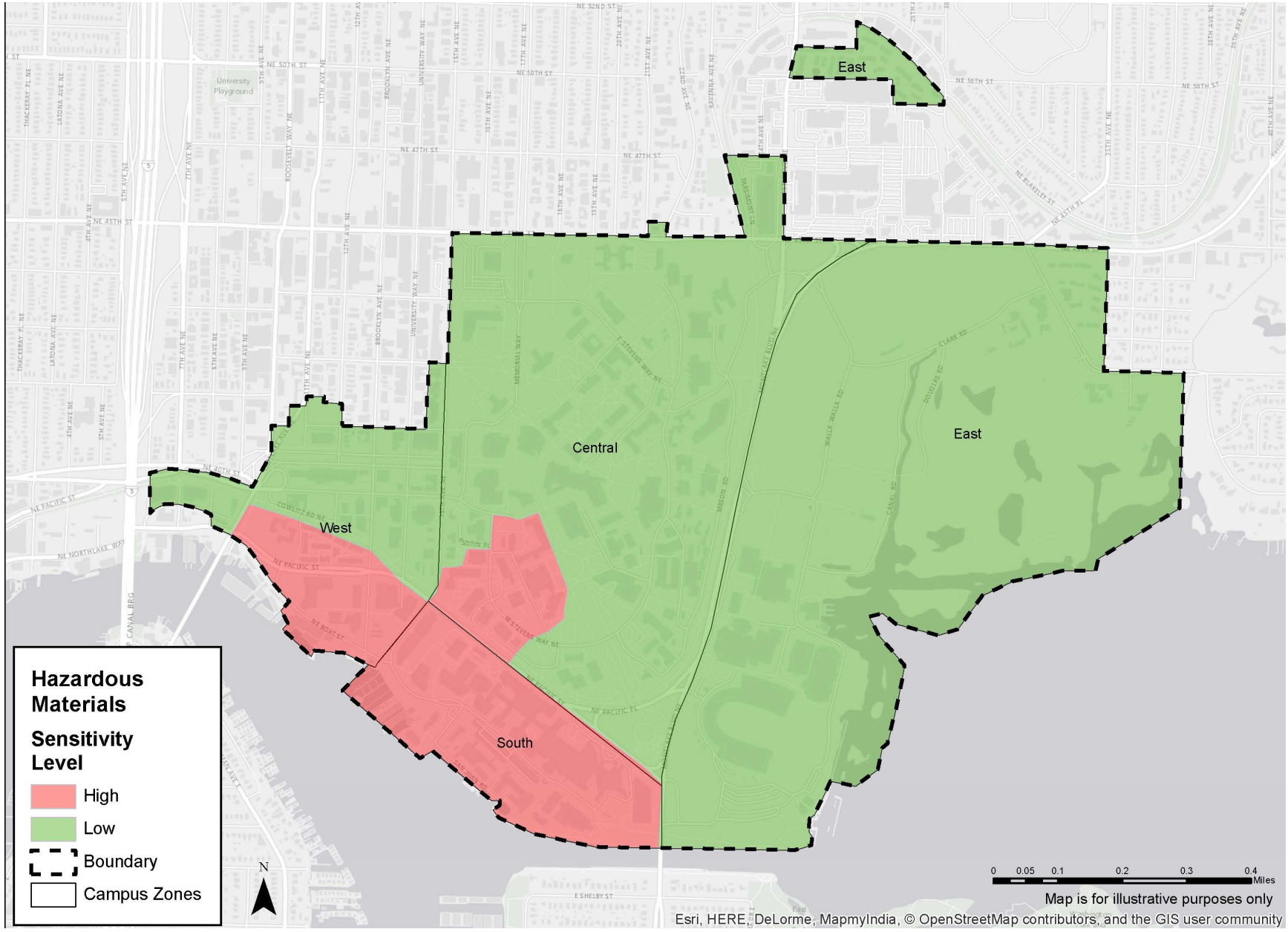
The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the 2018 Master Plan Update) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.5-1**, **3.5-2** and **3.5-3**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined.

For example, areas of campus that contain existing vibration-sensitive uses are identified as having a "High" potential to generate vibration impacts, while areas of campus located at a distance from those vibration-sensitive uses are identified as having a "Low" potential to result in vibration impacts. For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.5.3 Mitigation Measures

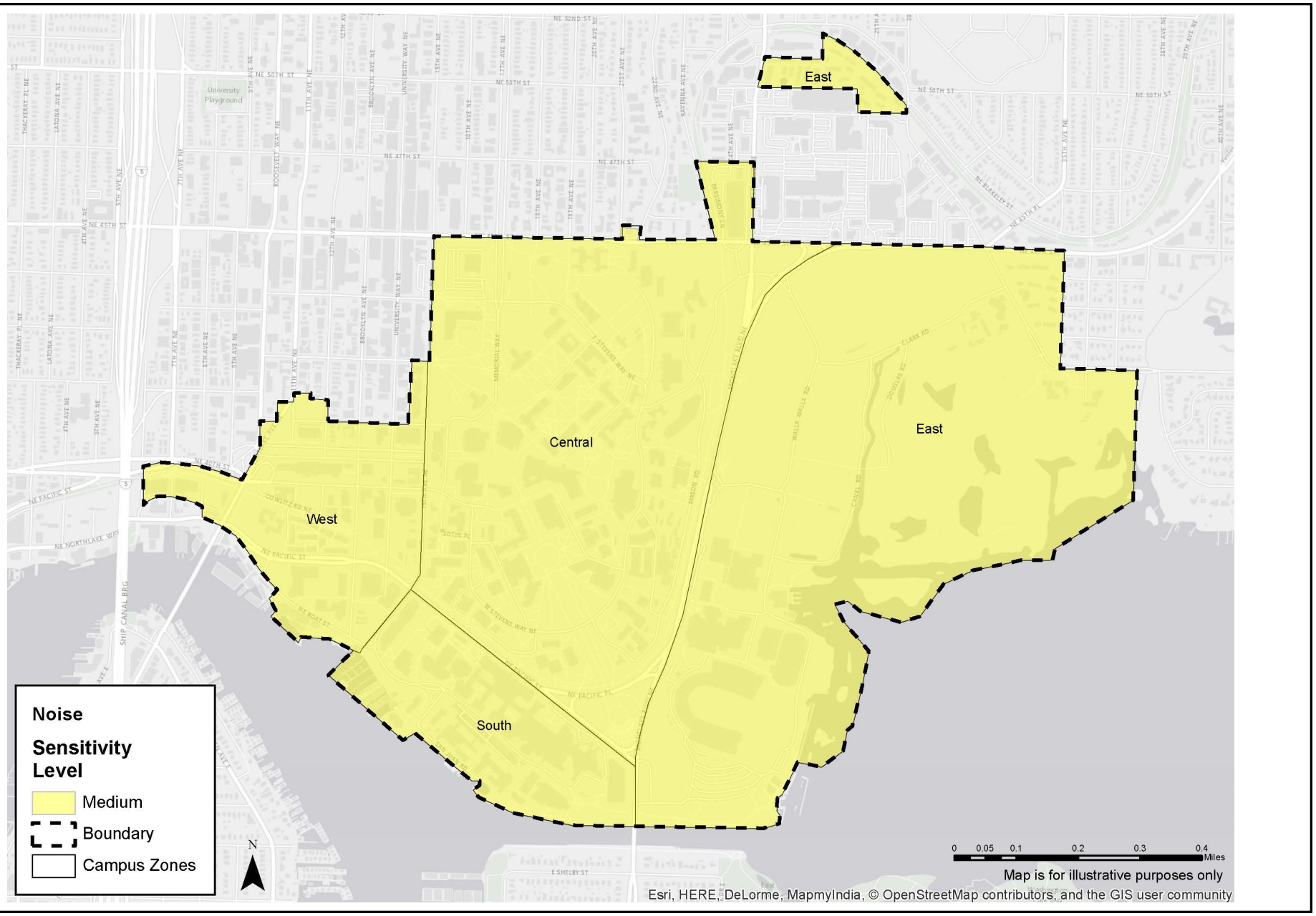
The following measures would be available for development under the *2018 Seattle Campus Master Plan*.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

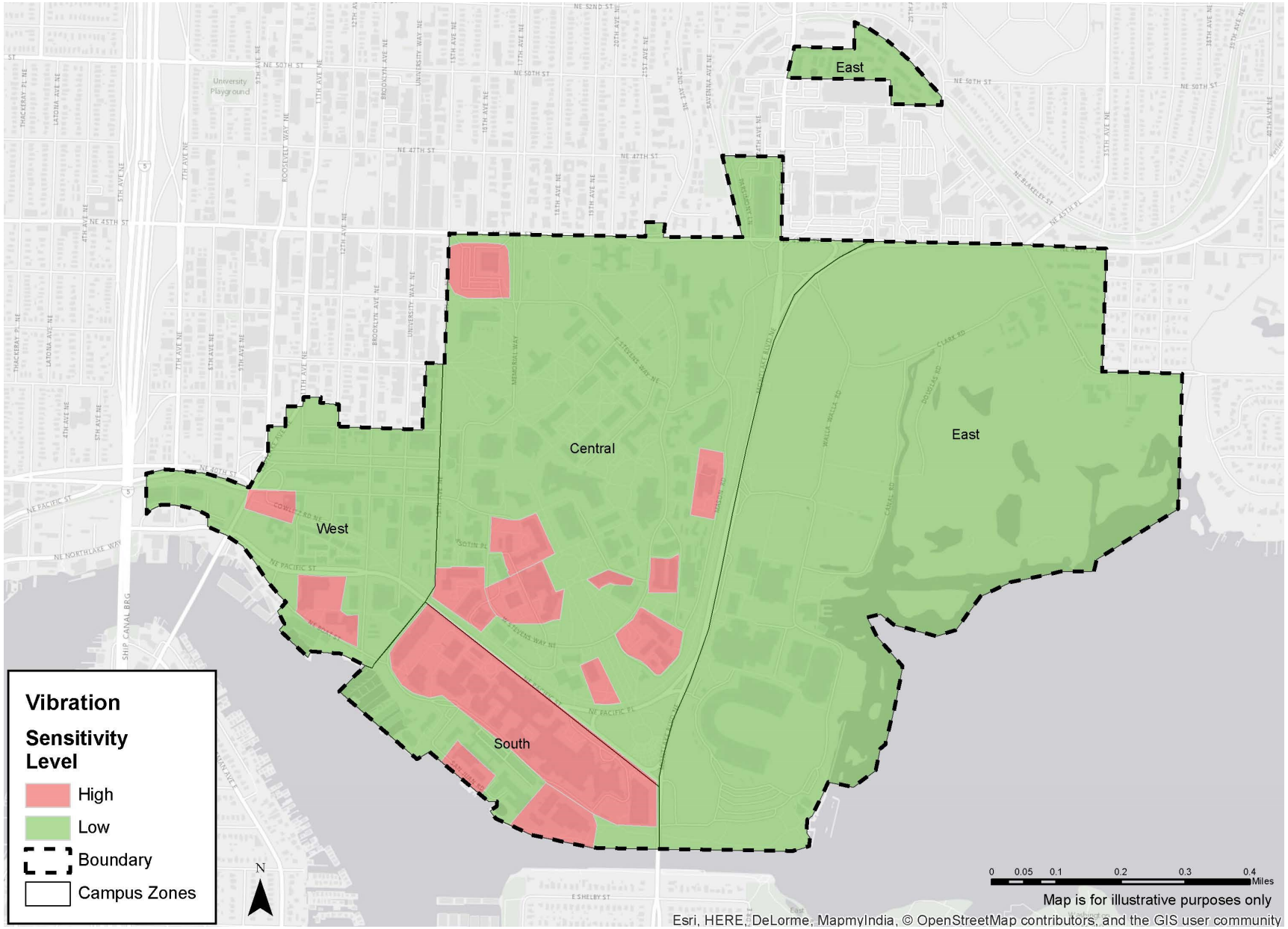
Figure 3.5-1
Hazardous Materials Sensitivity Map



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.5-2
Noise Sensitivity Map



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.5-3
Vibration Sensitivity Map

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Hazardous Materials

- Potential future development projects under the *2018 Seattle Campus Master Plan* should verify the presence, use and/or potential generation of hazardous materials on the project site prior to development.

Noise

- Construction activities would comply with the City of Seattle Noise Ordinance (SMC 25.08.425) which allows for temporary increases in the maximum permissible sound levels based on equipment type.

- The University of Washington also has additional conditions/considerations that project-specific campus contractors meet the following noise control criteria:

    - The sound pressure level of construction noise inside adjacent buildings and/or rooms cannot exceed 60 dBA (with windows closed) between the hours of 8 AM and 5 PM on week days. Barriers can be erected between construction activities and such interior areas, or equipment noise attenuators can be provided.
    - The use of electric equipment and machinery is preferred. If noise levels on any equipment or device cannot reasonably be reduced to criteria levels, either that equipment or device will not be allowed on the job or use times will have to be scheduled subject to approval.
    - The sound pressure level of each piece of equipment cannot be greater than 85 dBA at a distance of 50 feet. Rubber-tired equipment is to be used whenever possible instead of equipment with metal tracks. Mufflers for stationary engines are to be used in the hospital areas. Construction traffic should be routed through nearest campus exit.
    - Air compressors are to be equipped with silencing packages
    - Jack hammers and roto hammers may be used where no other alternative is available; core drilling and saw cutting equipment is preferred.
    - Specific scheduling of construction-related noise activities is required at the University of Washington Medical Center.

Vibration

- Potential future development projects under the *2018 Seattle Campus Master Plan* should verify the existence of vibration-sensitive uses located in proximity to the development site and if necessary, work to provide mitigation in the project design.

Additional Measures Applicable to Medium and High Potential Campus Areas

Hazardous Materials

- Hazardous materials generated and used on campus would continue to be managed in accordance with existing policies/standards established by the University's Environmental Health and Safety Department, as well as applicable local, state and federal standards/regulations.

- Existing facilities that handle hazardous materials (i.e. Magnuson Health Sciences Center, UW Medical Center, etc.) could be improved under the *2018 Seattle Campus Master Plan* to meet future needs and standards.

Noise

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located in areas that are proximate to noise-sensitive uses would require project-specific coordination with adjacent noise-sensitive users to determine potential noise-related issues associated with development on those sites and could require additional noise analysis and mitigation measures (if necessary).

Vibration

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located in areas that are proximate to vibration-sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites and could require additional mitigation measures (if necessary).

3.5.4 Significant Unavoidable Adverse Impacts

During construction activities, some temporary noise and vibration impacts would occur. It is also anticipated that an increase in hazardous materials and waste would occur on campus with the potential development of additional research and medical use facilities. However, with the implementation of the mitigation measures identified above, no significant unavoidable adverse environmental health impacts are anticipated.

3.6 LAND AND SHORELINE USE

This section of the Draft EIS describes the existing land use conditions on the University of Washington campus and vicinity, and evaluates the potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.6.1 Affected Environment

Existing Campus

University of Washington Campus

The University of Washington Seattle campus extends slightly over one mile in a north-south direction and slightly less than two miles in an east-west direction, and encompasses approximately 639 acres within the campus boundary. Of the 694 acres of campus area, approximately 588 acres are owned by the University of Washington, 47 acres are owned by other public entities (including land owned by the City of Seattle as street right-of-way) and four acres are in private ownership (see **Figure 2-2** for map of the existing campus).

The University of Washington Seattle campus reflects a variety of uses, including buildings, roads, paved and unpaved walkways, parking areas, landscaping, natural open space, and bulkhead and natural shoreline. Within the campus boundaries, the University of Washington has approximately 307 permanent and temporary buildings[1] that total an estimated 17 million gross square feet (gsf). These buildings vary in size from approximately 300 gsf to 500,000 gsf. They also vary in age from 121 years (Denny Hall and the Observatory) to the present. The buildings on campus generally contain instructional, research, medical, manufacturing, athletic, housing and/or office use.

The University of Washington currently (2015-16 academic year) maintains 19 student housing facilities on the Seattle campus, including 11 residence halls and 8 student apartment buildings. The majority of the housing facilities are located in the West Campus or Central Campus sectors. In total, the University has a capacity of approximately 8,233 single student beds and 697 family apartments within the existing student housing facilities on campus.

[1] The University of Washington also operates approximately 10 buildings outside of the campus boundaries.

For descriptive and planning purposes, the campus has been divided into four (4) campus areas which are described further below.

West Campus

The West Campus sector is generally bounded by NE 41st Street to the north, 15th Avenue NE to the east, NE Pacific Street to the south, and the University Bridge and Roosevelt Way NE to the west. This sector of campus has the strongest connection with the adjacent University District neighborhood and, as such, existing campus uses reflect that relationship with the adjacent area.

Poplar Hall

Existing campus uses primarily include instructional and administrative uses, as well as several recently constructed student housing buildings (Elm Hall, Poplar Hall, Alder Hall, Lander Hall, etc.). Instructional and administrative uses are generally located south of NE Pacific Street and along 15th Avenue NE and University Way NE. Student housing uses are generally located west of University Way NE and north of NE Pacific Street.

South Campus

The South Campus sector is bounded by NE Pacific Street to the north, Montlake Boulevard to the east, Portage Bay to the south, and 15th Avenue NE to the west. This sector is generally characterized by existing development associated with the University of Washington Medical Center and the Magnuson Health Sciences Center; instructional uses, including William H. Foege Hall, Hitchcock Hall and the Ocean Sciences Building are also located near 15th Avenue NE. To the south of Columbia Road, the sector also includes administrative and research uses, as well as shoreline open space and piers associated with Oceanography and Marine Sciences uses.

Central Campus

The Central Campus sector represents the original core and surrounding central perimeter of the University of Washington campus, and is generally bounded by NE 45th Street to the north, Montlake Boulevard to the east, NE Pacific Street to the south, and 15th Avenue NE to the west. The sector is comprised of numerous campus core buildings, including instructional/research (i.e., Denny Hall, Architecture Hall, Bagley Hall, Parrington Hall, etc.), administrative (i.e., Gerberding Hall, the UW Club, student housing (i.e., McMahon Hall, Hansee Hall, etc.),


Denny Hall

and student support uses (i.e., Suzzallo Library, Odegaard Library, the HUB, etc.). It is also characterized by several important open spaces, including the Liberal Arts Quadrangle, Denny Yard, Memorial Way, Rainier Vista, the HUB Yard, Parrington Lawn, and the Central Plaza (Red Square).

East Campus

The East Campus sector is bounded by NE 45th Street to the north, Union Bay to the east, the Lake Washington Ship Canal to the south, and Montlake Boulevard to the west. The existing character of the East Campus is primarily defined by athletic facilities/recreational uses, surface parking and open space/natural areas. Development is primarily located in the south portion of the sector, along Montlake Boulevard, and includes Husky Stadium, Alaska Airlines Arena at Hec Edmundson Pavilion, the Intermural Activities Building, the golf driving range, and several sports fields; the existing E1 parking area also comprises a large portion of the sector along Montlake Boulevard. Instructional/research uses are located along the eastern boundary of the sector, as well as student housing (Laurel Village) and the Union Bay Natural Area.

Surrounding Area

The University of Washington campus is situated in a City-designated Urban Center (University District); urban centers can be described as unique areas of concentrated employment and housing with direct access to high-capacity transit, and a wide range of supportive uses. The area surrounding the campus contains a variety of single-family and multifamily residential, commercial, educational, service and semi-industrial uses. The University of Washington is a dominant land use in the area (see **Figure 3.6-1** for map of existing surrounding land uses).

The land use pattern of the area surrounding the University of Washington campus is reflective of both natural and built features. The primary natural features in the area are Union Bay, Portage Bay and the Lake Washington Ship Canal that form the southern and eastern boundaries of the campus. These waterways also separate the University of Washington campus, the University District and the Laurelhurst neighborhood from the neighborhoods to the south (Mountlake, Broadmoor and Capitol Hill neighborhoods). The neighborhoods to the north of the Ship Canal and Portage Bay (University of Washington, University District, and Laurelhurst) are connected to the neighborhoods to the south by the Montlake Bridge and University Bridge.

Source: Sasaki Associates, Inc. and EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.6-1
Existing Surrounding Land Use Map

Prominent built features that influence the land use character of the area consist primarily of transportation routes, including Interstate 5 (I-5) and State Route 520. I-5, the major north/south vehicular travel corridor west of Lake Washington, effectively separates the communities in the vicinity of the University of Washington on the east side of I-5 from the communities of Wallingford, Fremont and Green Lake on the west side of I-5. State Route 520, a major east/west vehicle travel corridor across Lake Washington, provides an additional separation between the areas immediately north and south of the Ship Canal and Portage

Bay. In addition, the Sound Transit U District Light Rail station on Brooklyn Avenue NE between NE 43rd Avenue and NE 45th Avenue is currently under construction and is anticipated to open in 2021.

West Campus

University Way NE

The area adjacent to the West Campus sector is generally characterized by retail/commercial uses within the University District neighborhood, including retail shops/restaurants, offices, churches, multifamily residences, and hotels. Due to its proximity to the University of Washington campus and the amount of street-level retail, the area maintains an active streetscape environment, particularly during the daytime hours. Buildings in the area generally range from one to four stories in height, with several high-rise structures such as the 22-story UW Tower, the 14-story Hotel Deca, and several multifamily residential structures ranging from 7 to 11 stories. Further to the west is I-5.

South Campus


Montlake Bridge

Immediately to the south of the South Campus sector is the Montlake Bridge, Lake Washington Ship Canal and Portage Bay. Further to the south are Interstate 520 and the Montlake, Broadmoor and Madison Park neighborhoods, which are primarily comprised of low density single family residences. Several parks are located in this area, including the Washington Park Arboretum, Montlake Park and Playground, Interlaken Park, Louisa Boren Park, and Volunteer Park; the Broadmoor Golf Club is also located in the area. Industrial uses are also located to the southwest of the campus, along NE Northlake Way.

Central Campus

The area to the north of the Central Campus sector is primarily comprised of residential uses, including multifamily apartment buildings, fraternity/sorority houses and single family residences (many of which are rented to University of Washington students). Several churches are also located within the area, including the University Presbyterian Church, the University Congregational United Church of Christ, the University Christian Church, and the Prince of Peace Catholic Newman Center. Buildings in this area are generally two to four-stories in height.

East Campus

University Village

The area to the east of the East Campus sector includes Lake Washington/Union Bay and the Laurelhurst residential neighborhood. The Laurelhurst neighborhood generally consists of low density single family residences and park uses (Laurelhurst Park and Laurelhurst Community Center). Buildings in this area are generally two to three-stories in height. Commercial uses are also located near Sand Point Way NE, as well as Children's Hospital. To the north of the East Campus sector, the area is the generally characterized by commercial/retail uses in the University Village shopping center which includes retail/restaurant uses and structured parking; additional commercial uses (retail, hotels, offices, etc.) are also located surrounding the shopping center. Buildings are generally two to five-stories in height in this area.

Primary and Secondary Impact Zones

Primary and secondary impact zones were identified as part of the City-University Agreement and the Agreement indicates that these zones are to be utilized to assess and monitor direct, indirect and cumulative impacts of all University development.

The University of Washington campus is centrally located within the **Primary Impact Zone**. Other existing land uses within the Primary Impact Zone include retail/commercial uses, multifamily residential uses (generally associated with the University District area) and I-5 in the western portion of the Primary Impact Zone (adjacent to the West Campus sector and west of 15th Avenue NE). The northern portion (adjacent to the Central Campus and north of NE 45th Street) is generally comprised of residential uses (multifamily apartment buildings, fraternity/sorority houses and single family residences) and commercial uses (University Village area). The eastern portion (adjacent to the East Campus sector) consists of Lake Washington/Union Bay and the Laurelhurst neighborhood. The southern portion of

the Primary Impact Zone (south of the Montlake Cut) generally consists of the Montlake neighborhood and SR-520.

Existing land uses in the western portion of the **Secondary Impact Zone** (west of I-5) are generally comprised of single family/multifamily residential uses, with some retail/commercial and industrial uses adjacent to Lake Union. The northern portion (generally north of NE 55th Street) consists of single family/multifamily residential uses, retail/commercial uses and Ravenna Park. The eastern portion (generally east of 35th Avenue NE) is comprised of the Laurelhurst residential neighborhood, Children's Hospital, and retail/commercial uses along Sand Point Way NE. The southern portion of the Secondary Impact Zone (generally south of Portage Bay and SR-520) is comprised of single family/multifamily residential uses, Montlake Park, the Washington Park Arboretum and retail/commercial uses (primarily near Eastlake Avenue E).

Existing Land Use Designations

University Campus

The City of Seattle Comprehensive Plan was originally adopted in 1994 with the most recent update to the plan occurring in October 2015. The Comprehensive Plan identifies the University of Washington campus as a Major Institution and as part of the University Community Urban Center, which also includes the adjacent University District and Ravenna neighborhoods. It should be noted that the City of Seattle is also in the process of completing a major update to the Comprehensive Plan. The Mayor's Recommended Plan was released in May 2016 and City Council review of the Comprehensive Plan is anticipated by the end of 2016.

The University of Washington campus is located within the Major Institution Overlay (MIO) zoning area. As provided in City-University Agreement, and Seattle Municipal Code (SMC) 23.69.006 and SMC 23.12.120, development within the MIO is governed by the *CMP-Seattle 2003* until a new campus master plan is adopted. All University of Washington development occurring within MIO boundaries must follow the development standards identified in the *CMP-Seattle 2003* including: provisions addressing architectural and landscape review, building height, building setbacks, light and glare, signage, telecommunications, parking, open space, and environmental issues.

Surrounding Area

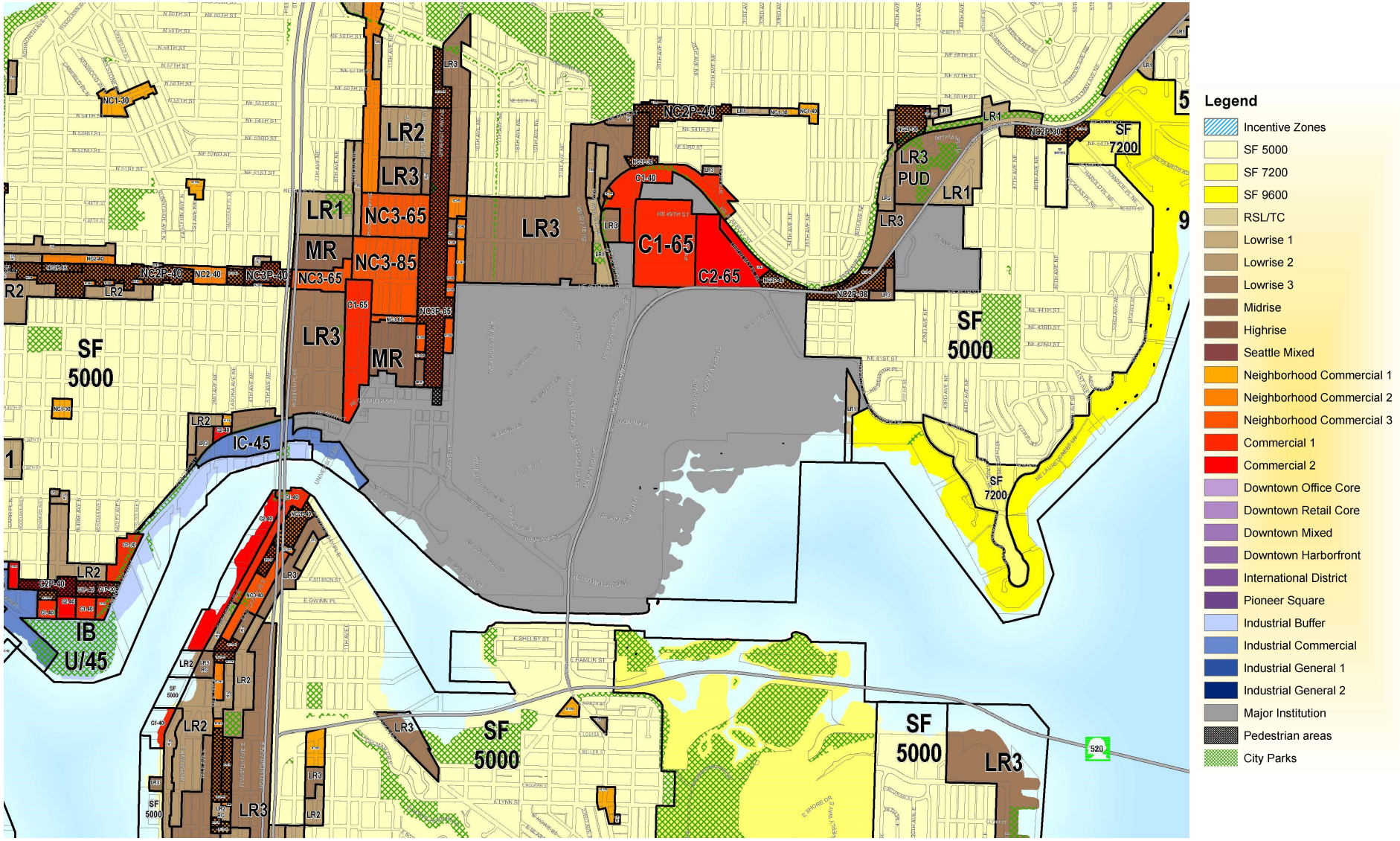
The University District area to the west of campus contains a mixture of commercial and residential zoning, including Neighborhood Commercial 3-85 (NC3 – 85-foot maximum height), Neighborhood Commercial 3-65 (NC3 – 65-foot maximum height), Commercial 1-65 (C1 – 65-foot maximum height), Residential Multifamily-Midrise (MR), and, Residential Multifamily-Lowrise 3 (LR3) (see **Figure 3.6-2** for a map of the existing zoning in the vicinity

of campus). It should be noted that the City of Seattle is currently evaluating changes to the Comprehensive Plan and zoning for the University District area as part of the *2015 University District Urban Design EIS* which would allow for increased building heights and building density, particularly within the areas adjacent to the University of Washington campus and the future light rail station. The *2015 University District Urban Design EIS* evaluates a range of increases in maximum building heights in the area from up to 125-160 feet (Alternative 1) to 240-320 feet (Alternative 2). The *University District EIS* indicates that "the study area is expected to experience new growth and development, but the overall mix of uses is not expected to significantly change from the existing mixed-use pattern." In September 2015, the City Council approved amendments to the Comprehensive Plan related to the University District to reflect community input provided throughout the process, update and consolidate goals and policies, and update the Future Land Use Map.

A draft zoning proposal for the University District was released in May 2016 which would allow greater height and density, particularly in areas surrounding light rail at NE 43rd Street and Brooklyn Avenue NE. It would also apply design standards to help new development fit into the neighborhood context, implement new affordable housing and open space requirements, and identify incentives for historic preservation and street improvements. The zoning proposal for the University District is tentatively anticipated for City Council review in early 2017.

The area to the north of campus and west of 25th Avenue NE is generally zoned as Residential Multifamily-Lowrise 3 (LR3), with a portion of area adjacent to Ravenna Avenue NE zoned as Residential Multifamily-Lowrise 1 (LR1). Further to the north, this area is zoned as Residential Single Family 5,000 (SF 5,000 sq. ft. minimum lot size). The area of the north of campus and east of 25th Avenue NE is generally zoned for commercial uses to coincide with the University Village shopping center, including Commercial 1-65 (C1 – 65-foot maximum height), Commercial 1-40 (C1 – 40-foot maximum height) Commercial 2-65 (C2 – 65-foot maximum height), Neighborhood Commercial 2 – 40 (NC2 – 40-foot maximum height), and Neighborhood Commercial 2 – 30 (NC2 – 30-foot maximum height). Residential Single Family 5,000 (SF 5,000 sq. ft. minimum lot size) zoned areas are generally located to the north of the commercial zoning.

The area to the east of campus is primarily zoned for residential use, including Residential Single Family 5,000 (SF 5,000 sq. ft. minimum lot size), Residential Single Family 7,200 (SF 7,200 sq. ft. minimum lot size) and Residential Single Family 9,600 (SF 9,600 sq. ft. minimum lot size). Neighborhood Commercial zoning (NC2-30) and Lowrise Multifamily Residential zoning (LR3) are also located along Sand Point Way NE. Children's Hospital is also located in this area and is zoned as Major Institution Overlay (MIO).



Note: This figure is not to scale.

Source: City of Seattle, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.6-2
Existing Zoning Map

The area to the south of campus is primarily zoned as Residential Single Family 5,000 (SF 5,000 sq. ft. minimum lot size) and Residential Single Family 7,200 (SF 7,200 sq. ft. minimum lot size) to coincide with the Montlake, Broadmoor and Madison Park residential neighborhoods. Industrial zoning (Industrial Commercial-45 [IC-45-foot maximum height]) is also located to the southwest of the campus, along NE Northlake Way.

3.6.2 Impacts

This section of the Draft EIS identifies the potential impacts on existing land uses on the University of Washington campus and in the surrounding areas that could occur with development under the EIS Alternatives. Direct impacts relate to changes in type, character or pattern of land use, and the density of development on the campus. Indirect land use impacts would relate to peripheral development and/or change in overall land use character of the area.

Overall, implementation of development contemplated in the *2018 Seattle Campus Master Plan* would result in an intensification of uses on campus, replacement of some buildings, and reservation of space for new primary open space areas. The overall mix and types of land uses on campus would not change under the *2018 Seattle Campus Master Plan*.

The proposed *2018 Seattle Campus Master Plan* identifies 85 potentially developable sites on campus. Collectively, the 85 potentially developable sites contain a total of approximately 12.9 million gsf of net new building area; however, the University anticipates that the development of only 6.0 million gsf of building area will be necessary to meet the building space needs over the timeframe of the *2018 Seattle Campus Master Plan*. Because future funding levels and program needs are fluid and cannot be exactly defined for master planning purposes, the individual sites that would be developed over the life of the master plan cannot be identified. Development could occur on any of the 85 development sites, but not all of the sites would be developed. **Figure 3.6-3** illustrates building development considering all 85 development sites identified in the *2018 Seattle Campus Master Plan*. For the purposes of environmental review, alternatives with differing focuses of assumed development are analyzed in this EIS.

No Action Alternative

Under the No Action Alternative, it is assumed that the approximately 6.0 million gsf of potential future development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *CMP Seattle 2003* would be developed (approximately 211,000 gsf). This development would accommodate approximately four (4) percent of anticipated demand for building space over the 10-year planning horizon of the *2018 Seattle Campus Master Plan*. Some level of increased campus population would occur under the No Action Alternative through the remaining development under the *CMP Seattle 2003*, but the increase in campus population

Note: This figure represents a conceptual massing of potential development sites and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.6-3

Conceptual Massing of 2018 Seattle Campus Master Plan Potential Development Sites

and associated activity levels would be substantially lower than under Alternatives 1-5. Due to the lower level of development and associated campus population that would occur on campus when compared to Alternatives 1-5, it is anticipated that the potential for land use impacts would be substantially lower under the No Action Alternative.

Alternative 1 –CMP Proposed Allocation with Requested Height Increases

Alternative 1 reflects the preferred allocation of building development under the *2018 Seattle Campus Master Plan* and includes development of 6.0 million gsf of net new building space throughout the campus with a focus of development in the West and South Campus sectors and more limited development in the Central and East Campus sectors. The *2018 Seattle Campus Master Plan* identifies 85 potential development sites on the campus. Since future funding levels and program needs are fluid, however, the individual sites to be developed have not been determined. Hence, development could occur on any of the sites, but not all of the sites would be developed. Development under Alternative 1 is assumed to be as follows:

- West Campus: 3.0[2] million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.75 million gsf

Table 3.6-1 summarizes the existing development on the University of Washington campus and how development under Alternative 1 would alter the distribution land uses and building space on the campus. As shown in **Table 3.6-1**, new development under Alternative 1 would shift the distribution of land use and building space on the campus. The amount of total campus building area in the West Campus would increase by approximately seven percent, while the East Campus sector would increase by approximately one percent. In addition, while the overall amount of building area would increase in the Central Campus and South Campus sectors, the percentage of total campus building area within these areas would decrease or remain the same under Alternative 1 (seven percent decrease in the Central Campus and no decrease in South Campus).

[2] *Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).*

Table 3.6-1
DEVELOPMENT BY CAMPUS AREA – ALTERNATIVE 1

	Existing Campus Development	Existing Percent of Total	Alt. 1 - Net New Development	Total Campus Development	Percent of Total with Alt. 1
West Campus	3.8 million gsf	23%	3.0 million gsf	6.8 million gsf	30%
South Campus	4.2 million gsf	25%	1.35 million gsf	5.55 million gsf	25%
Central Campus	7.1 million gsf	43%	0.9 million gsf	8.0 million gsf	35%
East Campus	1.5 million gsf	9%	0.75 million gsf	2.25 million gsf	10%
Total Campus	**16.6 million gsf**	**100%**	**6.0 million gsf**	**22.6 million gsf**	**100%**

Source: Sasaki Architects, Inc., 2016.

Consistent with the *2018 Seattle Campus Master Plan*, Alternative 1 assumes that the maximum building heights on the campus would change as follows:

- West Campus – from the current 37 to 105 feet[3] to a range from 30 feet to 240 feet[4].
- South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased;
- Central Campus – the current 50 foot to 160 foot range would be maintained[5]; and
- East Campus – the current 30 foot to 160 foot[6] range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet.

The increase in building height is intended to allow for a level of building development sufficient to meet forecasted population growth, allow the opportunity to reserve areas for potential new open space improvements (including the planned West Campus Green and

[3] Maximum building height limit of 37 feet along the shoreline to 105 feet in the area north of NE 40th Street.
[4] Maximum limit of 30 feet along the shoreline to 240 feet in the area north of NE Pacific Street.
[5] The height limit in the area of Central Campus located north of NE 45th Street would increase from 50 feet to 65 feet.
[6] The current 160-foot allowable height is primarily limited to Husky Stadium.

other open spaces), and allow for building heights in the West Campus sector to reflect potential future development in the University District.

West Campus

Approximately 3.0 million gsf of net new building space, representing approximately 50 percent of the total 6.0 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space over the planning horizon, would be provided in the West Campus sector under Alternative 1. Development of 3.0 million gsf of net new building space would require development of approximately 94 percent of the approximately 3.2 million gsf of net new building space capacity identified for the West Campus sector. Depending on the potential development sites developed to achieve 3.0 million gsf of net new building space, up to approximately 800,000 gsf of existing building space could be demolished.

The increase in the maximum building height limit in the West Campus sector is intended to allow for the 3.0 million gsf of net new building space to be accommodated through compact higher density development balanced with public spaces. Development of approximately 3.0 million gsf in West Campus would increase the density and amount of building space in this area of campus by approximately 44 percent. The increase in building height would result in development on fewer potential development sites, which would allow opportunities to reserve space for the potential new West Campus Green and other public/open spaces. Development standards like tower spacing, podium specifications, and setbacks would allow view corridors, light, and pedestrian-scaled streetscapes.

Land uses within the West Campus sector would be intended to provide a mix of uses similar to those that are currently located in this area of campus, such as instructional uses, research partnership uses, administrative uses, student support uses and student housing. These land uses would not represent a change in the types of land uses or land use patterns for the area as this area of the campus currently contains a similar mix of uses (see Section 3.7-1, Existing Conditions, for further details). The increase in density and building heights in the West Campus would change the land use character of the area and result in an increase in activity levels associated with additional population in the area. However, this area of campus and surrounding vicinity is already a highly urbanized area and currently experiences high levels of activity to the presence of existing University uses and surrounding commercial/retail uses. In addition to building-related land uses, Alternative 1 would allow opportunities to reserve space for potential new open space areas within the West Campus sector, primarily in the form of a new park adjacent to Brooklyn Avenue NE and Portage Bay (West Campus Green). The planned West Campus Green could serve as a gathering place and recreation area for the existing and additional campus population, as well as the surrounding community.

The increase in building heights under Alternative 1 would allow for taller building heights compared to the majority of the existing buildings in West Campus and surrounding University District area. While the West Campus sector and surrounding University District is currently a highly developed urban area, the majority of the land uses are one- to six-stories in height. These increased building heights would represent a change in the existing character of land use to a taller and denser urban environment and would be similar to some of the tallest buildings within the University District area (i.e. the UW Tower, Hotel Deca, multifamily residential buildings, etc.). The tallest building heights would be located north of NE Pacific Street and adjacent to the University District area; building heights would get progressively lower to the south approaching the shoreline. Although the increased heights would represent an increase in building heights when compared to the current land uses, they are compatible with potential future development that is identified for the University District as part of the City of Seattle's *University District Urban Design Framework Plan*, which could include building heights up to 320 feet. It is anticipated that potential future development under Alternative 1 would be compatible with the City of Seattle's vision for the University District neighborhood surrounding the campus.

Due to the proximity to existing off-campus uses within the University District, potential development sites on the perimeter of the West Campus that would be adjacent to off-site uses would represent a potential to indirectly impact these adjacent land uses; potential development sites that are not adjacent to off-site uses would have a lower potential to impact adjacent land uses. Development standards are identified in the *2018 Seattle Campus Master Plan* for the overall campus, as well as specifically for the West Campus sector, and would minimize potential impacts of increased density and increased building height in this area.

South Campus

Approximately 1.35 million gsf of net new building space, representing approximately 23 percent of the total 6.0 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space over the planning horizon, would be provided in the South Campus sector under Alternative 1. Development of 1.35 million gsf of net new building space would require development of approximately 47 percent of the approximately 2.9 million gsf of net new building space capacity identified for South Campus. Because the South Campus sector is a highly developed area (including the UW Medical Center and Magnuson Health Sciences Center) a substantial amount of building demolition would be required. Depending on the potential development sites developed to achieve 1.35 million gsf of net new building space, up to approximately 1.1 million gsf of existing building space could be demolished.

The types of proposed land uses in the South Campus sector would primarily include health sciences/medical center uses and instructional uses, which would be similar to the existing

land use character of the area which is defined by the Magnuson Health Sciences Center and University of Washington Medical Center. Increased density in the South Campus sector would result in an increase in activity levels associated with additional uses and population in the area; however, this area of campus is already a highly developed with health science, medical and instructional uses and currently experiences high levels of activity. In addition, the South Campus is separated from nearby land uses to the south by the Montlake Cut which provides a buffer between the campus and off-campus uses.

The *2018 Seattle Campus Master Plan* proposes increases in maximum building height within the South Campus to accommodate the increased density within the area. The existing maximum building heights in the South Campus range from 37 to 240 feet, with the majority of the area designated for 65 to 105 feet. Under Alternative 1, maximum building heights would range from 30 feet to 240 feet[7] and would include increased areas up to 105 feet and 240 feet when compared to the existing conditions. Development in this area of campus is already a dense cluster of health sciences/medical buildings ranging from five to 13-stories tall with limited accessibility between the north edge of the area (along NE Pacific Street) and the waterfront. Potential future development under the *2018 Seattle Campus Master Plan* would remove and redevelop many of the existing buildings to provide denser and taller building development which would allow the opportunity for areas to be reserved for potential open space and new connections through the South Campus sector such as the South Campus Green Corridor.

The South Campus sector is not located directly adjacent to any off-campus land uses and, as a result, potential future development within this area would have a low potential for indirect land use impacts. Development standards in the South Campus sector would be provided as part of the *2018 Seattle Campus Master Plan*. Implementation of these development standards would minimize potential land use impacts associated with increased density and increased building heights in the South Campus.

Central Campus

Approximately 0.9 million gsf of net new building space, representing approximately 15 percent of the total 6.0 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided in the Central Campus sector under Alternative 1. Development of 0.9 million gsf of net new building space would require development of approximately 45 percent of the approximately 2.0 million gsf of net new building space capacity identified for Central Campus. Depending on the potential development sites developed to achieve the 0.9 million gsf of net new building space, up to approximately 350,000 gsf of existing building space could be demolished.

[7] The 30-foot maximum building heights would be located within the shoreline jurisdictional area. All other areas of the South Campus would have a maximum building height of 105 to 240 feet.

Within the Central Campus sector, proposed land uses would be similar to the existing land uses and would primarily include instruction and instructional support uses. New land uses would not represent a change in the types of land uses or land use patterns for the area as it currently contains a similar mix of primarily instructional uses (see Section 3.7-1, Existing Conditions, for further details). The increase in density would result in an increase in activity levels associated with additional development and population in the area; however, this area of campus is already a highly developed area and currently experiences high levels of activity from existing University uses. Existing off-campus land uses to the north of the campus are primarily residential uses (including fraternity and sorority houses) and would generally have similar or lower activity levels than the existing campus.

Maximum building heights in the Central Campus sector would remain as under the current CMP and would be primarily 105 feet for the Central Campus with 160-foot height limits in the northeast corner of Central Campus and 65-foot height limits near Rainier Vista. As a result, it is anticipated that building heights under the *2018 Seattle Campus Master Plan* would be generally similar to existing development in the Central Campus.

Due to the proximity to existing off-campus uses, potential development sites along the north and west boundary of Central Campus would be adjacent to off-site uses and would have a potential to generate indirect land use impacts; potential development sites that are not adjacent to off-site uses would have a lower potential. Development standards in the Central Campus would be provided to ensure consistency and compatibility with the Central Campus and would minimize potential land use impacts associated with increased density and increased building heights in the Central Campus.

East Campus

Approximately 0.75 million gsf of net new building space, representing approximately 13 percent of the total 6.0 million gsf of development anticipated to be needed to meet the anticipated growth in demand for building space, would be provided by the East Campus under Alternative 1. Development of 0.75 million gsf of net new building space would require development of approximately 16 percent of the approximately 4.6 million gsf of net new building space capacity identified for the East Campus sector. Given the relatively undeveloped nature of East Campus, and the relatively small amount of development assumed, little to no building demolition in the East Campus sector would be anticipated under Alternative 1.

Proposed land uses within the East Campus sector would be intended to provide a mix of uses, such as instructional uses, administrative uses, and student support uses. These new uses could replace existing surface parking areas and recreational facilities (i.e., golf driving range, tennis courts, etc.); existing recreational uses near the shoreline of Union Bay would be retained (including the existing soccer facility, track facility and intermural fields). The change in land use would result in increased building density within the area and increased

activity levels associated with new development. These activity levels would be generally similar to off-campus land uses to the north (i.e., University Village and commercial uses), but would represent an increase compared with off-campus land uses to the east (i.e. residential uses).

Building heights in this area of campus would increase under the *2018 Seattle Campus Master Plan* from the existing 65 to 80 feet range, to 65 to 130 feet. Along Montlake Boulevard, 130-foot maximum building heights would be allowed, while 65-foot building heights would be located within the internal portions of the East Campus sector. While taller building heights would be allowed, development would occur on a more limited basis within the East Campus sector under Alternative 1 compared to other sectors. Potential development of approximately 0.75 million gsf under Alternative 1 would represent a slight increase in density and activity levels in the area, particularly when compared to the West Campus and South Campus sectors.

Potential development sites along the north and east boundary of the East Campus would be adjacent to off-campus uses and would have the potential for indirect land use impacts due to their proximity to off-campus land uses; potential development sites that are not adjacent to off-campus uses would have a lower potential for impacts. Development standards in the East Campus sector would be intended to minimize potential impacts of increased density and increased building height in this area and the implementation of development standards as part of the *2018 Seattle Campus Master Plan* would minimize potential land use impacts associated with increased density and increased building heights in the East Campus.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone** identified in the City-University Agreement, it is anticipated that potential land use impacts under Alternative 1 would be as described for adjacent off-campus land uses above for each of the campus sectors and primarily include changes in land use character associated with increased density and building heights (primarily to portions of the Primary Impact Zone adjacent to the West Campus and South Campus where the majority of potential development would occur under Alternative 1), as well as increased activity levels associated with development within the campus sectors.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be primarily related to indirect impacts from increased density and activity levels within and adjacent to the campus (i.e., increased traffic, noise, air emissions, etc.).

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 reflects accommodation of the requested 6 million gsf of building area developed generally consistent with the CMP proposed allocation without the height increases proposed in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1; thus, the existing CMP height limits are assumed. Without the proposed height increases, the development capacity of the West Campus is limited and additional development sites would be required to approach the 3.0 million gsf of net new development in the West Campus identified in the *2018 Seattle Campus Master Plan* and analyzed under Alternative 1. Given the developed nature of the West Campus, the opportunity for additional development sites in this sector is limited, and therefore, Alternative 2 assumes additional development sites in the area reserved for the West Campus Green under Alternative 1. Even with the additional development sites, the development capacity in the West campus without the requested height increases is only 2.4 million gsf of net new development (compared to 3.0 million gsf in the West Campus under Alternative 1) and the proposed CMP allocation for West Campus reflected in Alternative 1 cannot be achieved under Alternative 2. The approximately 0.6 million gsf of the net new development not accommodated by the West Campus development capacity is shifted to the East Campus under Alternative 2. The assumed building development by campus sector under Alternative 2 is as follows:

- West Campus: 2.4[8] million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 1.35 million gsf

Table 3.6-2 summarizes the existing development on the University of Washington campus and how development under Alternative 2 would alter the distribution land uses and building space on the campus.

Table 3.6-2
Development by Campus Area – Alternative 2

	Existing Campus Development	Existing Percent of Total	Alt. 2 - Net New Development	Total Campus Development	Percent of Total with Alt. 2
West Campus	3.8 million gsf	23%	2.4 million gsf	6.2 million gsf	28%

[8] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

Table 3.6-2 Continued

	Existing Campus Development	Existing Percent of Total	Alt. 2 - Net New Development	Total Campus Development	Percent of Total with Alt. 2
South Campus	4.2 million gsf	25%	1.35 million gsf	5.55 million gsf	22%
Central Campus	7.1 million gsf	43%	0.9 million gsf	8.0 million gsf	32%
East Campus	1.5 million gsf	9%	1.35 million gsf	2.85 million gsf	18%
Total Campus	**16.6 million gsf**	**100%**	**6.0 million gsf**	**22.6 million gsf**	**100%**

Source: Sasaki Architects, Inc., 2016.

As shown in **Table 3.6-2**, new development under Alternative 2 would have the most effect on the West Campus and East Campus, and would shift the distribution of land use and building space on the campus. The amount of total campus building area in the West Campus would increase by approximately five percent, while the East Campus would increase by approximately nine percent. In addition, while the overall amount of building area would increase in the Central Campus and South Campus, the percentage of total campus building area within these areas would decrease under Alternative 2 (11 percent decrease in the Central Campus and three percent decrease in the South Campus).

West Campus

Under Alternative 2, development in the West Campus would be less then under Alternative 1 (approximately 2.4 million gsf compared with 3.0 million gsf) and the maximum building heights for the campus would remain (currently ranging from 37 to 105 feet). Because there would be no increase in maximum building heights, the development of 2.4 million gsf in the West Campus would actually require the use of more development sites within the West Campus and would result in building development within area that was planned for the West Campus Green under Alternative 1; thus, this planned open space intended, in part, to connect the West Campus sector and the University District to the waterfront would not be provided under Alternative 2.

As under Alternative 1, potential future development along the perimeter of the West Campus, adjacent to off-campus uses would have the potential for indirect land use impacts due to increased density within the West Campus. The amount of density assumed for the West Campus and the maximum building heights for the area would be lower under Alternative 2 which would result a lower potential for land use impacts when compared with Alternative 1. Development standards would be provided to minimize potential land use impacts associated with development in the West Campus (see the discussion above for Alternative 1 for further details on potential land use impacts within the West Campus).

South Campus

Development in the South Campus sector under Alternative 2 would include the same amount of development as Alternative 1 (approximately 1.35 million gsf of net new building space). However, assumed development under Alternative 2 would be consistent with existing maximum building heights in the sector (65 feet to 240 feet) and would result in shorter buildings than under Alternative 1, which allows larger amounts of area up to 240 feet tall. As a result, potential building development under Alternative 2 would be similar in character and building heights to the existing conditions in the South Campus sector.

Similar land uses would be provided under Alternative 2, including health sciences, medical and instructional uses. The level of development in the South Campus would represent an increase in density and activity levels within the sector that would be similar to Alternative 1.

As described under Alternative 1, the South Campus sector is not located adjacent to any off-campus land uses (the Montlake Cut and Portage Bay provide a buffer between campus uses and land uses to the south) and potential future development within this area would have a lower potential to indirectly impact adjacent land uses. As under Alternative 1, development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use impacts associated with development in the South Campus.

Central Campus

Development in the Central Campus sector under Alternative 2 would include the same level of potential development as Alternative 1 (approximately 0.9 million gsf). No increases in maximum building heights are included for the Central Campus under Alternative 1 or Alternative 2. As a result, potential development in the Central Campus would include the same amount of density and building heights, and therefore, potential land use impacts would be the same under Alternative 2 as described under Alternative 1.

East Campus

Under Alternative 2, lower building heights in the West Campus when compared with Alternative 1 would result in the need to develop additional areas of the East Campus sector in order to achieve 6 million gsf for the overall campus as identified in the *2018 Seattle Campus Master Plan*. Increased development in the East Campus would include approximately 1.35 million gsf of building space (compared to 0.75 million gsf under Alternative 1), which would represent approximately 23 percent of the total development anticipated to be needed to meet the anticipated growth in demand for building space. Development of 1.35 million gsf of net new building space would require development of approximately 29 percent of the approximately 4.6 million gsf of net new building space capacity identified for the East Campus. Depending on the potential development sites

developed to achieve the 1.35 million gsf of net new building space, up to approximately 360,000 gsf of existing building space could be demolished.

New development in the East Campus under Alternative 2 would be intended to provide a range of mixed uses and replace primarily existing surface parking with new uses. Development of approximately 1.35 million gsf in the East Campus would change the character of the area from its current low intensity uses (surface parking) to new campus building development and would represent a shift of campus instructional and support building development beyond Montlake Boulevard in East Campus. The new land uses and increased density in the East Campus sector would also result in an associated increase it population (students, faculty and staff) and activity levels which would represent a shift in character from the primarily existing parking uses.

Building heights in the East Campus would be consistent with the existing maximum building heights for the area (65 to 80 feet[9]). While potential development under Alternative 2 would be consistent with existing building maximum building heights, it would represent a substantial shift in the land use character of the area, particularly when compared to the existing conditions (primarily surface parking) due to the increased amount of building density within the East Campus sector.

It is anticipated that Alternative 2 would have a greater potential for land use impacts in East Campus compared to Alternative 1 due to the increased level of development that would occur (1.35 million gsf versus 0.75 million gsf). Development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use and building height impacts associated with development in the East Campus.

Primary and Secondary Impact Zones

Potential land use impacts for the **Primary Impact Zone** under Alternative 2 would be as described above for adjacent off-campus land uses for each of the campus sectors and primarily include changes in land use character associated with increased development density (primarily in the West Campus, South Campus and East Campus), as well as increased activity levels associated with development within the campus sectors. Compared to Alternative 1, Alternative 2 would reflect a shift in new building development from West Campus to East Campus, increasing the potential for indirect land use impacts to the portion of the Primary Impact Zone in proximity to East Campus. The lower maximum building heights allowed compared to Alternative 1 would reduce the potential to view new on-campus buildings from certain portions of the Primary Impact Zone (particularly within the West Campus), with a resulting potential perception of less building intensity on the campus. However, this would be off-set by increased building development density that

[9] The lone exceptions to these maximum heights is the site of the existing Husky Stadium (up to a 160-foot maximum) and the Dempsey Indoor Center (up to a 107.

would be located in the East Campus which would result in the potential perception of more building intensity within that area of the campus..

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be primarily related to indirect impacts from increased density and activity levels within and adjacent to the campus (i.e., increased traffic, noise, air emissions, etc.).

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 reflects development of the 6.0 million gsf of net new building space consistent with the *2018 Seattle Campus Master Plan* but assumes that an increased amount of density would be provided in the West Campus and South Campus, as follows:

- West Campus: 3.2[10] million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

Table 3.6-3 summarizes the existing development on the University of Washington campus and how development under Alternative 3 would alter the distribution land uses and building space on the campus.

Table 3.6-3
Development by Campus Area – Alternative 3

	Existing Campus Development	Existing Percent of Total	Alt. 3 - Net New Development	Total Campus Development	Percent of Total with Alt. 3
West Campus	3.8 million gsf	20%	3.2 million gsf	7.0 million gsf	31%
South Campus	4.2 million gsf	25%	1.65 million gsf	5.85 million gsf	26%
Central Campus	7.1 million gsf	42%	0.9 million gsf	8.0 million gsf	35%
East Campus	1.5 million gsf	9%	0.25 million gsf	1.75 million gsf	8%
Total Campus	**16.6 million gsf**	**100%**	**6.0 million gsf**	**22.6 million gsf**	**100%**

Source: Sasaki Architects, Inc., 2016.

[10] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

As shown in **Table 3.7-3**, new development under Alternative 3 would have the most effect on the West Campus and South Campus, and would shift the distribution of land use and building space on the campus. The amount of total campus building area in the West Campus would increase by approximately 11 percent, while the South Campus would increase by approximately one percent. In addition, while the overall amount of building area would increase in the Central Campus and East Campus, the percentage of total campus building area within these areas would decrease under Alternative 3 (eight percent decrease in the Central Campus and one percent decrease in the East Campus).

West Campus

Under Alternative 3, development in the West Campus would feature a similar type and layout of land uses with the same maximum building heights compared to Alternative 1; however, Alternative 3 would include an increased amount of density within the West Campus than under Alternative 1 (approximately 3.2 million gsf compared with 3.0 million gsf). As under Alternative 1, potential future development along the perimeter of the West Campus, adjacent to off-campus uses would have the potential for indirect land use impacts due to increased density and building heights within the West Campus and associated increases in activity levels within the area. The potential for land use impacts would be slightly higher under Alternative 3 due to the increased amount of density when compared with Alternative 1. Development standards would be provided to minimize potential land use impacts associated with development in the West Campus (see the discussion above for Alternative 1 for further details on potential land use impacts within the West Campus).

South Campus

Development in the South Campus sector under Alternative 3 would also feature a similar type and layout of land uses as Alternative 1 with the same maximum building heights, but would represent an increase in development density when compared with Alternative 1 (approximately 1.65 million gsf versus 1.35 million gsf of net new building space). Alternative 3 would have a greater potential for land use impacts than Alternative 1 due to the increased amount of development density that would be provided and the associated increases in activity levels. However, as described under Alternative 1, the South Campus sector is not located directly adjacent to any off-campus land uses, and the Montlake Cut and Portage Bay provide a buffer between campus uses and land uses to the south. As under Alternative 1, development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use impacts associated with development in the South Campus.

Central Campus

Development in the Central Campus under Alternative 3 would include the same level of potential development as Alternative 1 (approximately 0.9 million gsf) and no increases in

maximum building heights are included for the Central Campus. As a result, potential development in the Central Campus would include the same amount of density and building heights, and therefore potential land use impacts would be the same as under Alternative 1.

East Campus

Under Alternative 3, development in the East Campus would include a similar mix of land uses as Alternative 1, but would provide a reduced amount of development within this campus sector. Approximately 0.25 million gsf would be provided under Alternative 3, compared with 0.75 million under Alternative 1. The reduced development density in the East Campus would result in a smaller increase in associated activity levels and would have a lower potential for land use impacts in the East Campus sector compared to Alternative 1. Development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use impacts associated with development in the East Campus.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone**, it is anticipated that potential land uses impacts under Alternative 3 would be as described above for each of the campus sectors and primarily include changes in land use character associated with increased density and building heights (primarily in the West Campus and South Campus where the majority of potential development would occur), as well as increased activity levels associated with development within the campus sectors.

Due to the distance between the **Secondary Impact Zone** and the campus, potential land use impacts to the Secondary Impact Zone would be primarily related to indirect impacts from increased density and activity levels within and adjacent to the campus (i.e., increased traffic, noise, air emissions, etc.).

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 reflects development of 6.0 million gsf of net new building space consistent with the *2018 Seattle Campus Master Plan.* The focus of development would be in the West and East Campus sectors, but an increased amount of density would be provided in the Central Campus and East Campus sectors when compared with Alternative 1:

- West Campus: 3.0[11] million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf
- East Campus: 1.7 million gsf

[11] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

Table 3.6-4 summarizes the existing development on the University of Washington campus and how development under Alternative 4 would alter the distribution land uses and building space on the campus.

Table 3.6-4
Development by Campus Area – Alternative 4

	Existing Campus Development	Existing Percent of Total	Alt. 4 - Net New Development	Total Campus Development	Percent of Total with Alt. 4
West Campus	3.8 million gsf	20%	3.0 million gsf	6.8 million gsf	30%
South Campus	4.2 million gsf	25%	0.2 million gsf	4.4 million gsf	20%
Central Campus	7.1 million gsf	42%	1.1 million gsf	8.2 million gsf	36%
East Campus	1.5 million gsf	9%	1.7 million gsf	3.2 million gsf	14%
Total Campus	**16.6 million gsf**	**100%**	**6.0 million gsf**	**22.6 million gsf**	**100%**

Source: Sasaki Architects, Inc., 2016.

As shown in **Table 3.7-4**, Alternative 4 would have the greatest land use effect on the West Campus and East Campus, while also resulting in the largest increase in density within the Central Campus of any of the EIS Alternatives. The amount of total campus building area in the West Campus would increase by approximately 10 percent, while the East Campus would increase by approximately five percent. While the overall amount of building area would also increase in the Central Campus and South Campus, the percentage of total campus building area within these areas would decrease under Alternative 4 (six percent decrease in the Central Campus and five percent decrease in the South Campus).

West Campus

Under Alternative 4, development in the West Campus sector would feature a similar type and layout of land uses, the same maximum building heights and the same amount of density as Alternative 1 (3.0 million gsf). As a result, it is anticipated that potential for land use impacts would be similar to Alternative 1. Development standards would be provided to minimize potential land use impacts associated with development in West Campus (see the discussion above for Alternative 1 for further details on potential land use impacts within the West Campus).

South Campus

Development in the South Campus sector under Alternative 4 would also feature a similar type, layout of land uses and maximum building heights as in Alternative 1, but would represent a substantial decrease in development density (approximately 0.2 million gsf under Alternative 4 versus 1.35 million gsf of net new building space under Alternative 1). It is anticipated that Alternative 4 would have a lower potential for land use impacts in South Campus than Alternative 1 due to the decreased amount of development density that would be provided and the associated lower activity levels that would result from development. As under Alternative 1, development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use impacts associated with development in the South Campus.

Central Campus

Under Alternative 4, development in the Central Campus sector would also feature a similar type and layout of land uses as in Alternative 1 with the same maximum building heights, but would represent an increase in development density when compared with Alternative 1 (approximately 1.1 million gsf versus 0.9 million gsf of net new building space). As under Alternative 1, potential future development along the perimeter of the Central Campus, adjacent to off-campus uses, would have the potential for indirect land use impacts due to increased density and associated increases in activity levels within the sector. The potential for land use impacts would be slightly higher under Alternative 4 due to the increased amount of density when compared with Alternative 1. Development standards would be provided to minimize potential land use impacts associated with development in the Central Campus sector (see the discussion above for Alternative 1 for further details on potential land use impacts within the Central Campus).

East Campus

Development in the East Campus under Alternative 4 would include a similar mix of land uses as in Alternative 1, but would provide an increased amount of development within this campus sector (1.7 million gsf versus 0.75 million gsf under Alternative 1. The increased development density in the East Campus under Alternative 4 would result in a potential increase in indirect land use impacts near adjacent off-campus land uses and associated increases in activity levels within the sector when compared with Alternative 1. The separation provided between assumed development in East Campus under Alternative 4 and the Laurelhurst neighborhood to the east by the retained natural area, would act to buffer this off-campus area from East Campus development on Parking Lot E1. Development standards would be provided under the *2018 Seattle Campus Master Plan* to minimize potential land use impacts associated with development in the East Campus.

Primary and Secondary Impact Zones

Potential land uses impacts in the **Primary Impact Zone** under Alternative 4 would be as described above for each of the campus sectors and primarily include changes in land use character associated with increased density and building heights (primarily in the West Campus, East Campus and Central Campus where the majority of potential development would occur under Alternative 4), as well as increased activity levels associated with development within the campus sectors.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be primarily related to indirect impacts from increased density and activity levels within and adjacent to the campus (i.e., increased traffic, noise, air emissions, etc.).

Alternative 5 – No Street, Alley or Aerial Vacations

Under the No Street, Alley or Aerial Vacation Alternative, none of the potential vacations under the *2018 Seattle Campus Master Plan* would occur. The potential vacations of a section of NE Boat Street and NE Northlake Place would not occur and the existing roadway system would remain; an aerial vacation over Montlake Boulevard NE would also not occur. Under Alternative 5, the retained portion of NE Boat Street would bisect Portage Bay Park and the planned West Campus Green and separate the two areas. Under this Alternative, the potential for a continuous open space area would not be created between the two parks and a continuous link between NE Pacific Street and the waterfront would not be provided.

Development associated with the aerial vacation of Montlake Boulevard would also not occur under this alternative, which would limit the provision of pedestrian circulation improvements to connect the East Campus and Central Campus. The proposed ADA accessible bridge connection and associated open space would not be located in this area which would reduce accessibility compared to the other alternatives. However, the visual impacts associated with the bridge would not occur under this alternative.

Since the proposed street and aerial vacations are not intended to increase the amount of building development on campus, the assumed amount of building development under Alternative 5 would be the same as Alternatives 1 through 4 (6.0 million gsf). As a result, it would be anticipated that land use impacts associated with potential future building development under the *2018 Seattle Campus Master Plan* would be similar to those analyzed for Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

2018 Seattle Campus Master Plan development under Alternatives 1 through 5 is intended to accommodate the increase in the number of students, faculty and staff, as well as allow

for the continued growth in the areas of research and service over the 10-year planning horizon. The scale of campus development under Alternatives 1 through 5 could further continue the existing and planned trend toward more intensive development in the University District, consistent with current and evolving goals and policies of the University District Urban Design Framework, as well as the Urban Center strategy associated with the City's Comprehensive Plan. The *University District Urban Design EIS* indicates that "the study area is expected to experience new growth and development, but the overall mix of uses is not expected to significantly change from the existing mixed-use pattern." In addition, increases in campus population would further increase pedestrian activity on the streets surrounding the campus, particularly in the University District and University-Village areas.

Development under Alternatives 1 through 5 would contribute to cumulative employment and population growth in the area surrounding the University of Washington campus, particularly contributing to the planned increase in the intensity of land uses in the University District. In addition, surrounding businesses (particularly in the University District and University Village) could experience an increase in demand for goods and services as a result of increased campus population. To the extent that increased campus population and development under Alternatives 1 through 5 increase demand for business uses in the campus vicinity (retail uses, restaurants etc.), campus growth could influence timing associated with redevelopment of properties in the campus vicinity.

Under the No Action Alternative, it is assumed that building development on the campus would not occur and that the University of Washington would not be able to accommodate the anticipated increase in student, faculty and staff population over the 10-year planning horizon. Because the University of Washington Seattle Campus would not be able to accommodate the anticipated educational and research demands over the planning horizon, it is possible that the pressure to convert existing and planned commercial uses in the campus vicinity (particularly in the University District) to instructional and University support uses could increase in comparison to Alternatives 1 through 5. Off-campus development pressure, and contribution to cumulative growth in the vicinity, could be greater under the No Action Alternative than under Alternatives 1 through 5.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis;

instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA threshold analysis/determination for individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.6-4**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined.

For example, areas of campus that are located adjacent to off-campus residential land uses are identified as having a "Medium" potential to generate land use impacts, while areas of campus located at a distance from the campus boundary are identified as having a "Low" potential to result in land use impacts.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

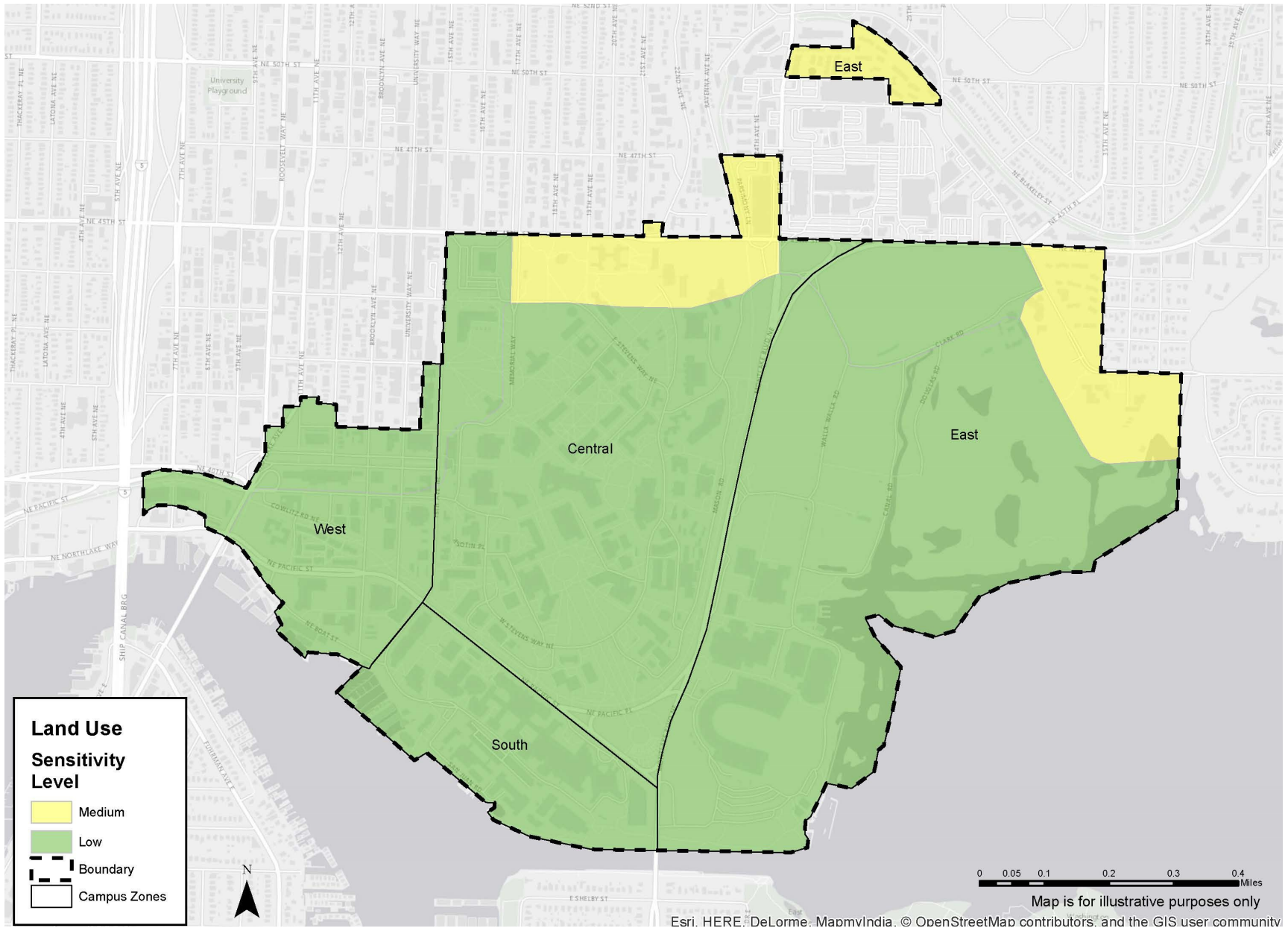
3.6.3 Mitigation Measures

The following measures would minimize potential land use impacts that could occur with the implementation of the *2018 Seattle Campus Master Plan*.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- Areas reserved for potential new open spaces, including the West Campus Green under Alternatives 1, Alternative 3, 4, and Alternative 5, would help to offset the proposed increase in land use density and building heights on the campus.

- Increases in height and density under the *2018 Seattle Campus Master Plan* would be minimized through the implementation of the University's proposed general policies, development programs and development standards for the campus (including those standards identified within the *2018 Seattle Campus Master Plan*).



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.6-4
Land Use Sensitivity Map

- New opportunities for potential open space areas, including the potential new West Campus Green, would be provided by the potential street vacations.

Additional Measure Applicable to Medium Potential Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located on development sites that are proximate to off-campus residential land uses would be considered as part of the University's Design Review process and could require additional mitigation measures (if necessary).

3.6.4 Significant Unavoidable Adverse Impacts

Under Alternatives 1 through 5 intensification in land uses on the campus would occur as a result of the increased density and building heights that would be provided under the *2018 Seattle Campus Master Plan*. The greatest potential for increases in development would occur in the West and South Campus sectors under Alternative 1 and 3, in the West, South and East Campus sectors under Alternative 2, and in the West, Central and East Campus under Alternative 4; development under Alternative 5 would feature a similar distribution of development as Alternatives 1 through 4. With implementation of the mitigation measures identified above, no significant unavoidable adverse land use impacts would be anticipated under the EIS Alternatives.

3.6.5 Relationship to Plans and Policies

This section identifies the existing plans and policies deemed the most relevant to the *2018 Seattle Campus Master Plan*. The plans and policies analyzed in this section include the following:

- Washington State Growth Management Act;
- Washington State Shoreline Management Act;
- City of Seattle Shoreline Master Program:
- City of Seattle Comprehensive Plan;
- City of Seattle Neighborhood Plans;
- The 1998 City-University Agreement;
- City of Seattle Land Use and Zoning Code: and,
- City of Seattle Street/Alley Vacation Policies.

Washington State Growth Management Act (RCW 36.70A)

Summary: The Growth Management Act (GMA) was first enacted as ESHB 2929 by the 1990 Washington State Legislature and has been subsequently amended to contain a comprehensive framework for managing growth and coordinating land use planning with the provision of adequate infrastructure. Many provisions of GMA apply to the state's largest and fastest growing jurisdictions, including King County and all of its cities; some provisions of GMA (such as requirements to identify and regulate critical areas) apply to all local jurisdictions. GMA is long and complex, and the following discussion provides a brief summary of key provisions of GMA that are relevant to the City of Seattle and the University of Washington.

Among other requirements, jurisdictions subject to GMA must prepare and adopt:

- Countywide planning policies for implementation of GMA;
- Comprehensive land use plans containing specific elements and embodying state-wide goals;
- Regulations consistent with those plans;
- Capital facilities plans (including financing elements) for utilities and transportation systems; and
- Programs designating and regulating critical/sensitive areas (including agricultural and forest lands, wetlands, steep slopes and critical habitat).

The general planning goals of GMA include: directing growth to urban areas; reducing sprawl; providing efficient transportation systems; promoting a range of residential densities and housing types; encouraging affordable housing; promoting economic development throughout the state; protecting private property rights; ensuring timely and fair processing of applications; maintaining and enhancing resource-based industries; encouraging retention of open space and habitat areas; protecting the environment; involving citizens in the planning process; ensuring the siting of essential public facilities (including state educational facilities); and identifing and encouraging the preservation of lands and structures with historical and archaeological significance.

Comprehensive Plans must contain elements dealing with land use, housing, capital facilities, utilities, rural lands, and transportation. Optional elements include conservation, solar energy and recreation, as well as other areas dealing with the physical environment. Sub-area plans (i.e., neighborhood and community plans) are also authorized.

GMA requires that early and continuous public participation be provided for comprehensive land use plans and development regulations implementing such plans.

Discussion: *The City of Seattle has prepared and adopted a Comprehensive Plan (most recently updated in 2015 and a major update is currently proposed) to guide future*

development and fulfill the City's responsibilities under GMA. The goals and objectives of the GMA have been incorporated into the City's Comprehensive Plan. The proposed 2018 Seattle Campus Master Plan is consistent with the City's Comprehensive Plan (see the discussion on the City of Seattle Comprehensive Plan later in this section for further details).

The 2018 Seattle Campus Master Plan is consistent with relevant planning goals of GMA. Efficient transportation systems would be encouraged through the continued implementation of a TMP and circulation system improvements. A range of housing densities and housing types would be enhanced with additional student housing facilities. The plan would promote economic development by fostering an educated workforce and providing additional staff and faculty employment opportunities. The 2018 Seattle Campus Master Plan would encourage the retention of open space and habitat areas by providing new public open spaces and the retention of existing open space and habitat areas. The Plan also includes a detailed process to ensure that campus areas and structures with historical significance are identified and preservation is encouraged.

Washington State Shoreline Management Act

Summary: The Washington State Legislature enacted the Shoreline Management Act (SMA) in 1971 to protect the public interest associated with shorelines of the state, while at the same time, recognizing and protecting private property rights consistent with the public interest. The primary mechanism for implementing the SMA is the adoption of a Shoreline Master Program (SMP) by local governments, which must be approved and the Washington State Department of Ecology (Ecology). The City of Seattle has an adopted SMP and implementing code. Proposed development that is located within a City or County designated shoreline environment and meets the definition of a shoreline "substantial development," must obtain a substantial development permit from the applicable jurisdiction.

SMA establishes two basic categories of shoreline: "shorelines of state-wide significance" which are identified in the SMA; and "shorelines" which includes all of the water areas of the state and their associated wetlands, together with the lands underlying them. Alterations to the natural condition of shorelines of state-wide significance are permitted, with priority given to residences, ports, and industrial and commercial developments which are particularly dependent on their location or use of the shorelines of the state. SMA also provides that governments should review regulations and plans relative to lands adjacent to shorelines to achieve a policy consistent with the SMA and adopted SMPs.

Discussion: *The City of Seattle's Shoreline Master Program (SMP) (adopted in 1983 and most recently updated in 2015) incorporates the policies of the Shoreline Management Act (SMA). The SMP was developed with the intent of regulating development and use of shorelines within the City consistent with the multiple objectives and policies of the SMA. The University campus includes approximately 12,000 linear feet of waterfront on Portage*

Bay, Union Bay and the Lake Washington Ship Canal. Public access is defined by the public access plan identified in the 2018 Campus Master Plan, per WAC 173-26-221(4)(c), based on the underlying shoreline zones: Conservancy Preservation, Conservancy Management, and Urban Commercial. See the discussion of the SMP later in this section for further details.

City of Seattle Shoreline Master Program

Summary: SMC 23.60A, commonly known as the Seattle Shoreline Master Program, implements the policies and provisions of the Shoreline Management Act and the Shoreline Goals and Policies of the Seattle Comprehensive Plan by regulating development of the shorelines of the City in order to: protect the ecosystems of the shoreline areas; encourage water dependent uses; provide for the maximum public enjoyment of the shorelines of the City; and, preserve, enhance and increase views of the water and access to the water.

The Shoreline District of the City of Seattle is divided into 11 environment classifications, including: Conservancy Management (CM), Conservancy Navigation (CN), Conservancy Preservation (CP), Conservancy Recreation (CR), Conservancy Waterway (CW), Urban Commercial (UC), Urban General (UG), Urban Harborfront (UH), Urban Industrial (UI), Urban Maritime (UM), and Urban Residential (UR).

The shoreline areas of the University of Washington are classified into three environments – Urban Commercial (UC), Conservancy Management (CM) and Conservancy Preservation (CP). The purpose of the UC environment is to provide for a mix of water-oriented uses and development. It allows limited nonwater-oriented uses and development where they would not displace water-oriented uses and, if located on waterfront lots, where they achieve another goal of the Shoreline Management Act, such as public access or protection or improvement of ecological functions. It also provides for public access and recreational enjoyment of the shoreline while protecting ecological functions.

The purpose of the CM environment is to provide water-dependent infrastructure, such as navigational locks, that provide a substantial public benefit and recreation facilities, such as marinas and parks. Development allowed in the CM environment can be managed to preserve ecological functions and typically provide public access.

The purpose of the CP environment is to preserve, protect, restore or enhance shoreline areas that have intact or mostly intact ecological functions and areas that are particularly biologically or geologically fragile. Enjoyment of these areas by the public is encouraged to the extent that sensitive or fragile ecological functions are not adversely impacted.

Discussion: *The University campus includes approximately 12,000 linear feet of waterfront on Portage Bay, Union Bay and the Lake Washington Ship Canal. Public access is defined by the public access plan identified in the 2018 Campus Master Plan, per WAC 173-26-221(4)(c), based on the underlying shoreline zones: Conservancy Preservation, Conservancy Management, and Urban Commercial. The 2018 Seattle Campus Master Plan identifies uses*

within the UC, CM and CP environment that would be consistent with the intent of the City of Seattle SMP. Project-specific review would be conducted at the time of individual building proposals, and compliance with applicable shoreline regulations would be assured as part of the permit process.

City of Seattle Comprehensive Plan

Summary: The City of Seattle Comprehensive Plan provides the overall goals and identifies land use patterns for the city. Land use development on the University of Washington campus is directed by the provisions of the 1998 City-University Agreement. The relationship of the *2018 Seattle Campus Master Plan* with relevant goals and policies of the Comprehensive Plan is provided below.

The City of Seattle's Comprehensive Plan, Toward a Sustainable Seattle, was originally adopted in 1994 to meet the requirements of GMA; the Comprehensive Plan has been amended every year since its adoption, including most recently in October 2015.[12] The Comprehensive Plan consists of 14 major elements – urban village, land use, transportation, housing, capital facilities, utilities, economic development, neighborhood planning, human development, cultural resources, environment, container port, urban design and shoreline. Each element contains goals and policies that are intended to guide development of the City in the context of regional growth management for the next 20 years. While each element affects development adjacent to the University of Washington campus, the Urban Village Element and the Land Use Element are the most relevant to the *2018 Seattle Campus Master Plan*.

The Urban Village Element includes the following major components:

- Urban Village Strategy;
- Distribution of Growth;
- Open Space Network; and
- Annexation.

The Land Use Element includes the following major components:

- Citywide Land Use Policies;
- Land Use Categories; and
- Location-Specific Land Use Policies.

The following goals and policies from the Urban Village Element and Land Use Element are the most applicable to development on the University of Washington campus because a

[12] It should be noted that the City of Seattle is currently in the process of developing a new Comprehensive Plan (Seattle 2035 – A Comprehensive Plan for Managing Growth 2015-2035). Draft and Final EIS documents for the Comprehensive Plan were issued in May 2015 and May 2016, respectively. The City anticipates the adoption of the new Comprehensive Plan in the fall of 2016.

majority of the campus is located within the University Community Urban Center and there are Land Use goals and policies relevant to the University.

Urban Village Element

Goal UVG3 – Promote densities, mixes of uses and transportation improvements that support walking, use of public transportation and other transportation demand management (TDM) strategies, especially within urban centers and urban villages.

Goal UVG7 – Use limited land resources more efficiently and pursue a development pattern that is economically sound, by encouraging infill development on vacant and underutilized sites, particularly within urban villages.

Goal UVG16 – Designate as urban centers unique areas of concentrated employment and housing with direct access to high-capacity transit, and a wide range of supportive land uses such as retail, recreation, public facilities, parks and open space.

Goal UVG27 – Encourage growth in locations within the city that support more compact and less land-consuming, high quality urban living.

Policy UV16 – Designate the following locations as urban centers as shown in Urban Village Figure 2-7: Downtown Seattle; First Hill/Capitol Hill; Uptown Queen Anne; **University Community**; Northgate; and South Lake Union.

Policy UV18 – Promote the balance of uses in each urban center indicated by one of the following designations, assigned as follows: University District – Mixed Residential and Employment.

Policy UV46 – Consider open space provisions identified in adopted neighborhood plans, including specific open space sites and features, in guiding the expansion of the open space network.

Discussion: *The University of Washington is located within one of the City of Seattle's designated urban centers (the University Community Urban Center). The University is the largest employer in this area and provides a vital and active urban environment. The 2018 Seattle Campus Master Plan would promote increased employment and residential densities, consistent with the intent of urban villages. The provision of increased building heights on the campus under the 2018 Seattle Campus Master Plan would create a more efficient use of limited land resources on campus and would allow for the provision of other supportive land uses, including additional open space areas within the campus. Consistent with the goal of promoting growth near transit, existing and future light rail stations are located on and adjacent to the campus, and the University would continue to be served by numerous bus routes in the vicinity of the campus.*

Land Use Element

Goal LUG32 – Maximize the public benefits of major institutions, including health care and educational services, while minimizing the adverse impacts associated with development and geographic expansion.

Goal LUG33 – Recognize the significant economic benefits of major institutions in the city and the region and their contributions to employment growth.

Goal LUG34 – Balance each major institution's ability to change and the public benefit derived from change with the need to protect the livability and vitality of adjacent neighborhoods.

Policy LU181 – Provide for the coordinated growth of major institutions through major institution conceptual master plans and the establishment of major institution overlay zones.

Policy LU183 – Allow modifications to the underlying zone provisions in order to allow major institutions to thrive while ensuring that impacts of development on the surrounding neighborhood are satisfactorily mitigated.

Policy LU187 – Encourage significant community involvement in the development, monitoring, implementation, and amendment of major institution master plans, including establishment of citizen advisory committees containing community and major institution members.

Policy LU188 – Encourage Advisory Committee participation throughout the process of revision, amendment and refinement of the master plan proposal.

Policy LU201 – Use the master plan to: 1) Give clear guidelines and development standards on which the major institutions can rely for long-term planning and development; 2) Provide the neighborhood advance notice of development plans of the major institution; 3) Allow the City to anticipated and plan for public capital or programmatic actions that will be needed to accommodate development; and, 4) Provide the basis for determining mitigating actions to avoid or reduce adverse impacts from major institution growth.

Discussion: *The University of Washington provides public benefit for the State of Washington through its educational services and as one the major employers in the University Community Urban Center.* The *2018 Seattle Campus Master Plan identifies and coordinates planned future growth on the University Campus to meet the future enrollment demands of the University. The Plan requests modifications to the current allowable maximum height limits on the campus to allow for taller and slimmer buildings, which represent and efficient use of land that would allow for the retention of existing open spaces on the campus and reservation of space for new potential open spaces identified in the 2018*

Seattle Campus Master Plan. The Plan also identifies guidelines and development standards for future development of the campus. Community involvement has been a major element of the development of the plan through coordination with the City-University-Community Advisory Committee (CUCAC), public open houses that were held for the Campus Master Plan and EIS scoping, and public hearings that will be conducted as part of the Draft Campus Master Plan and Draft EIS.

City of Seattle Neighborhood Plans

Summary: The City's Comprehensive Plan establishes guidelines for neighborhoods to develop their own plans to allow growth in ways that provide for a neighborhood's unique character, needs and livability. The University of Washington campus is located within the University Community Urban Center planning area. Following an extensive community-based planning effort, the Seattle City Council adopted the *University Community Urban Center Plan* (UCUC Plan) in August 1998.

Over the past four years, the City of Seattle has been working with the University District community to develop the University District Urban Design Framework which is intended to provide for more diverse neighborhood character by encouraging a mix of housing types, uses, building types and heights, while allowing a greater concentration of development in the area surrounding the future light rail station. As part of the plan, increased height and density would be permitted in areas to achieve the goals of the plan. As part of the planning process, the *Strategic Plan for Seattle's University District* was completed in January 2013 and *University District Urban Design Framework* was completed in June 2013 to provide urban design, zoning, and land use recommendations to make the University District an attractive, environmentally-supportive, walkable, and transit-friendly neighborhood. The City also completed an EIS as part of the process to analyze the potential environmental impacts associated with a range of potential height, density and design chances in the University District. The *University District Urban Design Draft EIS* was issued in April 2014 and the *University District Urban Design Final EIS* was issued in January 2015. Based on these plans and the EIS, the City of Seattle approved amendments to the Comprehensive Plan in June 2015 that included amendments to the Future Land Use Map (revising designations in some areas and adjustments to the Urban Center boundary), and amendments to consolidate and revise several goals and policies in the University Community Urban Center section of the Neighborhood Planning Element of the Comprehensive Plan. The City of Seattle is evaluating proposed zoning changes to the Land Use Code that would allow for greater height and density in the areas surrounding the light rail station at NE 43rd Street and Brooklyn Avenue NE, and implement new development standards to help new development fit with the University District neighborhood context. The proposed changes would also implement new affordable housing and open space requirements, as well as incentives for child care, historic preservation, and street

improvements. The proposed zoning changes are anticipated to be considered by the Seattle City Council over the next several months.

Discussion: *Implementation of development contemplated in the 2018 Seattle Campus Master Plan would result in a consolidation of uses on campus, replacement of some buildings and the reservation of space for potential new open space areas. The proposed 2018 Seattle Campus Master Plan anticipates that the development of 6.0 million gsf of building area will be necessary to meet the building space needs over the planning horizon of the 2018 Seattle Campus Master Plan. Up to 1,000 new student housing beds would also be provided on campus. The proposed 2018 Seattle Campus Master Plan is intended to provide additional capacity on the University of Washington campus to accommodate anticipated demand for higher education services, provide space for new research and academic uses and partnerships, and to provide student housing opportunities.*

The proposed 2018 Seattle Campus Master Plan identifies increases in maximum building heights on the campus that would allow for taller development within the campus (up to 240 feet in certain areas), that are generally consistent with proposed zoning changes for the University District. The Plan would also promote increased employment and residential densities consistent with the intent of the University District Urban Design Framework.

1998 Agreement Between the City of Seattle and the University of Washington

Summary: Originally signed by the City of Seattle and University of Washington in 1983, this agreement committed the University to prepare a campus master plan and EIS, and include specific guidelines for the master plan and EIS process. *The 1998 City-University Agreement* states "this Agreement is to define certain ways wherein the University, in its planning and development, may fulfill its mission in such a way as to continue to enhance the positive impacts on the City as a whole and particularly upon the surrounding communities, and at the same time minimize any adverse impacts it may have by working cooperatively with appropriate City agencies and community groups in order that problems may be identified at the earliest possible stage and that, where necessary, mitigating actions can be taken to maximize positive impacts and minimize adverse impacts upon the City and particularly the communities surrounding the University."

The 1998 City-University Agreement contains provisions for the following:

- Formulation of a Master Plan – Guidelines for the formulation of the Master Plan are provided. This 10-year plan should include identification of boundary changes; proposed institutional and non-institutional zone designations; general location of buildings, parking and open space; development standards; and, a transportation plan.

- Procedures for Consideration, City Approval and University Adoption of the University Master Plan – The procedures relating to public meetings (including formation of CUCAC), City and public review of the Draft Master Plan and EIS, and the City's process for approval of the Master Plan are specified.
- Changes to the University Master Plan – The procedures for changing elements of an adopted Master Plan are specified.
- University-Community Relations/City-Community Advisory Committee – Procedures and recommendations for achieving public input into the Master Planning process are provided. Procedures for the formation and operation of a City University Community Advisory Committee (CUCAC) are defined. The role of the CUCAC in the formation and review of the Master Plan is specified.
- Traffic and Transportation-Related Issues – A detailed set of goals, objectives and detailed requirements for monitoring transportation programs is provided. The collection of traffic survey data along with maximum limits on total campus trips and campus parking spaces form the centerpiece of the transportation program.

Discussion: The *2018 Seattle Campus Master Plan* follows the process and is consistent with the provisions of the *1998 City-University Agreement*.

The inability of the University of Washington to develop the six (6) million net new gsf of development, as well as open space and circulation improvements, to meet the anticipated demand over the 10-year planning horizon of the 2018 Seattle Campus Master Plan would result in the following:

- *Loss of the ability to meet the following University of Washington CMP goals:*
  - *Meet the University's education, research and service mission;*
  - *Better connect with the broader community*
  - *Extend commitment to sustainable land use; and,*
  - *Contribution to job growth and economic development.*
- *Identified park, open space and transportation improvements to enhance campus safety, mobility and recreational conditions identified in the Plan would not occur.*

With the projected student, faculty and staff demands and without new on-campus construction to meet increased building space demand, it is possible that the University could seek opportunities to more-intensively utilize existing campus space (e.g., more classes commencing before 8 AM, more evening classes, weekend classes, more-intensive summer programs, etc.), further utilize on-line learning opportunities, and expand the amount of off-campus leased space both within and outside the Primary and Secondary Impact zones noted in the 1998 City-University Agreement. Given the speculative nature of more-intensive utilization of existing facilities, however, it is assumed that the campus population would remain similar to 2015 conditions.

Seattle Land Use and Zoning Code

Summary: Master planning and land use for University development is governed by the *1998 City-University Agreement*. Seattle Municipal Code (SMC) 23.69.006B states the following:

> For the University of Washington, notwithstanding subsection A of this section, the 1998 agreement between the City of Seattle and the University of Washington, or its successor, shall govern relations between the City and the University of Washington, the master plan process (formulation, approval and amendment), uses on campus, uses outside the campus boundaries, off-campus land acquisition and leasing, membership responsibilities of CUCAC, transportation policies, coordinated traffic planning for special events, permit acquisition and conditioning, relationship of current and future master plans to the agreement, zoning and environmental review authority, resolution of disputes, and amendment or termination of the agreement itself. Within the Major Institution Overlay (MIO) boundaries for the University of Washington, development standards of the underlying zoning may be modified by an adopted master plan or by an amendment or replacement of the 1998 Agreement between the City of Seattle and University of Washington.

Discussion: The *2018 Seattle Campus Master Plan* follows the process and is consistent with the provisions of the *1998 City-University Agreement*.

City of Seattle Land Use Code – Rezone Procedures and Criteria

Summary: SMC 23.34 establishes procedures and criteria for amending the City's Official Land Use Map (rezones). To the extent that the proposed building heights in the *2018 Seattle Campus Master Plan* require amendments to the City's official land use map, the relationship to the City of Seattle General Rezone Criteria (SMC 23.34.008) and Major Institution Overly Criteria (SMC 23.34.124) is presented below

SMC 23.34.008 Criteria A. To be approved, a rezone shall meet the following standards:

1. In urban centers and urban villages the zoned capacity for the center or village taken as a whole shall be no less than one hundred twenty-five percent (125%) of the growth targets adopted in the Comprehensive Plan for that center or village.
2. For the area within the urban village boundary of hub urban villages and for residential urban villages taken as a whole the zoned capacity shall not be less than the densities established in the Urban Village Element of the Comprehensive Plan.

Discussion: *The City of Seattle Comprehensive Plan was originally adopted in 1994 with the most recent update to the plan occurring in October 2015. The Comprehensive Plan identifies the University of Washington campus as a Major Institution and as part of the University Community Urban Center, which also includes the adjacent University District and*

Ravenna Neighborhood. The City of Seattle is also in the process of completing an update to the Comprehensive Plan. The Mayor's Recommended Plan was released in May 2016 and the City Council is anticipated to consider the Plan in the next few months. According to the existing Comprehensive Plan, the growth targets for the University Community Urban Center are 2,700 new households and 8,000 new jobs.

In September 2015, the City Council approved amendments to the Comprehensive Plan related to the University District to: reflect community input provided throughout the University District urban design process; update and consolidate goals and policies; and update the Future Land Use Map. A draft zoning proposal for the University District was released in May 2016 which would allow greater height and density, particularly in areas surrounding light rail at NE 43rd Street and Brooklyn Avenue NE. It would also apply new development standards to help new development fit into the neighborhood context; implement new affordable housing and open space requirements; and implement incentives for historic preservation and street improvements. The zoning proposal for the University District is anticipated to be considered by the Seattle City Council over the next several months.

Overall, implementation of development contemplated in the 2018 Seattle Campus Master Plan would result in a consolidation of uses on campus, replacement of some buildings and provision of new open space areas. The proposed 2018 Seattle Campus Master Plan anticipates that the development of 6.0 million gsf of building area will be necessary to meet the building space needs over the planning horizon of the 2018 Seattle Campus Master Plan. Under the plan, up to 1,000 new beds to provide housing opportunities to students would also be provided on campus

Thus, the proposed 2018 Seattle Campus Master Plan is intended to provide additional capacity on the University of Washington campus to accommodate anticipated campus growth and demand for higher education services, including new academic, research and partnership spaces, and to provide student housing opportunities. The 2018 Seattle Campus Master Plan would not result in a reduction of the zoned capacity of the University Community Urban Center.

Summary: SMC 23.34.008 Criteria B. Match Between Zone Criteria and Area Characteristics. The most appropriate zone designation shall be that for which the provisions for designation of the zone type and the locational criteria for the specific zone match the characteristics of the area to be rezoned better than any other zone designation.

Discussion: *The proposed zone changes under the 2018 Seattle Campus Master Plan relate to increase in allowable building height; no expansion of campus MIO boundary or change in underlying zoning is proposed.*

Summary: SMC 23.34.008 Criteria C. Zoning History and Precedential Effect. Previous and potential zoning changes both in and around the area proposed for rezone shall be examined.

Discussion: *In 1983, a City-University Agreement was adopted by the University of Washington Board of Regents and the Seattle City Council that set out the process for the University to prepare a comprehensive master plan and EIS for future campus development. The Agreement specified that the master plan and EIS include boundaries surrounding the campus and the Primary and Secondary Impact zones. Consistent with the 1983 Agreement, the University of Washington adopted the General Physical Development Plan in 1992.*

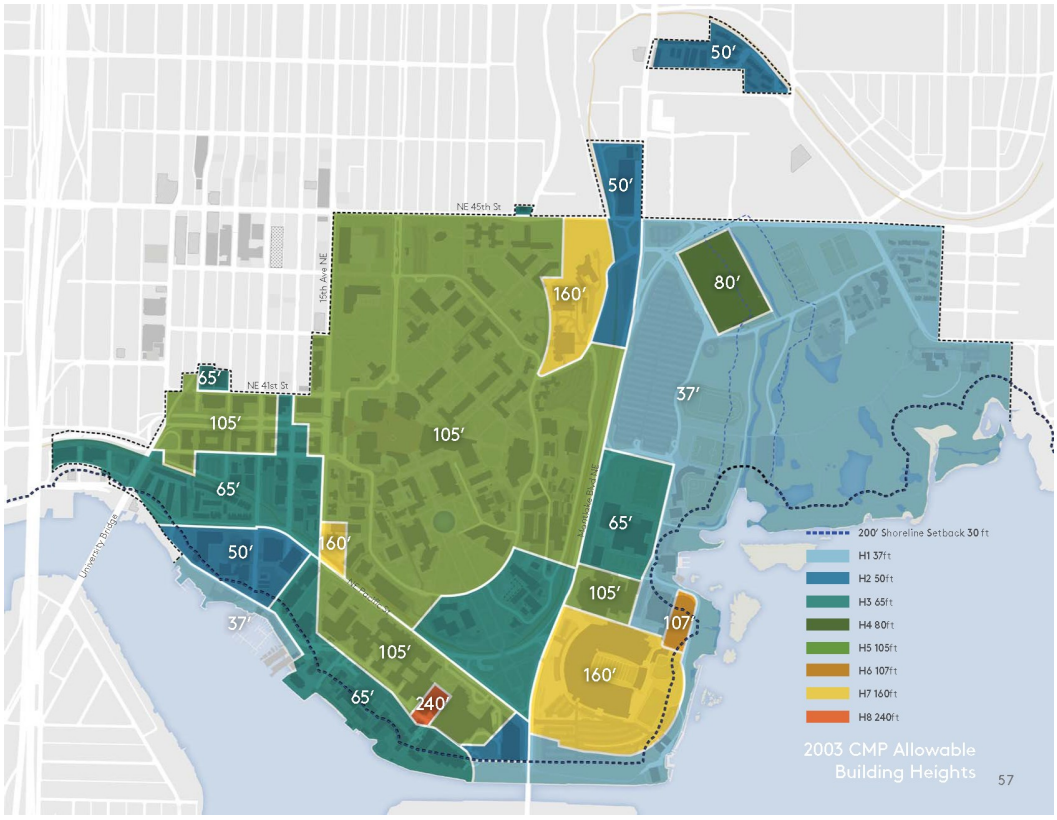
In 1998, a new, amended, City-University Agreement was adopted. The 1998 Agreement recognized that a substantial amount of growth was projected on the campus and that a new master plan would be prepared.
Consistent with the 1998 City-University Agreement, the University of Washington initiated a master planning process, including visioning, establishment of goals and objectives and community outreach. In 2003, the University of Washington Master Plan Seattle Campus (CMP Seattle 2003) was adopted. The CMP Seattle 2003 includes guidelines and policies for developing up to three (3) million gross square feet (gsf) on the Seattle campus[13]. The CMP Seattle 2003 included increases in allowable building heights as follows:

- *Increase from 37 feet to 80 feet at the golf driving range.*
- *Increase from 65 feet to 105 feet in the vicinity of University Way NE and NE Campus Parkway.*

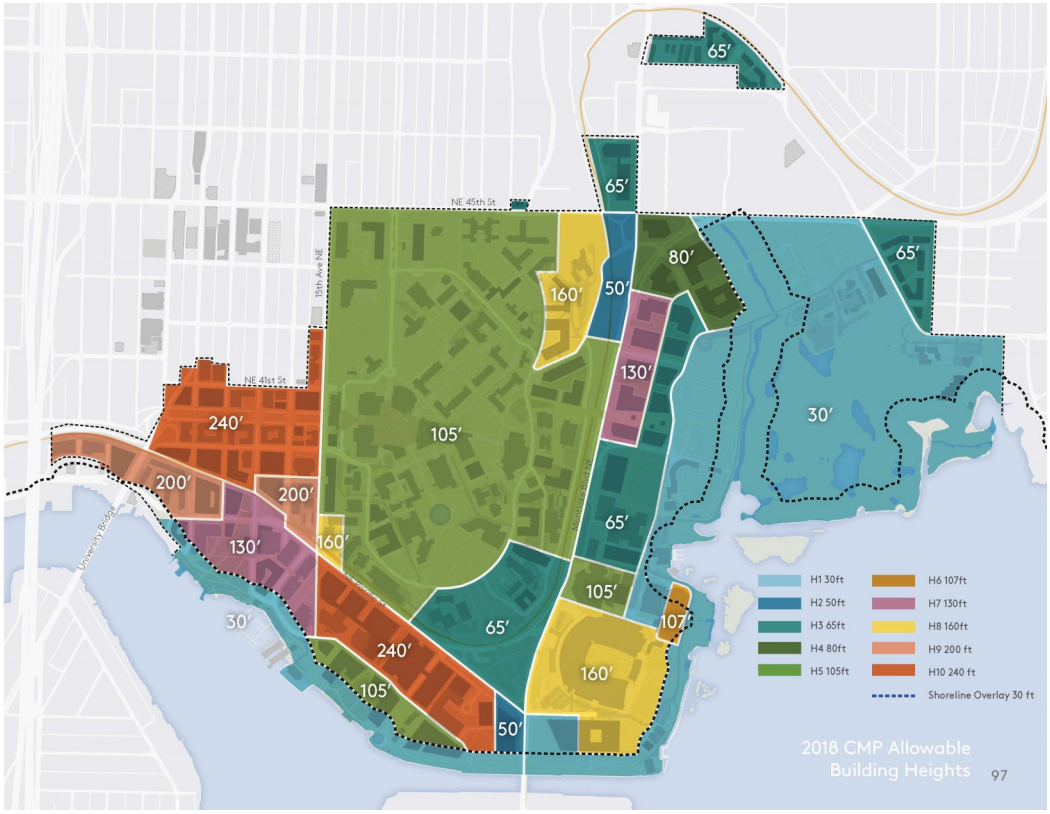
The 2018 Seattle Campus Master Plan addresses the need to conserve and enhance the valued historic environment on the Seattle campus while supporting future development to ensure the University's primary mission of "preservation, advancement, and dissemination of knowledge" is met. Major aspects of the plan include: planning for large areas of open space for active and passive recreation, providing transportation circulation improvements, and encouraging sustainability in the construction and operation of University facilities. The proposed zone changes (allowable height increases) are intended to help achieve the University's mission. See ***Figure 3.6-5*** *for an illustration of existing and proposed allowable building heights.*

The primary potential off-campus zoning action in the vicinity of the University of Washington campus is the University District Urban Design project. The University District Urban Design Final EIS identifies three primary alternatives for the zoning and development character of the U District, including: Alternative 1, medium tower heights with a more dispersed development pattern; Alternative 2, taller towers with a focused development

[13] The CMP Seattle 2003 identifies 68 development sites with approximately 8.2 million gsf of development capacity of which up to three million gsf would be developed.



Current 2003 CMP Allowable Building Heights



Proposed 2018 Seattle Campus Master Plan Building Heights

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.6-5

Existing and Proposed Building Heights

pattern; and, Alternative 3, current zoning with most dispersed development pattern. The proposed zone changes released in May 2016 (allowable building height increases) are intended be compatible with the City of Seattle's vision for the surrounding, adjacent University District area. The zoning proposal for the University District is anticipated to be considered by the Seattle City Council in the next several months.

Summary: SMC 23.34.008 Criteria D. Neighborhood Plans.

1. For the purposes of this title, the effect of a neighborhood plan, adopted or amended by the City Council after January 1, 1995, shall be as expressly established by the City Council for each such neighborhood plan.
2. Council adopted neighborhood plans that apply to the area proposed for rezone shall be taken into consideration.
3. Where a neighborhood plan adopted or amended by the City Council after January 1, 1995 establishes policies expressly adopted for the purpose of guiding future rezones, but does not provide for rezones of particular sites or areas, rezones shall be in conformance with the rezone policies of such neighborhood plan.
4. If it is intended that rezones of particular sites or areas identified in a Council adopted neighborhood plan are to be required, then the rezones shall be approved simultaneously with the approval of the pertinent parts of the neighborhood plan.

Discussion: *The University of Washington campus is located within the boundary of the University Community Urban Center Planning area (UCUC Plan). The UCUC Plan was adopted in 1998 and incorporated as part of the City's Comprehensive Plan.*

The goals and policies from the UCUC Plan most applicable to the proposed 2018 Seattle Campus Master Plan include:

Goal A-5 – Accommodate University of Washington growth in a way that benefits the community as well.

Policy A-5.1 – provide community input where appropriate into the University campus master plan process.

Goal D-1 – Increase open space to serve existing and projected need.

Goal D-5 – Improve the visual, spatial and circulatory connections between the UW and the community

The University of Washington coordinated with the City University Community Advisory Committee (CUCAC) during the formulation of the 2018 Seattle Campus Master Plan and CUCAC played a significant role in providing community input and guidance throughout the planning process. The University attended monthly CUCAC meetings to present updates and solicit feedback during the development of the plan.

The proposed increase in allowable building heights is intended, in part, to allow for the accommodation of building development needed to meet the demand for educational services and research through compact higher density development balanced with public spaces. The increase in allowable building heights would limit the number of development sites necessary to provide the desired building space, which allows opportunities to reserve space on campus for potential new public open spaces. Open space and view corridor connections associated with the proposed allowable building height increases are discussed below.

- *West Campus - from the current 37 to 105 feet to a range from 37 feet to 240 feet – The proposed increase in allowable height in the West Campus allows for the reservation of land for a new potential approximately five (5)-acre* ***West Campus Green*** *that would tie into the existing two (2)-acre Portage Bay Park, and would act to connect the West Campus Area and the University District to the waterfront. The increase in allowable building height would also allow for staggered towers creating view corridors and light access, and podiums (up to three-stories) with towers set-back above to provide pedestrian-scaled streetscapes.*

- *South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased – The proposed increase in allowable building height in the South Campus would allow for the reservation of space for a new potential open space located between the existing Magnuson Health Sciences Center pedestrian bridge over NE Pacific Street and Portage Bay. Associated with the redevelopment strategy for the South Campus Area, the Green Corridor concept is intended to enhance the existing pedestrian bridge and visually and spatially connect South and Central Campus Areas to the Waterfront. The Green Corridor would also connect with the Burke-Gilman Trail on the north and the Continuous Waterfront Trail on the south.*

- *East Campus – the current 37 foot to 160 foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet - The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. These changes in maximum building heights would create the opportunity for the development of new building space, while allowing for the retention of existing recreation opportunities and open spaces along the shoreline of the Union Bay Natural Area, provision of new open space opportunities and provision of view corridors. A portion of the 80-*

foot allowable building height at the golf driving range would be reduced to 30-feet to provide additional buffer from the canal. The area of East Campus east of Mary Gates Memorial Drive (Laurel Village) would increase from the current 37 feet to 65 feet to allow for additional housing opportunities.

The UCUC Plan does not include policies expressly adopted for the purpose of guiding future rezones.

Summary: SMC 23.34.008 Criteria E. Zoning Principles. The following zoning principles shall be considered:

1. The impact of more intensive zones on less intensive zones or industrial and commercial zones on other zones shall be minimized by the use of transitions or buffers, if possible. A gradual transition between zoning categories, including height limits, is preferred.
2. Physical buffers may provide an effective separation between different uses and intensities of development. The following elements may be considered as buffers: Natural features such as topographic breaks, lakes, rivers, streams, ravines and shorelines; freeways, expressways, other major traffic arterials, and railroad tracks; distinct change in street layout and block orientation; and open space and greenspaces.
3. Zone Boundaries.
    a. In establishing boundaries the following elements shall be considered: (1) Physical buffers as described in subsection E2 above; (2) Platted lot lines.
    b. Boundaries between commercial and residential areas shall generally be established so that commercial uses face each other across the street on which they are located, and face away from adjacent residential areas. An exception may be made when physical buffers can provide a more effective separation between uses.
4. In general, height limits greater than forty (40) feet should be limited to urban villages. Height limits greater than forty (40) feet may be considered outside of urban villages where higher height limits would be consistent with an adopted neighborhood plan, a major institution's adopted master plan, or where the designation would be consistent with the existing built character of the area.

Discussion: *The 2018 Seattle Campus Master Plan does not propose any change to the MIO zone boundaries. Uses on the campus would remain related to carrying out the mission of the University and would remain compatible with the characteristics of the surrounding area.*

- *<u>West Campus - from the current 37 to 105 feet to a range from 37 feet to 240 feet</u> – the 2018 Seattle Campus Master Plan proposes that the maximum building height limits would be increased in the West Campus from the current range of 30 to 105 feet to the proposed range of 30 to 240 feet; the assumed maximum building height assumed would be highest north of NE Pacific Street, and would step down to the south toward Portage Bay. The increase in the maximum building height limit in the West Campus is intended to allow for the desired new building space to be accommodated by compact higher density development balanced with the reservation of space for new potential public open spaces. This building height increase would allow for development on fewer potential development sites so as to accommodate room for potential new open space improvements like the West Campus Green and other public spaces, allow staggered towers to provide view corridors and light access, and allow podiums (up to three-stories) with towers set back above to provide pedestrian-scaled streetscapes.*

  The increased building heights would represent a change in the existing character of land use in West Campus to a taller and denser urban environment and would be similar in height to some of the tallest buildings within the University District area (i.e. the UW Tower, Hotel Deca, multifamily residential buildings, etc.). The tallest building heights would be located north of NE Pacific Street and adjacent to the University District area; building heights would get progressively lower to the south as it approaches the shoreline. Although these increased heights would represent an increase in building heights when compared to the current building heights in the area, they would be compatible with potential future development if height increases are implemented in the University District as identified in the University District Urban Design Framework Plan.

  As indicated above, the West Campus sector is located in a highly developed urban environment, with the primary separation between proposed development in West Campus with increased building heights provided by roadways such as NE 40th Street, Roosevelt Way NE, and NE 41st Street. The proposed building height increase is intended, on part, to integrate with the compact urban environment of the University District.

  Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the West Campus.

- *South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased - The 2018 Seattle Campus Master Plan proposes building heights up to 240 feet in the north portion of the South Campus (adjacent to NE Pacific Street). While the provision of taller building heights would represent an increase over the 2003 CMP-Seattle (small portions of the South Campus are allowed up to 240 feet in the 2003 CMP-Seattle), it would also create the opportunity for the increased building density to be accommodated by compact, high density development which would allow for the reservation of additional campus areas for use as open space, circulation and/or landscaping. This reservation of space for potential new open space, circulation and landscaping would enhance the aesthetic character of the South Campus along NE Pacific Street, which is predominantly comprised of building development in its current state. The allowance of taller buildings would also allow for the reservation of space for a view corridor and open space area within the central portion of the South Campus (the planned South Campus Green Corridor), which would enhance the aesthetic character and allow for additional views of Portage Bay.*

  Physical buffers between proposed development at South Campus with increased building heights and existing uses to the south include the Lake Washington Ship Canal and Portage Bay. The separation provided by these natural features would provide an effective buffer between proposed South Campus development with increased building heights and off-campus uses.

  Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the South Campus.

- *East Campus – the current 37 foot to 160 foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet - The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. These changes in maximum building heights would create the opportunity for the development of new building space, while allowing for the retention of existing recreational opportunities and open space areas along the shoreline of the Union Bay Natural Area, reservation of space for new potential open space opportunities and provision of view corridors. The 80-foot allowable building height at the golf driving range would be reduced to 30-feet to provide additional buffer from the canal. The area of East Campus east of Mary Gates Memorial Drive (Laurel*

Village) would increase from the current 37 feet to 65 feet to allow for additional housing opportunities.

Physical buffers between proposed development at East Campus with increased building heights at parking Lot E1 with increased building heights and existing uses to the east would be provided by the retained Union Bay Natural Area. The major traffic arterial of NE 45th Street would provide a separation between proposed East Campus and existing uses to the north. The separation provided by these natural and roadway features would provide effective buffers between proposed development with increased building heights at East Campus and off-campus uses.

Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the East Campus.

Summary: SMC 23.34.008 Criteria F. Impact Evaluation. The evaluation of a proposed rezone shall consider the possible negative and positive impacts on the area proposed for rezone and its surroundings.

1. Factors to be examined include, but are not limited to, the following: housing, particularly low-income housing; public services; environmental factors, such as noise, air and water quality, terrestrial and aquatic flora and fauna, glare, odor, shadows, and energy conservation; pedestrian safety; manufacturing activity; employment activity; character of areas recognized for architectural or historic value; and shoreline view, public access and recreation.

Further discussion of each of the Criteria F – Impact Evaluation is described below.

Summary: Low Income Housing

Discussion: *No existing low-income housing would be permanently displaced under the 2018 Seattle Campus Master Plan. The 2018 Seattle Campus Master Plan includes provisions for up to 1,000 additional student housing beds on the University of Washington campus and proposed increases allowable building heights in the West and East campus would provide opportunities for increased levels of housing in the area.*

Summary: Noise, air and water quality, terrestrial and aquatic flora and fauna, glare, odor, shadows, and energy conservation; pedestrian safety; manufacturing activity; employment activity; character of areas recognized for architectural or historic value

Discussion:

- *West Campus - from the current 37 to 105 feet to a range from 37 feet to 240 feet – The proposed increase in the allowable building height is intended to allow for the new building space anticipated to be needed through the 10-year planning horizon to be accommodated through compact higher density development balanced with reservation of space for public spaces.*

  This Draft EIS includes analysis of conditions both with proposed increase in allowable building heights (Alternative 1) and without the proposed increase in allowable building heights (Alternative 2). The increased building height scenario analyzed under Alternative 1 would increase the potential for increased shadows associated with certain buildings in West Campus compared to existing conditions. However, without the proposed increase in allowable building heights (Alternative 2), the number of individual buildings in West Campus would be necessarily increased in order to provide the building space, thus resulting in greater shadowing conditions in some portions of the West Campus compared to Alternative 1. Note that without the proposed increase in allowable building height; the preferred allocation of building space for West campus cannot be achieved, requiring transfer of this needed building space to other portions of the campus and resulting in potential inefficiencies in meeting the educational and research demands. Refer to Section 3.8, ***Light, Glare and Shadows****, of this Draft EIS for detail.*

  Conditions associated with noise, air quality, water quality, terrestrial and aquatic fauna, glare, odor and energy conservation in West Campus are analyzed in this Draft EIS. In general, conditions for these elements would not be substantially different with proposed allowable building height (Alternative 1) and with current allowable building heights (Alternative 2. Please refer to the ***Air Quality, Historic Resources, Cultural Resources, Land Use, and Aesthetics*** *sections of this Draft EIS.*

  Conditions associated with earthwork, recreation and open space, stormwater, and construction would result in a greater potential for impacts with the currently allowable building heights (Alternative 2) than with the proposed increase in allowable building heights (Alternative 1); for example, approximately 5-acres of planned open space in West Campus provided with the increase in allowable building heights (Alternative 1) would not be provided under current building heights (Alternative 2), resulting in less recreational opportunities and more surface water runoff. Please refer to the ***Recreation and Open Space****,* ***Utilities*** *and* ***Construction Impacts*** *sections of this Draft EIS for detail.*

- *South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased. Development in this area of campus is currently a dense cluster of health sciences/medical buildings ranging from five to 13-stories tall with limited accessibility between the north edge of the area (along NE Pacific Street)*

and the waterfront. The proposed increase in allowable building height would allow for potential future development under the 2018 Seattle Campus Master Plan to remove and redevelop many of the existing buildings to provide denser and taller buildings which would allow the opportunity for areas reserved for potential new open space and connections through the South Campus sector, such as the South Campus Green Corridor and the establishment of north/south view corridors.

This Draft EIS includes analysis of conditions both with proposed increase in allowable building heights (Alternative 1) and without the proposed increase in allowable building heights (Alternative 2). The increased building height analyzed under Alternative 1 would increase the potential for shadows associated with certain buildings in South Campus compared to existing conditions. Without the proposed increase in allowable building heights (Alternative 2), however, the footprints of certain buildings would increase in order to provide the building space, thus resulting in greater shadowing conditions in some portions of the South Campus compared to Alternative 1; refer to Section 3.8, ***Light, Glare and Shadows****, of this Draft EIS for detail.*

Conditions associated with noise, air quality, water quality, terrestrial and aquatic fauna, glare, odor and energy conservation in South Campus are analyzed in this Draft EIS. In general, conditions for these elements would not be substantially different with proposed allowable building height (Alternative 1) and with current allowable building heights (Alternative 2. Please refer to the ***Air Quality, Historic Resources, Cultural Resources, Land Use, and Aesthetics*** *sections of this Draft EIS.*

- *East Campus – the current 37 foot to 160 foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet. The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. These changes in maximum building heights would create the opportunity for the development of new building space, while allowing for the retention of existing recreation opportunities and open space areas along the shoreline of the Union Bay Natural Area, and the reservation of space for new open space opportunities and view corridors.*

  This Draft EIS includes analysis of conditions both with proposed increase in allowable building heights (Alternative 1) and without the proposed increase in allowable building heights (Alternative 2). The increased building height analyzed under Alternative 1 would increase the potential for increased shadows associated with certain buildings in West Campus compared to existing conditions. However, without the proposed increase in allowable building heights (Alternative 2), the

number of individual buildings would be necessarily increased in order to provide the building space, thus resulting in greater shadowing conditions in some portions of the West Campus compared to Alternative 1; refer to ***Section 3.8, Light, Glare and Shadows****, of this Draft EIS for detail.*

Conditions associated with noise, air quality, water quality, terrestrial and aquatic fauna, glare, odor and energy conservation in West Campus are analyzed in this Draft EIS. In general, conditions for these elements would not be substantially different with proposed allowable building height (Alternative 1) and with current allowable building heights (Alternative 2. Please refer to the ***Air Quality, Historic Resources, Cultural Resources, Land Use, and Aesthetics*** *sections of this Draft EIS.*

Summary: Shoreline view, public access and recreation.

Discussion:

- *West Campus - from the current 37 to 105 feet to a range from 37 feet to 240 feet – The proposed increase in the allowable building height is intended to allow for the new building space anticipated to be needed through the 10-year planning horizon to be accommodated through compact higher density development balanced with public spaces. The increase in building height would allow for development on limited number potential development sites, which would allow opportunities for areas to be reserved for potential new public open spaces (including the 5-acre West Campus Green). The increase in allowable building height would also allow for the accommodation on building space in staggered towers to allow for view corridors and light access, and podiums (up to three-stories) with towers setback above to provide pedestrian-scaled streetscapes. Overall, the proposed height increase would allow substantial public access to open spaces and the waterfront.*

  This Draft EIS includes analysis of conditions both with proposed increase in allowable building heights (Alternative 1) and without the proposed increase in allowable building heights (Alternative 2). Without the proposed increase in allowable building height (Alternative 2), the number of individual buildings in West Campus would be increased in order to provide the building space needed and the 5-acre area reserved for the for the West Campus Green under Alternative 1 would be in building development (thus, without the increase in allowable building height the amount of area reserved for public open space in West Campus would be substantially reduced).

- *South Campus – the current 37-foot to 240-foot range would be maintained, with the amount of area in 240-foot height increased. Development in this area of campus is currently a dense cluster of health sciences/medical buildings ranging*

from five to 13-stories tall with limited accessibility between the north edge of the area (along NE Pacific Street) and the waterfront. The proposed increase in allowable building height would provide for potential future development under the 2018 Seattle Campus Master Plan to remove and redevelop many of the existing buildings to provide denser and taller building development which would provide the opportunity for areas reserved for potential new open space, connections through the South Campus sector (e.g., the South Campus Green Corridor), and north/south view corridors.

This Draft EIS includes analysis of conditions both with the proposed increase in allowable building heights (Alternative 1) and without the proposed increase in allowable building heights (Alternative 2). Without the proposed increase in allowable building height (Alternative 2), the footprint of individual buildings in South Campus would be increased in order to provide the building space and the ability to provide north/south view corridors would be reduced.

- *East Campus – the current 37-foot to 160-foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65 feet to 130 feet - The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. These changes in maximum building heights would create the opportunity for the development of new building space, while allowing for the retention of existing recreation opportunities and open space areas along the shoreline of the Union Bay Natural Area. The changes would also allow for the reservation of space for potential new open space opportunities and view corridors. The portion of the 80-foot allowable building height at the golf driving range would be reduced to 30-feet to provide additional buffer from the canal.*

Summary: SMC 23.34.008 Criteria F. Impact Evaluation. The evaluation of a proposed rezone shall consider the possible negative and positive impacts on the area proposed for rezone and its surroundings.

2. Service Capacities. Development which can reasonably be anticipated based on the proposed development potential shall not exceed the service capacities which can reasonably be anticipated in the area, including: street access to the area; street capacity in the area; transit service; parking capacity; utility and sewer capacity; and shoreline navigation.

Discussion: *The following provides a discussion on the proposed increase in allowable building heights in regards to service capacities by campus sector.*

- *West Campus - from the current 37 to 105 feet to a range of from 37 feet to 240 feet – The proposed increase in the allowable building height is intended to allow for the new building space anticipated to be needed through the 10-year planning horizon to be accommodated through compact higher density development balanced with public spaces.*

  The proposed allowable height increase in West Campus would provide the opportunity for increased housing, educational, research and employment on the campus. These increased opportunities would increase demands on area streets, transit, parking, utilities and other area services. West Campus development with the increase in allowable height would not result in significant impacts to area services, and would not result in greater service demands than would occur under current allowable building heights (Alternative 2). Refer to Sections 3.13 ***– Public Services****, 3.14* ***– Utilities*** *and 3.15* ***– Transportation*** *for discussion on service conditions with and without increase in allowable heights.*

- *South Campus – the current 37-foot to 240-foot range would be maintained, with the amount of area in 240-foot height increased. Development in this area of campus is currently a dense cluster of health sciences/medical buildings ranging from five to 13-stories tall with limited accessibility between the north edge of the area (along NE Pacific Street) and the waterfront. The proposed allowable height increase in South Campus would provide the opportunity for increased housing, educational, research and employment on the campus. These increased opportunities would increase demands on area streets, transit, parking, utilities and other area services. South Campus development with the increase in allowable height would not result in significant impacts to area services, and would not result in greater service demands than would occur under current allowable building heights (Alternative 2). Refer to Sections 3.13* ***– Public Services****, 3.14* ***– Utilities*** *and 3.15* ***– Transportation*** *for discussion on service conditions with and without increase in allowable heights.*

- *East Campus – the current 37-foot to 160-foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65 feet to 130 feet. The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. The proposed allowable height increase in East Campus would provide the opportunity for increased housing, educational, research and employment on the campus. These increased opportunities would increase demands on area streets, transit, parking, utilities and other area services. East Campus development with the increase in allowable height would not result in*

significant impacts to area services, and would not result in greater service demands than would occur under current allowable building heights (Alternative 2). Refer to Sections 3.13 ***– Public Services****, 3.14* ***– Utilities*** *and 3.15* ***– Transportation*** *for discussion on service conditions with and without increase in allowable heights.*

Summary: SMC 23.34.008 Criteria G. Changed Circumstances. Evidence of changed circumstances shall be taken into consideration in reviewing proposed rezones, but is not required to demonstrate the appropriateness of a proposed rezone. Consideration of changed circumstances shall be limited to elements or conditions included in the criteria for the relevant zone and/or overlay designations in this chapter.

Discussion: *Since approval of the CMP Seattle 2003, development on the University of Washington campus has occurred under that Plan and all but approximately 211,000 gsf of the 3 million gsf authorized under the CMP Seattle 2003 has been developed. The proposed 2018 Seattle Campus Master Plan, including the proposed increase in allowable building height, is intended to allow a level of new development on the campus to accommodate projected demands on campus, including enrollment growth, and increased teaching and research demands.*

Summary: SMC 23.34.008 Criteria H. Overlay Districts. If the area is located in an overlay district, the purpose and boundaries of the overlay district shall be considered.

1. Critical Areas. If the area is located in or adjacent to a critical area (SMC Chapter 25.09), the effect of the rezone on the critical area shall be considered.
2. Incentive Provisions. If the area is located in a zone with an incentive zoning suffix a rezone shall be approved only if one of the following conditions are met: 1) The rezone includes incentive zoning provisions that would authorize the provision of affordable housing equal to or greater than the amount of affordable housing authorized by the existing zone; or 2) If the rezone does not include incentive zoning provisions that would authorize the provision of affordable housing equal to or greater than the amount of affordable housing authorized by the existing zone, an adopted City housing policy or comprehensive plan provision identifies the area as not a priority area for affordable housing, or as having an adequate existing supply of affordable housing in the immediate vicinity of the area being rezoned.

Discussion*: According to the City of Seattle Zoning Map, the University of Washington campus is overlain with the Major Institution Overlay designation (MIO). However, the 1998 Agreement between the City of Seattle and the University of Washington (Agreement) establishes a process for the formation of a master plan to guide University development. Consistent with the Agreement, the 2018 Seattle Campus Master Plan includes campus boundaries, policies, standards and a transportation management plan. The proposed request to revise allowable heights is included as a part of the master plan process and*

consistent with the Agreement. No changes to the campus boundaries are proposed with the 2018 Seattle Campus Master Plan.

The following provides a discussion on identified critical area in the campus sectors where increase in allowable height is proposed.

- *West Campus - from the current 37 to 105 feet to a range of from 37 feet to 240 feet – Identified SMC 25.09 environmentally critical areas in the West Campus sector include Steep Slope Area. As indicated in Section 3.1* ***– Earth****, the proposed increase in allowable building height in West Campus would not increase the potential to impact steep slopes.*

- *South Campus – the current 37-foot to 240-foot range would be maintained, with the amount of area in 240-foot height increased. Identified SMC 25.09 environmentally critical areas in the South Campus sector include Steep Slope Area and Peat-Settlement Area. As indicated in Section 3.1* ***- Earth****, the proposed increase in height in the South Campus would not increase the potential to impact steep slopes or peat-settlement areas.*

- *East Campus – the current 37-foot to 160-foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65 feet to 130 feet. Identified SMC 25.09 environmentally critical area in the East Campus sector includes Steep Slope Area, Liquefaction Area, Abandoned Landfill Area, Peat-Settlement Area, and Wetlands. As indicated in Section 3.1* ***– Earth*** *and Section 3.3* ***– Wetlands, Plants and Animals****, the proposed increase in height in the East Campus would not increase the potential to impact steep slopes, peat-settlement, liquefaction, and wetland areas.*

Summary: SMC 23.34.124 establishes the purpose and criteria for rezones within Major Institution Overlay (MIO) districts.

A. Public Purpose: The applicant shall submit a statement which documents the reasons the rezone is being requested, including a discussion of the public benefits resulting from the proposed expansion, the way in which the proposed expansion will serve the public purpose mission of the major institution, and the extent to which the proposed expansion may affect the livability of the surrounding neighborhood. Review and comment on the statement shall be requested from the appropriate Advisory Committee as well as relevant state and local regulatory and advisory groups. In considering rezones, the objective shall be to achieve a better relationship between residential or commercial uses and the Major Institution uses, and to reduce or eliminate major land use conflicts in the area.

Discussion: *The proposed 2018 Seattle Campus Master Plan, including the proposed increase in allowable building height, is intended to allow a level of new development on the campus to accommodate projected demands on campus, including enrollment growth, and increased teaching and research demands. The increase in allowable building heights would limit the number of development sites necessary to provide the desired building space, which allows opportunities to reserve space on campus for potential new public open spaces.*

Summary: C. Height Criteria: The following height criteria shall be used in the selection of appropriate height designations for: 1) proposed new Major Institution Overlay districts; 2) proposed additions to existing MIO districts; and 3) proposed modifications to height limits within existing MIO districts;

1. Increases to height limits may be considered where it is desirable to limit MIO district boundary by expansion.
2. Height limits at the district boundary shall be compatible with those in the adjacent areas.
3. Transitional height limits shall be provided wherever feasible when the maximum permitted height within the overlay district is significantly higher than permitted in areas adjoining the major institution campus.
4. Height limits should generally not be lower than existing development to avoid creating non-conforming structures.
5. Obstruction of public scenic or landmark views to, from or across a major institution campus should be avoided where possible.

Discussion: *The proposed zone changes under the 2018 Seattle Campus Master Plan relate to an increase in allowable building height; no expansion of campus boundary or change in underlying zoning is proposed.*

- West Campus - from the current 37 to 105 feet to a range from 37 feet to 240 feet – *the 2018 Seattle Campus Master Plan proposes that the maximum building height limits would be increased in the West Campus from the current range of 30 to 105 feet to the proposed range of 30 to 240 feet; the assumed maximum building height assumed would be highest north of NE Pacific Street, and would step down to the south toward Portage Bay. The increase in the maximum building height limit in the West Campus is intended to allow for the desired new building space to be accommodated by compact higher density development balanced with the reservation of space for new potential public open spaces. This building height increase would allow for development on fewer potential development sites so as to accommodate room for potential new open space improvements like the West Campus Green and other public spaces, allow staggered towers to provide view corridors and light access, and allow podiums (up to three-stories) with towers set back above to provide pedestrian-scaled streetscapes. Development in the West*

Campus with the proposed increase in allowable building height would not obstruct public scenic or landmark views (refer to Section 3.9 - ***Aesthetics*** *for detail).*

The increased building heights would represent a change in the existing character of land use in West Campus to a taller and denser urban environment and would be similar in height to some of the tallest buildings within the University District area (i.e. the UW Tower, Hotel Deca, multifamily residential buildings, etc.). The tallest building heights would be located north of NE Pacific Street and adjacent to the University District area; building heights would get progressively lower to the south as it approaches the shoreline. Although these increased heights would represent an increase in building heights when compared to the current building heights in the area, they would be compatible with potential future development if height increases are implemented in the University District as identified in the University District Urban Design Framework Plan.

Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the West Campus.

- *South Campus – the current 37 foot to 240 foot range would be maintained, with the area in 240 foot height increased - The 2018 Seattle Campus Master Plan proposes building heights up to 240 feet in the north portion of the South Campus (adjacent to NE Pacific Street). While the provision of taller building heights would represent an increase over the 2003 CMP-Seattle (small portions of the South Campus are allowed up to 240 feet in the 2003 CMP-Seattle), it would also create the opportunity for the increased building density to be accommodated by compact, high density development which would allow for the reservation of additional campus areas for use as open space, circulation and/or landscaping. This reservation of space for potential new open space, circulation and landscaping would enhance the aesthetic character of the South Campus along NE Pacific Street, which is predominantly comprised of building development in its current state. The allowance of taller buildings would also allow for the reservation of space for a view corridor and open space area within the central portion of the South Campus (the planned South Campus Green Corridor), which would enhance the aesthetic character and allow for additional views of Portage Bay. Development in the South Campus with the proposed increase in allowable building height would not obstruct public scenic or landmark views (refer to Section 3.9 -* ***Aesthetics*** *for detail).*

  Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased

building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the South Campus.

- *East Campus – the current 37 foot to 160 foot range would be maintained, with the allowable height at E1 parking lot increased from 37 feet to a range of 65-feet to 130-feet - The focus of allowable building height increases in East campus is the area encompassing the existing E1 Parking Lot. For the E1 parking lot area along Montlake Boulevard NE, 130-foot building heights would be allowed, while 65-foot building heights would be located further east within the internal portions of the East Campus. These changes in maximum building heights would create the opportunity for the development of new building space, while allowing for the retention of existing recreational opportunities and open space areas along the shoreline of the Union Bay Natural Area, reservation of space for new potential open space opportunities and provision of view corridors. The 80-foot allowable building height at the golf driving range would be reduced to 30-feet to provide additional buffer from the canal. The area of East Campus east of Mary Gates Memorial Drive (Laurel Village) would increase from the current 37 feet to 65 feet to allow for additional housing opportunities. Development in the East Campus with the proposed increase in allowable building height would not obstruct public scenic or landmark views (refer to Section 3.9* ***- Aesthetics*** *for detail).*

  Development standards are identified in the 2018 Seattle Campus Master Plan and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the 2018 Seattle Campus Master Plan would minimize potential impacts associated with increased building heights in the East Campus.

City of Seattle Street Vacation Policies

Summary: The *2018 Campus Master Plan* identifies potential street, alley, and aerial vacations that may occur over the 10-year planning horizon. All of the vacations are potential and none are imminent or essential to the implementation of the *2018 Campus Master Plan*. The potential vacations are intended to improve circulation and open space conditions and would not increase the amount of building development capacity of the campus. These potential vacations are included in the *2018 Campus Master Plan* for disclosure purposes only; no petitions or applications are pending. No master plan amendment would be necessary when a street or aerial vacation is proposes, provided that the proposal is consistent with the range of alternatives identified.

The City of Seattle Street Vacation Policies (Clerk File 310078) provide policies to guide City Council decisions regarding the vacation of public rights-of-way. In making the decision, the Council weighs three components of the public interest, including:

1. Public Trust Functions – Consider the impact of the vacation upon the circulation, access, utilities, light, air, open space and views provided by the right-of-way. These are defined by these policies as the public trust function of the right-of-way and are given primary importance in evaluating vacation proposals. The policies require mitigation of adverse effects upon these public trust functions.
2. Land Use Impacts – Consider land use impacts of the proposed vacation. Potential development involving the vacated right-of-way must be consistent with City land use policies for the area in which the right-of-way is located.
3. Public Benefit – Benefits to the public from the vacation of the right-of-way will be considered. The proposal must provide a long-term benefit for the general public.

Discussion: *Although no street vacation is specifically proposed as part of the 2018 Seattle Campus Master Plan, the plan does identify two potential street vacations and a potential aerial vacation. The potential street and aerial vacations are not identified to provide additional development capacity on the campus and none of the potential development sites identified in the 2018 Seattle Campus Master Plan are dependent on the potential vacations. The street and aerial vacations that are identified in the Plan are intended to provide enhanced pedestrian circulation and safety between campus sectors, as well as enhance planned open space areas that are identified as part of the 2018 Seattle Campus Master Plan.*

As outlined in the 2018 Seattle Campus Master Plan, at such time as a vacation is considered by the University, a work plan specific to that vacation would be prepared by the University. The work plan would identify opportunities for public participation, contain an analysis of traffic and circulation, include a utility analysis, specific design and environmental analysis, landscape analysis and identify possible public benefit. It is intended that the work plan for a specific vacation would accompany the petition and supporting application materials for the vacation that is submitted to the City of Seattle.

Analysis of the relationship of potential vacations with the components of public interest is provided in the discussion of specific policies below.

Summary: Specific policies and guidelines for street vacations relevant to the proposed *2018 Seattle Campus Master Plan* include the following:

Policy 1 – Circulation and Access. Vacations may be approved only if they do not result in negative effects on both the current and future needs of the City's vehicular, bicycle, or pedestrian circulation systems or on access to private property, unless the negative effects can be mitigated.

Discussion: *The 2018 Seattle Campus Master Plan includes the potential for vacating sections of two public streets; the Plan also identifies one potential aerial vacation. The potential street vacations would generally consist of relatively small segments that would not affect overall circulation of the roadway system. All above-grade and below-grade utilities associated with these street segments would be replaced or relocated as part of any potential vacation.*

The potential aerial vacation would allow for the development of an elevated pedestrian walkway (skybridge) over Montlake Boulevard NE. The skybridge would enhance pedestrian and bicycle circulation and safety between the Central and East Campus and would create an opportunity for additional open space to be incorporated into the skybridge. The potential aerial vacation would not result in negative impacts to vehicular circulation.

Policy 2 – Utilities. Rights-of-way which contain or are needed for future utility lines or facilities may be vacated only when the utility can be adequately protected with an easement, relocation, fee ownership or similar agreement satisfactory to the utility owner.

Discussion: *All utilities and planned future utilities, located within vacated rights-of-way would be adequately protected by easements, relocation, or agreements satisfactory to the utility owner.*

Policy 3 – Light, Air, Open Space and Views. When the City Council determines that the light, air, open space or view provided by a particular street or alley should be retained, the right-of-way may be vacated only if the public open space, light, air and view can be retained or substituted by dedication to the public of other comparable street right-of-way or other property such as an open space property or on future development on the vacated and abutting property.

Discussion: *The potential street and aerial vacations that would have the greatest potential to affect light, air, open space and view would be the potential street vacation of NE Boat Street and the potential aerial vacation of Montlake Boulevard NE. The potential street vacation of NE Boat Street would allow for the continuous open space area from NE Pacific Street to Portage Bay as part of the planned West Campus Green. This planned open space area would provide new opportunities for views and open space in the West Campus and along the Portage Bay shoreline. The potential aerial vacation over Montlake Boulevard NE would create new open space as part of the pedestrian/bicycle connection between the Central and East Campus. However, the potential skybridge could diminish the feeling of openness along a portion of the Montlake Boulevard NE corridor.*

Policy 4 – Land Use. A proposed vacation may be approved only when the increase in development potential that is attributable to the vacation would be consistent with the land use policies adopted by the City Council. The criteria considered for making individual vacation decisions will vary with the land use policies and regulations for the

area in which the right-of-way is located. The City Council may place conditions on a vacation to mitigate negative land use effects.

Discussion: *The potential street and aerial vacations in the 2018 Seattle Campus Master Plan are not identified to provide additional development capacity on the campus and none of the potential development sites identified in the 2018 Seattle Campus Master Plan are dependent on the potential vacations. The street and aerial vacations that are identified in the Plan are intended to provide enhanced pedestrian circulation and safety between campus sectors, as well as enhance planned open space areas that are identified as part of the 2018 Seattle Campus Master Plan*

Policy 5 – Public Benefit. A vacation petition shall include a public benefit proposal. The concept of providing a public benefit is derived from the nature of street right-of-way. Right-of-way is dedicated for use by the general public in perpetuity whether or not a public purpose can be currently identified. The City acts as a trustee for the public in its administration of rights-of-way. Case law requires that in each vacation there must be an element of public use or benefit and a vacation cannot be granted solely for a private use or benefit.

Discussion: *As outlined in 2018 Seattle Campus Master Plan, at such a time as a vacation is considered, a work plan specific to that vacation would be prepared by the University. The work plan would identify opportunities for public participation, contain an analysis of traffic and circulation, include a utility analysis, specific design and environmental analysis, landscape analysis, and identify potential public benefits.*

The potential street vacation of NE Boat Street would benefit the public by providing increased open space as part of the planned West Campus Green which would create a continuous open space area from NE Pacific Street to Portage Bay and its associated shoreline area. The potential aerial vacation over Montlake Boulevard NE would benefit the public by allowing the opportunity for the potential development of skybridge that would provide an enhanced pedestrian and bicycle connection between the Central and East Campus. The skybridge would also improve safety for pedestrians and bicycles by creating an elevated crossing over Montlake Boulevard NE.

City of Seattle Skybridge Policies

Summary: Seattle Municipal Code (SMC) Section 15.64 provides the procedures and criteria for the administration and approval of applications related to pedestrian skybridges that encroach over and above a public place within the City of Seattle. It is the intent of the City Council to limit the proliferation and adverse effects of skybridges. Proposed skybridges are reviewed with regard to how well they serve the public interest and their relationship to the cityscape.

SMC Section 15.64.065(B) states that the City Council shall not grant conceptual approval to construct, maintain, and operate a proposed new skybridge unless it finds that the skybridge is in the public interest and no reasonable alternative to the skybridge exists.

Discussion*: The University of Washington campus currently contains six skybridges: one over 15th Avenue NE; two over NE Pacific Street; and, three over Montlake Boulevard NE. the skybridges are currently permitted under term-permits with the City of Seattle. The skybridges serve important pedestrian circulation and safety functions for the University of Washington campus. No new skybridges are proposed under the 2018 Seattle Campus Master Plan.*

3.7 POPULATION AND HOUSING

This section of the Draft EIS describes the existing population and housing conditions on the University of Washington campus and in the site vicinity and evaluates the potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.7.1 Affected Environment

Population

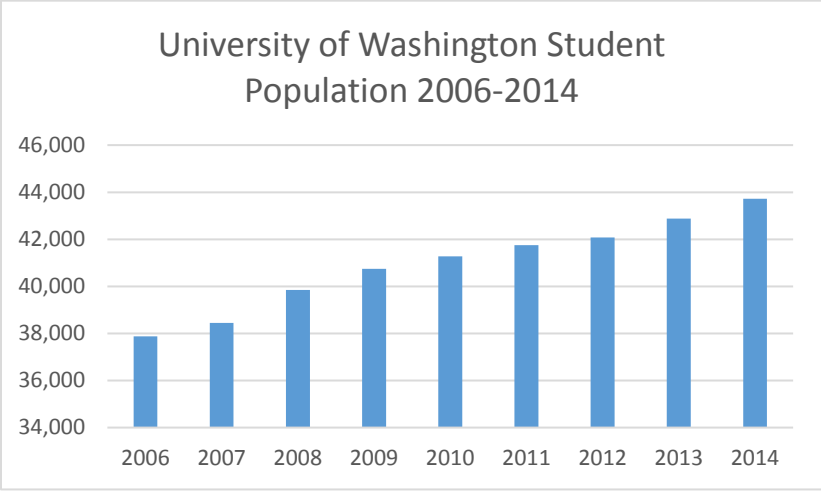
Existing Overall Campus

In the Fall of 2014, the total University of Washington campus population was approximately 67,155. The campus population is generally comprised of three major groups: students, faculty and staff. Over the past nine years, overall campus population has progressively increased; however, each group has somewhat different characteristics and factors, which are discussed below.

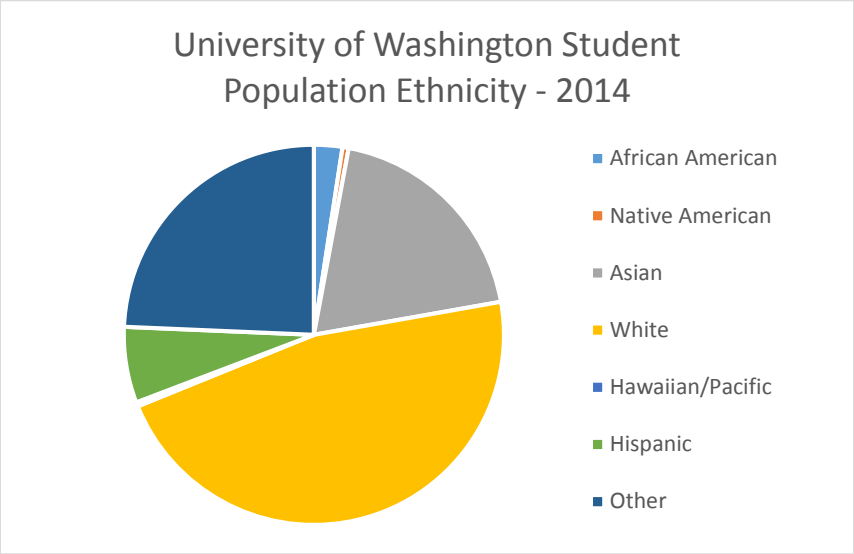
Students

The state operating budget includes minimum student enrollment thresholds, which the University of Washington far exceeds. In the past, the state used student enrollment as a basis for determining appropriation levels for public higher education institutions. Since the recession (2008), however, state appropriations have instead been determined by available funding and legislative priorities, and have generally decreased, despite a slight uptick in recent years.

Since 2006, there has been an overall increasing trend in student enrollment population at the University from approximately 37,878 FTE students to 43,724 FTE students in 2014. See below for a summary of the University of Washington student population since 2006.



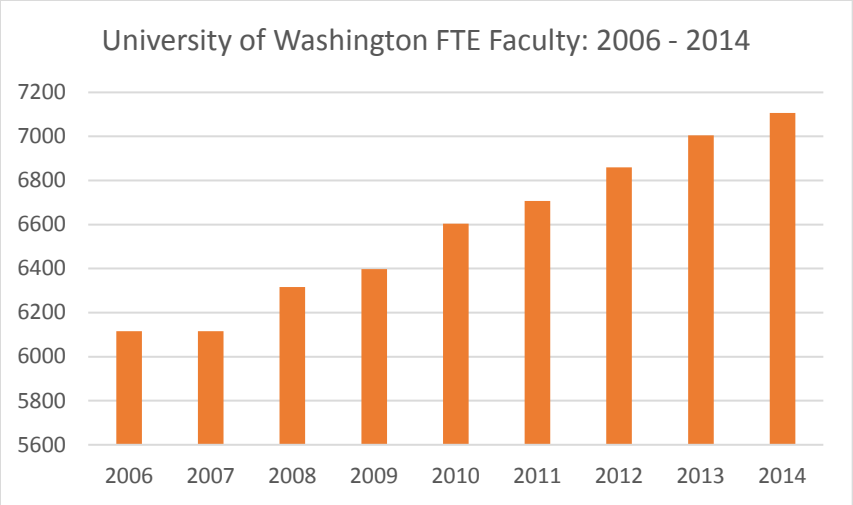
The University also compiles statistics on the ethnicity of the student population. In Fall 2014, of the total student enrollment, approximately 47 percent were Caucasian, 19 percent were Asian, 6 percent were Hispanic, 2 percent were African American, 1 percent were Native American, less than 1 percent were Hawaiian/Pacific Islander and 24 percent were classified as "Other". See below for a summary on the ethnicity of the student population.



Many factors influence the levels of student enrollment at the University. Changes to state and federal level financial aid programs can affect the quantity and demographic composition of students enrolling at the University. The Washington Student Achievement Council (WSAC) provides strategic planning, oversight, advocacy, and student success and retention programs, which can also impact enrollment. In addition, partnerships with community and technical colleges can influence student enrollment and demographics.

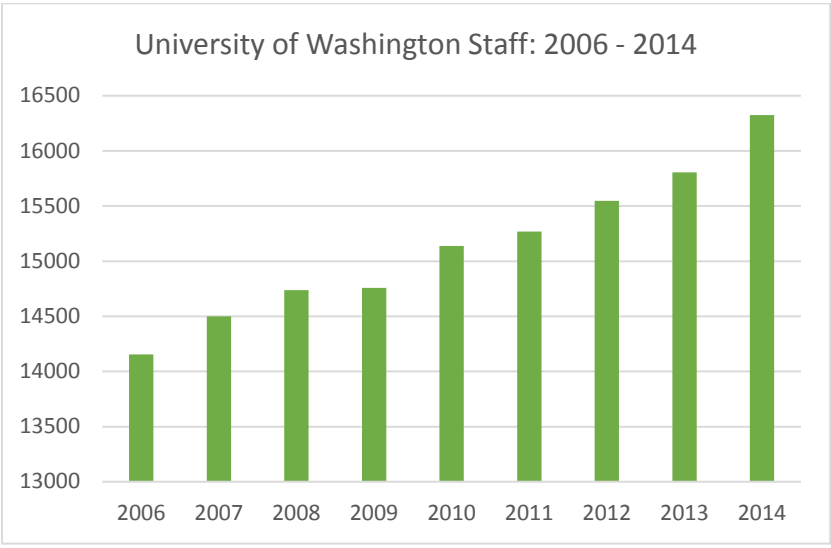
Faculty

University faculty are funded by the State of Washington or by external grant and contract sources (or both). The total faculty population includes faculty supported by all funding mechanisms. In accordance with the increasing student population trend, faculty population has steadily increased on campus from 2006 (approximately 6,116 FTE faculty) to 2014 (approximately 7,107 FTE faculty). See the graph below for a summary of the University of Washington faculty population.



Staff

University of Washington staff include staff funded through different sources, which can be categorized as follows: State-funded University staff, University of Washington Medical Center (UWMC) hospital staff, Intercollegiate Athletics staff, Housing and Food Services staff, and grant-funded staff. The number of State-funded University staff is determined by State funding through the biennial budget process. UWMC hospital staff can fluctuate based on patient revenue, bed count, and third-party reimbursement policy changes. Self-sustaining units such as Intercollegiate Athletics and Housing and Food Services increase or decrease their staff based on their ability to generate revenue to fund their staffing needs. The number of staff that are funded on grants and contracts can also fluctuate as the volume of grant and contract funded research changes, and according to changes in the mix between research needs for staff versus equipment. Overall staffing levels increased from approximately 14,155 FTE in 2006 to approximately 16,324 FTE in 2014 (see below for summary illustration).



Campus Sectors

For analysis purposes in this Draft EIS, campus population (students, faculty and staff) have been divided amongst each of the campus sectors based on a ratio of overall persons (FTE) per square foot of existing campus development.[1]

West Campus

The West Campus sector currently (2015) contains approximately 3.8 million gsf of building space, which equates to approximately 23 percent of the overall building space on campus (approximately 16.6 million gsf). Based on this percentage, the assumed population for West Campus is approximately 15,375 people.

South Campus

The South Campus sector currently contains approximately 4.2 million gsf of building space, which equates to approximately 25 percent of the overall building space on campus. Based on this percentage, the assumed population for South Campus is approximately 16,990 people.

Central Campus

The Central Campus sector currently contains approximately 7.1 million gsf of building space, which equates to approximately 43 percent of the overall building space on campus. Based on this percentage, the assumed population for Central Campus is approximately 28,720 people.

East Campus

The East Campus sector currently contains approximately 1.5 million gsf of building space, which equates to approximately nine percent of the overall building space on campus. Based on this percentage, the assumed population for the East Campus is approximately 6,070 people.

Surrounding Area (Including the Primary and Secondary Impact Zones)

The University of Washington campus, surrounding area and City of Seattle population is described below based on data from the *2010 US Census* and the *2014 American Community Survey*.

[1] The person per square foot ratio is equal to the existing campus population (67,155) divided by the total campus building square footage (16.6 million gsf).

According to the 2010 Census, the total population of the City of Seattle was 608,660 people. The total population of the University of Washington campus area (generally the Primary Impact Zone as represented by Census Tracts 52, 53.01 and 53.02) was 18,867 people. The total population for the University of Washington campus area and surrounding area (generally the Primary and Secondary Impact Zones represented by Census Tracts 41, 42, 43.01, 43.02, 44, 45 52, 53.01, 53.02, 61 and 62[2]) was 58,903 people. **Figure 3.7-1** shows the location and boundaries of the relevant Census Tracts. The University campus area population represents approximately three percent of the total City of Seattle population; the campus and surrounding area represents approximately 10 percent of the total City of Seattle population.

The racial makeup of the University of Washington campus area does not differ significantly from the surrounding campus area or the greater City of Seattle. However, there are substantial differences between the University campus area and surrounding area/City of Seattle as it relates to population age, median household income, and percentage of the population below the poverty level. The majority of the University campus area population is age 21 or younger and earns less than one-third of the income of the population in the University campus surrounding area or the greater City of Seattle. These differences are directly related to the nature of the University campus area population, which is generally comprised of large numbers of students and results in a younger population with fewer people employed or people employed at lower wage levels (while they attend school).

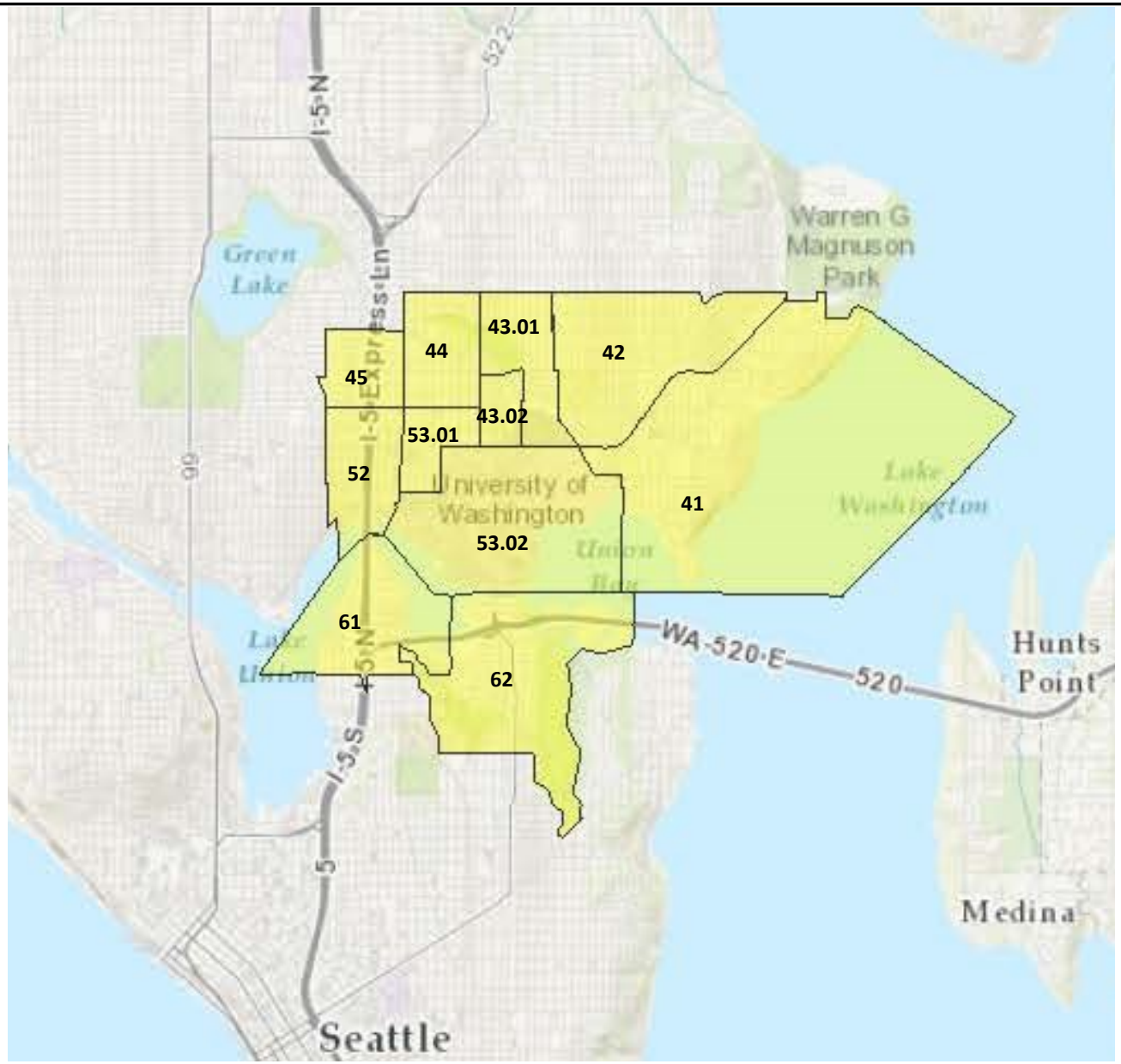
Table 3.7-1 though **Table 3.7-3** provides a summary of the area population by race, income level, and age, and compares those demographics for the area population to the greater City of Seattle.

Table 3.7-1
SUMMARY OF AREA POPULATION BY AGE

	21 years and under	22 years to 59 years	60 years and older
University Campus Area	11,087 (59%)	7,124 (37%)	656 (4%)
University Campus and Surrounding Area	22,137 (38%)	30,176 (51%)	6,590 (11%)
City of Seattle	131,541 (22%)	379,561 (62%)	97,558 (16%)

Source: US Census, 2010.

[2] These Census Tracts, with the exception of Tracts 52, 53.01 and 53.02 generally comprise the Secondary Impact Zone.



Note: This figure is not to scale.

Source: US Census, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.7-1
Census Tract Map

Table 3.7-2
SUMMARY OF AREA POPULATION BY INCOME LEVELS

	Median Household Income	Persons Below Poverty Level	Percent Below the Poverty Level
University Campus Area	$19,118	5,414	29%
University Campus and Surrounding Area	$64,027	12,412	21%
City of Seattle	$67,365	86,593	14%

Source: US Census, 2014.

Table 3.7-3
SUMMARY OF AREA POPULATION BY RACE

	White	African-American	American-Indian	Asian	Native Hawaiian	Other	Two or More Races
University Campus Area	11,524 (61%)	435 (2%)	87 (<1%)	5,263 (28%)	72 (<1%)	86 (<1%)	1,200 (6%)
University Campus and Surrounding Area	43,960 (75%)	1,199 (2%)	236 (<1%)	9,444 (16%)	137 (<1%)	824 (1%)	3,103 (5%)
City of Seattle	422,870 (69%)	48,316 (8%)	4,809 (<1%)	84,215 (14%)	2,351 (<1%)	14,852 (2%)	31,247 (5%)

Source: US Census, 2010.

Housing

Existing University Housing Facilities

The *University of Washington Student Housing Statement of Principles* was adopted by the Board of Regents in 1978. It provides policy direction for University decision-making related to the provision of student housing. The Principles state that "the primary source for student housing continues to be the off-campus private housing market." This principle was reaffirmed by the Regents in 1988 and again in 1997. As of 2015, approximately 80 percent of University of Washington students live off-campus. See the discussion below regarding *Existing University Student, Faculty and Staff Housing Data* and *Surrounding Areas* for further details on off-campus housing.

West Campus Residence Halls

Consistent with the *University of Washington Student Housing Statement of Principles,* the University is primarily a non-residential campus with no requirement for students to live on-campus. The University of Washington does currently provide two forms of housing as an option for students: on-campus residence halls (dormitories) and student apartment buildings (both single student and family housing apartments). There are 11 existing residence halls located on the University of Washington campus, with the current capacity to house approximately 6,442 students (residence halls are intended for non-married students, the University has separate family housing facilities, as discussed below). Four of the residence halls are located in the North Campus, including Hansee Hall, Haggett Hall, McMahon Hall and 2104 House. Seven residence halls are located in the West Campus and include Alder Hall, Elm Hall, Lander Hall, Poplar Hall, Maple Hall, Mercer Court and Terry Hall. **Table 3.7-4** provides a breakdown of the total number of beds for each residence hall and indicates that the University of Washington has a current residence hall operating capacity of 6,422 beds.

Table 3.7-4
EXISTING UNIVERSITY OF WASHINGTON RESIDENCE HALLS

Name of Building	Operating Bed Capacity
2104 House	31
Alder Hall	641
Elm Hall	543
Haggett Hall	818
Hansee Hall	332
Lander Hall	688
Maple Hall	831
McMahon Hall	1,044
Mercer Court A-B	842
Poplar Hall	318
Terry Hall	334
TOTAL RESIDENCE HALL BEDS	**6,422**

Source: University of Washington, 2016

The University of Washington is also in the process of development of their North Campus Student Housing Project, which would include the development of new residence hall buildings with space for approximately 2,942 student beds. Phase IV(a) of the project is currently underway and includes the demolition of McCarty Hall (which is not included in the existing residence hall capacity) and development of three new residence hall buildings.

Phase IV(b) would include the demolition of Haggett Hall and construction of two new residence halls. In total, the North Campus Student Housing Project would result in a net increase of approximately 1,366[3] student beds on the campus. With the completion of the North Campus Student Housing Project, the University's residence halls would have a capacity of approximately 8,546 beds.

The University also provides student apartments as a housing option for students. The University owns eight apartment buildings or complexes, with four dedicated to single students (non-married) and four dedicated for families. **Table 3.7-5** summarizes the total number of beds provided by each apartment complex or building.

Table 3.7-5
EXISTING UNIVERSITY OF WASHINGTON APARTMENTS

Name of Building	Operating Bed Capacity
Single Student Apartments	
Cedar Apartments	344
Mercer Court C-E	489
Stevens Court	518
Nordheim Court	460
Total Single Student Apartments	***1,811***
Family Housing Apartments	
Blakely Village	80
Laurel Village	79
Radford Court	399
Commodore Duchess	139
Total Family Housing Apartments	***697***
TOTAL APARTMENT BEDS	**2,508**

Source: University of Washington, 2016

As indicated in **Table 3.7-5**, the University of Washington has the current capacity to house 2,508 students in apartments, including 1,811 single student (non-married) beds and 697 family housing beds.

In total, considering 6,422 residence hall beds and 2,508 family and non-family apartment beds, the University of Washington has the capacity to currently house approximately 8,930 students. The University's Housing and Food Services Department indicates that in 2015, their student housing facilities were at full occupancy.[4]

[3] The net increase in student beds equates to 2,942 new beds from the North Campus Student Housing Project, less the beds that would be removed with the demolition of McCarty Hall (758 beds) and Haggett Hall (818 beds).
[4] University of Washington Housing and Food Services Resource Guide: 2015-2016.

As part of their North Campus Student Housing Project, the University of Washington identified a goal of housing approximately 21 percent of their student population in on-campus facilities. With existing facilities, the University of Washington currently houses approximately 20 percent of the enrolled students on campus. With the completion of the North Campus Student Housing Project (which is currently under construction), the University would have a student housing capacity of approximately 11,054 student beds), and would allow the University to meet its goal of housing 21 percent of the student population on-campus, (the new capacity would house approximately 25 percent of the currently enrolled students).

West Campus

Existing University of Washington housing facilities in the West Campus sector include Alder Hall, Elm Hall, Lander Hall, Maple Hall, Mercer Court, Poplar Hall, Terry Hall, the Cedar Apartments, Stevens Court, and the Commodore Duchess. These existing facilities include approximately 5,687 student beds.

South Campus

There are currently no existing University of Washington housing facilities in the South Campus sector.

Central Campus

Existing University of Washington housing facilities in the Central Campus sector include 2104 House, Haggett Hall, Hansee Hall, and McMahon Hall. These existing facilities include approximately 2,225 student beds. As noted above, the completion of the North Campus Student Housing Project will add an additional 2,124 student beds within the Central Campus sector.

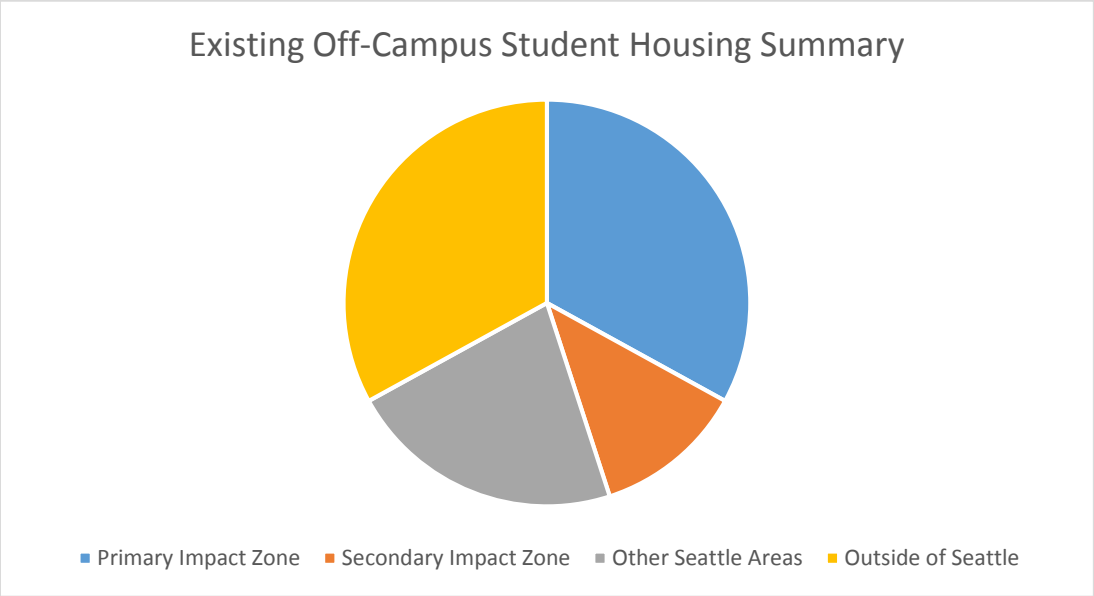
East Campus

Existing University of Washington housing facilities in the East Campus sector include Nordheim Court, Blakely Village, Laurel Village, and Radford Court. These existing facilities contain approximately 1,018 student beds.

Existing University Student, Faculty and Staff Housing Data

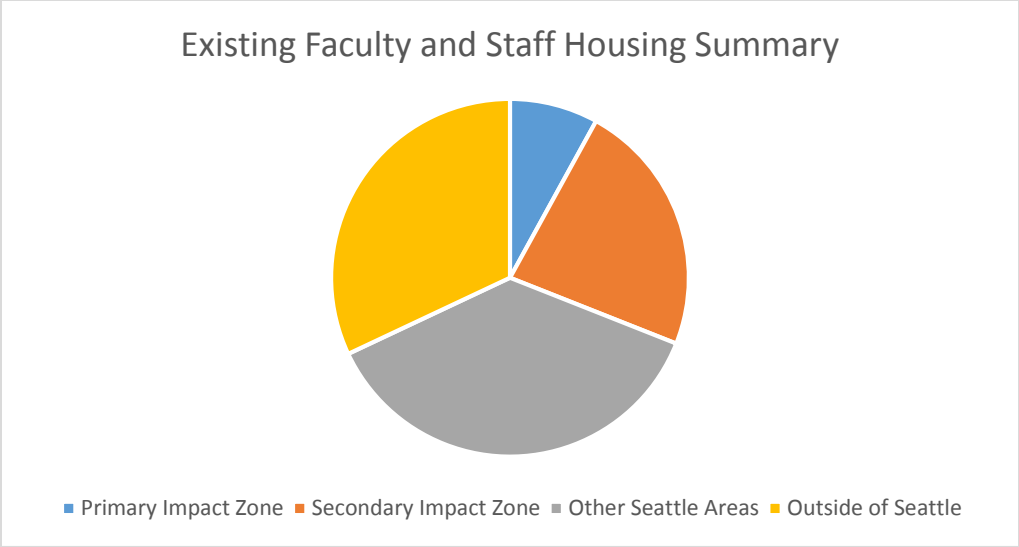
As described above, The *University of Washington Student Housing Statement of Principles* provides policy direction for University decision-making related to the provision of student housing and states that "the primary source for student housing continues to be the off-campus private housing market."

The University of Washington maintains data on the existing campus population[5] (students, faculty, and staff), including home address zip code data. Based on this data, estimates have been generated for the percentage of the campus population that lives in various areas surrounding the University of Washington campus. For University of Washington students that live in off-campus housing within the City of Seattle, approximately 33 percent of those students live within the Primary Impact Zone area (generally encompassing zip code 98105) and 12 percent of students reside within the Secondary Impact Zone. Approximately 22 percent of students live within other areas of the City of Seattle and 33 percent live outside of the City of Seattle. See below for a summary of existing off-campus student housing data.



Based on existing faculty and staff zip code data, approximately eight percent of faculty and staff reside within the Primary Impact Zone, while approximately 23 percent live within the Secondary Impact Zone. Of the remaining faculty and staff, 37 percent live within other areas of the City of Seattle and 32 percent live outside of the City of Seattle. See below for a summary of existing faculty and staff housing data.

[5] University of Washington Fall 2015 enrollment and faculty/staff data.



Surrounding Area (Including the Primary and Secondary Impact Zones)

According to the *2014 American Community Survey*, the City of Seattle contains approximately 311,286 housing units, of which approximately 93 percent are occupied and seven percent are vacant (**Table 3.7-6** provides a summary of the existing housing stock in the City of Seattle, as well as the University of Washington campus area and surrounding area). Of the occupied housing units, approximately 46 percent are owner-occupied and 54 percent are renter-occupied. The median home value in 2014 for the Seattle area was approximately $437,400. For housing units that are rented, the median monthly rental price was approximately $1,131.

Table 3.7-6
SUMMARY OF EXISTING HOUSE STOCK IN THE SURROUNDING AREA

	City of Seattle	UW Campus Area[1]	UW Campus and Surrounding Area[2]
Owner-Occupied Units	134,357	827	9,559
Renter-Occupied Units	156,465	4,483	12,849
Vacant Units	20,464	275	1,227
Total Housing Units	**311,286**	**5,945**	**23,635**
Median Home Value	$437,400	$292,500	$546,780
Median Rental Price	$1,131	$1,090	$1,239

Source: US Census, 2014.

[1] Generally the Primary Impact Zone – Census Tracts 52, 53.01 and 53.02.

[2] Generally the Primary and Secondary Impact Zones - Census Tracts 41, 42, 43.01, 43.02, 44, 45 52, 53.01, 53.02, 61 and 62.

The University of Washington campus area (generally the Primary Impact Zone as represented by Census Tracts 52, 53.01 and 53.02) contained approximately 5,945 housing units, of which approximately 95 percent are occupied and five percent are vacant. Of the occupied units, approximately 19 percent are owner-occupied and 81 percent are renter-

occupied. This increased percentage of renter-occupied housing is indicative of the University area, which typically has a higher percentage of students seeking housing for the school year than the overall Seattle area in general. In addition, the median home value in this area was approximately $292,500 and median rental prices were approximately $1,090, which is also reflective of University area housing/rental market with lower rental rates than the overall Seattle area to attract and accommodate students.

The University of Washington campus and surrounding area (generally the Primary and Secondary Impact Zones as represented by Census Tracts 41, 42, 43.01, 43.02, 44, 45 52, 53.01, 53.02, 61 and 62) contained approximately 23,635 housing units, of which, approximately 95 percent are occupied and five percent are vacant. Of the occupied units, approximately 46 percent are owner-occupied and 54 percent are renter-occupied. This distribution of renter-occupied units is equal to the overall City of Seattle and when taking into account the high rental rate of the University area itself (81 percent), it indicates the substantially higher owner-occupied rate of the surrounding area. The median home values in the campus and surrounding area were approximately $546,780 and median rental prices were approximately $1,239, which also indicate the higher home values and rental rates in the surrounding University area.

It should also be noted that the City of Seattle has implemented planning measures as part of the University District Urban Design Framework Plan, including drafting an EIS and Comprehensive Plan amendments for the University District (to the north and west of campus). The plan for the University District proposes zoning changes to increase density and building heights in the University District, and encourages a range of housing types and housing affordability levels. The *University District Urban Design Plan EIS* assumed growth levels of 3,900 and 5,000 housing units for the purposes of studying the impacts of increased density, and found that both levels of assumed housing growth could be accommodated in the University District study area[6] under all of the alternatives studied, including the no action alternative. The *University District Urban Design Plan EIS* also disclosed the amount of development capacity availabile in the University District study area and found that 9,130 and 9,800 units[7] units could be accommodated in the District under both of the action alternatives and that more than 6,600 units could be accommodated under existing zoning (the no action alternative).

[6] The University District study area was generally bounded by Ravenna Avenue NE to the north, 15th Avenue NE to the east, Portage Bay to the south, and I-5 to the west.

[7] To provide a conservative analysis, the subsequent discussions analyze the lower end of the development capacity (9,130 units).

3.7.2 Impacts

This section of the Draft EIS identifies the potential impacts of the *2018 Seattle Campus Master Plan* on existing population and housing on the University of Washington campus and in the surrounding areas that could occur with development under the EIS Alternatives.

The *2018 Seattle Campus Master Plan* is intended to identify development to accommodate the continued anticipated growth of the University of Washington. Approximately 6.0 million gross square feet (gsf) of new development would occur on the campus during the planning horizon of the *2018 Seattle Campus Master Plan* and the growth of the campus would include both an increase in the number of students, faculty, and staff, as well as additional student housing to accommodate some of the increase in new students. The identified population growth (students, faculty, and staff) and new student housing for the campus over the planning horizon of the *2018 Seattle Campus Master Plan* is assumed to be the same for Alternatives 1 through 5, the difference between the alternatives would be how the distribution of the development throughout the campus (i.e., West and South Campus focus under Alternative 1 versus West and East Campus focus under Alternative 4) would accommodate the increase in population.

No Action Alternative

Under the No Action Alternative, it is assumed that the approximately 6.0 million gsf of new development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *2003 CMP-Seattle* would be developed (approximately 211,000 gsf). As a result, the assumed student, faculty and staff increases under the *2018 Seattle Campus Master Plan* would not be accommodated under the No Action Alternative. It is assumed that the remaining 211,000 gsf of development capacity under the *2003 CMP-Seattle* would generate approximately 422 FTE population growth.

The increase in campus population associated with the remaining development under the *2003 CMP-Seattle* as part of the No Action Alternative would result in an associated increase in demand for housing; however, this increase in demand would be substantially less than under Alternatives 1-5. Under the No Action Alternative, no new campus student housing is assumed to be developed beyond the existing facilities and those facilities that are currently under construction (i.e., the North Campus Student Housing Project). Existing campus student housing would be anticipated to house a portion of the potential increase in new students (approximately 422 FTE). Similar to Alternatives 1-5, the private housing market would also fulfill a portion of the demand for housing associated with increases in students, faculty, and staff; however, this demand for housing would be lower than Alternatives 1-5.

Alternative 1 – CMP Proposed Allocation with Requested Height Increase

Alternative 1 most closely reflects the preferred distribution of building development and requested height increases under the *2018 Seattle Campus Master Plan*. It includes the development of 6.0 million gsf of building area throughout the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors.

Population

Under the *2018 Seattle Campus Master Plan*, it is anticipated that the campus population (student, staff and faculty) would continue to grow, similar to current and prior trends. The *2018 Seattle Campus Master Plan* assumes a growth rate of approximately 20 percent through 2028. It is anticipated that by 2028, the student population would increase to approximately 52,399 (an increase of 8,675 FTE students), staff population would increase to approximately 8,517 (an increase of 1,410 FTE people), and the faculty population would increase to approximately 19,563 (an increase of FTE 3,239 people). In total, the on-campus population under the *2018 Seattle Campus Master Plan* would increase to approximately 80,479 people (an increase of 13,324 over 2015 conditions).

The increase in population on the campus would lead to an increased demand for housing, energy, recreation and open space, transportation facilities and public services. Activity levels on campus and in the adjacent area would also increase with additional population. These population-induced impacts are discussed further below regarding housing, as well as in Section 3.4 - **Energy and Natural Resources**, Section 3.6 - **Land Use**, Section 3.10 - **Recreation and Open Space**, Section 3.14 - **Public Services** and Section 3.15 - **Transportation**.

The following provides a discussion of the anticipated population growth by campus sector based on the assumed potential development distribution under Alternative 1. Similar to the discussion of the Affected Environment, for analysis purposes, the increase in campus population (students, faculty, and staff) associated with new development in each sector under the EIS Alternatives has been estimated based on a population per square foot ratio based on the the amount of development anticipated for each campus sector.[8]

West Campus

With potential development under Alternative 1, the West Campus sector would contain approximately 6.8 million gsf of building space, which would equate to approximately 30

[8] For the EIS Alternatives, the person per square foot ratio is equal to the increase in future campus population (13,324 people) divided by the increase in future campus building square footage (6.0 million gsf).

percent of the overall building space on campus (approximately 22.6 million gsf), compared to approximately 23 percent under existing 2015 conditions. Based on the amount of potential development in West Campus, the assumed population would be approximately 22,035 people, which would represent an increase of approximately 6,660 people over 2015 conditions.

South Campus

With potential development under Alternative 1, the South Campus sector would contain approximately 5.55 million gsf of building space, which equates to approximately 25 percent of the overall building space on campus, similar to the 2015 conditions. Based on the amount of potential development in the South Campus, the assumed population would be approximately 19,990 people, representing an increase of approximately 3,000 people over 2015 conditions.

Central Campus

With potential development under Alternative 1, the Central Campus sector would contain approximately 8.0 million gsf of building space, which equates to approximately 35 percent of the overall building space on campus, compared with approximately 43 percent under 2015 conditions. Based on the amount of potential development in Central Campus, the assumed population would be approximately 30,720 people, which would represent an increase of approximately 2,000 people.

East Campus

With potential development under Alternative 1, the East Campus sector would contain approximately 2.25 million gsf of building space, which equates to approximately 10 percent of the overall building space on campus, similar to 2015 conditions. Based on the amount of development in East Campus, the assumed population would be approximately 7,735 people, representing an increase of approximately 1,665 people.

Housing

The *2018 Seattle Campus Master Plan* identifies the potential future development of approximately 1,000 new student beds on the University of Washington campus by the end of the planning horizon in 2028. With the existing student housing on campus, the development of the North Campus Student Housing Project (which is currently under construction), and approximately 1,000 new student beds under the *2018 Seattle Campus Master Plan*, the University of Washington would have approximately 12,054 student beds within their student housing facilities. With a capacity of approximately 12,054 student beds, the University would be able to house approximately 23 percent of the projected

student population by 2028 (approximately 52,399 students), which would represent an increase over the current conditions (current capacity to house approximately 20 percent of students) and would exceed the University's goal of housing approximately 21 percent of its student population in on-campus facilities.

Although no specific locations for the proposed up to 1,000 student housing beds is identified in the *2018 Seattle Campus Master Plan* and student housing could be distributed amongst the campus sectors, for analysis purposes, under Alternative 1, it is assumed that the 1,000 new student beds are allocated to the campus sectors as follows[9]:

West Campus

Under Alternative 1, no new student housing is assumed in the West Campus sector.

South Campus

Under Alternative 1, it is assumed that the 1,000 new student beds would all be located within the South Campus sector. The provision of student housing in South Campus would create a more equitable balance of housing throughout all of the campus sectors. Potential housing facilities in the South Campus sector would be located in proximity to the Health Sciences, Marine Sciences, and University of Washington Medical Center facilities and could be desirable for students who frequently utilize those facilities and are interested in residing close to those uses.

Central Campus

Under Alternative 1, no new student housing is assumed in the Central Campus sector.

East Campus

Under Alternative 1, no new student housing is assumed in the East Campus sector.

Surrounding Areas (Including the Primary and Secondary Impact Zones)

While new student housing on-campus would give the University of Washington the ability to house a larger percentage of students in on-campus facilities, the private housing market in the vicinity of the University of Washington campus (the Primary Impact Zone represented by Census Tracts 52, 53.01 and 53.02) will continue to be a source of housing for many students, as well as faculty and staff, and would likely experience an increased demand from increased population growth at the University of Washington under the *2018 Seattle Campus Master Plan*.

[9] To provide a conservative worst-case analysis, all new student housing is assumed to located in one campus sector under an EIS Alternative, as follows: Alternative 1 – South Campus; Alternative 2 – East Campus; Alternative 3 – West Campus; and, Alternative 4 – Central Campus.

It is anticipated that new students, faculty, and staff that would be accommodated as part of the *2018 Seattle Campus Master Plan* would follow similar housing patterns as those described previously for existing students, faculty, and staff (including housing approximately 23 percent of the total student population on campus). The following estimates for housing patterns of new students, faculty and staff are based on the existing distribution of students in off-campus housing and the existing housing patterns for staff and faculty. **Table 3.7-7** summarizes the anticipated housing distribution for increased students, faculty, and staff under the *2018 Seattle Campus Master Plan*.

Table 3.7-7
ANTICIPATED OFF-CAMPUS HOUSING DISTRIBUTION FOR NEW STUDENTS, FACULTY AND STAFF

	Students (with new on-campus housing)	Faculty	Staff
Primary Impact Zone	2,532	259	113
Secondary Impact Zone	921	745	324
Other Seattle Areas	1,689	1,198	522
Outside of Seattle	2,533	1,037	451
Total	**7,675**[1]	**3,239**	**1,410**

Source: University of Washington, 2016.

1 This total assumes that 1,000 students would utilize the new on-campus housing that is planned as part of the 2018 Seattle Campus Master Plan (1,000 student beds).

As noted in **Table 3.7-6**, the majority of the existing housing units in the immediate vicinity of the University of Washington campus are renter-occupied units (approximately 81 percent renter-occupied) which are conducive for housing students. While there is a high percentage of rental units in the campus area, the percentage of vacant/available units is low (approximately five percent). However, it should be noted that rental housing within the University campus area typically has a high turnover rate on an annual basis as students graduate or move on to other housing options at the end of each school year. As a result, many rental units within the University campus area typically become available for students to live in each fall at the beginning of the school year.

The existing private housing stock in the vicinity of the campus and surrounding area (represented by Census Tracts 41, 42, 43.01, 43.02, 44, 45 52, 53.01, 53.02, 61 and 62[10]) contains a more equal mix of owner-occupied and renter-occupied units (46 percent and 54 percent respectively) and would also likely experience an increased demand from students, faculty and staff due to the proximity to the campus. Approximately 1,200 units were considered vacant and could be available for new students, staff, or faculty; however, the low percentage of vacancy rates (approximately five percent) would indicate that many of

[10] With the exception of Tracts 52, 53.01 and 53.02, these areas generally represent the Secondary Impact Zone.

these units may not be available for use by the increased population under the *2018 Seattle Campus Master Plan*. The development of the Sound Transit light rail system would provide increased transit options that would allow for more convenient access between the campus and other surrounding areas such as Capitol Hill to the south and Northgate to the north. Enhanced access to these areas would provide additional housing markets that could be desirable for students, faculty, and staff.

As noted under the *Affected Environment* discussion above, the City of Seattle has also recently conducted a planning effort for the University District as part of the University District Urban Design Framework Plan. The plan proposes zoning changes to increase density and building heights in the area, and encourages a range of housing types and housing affordability levels. The *University District Urban Design Final EIS* assumed growth levels of 3,900 and 5,000 housing units for the purposes of studying the impacts of increased density, and found that both levels of assumed housing growth could be accommodated in the University District study area[11] under all of the alternatives studied including the no action alternative. The *University District Urban Design Final EIS* also disclosed the amount of development capacity availabile in the University District study area. The *Final EIS* found that 9,130 and 9,800 units[12] could be accommodated in the District under the action alternatives studied, and that more than 6,600 units could be accommodated under existing zoning (the no action alternative).

Consistent with the *University of Washington Student Housing Statement of Principles,* the private housing market has and will continue to be the source of housing for most students. As noted previously, University of Washington home zip code data indicates that approximately 45 percent of current students living off-campus reside in the Primary and Secondary Impact Zones. Applying this same percentage to the estimate of 8,675 new students on campus under the *2018 Seattle Campus Master Plan* and, considering the proposed 1,000 new student housing beds on campus, approximately 3,453 new students[13] would be anticipated to search for housing in the Primary and Secondary Impact Zones. In addition, under the *2018 Seattle Campus Master Plan* approximately 1,441 new faculty and staff would also be anticipated to search for housing in the Primary and Secondary Impact Zones (see **Table 3.7-7** for further details).

Students live both alone and in shared housing. Based on 2014 Census data for the area, an average of one person per bedroom is a reasonable estimate for housing units in the University District area. Given the high proportion of studio, one-bedroom, and two-bedroom dwelling units, an average two-person household is assumed. This means that assuming all new students anticipated to reside in the Primary and Secondary Impact Zones

[11] The University District study area was generally bounded by Ravenna Avenue NE to the north, 15th Avenue NE to the east, Portage Bay to the south, and I-5 to the west.

[12] To provide a conservative analysis, the subsequent discussions analyze the lower end of the development capacity (9,130 units).

[13] This total also assumes the completion of the North Campus Student Housing Project, which is under construction.

were to reside in the University District[14], approximately 1,726 private rental units could be leased to students. This represents approximately 44 percent of the 3,900 unit assumed housing unit growth in the *University District Urban Design Final EIS,* or approximately 35 percent of the 5,000 unit assumed housing unit growth. It also represents 26 percent of the disclosed unit development capacity for housing units under the *University District Urban Design Final EIS* no action alternative. If increased density is allowed in the University District, as identified in the *University District Urban Design Final EIS* action alternatives, then, the number of private rental units that could be leased to students represents 19 percent of the disclosed unit development capacity.

For comparision purposes and utilizing the methodology described above for students in the Primary and Secondary Impact Zones and household occupancy, the existing University student population utilizes approximately 9,837 housing units or 77 percent of the current rental housing stock (12,849 units) located in the Primary and Secondary Impact Zones.[15] When factoring the amount of housing units in the Primary and Secondary Impact Zones that would be utilized by new students under the *2018 Seattle Campus Master Plan* (1,726 units) and the additional 3,900 or 5,000 unit growth assumed in the University District under the *University District Urban Design Plan EIS*, the assumed student population under the *2018 Seattle Campus Master Plan* would utilize approximately 69 or 65 percent[16] of the rental housing stock in the Primary and Secondary Impact Zones, which would be a lower percentage than the current conditions. If future development in the University District were to reach the development capacity for housing units under the *University District Urban Design Final EIS* no action alternative (6,600 units), students could represent up to 59 percent of the disclosed development capacity. If increased density is allowed in the University District, as identified in the *University District Urban Design Final EIS* action alternatives, then, the number of private rental units that could be leased to students represents up to 53 percent of the disclosed unit development capacity (9,130 units).

Approximately 1,441 new faculty and staff would be anticipated to search for housing in the Primary and Secondary Impact Zones. Assuming all new faculty and staff anticipated to reside in the Primary and Secondary Impact Zones were to reside in the University District, they would account for approximately 37 percent of the 3,900 unit assumed housing unit growth in the *University District Urban Design Final EIS,* or approximately 29 percent of the 5,000 unit assumed housing unit growth. It also represents 22 percent of the disclosed unit development capacity for housing units under *University District Urban Design Final EIS* the

[14] This provides a conservative estimate of potential housing impacts since the University District study area is smaller than the Primary and Secondary Impact Zones.

[15] Approximatley 45% of the existing student population (43,724) within the Primary and Secondary Impact Zones (19,674) divided by two persons per household equals approximately 9,837 units utilized by existing students. These units utilized by student would equate to 77% of the current rental housing stock (12,849 units) in the Primary and Secondary Impact Zones.

[16] Approximately 11,563 units utilized by existing and additional students (9,837 existing student units plus 1,720 additional student units) divided by 16,749 units (12,849 existing units plus 3,900 additional units) equates to 69 percent utilization by students.

no action alternative. If increased density is allowed in the University District, as identified in the *University District Urban Design Final EIS* action alternatives, then, the number of private rental units that could be leased to faculty and staff represents 16 percent of the disclosed unit development capacity.

For comparision purposes and utilizing the methodology described above, the existing University student, faculty and stuff population utilizes approximately 17,100 housing units[17] or 76 percent of the total current housing stock (22,408 units[18]) located in the Primary and Secondary Impact Zones. When factoring the amount of housing units in the Primary and Secondary Impact Zones that would be utilized by new students, faculty and staff under the *2018 Seattle Campus Master Plan* (3,161 units) and the additional 3,900 or 5,000 unit growth assumed in the University District under the *University District Urban Design Plan EIS*, the assumed student, faculty and staff population under the *2018 Seattle Campus Master Plan* would utilize approximately 76 or 74 percent[19] of the overall housing stock in the Primary and Secondary Impact Zones, which would be a similar or lower percentage than the current conditions. If future development in the University District were to reach the development capacity for housing units under the *University District Urban Design Final EIS* no action alternative (6,600 units), students, faculty and staff could represent 70 percent of the disclosed development capacity. If increased density is allowed in the University District, as identified in the *University District Urban Design Final EIS* action alternatives, then, the number of total housing units that could be utilized by students, faculty and staff represents up to 64 percent of the disclosed unit development capacity (9,130 units).

In total, new students, faculty, and staff under the *2018 Seattle Campus Master Plan* could utilize approximately 81 percent of the 3,900 unit assumed housing growth in the *University District Urban Design Final EIS* or approximately 63 percent of the 5,000 unit assumed housing growth. The total student, faculty, and staff housing estimates represent 48 percent of the disclosed unit development capacity for housing units under the *University District Urban Design Final EIS* no action alternative, or between 35 percent of the disclosed unit development capacity under the action alternatives.

Under the *2018 Seattle Campus Master Plan*, the University of Washington would be able to housing a larger percentage of their student population in on-campus student housing facilities when compared to the current conditions (23 percent of the student population compared with a current capacity of 20 percent). Given that the University would house a greater percentage of its student population in on-campus facilities than under 2015

[17] Approximatley 9,837 units utilized by existing students and 7,263 units by existing faculty and staff (31 percent of all faculty and staff [23,431]).

[18] This number represents total housing units (rental and owner-occupied) since it is assumed that some faculty and staff would reside in owner-occupied housing units.

[19] Approximately 20,261 units utilized by existing and additional students (17,100 existing units plus 3,161 additional units) divided by 26,308 units (22,408 existing units plus 3,900 additional units).

conditions, that new students, faculty, and staff would utilize a similar or lower percentage of University District housing than under 2015 conditions, and that additional housing capacity would be available in the University District, significant housing impacts would not be anticipated.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, consistent with the proposed CMP allocation but without height increases proposed in the *2018 Seattle Campus Master Plan*; instead, the existing height limits are assumed. Without the proposed height increases, the amount of development capacity in the West Campus sector is limited and some potential development that was assumed for the West Campus under Alternative 1 is shifted to East Campus under Alternative 2.

Population

Under Alternative 2, the campus population growth (student, staff and faculty) under the *2018 Seattle Campus Master Plan* would be the same as Alternative 1. The majority of the additional population growth would be accommodated in the West Campus, South Campus, and East Campus sectors since those areas would contain the largest portion of the new potential development on campus under Alternative 2. Similar to Alternative 1, the increase in population on the campus would lead to increased demand for housing, energy, recreation and open space, transportation facilities and public services. Activity levels on campus and in the adjacent area would also increase with additional population. These population-induced impacts are discussed further below regarding housing, as well as in Section 3.4 - **Energy and Natural Resources**, Section 3.6 - **Land Use**, Section 3.10 - **Recreation and Open Space**, Section 3.14 - **Public Services** and Section 3.15 - **Transportation**.

The following provides a discussion of the anticipated campus population by campus sector based on the assumed potential development distribution under Alternative 2. Similar to the discussion of Alternative 1, for analysis purposes, the increase in campus population (students, faculty and staff) associated with new development in each sector under the EIS Alternatives has been estimated based on a population per square foot ratio and the amount of development anticipated for each campus sector.

West Campus

With potential development of 2.4 million gsf under Alternative 2, the West Campus sector would contain approximately 6.2 million gsf of building space, which would equate to approximately 27 percent of the overall building space on campus (approximately 22.6

million gsf). Based on the amount of development in West Campus, the assumed population would be approximately 20,705 people, which would represent an increase of approximately 5,330 people over the 2015 conditions.

South Campus

With potential development of 1.35 million gsf under Alternative 2, the South Campus sector would contain approximately 5.55 million gsf of building space, which equates to approximately 25 percent of the overall building space on campus. Based on the amount of development in South Campus, the assumed population would be approximately 19,990 people, which would represent an increase of approximately 3,000 people over the 2015 conditions.

Central Campus

With potential development of 0.9 million gsf under Alternative 2, the Central Campus sector would contain approximately 8.0 million gsf of building space, which would be the same as under Alternative 1. The increase in population would also be the same as Alternative 1 (approximately 30,720 people, which would represent an increase of approximately 2,000 people over 2015 conditions).

East Campus

With potential development of 1.35 million gsf under Alternative 2, the East Campus sector would contain approximately 2.85 million gsf of building space, which equates to approximately 13 percent of the overall building space on campus. Based on the amount of development in East Campus, the assumed population would be approximately 9,070 people, which would represent an increase of approximately 3,000 people over 2015 conditions.

Housing

Alternative 2 would include the same amount of new on-campus student housing as Alternative 1 (approximately 1,000 student beds). It is anticipated that the private housing market in area surrounding the campus would continue to provide housing opportunities for new students, faculty and staff as described under Alternative 1.

Although no specific locations for the proposed up to 1,000 student housing beds is identified in the *2018 Seattle Campus Master Plan* and student housing could be distributed amongst the campus sectors, for analysis purposes, under Alternative 2, it is assumed that the 1,000 new student beds are allocated to the campus sectors as follows:

West Campus

Under Alternative 2, no new student housing is assumed in the West Campus sector.

South Campus

Under Alternative 2, no new student housing is assumed in the South Campus sector.

Central Campus

Under Alternative 2, no new student housing is assumed in the Central Campus sector.

East Campus

Under Alternative 2, it is assumed that the 1,000 new student beds would all be located within the East Campus sector. The provision of potential future student housing in the East Campus would shift a larger percentage of the overall campus student housing stock to the East Campus sector. Potential housing facilities in the East Campus would be located in proximity to the Intermural Activities Building, athletic facilities, new campus development and other off-campus uses (i.e. University Village), and could be desirable for students who frequently utilize those facilities and are interested in residing close to them.

Surrounding Areas (Including the Primary and Secondary Impact Zones)

Potential housing impacts in the surrounding areas are anticipated to be similar to those described under Alternative 1.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

Population

Under Alternative 3, the campus population growth (student, staff and faculty) under the *2018 Seattle Campus Master Plan* would be the same as Alternative 1. The majority of the additional population growth would be accommodated in the West Campus and South Campus sectors since those areas would contain the largest portion of the new development on campus under Alternative 3. As described under Alternative 1, the increase in population on the campus associated with potential development would lead to an increased demand for housing, energy, recreation and open space, transportation facilities and public services. Activity levels on campus and in the adjacent area would also increase with additional population. These population-induced impacts are discussed further below regarding housing, as well as in Section 3.4 - **Energy and Natural Resources**, Section 3.6 - **Land Use**, Section 3.10 - **Recreation and Open Space**, Section 3.14 - **Public Services** and Section 3.15 - **Transportation**.

The following provides a discussion of the anticipated campus population by campus sector based on the assumed potential development distribution under Alternative 3. Similar to the discussion of Alternative 1, for analysis purposes, the increase in campus population (students, faculty and staff) associated with new development in each sector under the EIS Alternatives has been estimated based on a population per square foot ratio and the amount of development anticipated for each campus sector.

West Campus

With 3.2 million gsf of potential development under Alternative 3, the West Campus sector would contain approximately 7.0 million gsf of building space, which would equate to approximately 31 percent of the overall building space on campus (approximately 22.6 million gsf). Based on the amount of increased development in West Campus, the assumed population would be approximately 22,480 people, which would represent an increase of approximately 7,105 people over the 2015 conditions.

South Campus

With potential development of 1.65 million gsf under Alternative 3, the South Campus sector would contain approximately 5.85 million gsf of building space, which equates to approximately 26 percent of the overall building space on campus. Based on the amount of development in South Campus, the assumed population would be approximately 20,650 people, which would represent an increase of approximately 3,660 people over the 2015 conditions.

Central Campus

With potential development of 0.9 million gsf under Alternative 3, the Central Campus sector would contain approximately 8.0 million gsf of building space with development, which would be the same as under Alternative 1. The increase in population would also be the same as Alternative 1 (approximately 30,720 people, which would represent an increase of approximately 2,000 people over the 2015 conditions).

East Campus

With potential development of 0.25 million gsf under Alternative 3, the East Campus would contain approximately 1.75 million gsf of building space, which equates to approximately eight percent of the overall building space on campus. Based on the amount of development in the East Campus, the assumed population would be approximately 6,625 people, which would represent an increase of approximately 555 people over the 2015 conditions.

Housing

Alternative 3 would include the same amount of new on-campus student housing as Alternative 1 (approximately 1,000 student beds). It is anticipated that the private housing market in the area surrounding the campus would also continue to provide housing opportunities for new students, faculty and staff as described under Alternative 1.

Although no specific locations for the proposed up to 1,000 student housing beds is identified in the *2018 Seattle Campus Master Plan* and student housing could be distributed amongst the campus sectors, for analysis purposes, under Alternative 3, it is assumed that the 1,000 new student beds are allocated to the campus sectors as follows:

West Campus

It is assumed that under Alternative 3, the 1,000 new student beds would all be located within the West Campus sector. The provision of potential future student housing in the West Campus would shift a larger percentage of the overall campus student housing stock to the West Campus sector and would continue the trend of the University developing new student housing facilities in the West Campus. Potential housing facilities in the West Campus would be located in proximity to other University student housing facilities which could create centrally located student housing area on campus; other off-campus uses (i.e. commercial/retail uses in the University District) are located adjacent to the West Campus. Additional student housing in this area could be desirable for students who are interested in residing close to the University District and other student housing facilities.

South Campus

Under Alternative 3, no new student housing is assumed in the South Campus sector.

Central Campus

Under Alternative 3, no new student housing is assumed in the Central Campus sector.

East Campus

Under Alternative 3, no new student housing is assumed in the East Campus sector.

Surrounding Areas (Including the Primary and Secondary Impact Zones)

Potential housing impacts in the surrounding areas are anticipated to be similar to those described under Alternative 1.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

Population

Overall campus population growth (student, staff and faculty) under Alternative 4 would be the same as Alternative 1. The majority of the additional population growth would be accommodated in the West, Central, and East Campus sectors since those areas would contain the largest portion of the new development on campus under Alternative 4. Similar to Alternative 1, the increase in population on the campus associated with potential development would lead to an increased demand for housing, energy, recreation and open space, transportation facilities and public services. Activity levels within the West, Central and East Campus sectors, and the adjacent areas, would also increase with additional population. These population-induced impacts are discussed further below regarding housing, as well as in Section 3.4 - **Energy and Natural Resources**, Section 3.6 - **Land Use**, Section 3.10 - **Recreation and Open Space**, Section 3.14 - **Public Services** and Section 3.15 - **Transportation**.

The following provides a discussion of the anticipated campus population by campus sector based on the assumed potential development distribution under Alternative 4. Similar to the discussion of the Affected Environment, for analysis purposes, the increase in campus population (students, faculty and staff) associated with new development in each sector under the EIS Alternatives has been estimated based on a population per square foot ratio and the amount of development anticipated for each campus sector.

West Campus

With potential development of 3.0 million gsf under Alternative 4, the West Campus sector would contain approximately 6.8 million gsf of building space, which would be the same as Alternative 1. The increase in population would also be the same as Alternative 1 (approximately 22,035 people, which would represent an increase of approximately 6,660 people over 2015 conditions).

South Campus

With potential development of 0.2 million gsf under Alternative 4, the South Campus sector would contain approximately 4.4 million gsf of building space, which equates to approximately 20 percent of the overall building space on campus. Based on the amount of

development in South Campus, the assumed population would be approximately 17,435 people, which would represent an increase of approximately 445 people over 2015 conditions.

Central Campus

With potential development of 1.1 million gsf under Alternative 4, the Central Campus sector would contain approximately 8.2 million gsf of building space, which equates to approximately 36 percent of the overall building space on campus. Based on the amount of increased development in Central Campus, the assumed population would be approximately 31,165 people, which would represent an increase of approximately 2,445 people over 2015 conditions.

East Campus

With potential development of 1.7 million gsf under Alternative 4, the East Campus sector would contain approximately 3.2 million gsf of building space, which equates to approximately 14 percent of the overall building space on campus. Based on the amount of development in East Campus, the assumed population would be approximately 9,845 people, which would represent an increase of approximately 3,775 people over 2015 conditions.

Housing

Alternative 4 would include the same amount of new on-campus student housing as Alternative 1 (approximately 1,000 student beds). It is anticipated that the private housing market in the area surrounding the campus would also continue to provide housing opportunities for new students, faculty and staff as described under Alternative 1.

Although no specific locations for the proposed up to 1,000 student housing beds is identified in the *2018 Seattle Campus Master Plan* and student housing could be distributed amongst the campus sectors, for analysis purposes, under Alternative 4, it is assumed that the 1,000 new student beds are allocated to the campus sectors as follows:

West Campus

Under Alternative 4, no new student housing is assumed in the West Campus sector.

South Campus

Under Alternative 4, no new student housing is assumed in the South Campus sector.

Central Campus

Under Alternative 4, it is assumed that the 1,000 new student beds would all be located within the Central Campus sector. The provision of potential future student housing in Central Campus would shift a larger percentage of the overall campus student housing stock to the Central Campus sector and would continue the trend of the University developing new student housing facilities in Central Campus. Potential housing facilities in the Central Campus could be located in proximity to other University student housing facilities, which could create centrally located student housing area on campus. They would also be located nearby existing academic facilities. Additional student housing in this area could be desirable for students who are interested in residing close to other student housing facilities and academic uses.

East Campus

Under Alternative 4, no new student housing is assumed in the East Campus sector.

Surrounding Areas (Including the Primary and Secondary Impact Zones)

Potential housing impacts in the surrounding areas are anticipated to be similar to those described under Alternative 1.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of development and associated campus population increases would occur as under Alternatives 1-4; however, none of the assumed street or aerial vacations would occur. As a result, it is anticipated that the population and housing impacts under Alternative 5 would be similar to those analyzed under Alternatives 1-4.

Potential Indirect/Cumulative Impacts

Under Alternatives 1 through 5, the increase in on-campus population under the *2018 Seattle Campus Master Plan* would lead to indirect impacts to housing, energy, recreation and open space, transportation facilities and public services. Indirect increased demands for commercial/retail uses and services could also be generated by increases in population on-campus. These indirect population-induced impacts are discussed further in Section 3.4 - **Energy and Natural Resources**, Section 3.6 - **Land Use**, Section 3.10 - **Recreation and Open Space**, Section 3.14 - **Public Services** and Section 3.15 - **Transportation**.

To the extent that increased on-campus population creates an increased demand for housing, additional pressure to develop new housing in the surrounding off-campus areas could occur. The *University District Urban Design EIS* indicates that ample housing capacity for the estimated population growth would be provided in the University District.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA threshold analysis/determination for individual projects.

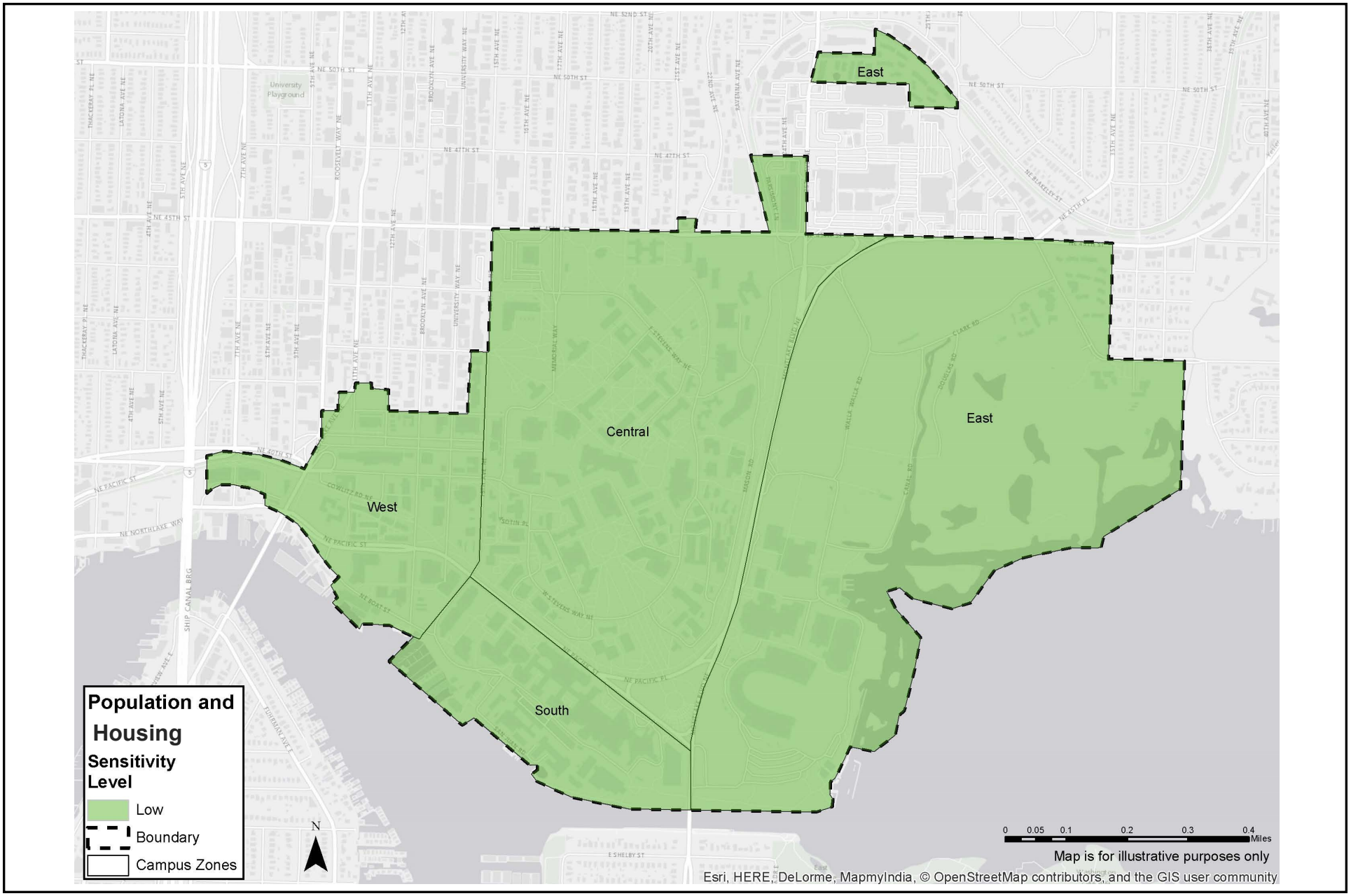
Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.7-2**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined.

For population and housing, the entire University of Washington campus is identified as having a "Low" potential to encounter sensitive population or housing conditions or result in impacts since the University would be able to house a greater percentage of its student population in on-campus facilities and additional housing capacity would be available in the University District area to serve additional students, faculty, staff and others in the area.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.7.3 Mitigation Measures

No direct population-related mitigations measures would be necessary. Mitigation associated with indirect population impacts identified above are discussed under their respective sections.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.7-2
Population and Housing Sensitivity Map

The *2018 Seattle Campus Master Plan* identifies approximately 1,000 new student beds on-campus over the life of the plan, which would minimize potential housing impacts associated with new students and allow the University to house a higher percentage of students in on-campus facilities, compared to existing conditions[20]. Additional growth in students, faculty and staff would not be anticipated to result in significant housing impacts to the private housing market in the surrounding areas and region, and no additional mitigation would be necessary.

3.7.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to population or housing are anticipated.

[20] The University currently has the capacity to housing approximately 20 percent of the student population.

3.8 LIGHT, GLARE and SHADOWS

This section of the Draft EIS describes the existing light, glare and shadow conditions on the University of Washington campus and in the site vicinity and evaluates the potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.8.1 Affected Environment

West Campus

The University of Washington campus contains various sources of light, glare and shadows. The following describes existing sources of light, glare and shadows by campus sector.

Light

Ambient light in the vicinity of the West Campus sector is comprised of stationary and mobile sources. Stationary sources include street lighting on-campus in conjunction with streets and surface parking areas, street lighting on City streets that are located within campus boundaries, and street lighting on major arterials that surround the University campus (e.g. NE 45th Street and 15th Avenue NE). On-campus lighting includes both pedestrian-scale lamp standards and cobra-type standards. Pedestrian-scale standards are typically 12 to 15 feet in height, and illuminate a relatively small area, whereas cobra-type standards are typically 30 to 35 feet in height and function by lighting a much broader area, which can result in light spillage onto adjacent areas. Off-campus street lighting in the vicinity generally consists of cobra-type standards. Other stationary sources of ambient light include security lighting, and light that emanates from within buildings – both on-campus and proximate to campus.

Mobile sources of light primarily include light from headlights of vehicles operating on-campus, on streets that are located within campus boundaries, and on major arterials that surround the University campus.

Glare

There are no buildings in the West Campus sector that contain highly reflective surfaces that would produce substantial amounts of solar glare. Glazing on campus buildings has a relatively low level of reflectance. Vehicle headlights and glass surfaces on vehicles can, at times, temporarily produce reflective glare.

Shadows

Existing buildings comprise a major portion of the existing land uses in West Campus and are the primary source of shadows in this sector. Existing trees (primarily street trees) are also a source of shadows.

South Campus

Light

Lighting sources in the South Campus sector are similar to those described for the West Campus and include interior and exterior building lighting, street lighting on-campus in conjunction with streets and surface parking areas, street lighting on City streets that are located within campus boundaries, and street lighting on major arterials that surround the South Campus (e.g. Montlake Boulevard NE and NE Pacific Street). On-campus lighting also includes both pedestrian-scale lamp standards and cobra-type standards.

Glare

There are no buildings in the South Campus sector that contain highly reflective surfaces that would produce substantial amounts of solar glare. Glazing on campus buildings has a relatively low level of reflectance. Vehicle headlights and glass surfaces on vehicles can, at times, temporarily produce reflective solar glare.

Shadows

Existing buildings comprise a major portion of the existing land uses in South Campus and are the primary source of shadows in this sector. Existing mature trees (primarily street trees) are also a source of shadows.

Central Campus

Light

Lighting sources in the Central Campus sectorinclude interior and exterior building lighting, street lighting on-campus in conjunction with streets and surface parking areas, street lighting on City streets that are located within campus boundaries, and street lighting on major arterials that surround the Central Campus (e.g. NE 45th Street, 15th Avenue NE and NE Pacific Street). On-campus lighting also includes both pedestrian-scale lamp standards and cobra-type standards.

University of Washington Observatory

As depicted in **Figure 2-2**, the University's Observatory[1] is located in the north-central area of the Central Campus sector, near NE 45th Street, adjacent to Memorial Way. The Observatory is used for research and teaching, and activities within the Observatory can be sensitive to surrounding ambient lighting. As shown in **Figure 2-2**, a University surface parking lot (N5) is located immediately east of the Observatory and existing trees/landscaping are located to the west along Memorial Way NE.[2] Because of the size of existing deciduous trees that are proximate to the Observatory (immediately west, southwest and northwest), the only effective direction for celestial viewing from the Observatory for most altitudes and during much of the year is toward the east over parking lot N5. This is particularly true when viewing at relatively low altitudes above the horizon (i.e. below 65 degrees), and from mid-March to late October. At such times, the optimal field of view is roughly a 150-degree arc that extends from the northeast to the south. The present range of altitude, as viewed over parking lot is approximately 75 degrees, from roughly 15 degrees above the horizon to zenith. At altitudes above 65-75 degrees, the adjacent trees are less of a problem. Although the parking lot is lighted, staff of the Observatory exercise localized control over the level of light intensity in the parking lot in order to enhance celestial viewing.

Glare

There are no buildings in the Central Campus sector that contain highly reflective surfaces that would produce substantial amounts of solar glare. Glazing on campus buildings has a relatively low level of reflectance. Vehicle headlights and glass surfaces on vehicles can, at times, temporarily produce reflective solar glare.

Shadows

Mature vegetation (including deciduous and conifer trees) and buildings comprise a major portion of the land uses in Central Campus. These existing trees and buildings are the primary source of shadows in the Central Campus sector and periodically shade existing open space areas.

East Campus

Light

Lighting sources in the East Campus sector a include interior and exterior building lighting, street lighting on-campus in conjunction with streets and surface parking areas, street lighting on City streets that are located within campus boundaries, and street lighting on major arterials that surround the East Campus (e.g. NE 45th Street and Montlake Boulevard

[1] The Observatory is a historic structure that is listed on the Washington Historic Register.

[2] Tree height is approximately 45 to 55 feet, roughly 20 to 25 feet above the height of the telescope in the Observatory dome.

NE). On-campus lighting also includes both pedestrian-scale lamp standards and cobra-type standards

Other stationary sources of ambient light in the East Campus sector include fixed lighting in conjunction with athletic fields (e.g. Husky Stadium, golf driving range, tennis courts, etc.). Whereas lighting associated with athletic fields is elevated to cover a broader area, it is also focused on the field, with typically relatively little spillover. For example, fixed lighting associated with Husky Stadium is at a height of approximately 160 feet and is directed toward the playing field. Such light, however, remains visible from great distances.

Glare

There are no buildings in East Campus that contain highly reflective surfaces that would produce substantial amounts of solar glare. Glazing on campus buildings has a relatively low level of reflectance. Vehicle headlights and glass surfaces on vehicles can, at times, temporarily produce reflective solar glare.

Shadows

Existing buildings and mature trees are the primary source of shadows in the East Campus sector.

Surrounding Primary and Secondary Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

Existing lighting sources in the Primary and Secondary Impact Zones are similar to those described for the University of Washington campus and include interior and exterior building lighting, street lighting in conjunction with streets and surface parking areas, pedestrian-scale lamp standards and cobra-type standards. In general, lighting levels are highest surrounding commercial/retail areas surrounding the campus, including the University District, University Village, and Eastlake areas. Surrounding adjacent residential areas (Laurelhurst neighborhood, Montlake neighborhood and the residential area north of NE 45th Street) have generally lower existing lighting levels.

The primary source of existing glare in the Primary and Secondary Impact Zone is vehicle headlights and glass surfaces on vehicles. Glazing on certain existing buildings can also have some level of reflectance and associated glare.

Existing buildings and mature vegetation/trees is the primary source of shadows in the Primary and Secondary Impact Zones. Taller buildings within the commercial areas of the

University District, University Village, and Eastlake areas generally cast longer shadows than building within existing residential neighborhoods.

3.8.2 Impacts

This section of the Draft EIS identifies the potential impacts of the *2018 Seattle Campus Master Plan* on light, glare, and shadows on the University of Washington campus and in the surrounding areas that could occur with development under the EIS Alternatives.

No Action Alternative

Under the No Action Alternative, it is assumed that the approximately 6.0 million gsf of new development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *2003 CMP-Seattle* would be developed (approximately 211,000 gsf). Some level of increased campus population would occur under the No Action Alternative through the development of the capacity remaining under the *2003 CMP-Seattle*. Development of 211,000 gsf of building space could result in a potential increase in light levels. Due to the lower level of development that would occur on campus when compared to Alternatives 1-5, it is anticipated that light, glare and shadow impacts would be substantially lower under the No Action Alternative.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 reflects the preferred allocation of building development and requested height increases under the *2018 Seattle Campus Master Plan*. It includes the development of 6.0 million gsf of building area throughout the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors.

West Campus

Light

Under Alternative 1, potential future development identified in the *2018 Seattle Campus Master Plan* would add new sources of light to the West Campus sector including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting, and an increase mobile sources of lighting such as vehicle headlights. It is anticipated that the amount of light emanating from potential future buildings would be similar to those of other recently-construction buildings on the campus. Under Alternative 1, it is anticipated that the West Campus would have the greatest increase in light sources among the campus sectors since it is identified for the largest amount of assumed

development. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, including certain areas adjacent to the campus boundaries (particularly along the edges of the West Campus sector adjacent to the University District). However, the amount of light spillage is not anticipated to be significant and existing mature trees and landscaping, as well as new plantings that could result from the *2018 Seattle Campus Master Plan*, would serve as a partial buffer to screen light spillage in certain locations. The addition of lighting along new or updated pedestrian pathways would be consistent with other pedestrian facilities on campus and would be intended to enhance the safety of those areas. An increase in "light sky" conditions would be visible from Portage Bay and the Eastlake neighborhood south of West Campus.

One of the major contributors of existing on-campus lighting is surface parking lot lighting. The *2018 Seattle Campus Master Plan* identifies several of the existing surface parking lots as potential development sites in West Campus, which would result in the removal of those parking lots and associated lighting to accommodate future development. As a result, it is possible that potential future development in the West Campus sector would result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

The primary source of glare on the University of Washington campus is associated with vehicles traveling through and adjacent to the campus. Glare caused by vehicles can be intrusive but is typically temporary as vehicles move through the campus area. The principal source of glare associated with most potential development projects is from sunlight reflected off of specular building surfaces on building façades. Factors influencing the amount of glare and the effect of glare include weather (i.e. cloud cover and sunlight), time of day, building height, width and orientation of south-facing façades, percent of south-facing façades that are glazed or consist of specular material, reflectivity of glass or specular surfaces, the color and texture of building materials, and the proximity of intervening structures and landscaping. Under Alternative 1, it is anticipated that potential increases in glare would be greatest in the West Campus among the campus sectors as it is identified for the largest amount of assumed development. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review) which would include a review of potential factors that could influence glare such as façade design, façade materials, and glazing. It is anticipated that façade design, materials and glazing on potential future development would be similar to recent campus development and would not be highly reflective or create a substantial source of glare. As a result, the potential for glare impacts related to development in the West Campus under Alternative 1 is anticipated to be low.

Shadows

Potential future development and associated landscaping in the West Campus sector would generate shadows over adjacent portions of the campus and surrounding streets. In general, the time of greatest shading would occur during periods when the sun is at a low-angle, including mid- to late afternoon in the winter and late afternoon to early evening in the summer. Under Alternative 1, the West Campus would be the most likely to experience the potential for increased shadows among the campus sectors. In particular, increased building heights in the West Campus under Alternative 1 (up to 240 feet in areas north of NE Pacific Street) would be anticipated to have the greatest potential for increased shadows on surrounding areas. However, due to the highly developed nature of the campus and surrounding areas, in most cases, areas that would be periodically shaded by potential future development are already shaded by existing buildings and mature trees. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review) which would include a review of building orientation, building height, and associated potential shadows. Due to the developed nature of the campus and surrounding areas, the potential for shadow impacts associated with future development in the West Campus would be low.

Shadow simulations were completed for the area of the West Campus sector south of NE Campus Parkway due to the proximity of this area to public open spaces, including the City of Seattle's Portage Bay Park and the Sakuma Viewpoint. With development under Alternative 1, shadows in this area during the Summer Solstice would extended in a westerly direction in the morning (8 AM) and would shift to the north and east as the day progresses toward the evening (4 PM). The provision of the planned West Campus Green would create additional open space around Portage Bay Park, and at no point during the day would shadows be cast over the Park. During the Winter Solstice, shadows cast in the area would be longer due to the low angle of the sun. In the morning, shadows would extend to the northwest of buildings and would transition to the north and northeast by the late afternoon (3 PM). At no point during the day would shadows be cast over Portage Bay Park (see **Figure 3.8-1** for the shadow simulations under Alternative 1).

South Campus

Light

New sources of light would be generated by development in the South Campus under Alternative 1, including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting and an increase mobile sources of lighting such as vehicle headlights. It is anticipated that the South Campus would also have a higher increase in light sources compared to the East and Central Campus sectors as it is assumed to have a larger amount of development compared to those sectors under Alternative 1. Areas

Summer:

8 am

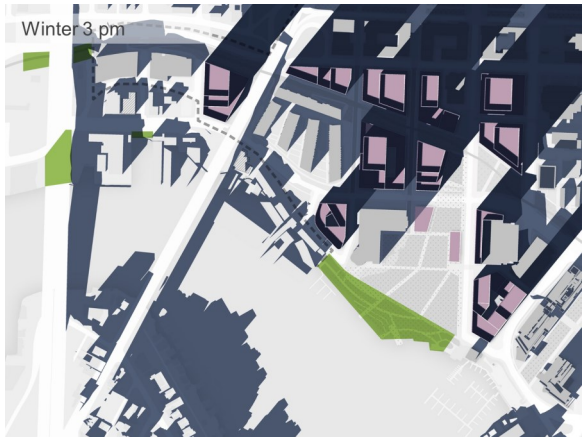
12 pm

4 pm

Winter:

9 am

12 pm



3 pm

Source: Sasaki, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.8-1

Alternative 1—West Campus Shadow Simulations

immediately adjacent to potential new campus buildings could experience some localized light spillage, and increase in "light sky" conditions would be visible from Portage Bay and portions of the Montlake residential neighborhood to the south.

Potential future development in the South Campus sector would result in a reduction in the amount of surface parking lot lighting and associated light spillage as well. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

Glare would be generated by development in the South Campus sector and would primarily be associated with vehicles traveling through and adjacent to the sector. New building development could also generate glare within the South Campus. The principal source of glare associated with most potential development projects is from sunlight reflected off of specular building surfaces on building façades. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence glare such as façade design, façade materials, and glazing.

Shadows

Potential future development and increased building heights in the South Campus would generate additional shadows within the sector. Due to the level of development under Alternative 1, the South Campus would have a higher potential to generate shadows compared to the East and Central Campus sectors. However, there are no existing public park/open spaces adjacent to the South Campus, and shadows from future development would generally be cast on existing campus areas, some of which are already shadowed by existing development in the South Campus. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review) which would include a review of building orientation, building height, and associated potential shadows.

Central Campus

Light

New sources of light in the Central Campus would be similar to those described for the West and South Campus but the increase in the amount of new light sources would be less due to the lower amount of development in this sector under Alternative 1. Areas immediately adjacent to potential new campus buildings could experience some localized

light spillage, particularly in the north Central Campus (near NE 45th Street and the adjacent residential areas) and in the west Central Campus (near 15th Avenue NE and the adjacent University District). Potential future development in the Central Campus would occur on some existing surface parking lots and result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Parking lot N5 is located adjacent to the existing Observatory and potential future development within this area could result in impacts to the existing adjacent Observatory, due to the potential building height and increase in ambient light/light spillage that could occur with development on the site. Currently, the Observatory is able to reduce lighting intensity in the existing parking lot to improve nighttime viewing. The ability to reduce lighting intensity would be more difficult with potential development on the existing parking lot and would create a high potential for light impacts.

Glare

Glare would be generated by development in the Central Campus sector and would primarily be associated with vehicles traveling through and adjacent to the sector, as well as new building development. The principal source of building glare associated with most potential development projects is from sunlight reflected off of specular building surfaces on building façades. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence glare such as façade design, façade materials, and glazing.

Shadows

Under Alternative 1, potential future development in the Central Campus would generate additional shadows within the sector. Due to the level of development assumed in this sector under Alternative 1, the Central Campus would have a lower potential to generate shadows compared to West and South Campus. Shadows from future development would not be anticipated to affect public parks/open spaces but could be cast over some existing off-campus areas (to the north and west of the Central Campus). All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of building orientation, building height and associated potential shadows.

East Campus

Light

New sources of light in the East Campus would be similar to those described for the West and South Campus, but the increase in the amount of new light sources would be lowest in East Campus among all campus sectors due to the lower amount of development under Alternative 1. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, particularly along Montlake Boulevard NE. Potential future development in East Campus would occur on some existing surface parking lots and result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

New sources of glare would be generated in the East Campus sector from vehicles traveling through and adjacent to the sector, as well as new building development. The principal source of building glare associated with most potential development projects is from sunlight reflected off of specular building surfaces on building façades. The increase in glare would be lower in East Campus compared to other campus sectors due to the lower amount of development in the East Campus.

Shadows

Additional shadows would be cast within the East Campus sector, but due to the level of development under Alternative 1, the East Campus would have the lowest potential to generate shadows. Shadows from future development would not be anticipated to affect public parks/open spaces but could be cast over some existing off-campus areas (primarily Montlake Boulevard NE to the west of the East Campus).

Summary of Impacts in Primary & Secondary Impact Zones

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

Alternative 1 would contribute to the overall amount of development on the University of Washington Seattle campus. With the focus of development in the West Campus and South Campus sectors (73 percent of development under Alternative 1), potential development would occur in proximity to residential, commercial, and other uses in the portions of the

Primary Impact Zone located adjacent to these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus). Potential development would result in new light and glare sources and potential increased shadows from certain areas surrounding potential development sites.

Less development is assumed to occur in the Central Campus and East Campus sectors under Alternative 1. As a result, there would be less potential for change in light, glare and shadows that would impact land uses in the Primary Impact Zone adjacent to those sectors.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, light may be visible from certain areas of the Secondary Impact Zone, but would not be anticipated to result in impacts to those land uses.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height associated with potential development. All potential development projects would also comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence light, glare and shadows.

Alternative 2 – Campus Development Consistent with CMP and Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus as identified in the proposed CMP allocation, but without the requested height increases. Without the proposed height increases, the development capacity in the West Campus sector is limited and additional development sites would be required to approach the 3.0 million gsf that is identified in the 2018 CMP. Given the developed nature of West Campus, the opportunity for additional development sites in this sector is limited, and Alternative 2 assumes additional development sites in the area reserved for the West Campus Green under Alternative 1. Even with the additional development sites, the development capacity in the West Campus without the requested height increases is 2.4 million gsf of net new development (compared to 3 million gsf in the West Campus under Alternative 1) and the proposed CMP allocation for West Campus reflected in Alternative 1 cannot be achieved under Alternative 2. As a result, the proposed development allocation for the West Campus sector under Alternative 1 cannot be achieved under Alternative 2 and some West Campus development capacity is shifted to East Campus.

West Campus

Light

Similar to Alternative 1, potential future development would add new sources of light to the West Campus sector. However, the amount of new light sources would be less than under Alternative 1 due to the lower amount of development anticipated in the West Campus. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, including certain areas adjacent to the campus boundaries (i.e. the adjacent University District). However, the amount of light spillage is not anticipated to be significant since the surrounding area is already a highly developed urban area.

An increase in "light sky" conditions would be visible from Portage Bay and the Eastlake neighborhood to the south, but the increase would be less than under Alternative 1.

Development on existing surface parking lots under Alternative 2 would result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of these surface parking lots and associated lighting would include the development of new buildings on the parking lots and addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

Potential future development in the West Campus sector under Alternative 2 could introduce new sources of glare on the campus and result in an increase in glare from vehicles and certain new building surfaces. The increase in glare under Alternative 2 would be lower than Alternative 1 due to the lower amount of anticipated development. It is anticipated that façade design, materials and glazing on potential future development projects would be similar to recent campus development and would not be highly reflective or create a substantial source of glare. As a result, the potential for glare impacts is anticipated to be low.

Shadows

Potential future development and associated landscaping under Alternative 2 would generate shadows over adjacent portions of the West Campus sector, surrounding streets, and adjacent areas (the University District). While new shadows would be generated by development under Alternative 2, the potential for shadows would be less than Alternative 1 due to the lower buildings heights and lower amount of assumed development density in the West Campus.

Shadow simulations were completed for the West Campus sector under Alternative 2 (see **Figure 3.8-2** for the shadow simulations). During the Summer Solstice shadows would be

cast to the west of potential new development and would transition to the north and east during the course of the day. No shadows would be cast over Portage Bay Park. During the Winter Solstice, shadows would be longer during the morning and evenings due to the lower angle of the sun, but would not be cast over Portage Bay Park (see **Figure 3.8-2** for the shadow simulations).

South Campus

Light

Light and "light sky" conditions associated with from potential development in the South Campus sector under Alternative 2 would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector.

Glare

Glare from potential development in the South Campus sector under Alternative 2 would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector.

Shadows

Potential shadows associated with development in the South Campus sector under Alternative 2 would be the same as Alternative 1 due to the similar amount of development density that is assumed for the sector.

Central Campus

Light

Light from potential development in the Central Campus sector under Alternative 2 would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector. Similar to Alternative 1, potential future development of the N5 parking area, adjacent to the existing Observatory could have a high potential for light impacts on its operation.

Glare

Glare associated with potential development in the Central Campus sector under Alternative 2 would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector.

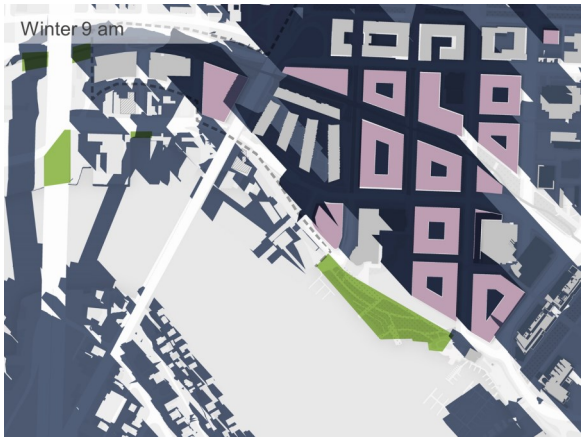
Summer:

8 am

12 pm

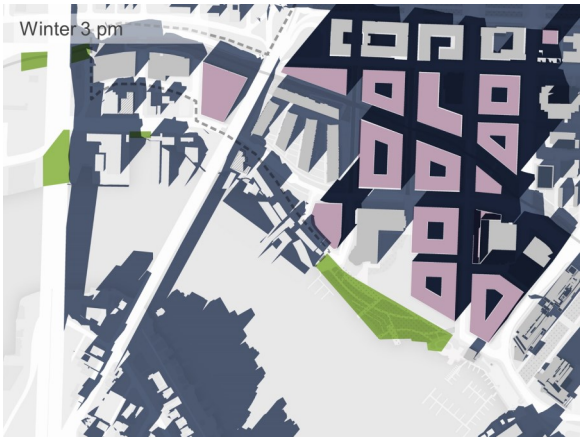
4 pm

Winter:



9 am

12 pm



3 pm

Source: Sasaki, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.8-2
Alternative 2—West Campus Shadow Simulations

Shadows

Potential shadows associated with development in the Central Campus sector under Alternative 2 would be the same as Alternative 1 due to the similar amount of development density that is assumed for the sector.

East Campus

Light

Development within the East Campus sector under Alternative 2 would create new sources of light that would be similar to those described for Alternative 1. Due to the amount of development density assumed in this sector under Alternative 2, it is anticipated that the amount of light that would be generated in the East Campus would be higher than under Alternative 1. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, particularly along Montlake Boulevard NE. Potential future development in the East Campus sector would occur on some existing surface parking lots and result in a reduction in the amount of surface parking lot lighting and associated light spillage with those former facilities. The removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

New sources of glare would be generated in the East Campus sector from vehicles traveling through and adjacent to the sector, as well as new building development exterior surfaces. It is anticipated that potential increases in glare would be higher under Alternative 2 compared with Alternative 1 due to the increased amount of development density that is assumed in the East Campus. It is anticipated that façade design on potential future development projects would be similar to recent campus development and would not be highly reflective or create a substantial source of glare.

Shadows

Development in the East Campus would also result in an increase in shadows when compared to Alternative 1 due to the increased development density assumed within the sector. Potential development within the existing surface parking lots in the East Campus would create shadows over portions of Montlake Boulevard NE, existing athletic facilities (i.e., track facility, baseball field, and soccer fields), and campus open space areas. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental

review), which would include a review of building orientation, building height and associated potential shadows.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development on the University of Washington Seattle campus. With the focus of development in the West, South, and East Campus sectors (85 percent of development under Alternative 2), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus), and the Laurelhurst neighborhood and University Village (adjacent to the East Campus). Potential development would result in new light and glare sources and potential increased shadows from certain areas surrounding potential development sites. Because of the lower building heights under Alternative 2, the potential for shadows to be cast toward land uses in the Primary Impact Zone would generally be less than under Alternative 1. With the additional building area in East Campus, the potential for increases in light, glare and shadows from the East Campus towards uses in the Primary Impact Zone would generally be greater under Alternative 2 than under Alternative 1.

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for increases in light, glare and shadows that would impact land uses adjacent to Central Campus in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, new light sources could be visible from certain areas of the Secondary Impact Zone but would not be anticipated to result impacts to land uses in those areas. New sources of glare and shadows would not be anticipated to impact the Secondary Impact Zone

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height associated with potential development. All potential development projects would also comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence light, glare and shadows.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1. The proposed increase in maximum building heights in the West, South, and East Campus sectors under Alternative 1 are also assumed under Alternative 3.

West Campus

Light

Under Alternative 3, potential future development in the West Campus sector would add new sources of light to the campus including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting and an increase mobile sources of lighting such as vehicle headlights. The amount of new light sources would be greater than Alternative 1 due to the higher amount of development density assumed in the West Campus under Alternative 3. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, including certain areas adjacent to the campus boundaries (i.e. the adjacent University District). However, the amount of light spillage is not anticipated to be significant since the surrounding area is already a highly developed urban area. The potential for increase in "light sky" conditions that could be visible from Portage Bay and the Eastlake neighborhood south of West Campus would be greater than under Alternative 1

Development on existing surface parking lots under Alternative 3 would result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of these surface parking lots and associated lighting would include the development of new buildings on the parking lots and addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

Under Alternative 3, potential future development in the West Campus sector could introduce new sources of glare and result in an increase in glare from vehicles and certain new building surfaces. The increase in glare under Alternative 3 would be greater than Alternative 1 due to the increased amount of development density assumed in West Campus. It is anticipated that façade design, materials and glazing on potential future development projects would be similar to recent campus development and would not be highly reflective or create a substantial source of glare. As a result, the potential for glare impacts is anticipated to be low.

Shadows

Similar to Alternative 1, potential future development and associated landscaping under Alternative 3 would generate shadows over adjacent portions of West Campus, surrounding streets and adjacent areas (the University District). The potential for shadows to be generated in the West Campus sector would be greater than under Alternative 1 due to the greater amount of development density assumed in the West Campus under Alternative 3.

Shadow simulations were completed for the West Campus sector under Alternative 3 (see **Figure 3.8-3** for the shadow simulations). During the Summer Solstice shadows would extend to the west of potential new development sites and would transition to the north and east during the course of the day. No shadows would be cast over Portage Bay Park. During the Winter Solstice, shadows would be cast similar directions as during the Summer Solstice but would be longer in the morning and evening due to the lower angle of the sun; no shadows would be cast over Portage Bay Park.

South Campus

Light

Under Alternative 3, new sources of light would be generated by development in the South Campus sector similar to Alternative 1, including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting and an increase mobile sources of lighting such as vehicle headlights. It is anticipated that lighting levels in the South Campus would be higher than under Alternative 1 due to the assumed increased development density in the sector. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, and additional light sources could be visible from portions of the Montlake residential neighborhood to the south. The potential for increase in "light sky" conditions that could be visible from Portage Bay and the Montlake neighborhood would be greater than under Alternative 1.

Potential future development in the South Campus sector would also result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

Similar to Alternative 1, glare would be generated by development in the South Campus sector under Alternative 3 and would primarily be associated with vehicles traveling through and adjacent to the sector, as well as new building development. The potential for glare in the South Campus sector would be greater than under Alternative 1 due to the

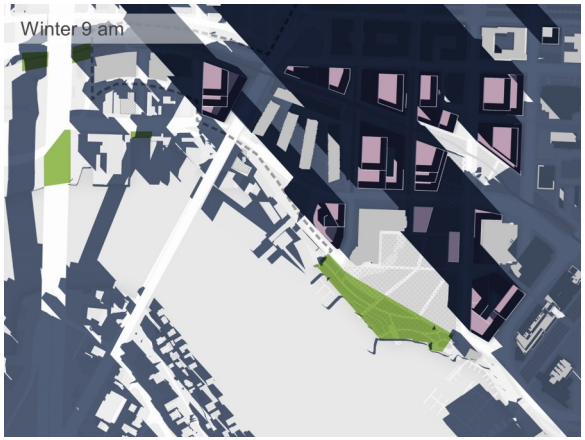
Summer:

8 am

12 pm

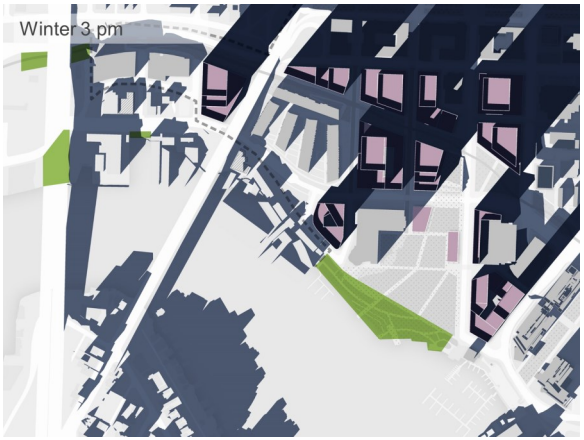
4 pm

Winter:



9 am

12 pm



3 pm

Source: Sasaki, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.8-3
Alternative 3—West Campus Shadow Simulations

assumed increased development density in the sector. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence glare such as façade design, façade materials, and glazing.

Shadows

Potential future development in the South Campus sector would generate additional shadows within the sector. Due to the level of development under Alternative 3, it is anticipated that the potential for shadows in South Campus would be greater than under Alternative 1. However, there are no existing public park/open spaces adjacent to the South Campus and shadows from future development would generally be cast on campus areas, some of which are already shadowed by existing development in the South Campus. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of building orientation, building height and associated potential shadows.

Central Campus

Light

Light from potential development in the Central Campus sector would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector. Similar to Alternative 1, potential future development of the N5 parking area, adjacent to the existing Observatory could have a high potential for light impacts to itsoperation.

Glare

Glare associated with potential development in the Central Campus sector under Alternative 3 would be the same as under Alternative 1 due to the similar amount of development density that is assumed for the sector.

Shadows

Potential shadows associated with development in the Central Campus sector under Alternative 3 would be the same as Alternative 1 due to the similar amount of development density that is assumed for the sector.

East Campus

Light

Development within the East Campus sector under Alternative 3 would create new sources of light that would be similar to those described for Alternative 1. Due to the amount of development density in this sector under Alternative 3, it is anticipated that the amount of light that would be generated in the East Campus would be lower than under Alternative 1.

Glare

New sources of glare would be generated in the East Campus from vehicles traveling through and adjacent to the sector, as well as from the exterior surfaces of newbuildings. It is anticipated that potential increases in glare would be lower under in East Campus Alternative 3 when compared with Alternative 1 due to the reduced amount of development density that is assumed.

Shadows

Development in the East Campus sector under Alternative 3 would also result in an increased potential for shadows; however, the potential for shadows would lower than Alternative 1 due to the reduced development density within the sector.

Summary of Impacts in Primary & Secondary Impact Zone Areas

As under Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to the these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus). Potential development would result in new light and glare sources and potential increased shadows from certain areas surrounding potential development sites. With the additional building area in West and South Campus, the potential for increases in light, glare, and shadows from these sectors towards uses in the adjacent Primary Impact Zone areas would generally be greater under Alternative 3 than under Alternative 1.

Less development is assumed to occur in the Central Campus and East Campus sectors under Alternative 3 compared to Alternative 1. As a result, there would be less potential for light, glare, and shadows that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, new light sources could be visible from certain areas of the Secondary

Impact Zone but would not be anticipated to result impacts to those land uses. New sources of glare and shadows would not be anticipated to impact the Secondary Impact Zone

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height associated with potential development. All potential development projects would also comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence light, glare and shadows.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1. The proposed increase in maximum building heights under Alternative 1 are also assumed under Alternative 4.

West Campus

Light

Potential future development in the West Campus sector under Alternative 4 would add new sources of light to the campus including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting and an increase mobile sources of lighting such as vehicle headlights. The amount of new light sources, and the potential for light spillage and increase in "light sky" conditions, would be the same as under Alternative 1.

Glare

Under Alternative 4, potential future development in the West Campus sector could introduce new sources of glare on the campus and result in an increase in glare from vehicles and certain new building surfaces. The increase in glare under Alternative 4 would be the same as under Alternative 1.

Shadows

Similar to Alternative 1, potential future development and associated landscaping under Alternative 4 would generate shadows over adjacent portions of the West Campus sector, surrounding streets, and adjacent areas (the University District). The potential for shadows to be generated in the West Campus sector would be the same as under Alternative 1.

Shadow simulations for the West Campus sector under Alternative 4 would be the same as illustrated for Alternative 1 (see **Figure 3.8-1** for the shadow simulations). At the Summer Solstice, shadows would be cast to the west of potential new building development and would transition to the north and east over the course of the day; no shadows would be cast over Portage Bay Park. During the Winter Solstice, shadows would extend in similar directions as during the Summer Solstice but would be longer in the morning and evening due to the lower angle of the sun. No shadows would be cast over Portage Bay Park.

South Campus

Light

Under Alternative 4, new sources of light would be generated by development in the South Campus sector, including interior/exterior building lighting associated with new campus buildings, pedestrian-scale lighting and an increase mobile sources of lighting such as vehicle headlights. It is anticipated that lighting levels, and potential for light spillage and increase in "light sky" conditions, in the South Campus sector would be less than under Alternative 1 due to the lower amount of development density in the sector.

Glare

Glare would be generated by development in the South Campus sector with development under Alternative 4 and would primarily be associated with vehicles traveling through and adjacent to the sector, as well as new building development. The potential for glare in the South Campus sector would be lower than under Alternative 1 due to the lower amount of building development density in South Campus assumed under Alternative 4.

Shadows

Potential development in the South Campus would generate additional shadows within the sector. Due to the level of development in the South Campus sector anticipated under Alternative 4, it is anticipated that the potential for shadows in the sector would be less than under Alternative 1.

Central Campus

Light

New sources of light would be generated in the Central Campus sector as part of potential development under Alternative 4. New light levels in the Central Campus sector would be greater than under Alternative 1 due to the increased amount of development in the sector. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, particularly in the north Central Campus (near NE 45th Street and the adjacent residential areas) and in the west Central Campus (near 15th Avenue NE and the

adjacent University District). Potential future development in the Central Campus sector would occur on some existing surface parking lots and result in a reduction in the amount of surface parking lot lighting and associated light spillage. Removal of existing surface parking lots and associated lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Potential development in Parking lot N5 would be located adjacent to the existing Observatory and could result in impacts to the Observatory due to the potential building height and increase in ambient light/light spillage that could occur with development on the site. Currently, the Observatory is able to reduce lighting intensity in the existing parking lot to improve nighttime viewing. The ability to reduce lighting intensity would be more difficult with potential development on the existing parking lot and would create a high potential for light impacts.

Glare

Glare would be generated by development in the Central Campus sector and would primarily be associated with vehicles traveling through and adjacent to the sector, as well as new building development. The potential for glare would be greater under Alternative 4 compared to Alternative 1 due to the increased amount of development density assumed in the Central Campus. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence glare such as façade design, façade materials, and glazing.

Shadows

Under Alternative 4, potential future development in the Central Campus sector would generate additional shadows within the sector. Due to the level of development assumed under Alternative 4, Central Campus would also have a higher potential to generate shadows compared to Alternative 1. Shadows from future development would not be anticipated to affect public parks/open spaces but could be cast over some existing off-campus areas (to the north and west of the Central Campus). All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of building orientation, building height and associated potential shadows.

East Campus

Light

Potential development within the East Campus sector under Alternative 4 would create new sources of light that would be similar to those described for Alternative 1. Due to the increased amount of assumed development in this sector under Alternative 4, it is anticipated that the amount of light that would be generated in the East Campus would be higher than under Alternative 1. Areas immediately adjacent to potential new campus buildings could experience some localized light spillage, particularly along Montlake Boulevard NE and existing athletic facilities (soccer field and baseball field). Potential future development in the East Campus would occur on a majority of the existing E1 and E18 surface parking lots and would result in a reduction in the amount of surface parking lot pole lighting and associated light spillage associated with those former facilities. The removal of existing surface parking lots and lighting would include the development of new buildings on the parking lots and the addition of new building lighting and pedestrian lighting that would be a part of new development on those sites.

Glare

New sources of glare would be generated in the East Campus sector from the exterior surfaces of new buildings and vehicles traveling through and adjacent to the sector. It is anticipated that potential for glare would be higher under Alternative 4 when compared with Alternative 1 due to the increased amount of development density that is assumed in the East Campus. It is anticipated that façade design on potential future development projects would be similar to recent campus development and would not be highly reflective or create a substantial source of glare.

Shadows

Development in the East Campus sector would also result in an increased potential for shadows when compared to Alternative 1 due to the increased development density within the sector. Potential development within the existing surface parking lots in the East Campus would result in building-generated shadows over portions of Montlake Boulevard NE, existing athletic facilities (i.e., track facility, baseball field, and soccer fields) and open space areas. All potential development projects would comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of building orientation, building height and associated potential shadows.

Summary of Impacts in Primary & Secondary Impact Zone Areas

Similar to Alternative 1, Alternative 4 would contribute to the overall amount of development on the University of Washington Seattle campus. With the focus of development in the West, Central and East Campus sectors (97 percent of development under Alternative 4), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West and Central Campus), a portion of the residential neighborhood to the north of 45th Street NE (adjacent to Central Campus), and University Village and the Laurelhurst neighborhood (adjacent to the East Campus sector). Potential development would result in new light and glare sources and potential increased shadows from certain areas surrounding potential development sites. With the increased building development area in West, Central, and East Campus sectors, thre is a potential for increases in light, glare and shadows from these sectors towards uses in the adjacent Primary Impact Zone areas.

Less development is assumed to occur in the South Campus sector under Alternative 4 compared to Alternative 1. As a result, there would be less potential for light, glare and shadows that would impact land uses adjacent to the South Campus sector in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, new light sources could be visible from certain areas of the Secondary Impact Zone but would not be anticipated to result impacts to land uses in those areas. New sources of glare and shadows would not be anticipated to impact the Secondary Impact Zone

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height associated with potential development. All potential development projects would also comply with the University's design review process and design standards (i.e., architectural review, landscape review and environmental review), which would include a review of potential factors that could influence light, glare and shadows.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, none of the assumed street or aerial vacations would occur. Because the vacations are not intended to increase the amount of building development on campus, the same amount of development and associated increases in light, glare and shadows would occur as under Alternatives 1 through 4. As a result, it is anticipated that the light, glare and shadow impacts under Alternative 5 would be similar to those analyzed under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

To the extent that increases in light, glare and shadows would occur with development under the *2018 Seattle Campus Master Plan*, it could result in a cumulative increase in light, glare and shadows when combined with existing and potential future development in the surrounding campus area. However, the existing campus and surrounding areas are already highly developed urban areas and significant cumulative impacts associated with light, glare and shadows would not be anticipated.

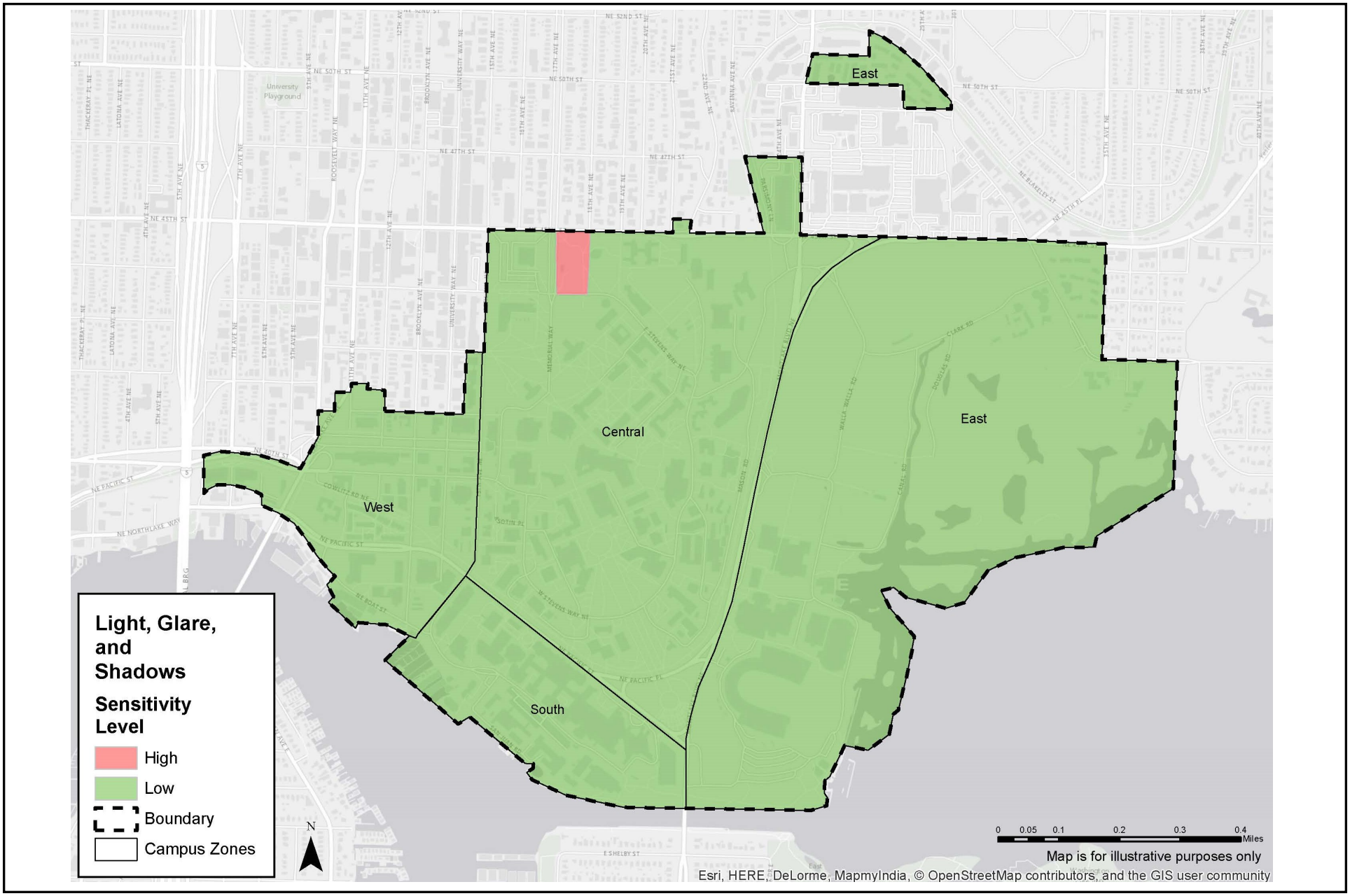
Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington is responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA threshold analysis/determination for individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.8-4**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For example, areas of campus that contain existing light-sensitive uses (i.e., the Observatory) are identified as having a "High" potential for light impacts, while areas of campus located at a distance from those light-sensitive uses are identified as having a "Low" potential for impacts.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.8-4
Light, Glare and Shadows Sensitivity Map

3.8.3 Mitigation Measures

The following measures would be available for development under the *2018 Seattle Campus Master Plan*.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The University of Washington's existing design review processes (architectural, landscaping and environmental review) would continue to be used to review all building projects on campus.
- Exterior light fixtures would continue to be shielded and sited to focus lighting and direct light away from adjacent off-campus land uses.
- The design of potential future development would consider the use of the least reflective glazing available to minimize the effects of reflective solar glare.

Additional Measure Applicable to High Potential Campus Areas

- Potential future development on the N5 parking area under the *2018 Seattle Campus Master Plan* would require project-specific coordination with the adjacent Observatory to determine potential light-related issues and could require additional analysis and mitigation measures (if necessary).

3.8.4 Significant Unavoidable Adverse Impacts

Potential future development under the *2018 Seattle Campus Master Plan* would result in an increase in light, glare, and shadows on campus associated with new buildings and associated campus landscaping. With the implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

3.9 AESTHETICS/VIEWS

This section of the Draft EIS describes the existing aesthetic and view conditions on the University of Washington campus and in the site vicinity and evaluates the potential impacts to aesthetics and views that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.9.1 Affected Environment

Existing Campus

The visual character of the University of Washington campus is quite varied and contains a variety of buildings types, open space areas and views. For example, the Central Campus sector is typified by older, brick buildings with formal open space areas, while the South Campus sector is characterized by larger, contemporary buildings and more informal shoreline open spaces. The campus setting and layout of buildings and open space areas provides views of Mount Rainier, the Cascade Mountains, the Olympic Mountains, Lake Washington, Union Bay, Portage Bay and the downtown Seattle skyline. A more detailed discussion of the aesthetic and visual character for each of the four campus sectors is provided below.

West Campus

Aesthetic Character

Alder Hall

The West Campus sector is generally bounded by NE 41st Street to the north, 15th Avenue NE to the east, Portage Bay to the south, and the University Bridge/Roosevelt Way NE and 6th Avenue NE to the west. This area of campus has the strongest connection with the adjacent University District neighborhood and as such, existing campus uses reflect that relationship with the adjacent area. Existing campus uses primarily include instructional and administrative uses, as well as several recently constructed student housing buildings. Instructional and administrative uses are generally located south of NE Pacific Street and along 15th Avenue NE and University Way NE. These uses include a range of building sizes and building heights; several of the buildings are over 50 years of age (i.e., the Commodore-Duchess Apartments, Eagleson Hall, and Henderson Hall).

Student housing uses are generally located west of University Way NE and north of NE Pacific Street. Student housing buildings (Elm Hall, Poplar Hall, Alder Hall, Lander Hall, etc.) are primarily recently constructed buildings ranging from six to seven stories in height. The southern portion of the West Campus sector also includes shoreline uses such as spaces

leased for private houseboats and boat moorages, as well as a street-end boat launch; Sakuma Viewpoint is located along the shoreline as well and provides a small-scale park/open space.

Views

Existing views in the West Campus sector are primarily provided by many of the north-south streets that allow for territorial views of the surrounding area. The views, for the most part, are of Portage Bay and the north portion of Capitol Hill. Views are available along Campus Parkway NE and include territorial views of the surrounding area to the west. The Sakuma Viewpoint is also located in the area along the shoreline and provides views to the south over Portage Bay.

In addition to existing views on campus, Scenic Routes are located within the campus area as designated by the City of Seattle (Ordinances #97025 and #114057). Scenic Routes are identified by the City as roadways/rights-of-way where view protection is encouraged. Within the West Campus sector, NE Campus Parkway and 15th Avenue NE are designated as Scenic Routes by the City of Seattle. NE Campus Parkway provides views to the west to portions of downtown Seattle, while 15th Avenue NE provides views to the south of Portage Bay (primarily in the south portion of the roadway near NE Pacific Street). In addition, several designated landmark buildings are located in the site vicinity and are visible and/or have views of the West Campus sector, including: the Puget Sound Lumber/Bryant Marina Building[1], Seattle Yacht Club, Montlake Community Center, the University Methodist Episcopal Church, and the Neptune Building.

Seattle Scenic Routes Map

South Campus

Aesthetic Character

The South Campus sector is bounded by NE Pacific Street to the north, Montlake Boulevard to the east, Portage Bay to the south, and 15th Avenue NE to the west. This area is generally characterized by existing development associated with the University of Washington

[1] It should be noted that the Puget Sound Lumber/Bryant Marina Building is anticipated to be demolished to accommodate the proposed Bryant Park which is part of the mitigation for the SR 520 bridge project.

Medical Center and the Magnuson Health Sciences Center; instructional uses, including William H. Foege Hall, Hitchcock Hall and the Ocean Sciences Building are also located near 15th Avenue NE. To the south of Columbia Road, the area also includes administrative and research uses, as well as shoreline open space and piers associated with Oceanography and Marine Sciences uses. Several buildings in this area are over 50 years of age, including the Magnuson Health Sciences Center and the Oceanography Building.

The medical and health facilities in this area of campus range from five to 13 stories in height and have taken the form of a continuous building structure that extends from the Portage Bay Vista to Montlake Boulevard NE. This form of development has restricted the number of pedestrian connections between NE Pacific Street and the waterfront. The area south of Columbia Road is also developed, but waterfront open space is provided south of the Surgery Pavilion and near the Portage Bay Building.

UW Medical Center

Views

The South Campus includes the existing Portage Bay Vista, which provides views to the south of Portage Bay and portions of Capitol Hill. 15th Avenue NE also provides a view to the south of a portion of Capitol Hill. Due to the presence of existing trees and development adjacent to the roadway, views to the west and east along NE Pacific Street are generally limited to the immediate surrounding area, with the exception being near the intersection with Montlake Boulevard NE where partial views of Lake Washington and Bellevue are available in the background.

Several designated City of Seattle landmark buildings are located in the site vicinity and are visible and/or have views of the South Campus, including: the Seattle Yacht Club, Montlake Community Center, and the Montlake Bridge.

Central Campus

Aesthetic Character

The core of the Central Campus sector contains most of the early campus buildings and is surrounded by a perimeter of newer development. The framework for the historic core was based on an integration of the plan for the *1909 Alaska-Yukon-Pacific Exposition* and the *1915 Bebb and Gould Plan*. Stevens Way essentially encircles the core, with extensions along Memorial Way and Rainier Vista. As such, the Central Campus sector includes several buildings that are 50

Liberal Arts Quad

years of age or older (see Section 3.12, Historic Resources, for further details on each building), including Denny Hall (1895 – first building on campus), the Observatory (1895), Lewis Hall (1896), Clark Hall (1896), Parrington Hall (1902), and Architecture Hall (1909 – the last major building remaining from the *1909 Alaskan-Yukon-Pacific Exposition*). The Central Campus sector also includes areas surrounding the perimeter of the historic core, such as along Montlake Boulevard, NE Pacific Street and 15th Avenue NE. Important buildings in the Central Campus sector perimeter include Kincaid Hall, Guthrie Hall and the Physics and Astronomy Building. Building heights and sizes range from small, one-story structures to larger and taller buildings such as the 12-story McMahon Hall and the 8-story Physics/Astronomy Tower; however, the majority of the buildings in the Central Campus sector range from two- to five-stories in height.

Major open spaces on the Central Campus sector include Rainier Vista, Memorial Way, the Liberal Arts Quadrangle, Denny Yard, the Central Plaza/Red Square, the Campus Green/Parrington Lawn, Engineering Quadrangle, the HUB Yard, Denny Field, and the Archery Range/Penthouse Lawn. Rainier Vista is a tree-lined view corridor that provides views into campus and out towards Mount Rainier, and is vital to the character and form of the campus open space system. Memorial Way is the major ceremonial entrance for vehicle and pedestrian traffic entering the campus from NE 45th Street. The Liberal Arts Quadrangle (the Quad) is a formal open space that is framed by Collegiate Gothic buildings. The Central Plaza/Red Square is a hardscaped, urban plaza of red brick. The HUB Yard is a sunny, open tree-lined lawn area adjacent to the HUB. Denny Yard was the earliest "front yard" of the campus and consists of lawn areas framed by existing trees and buildings.

Views

From the Central Campus sector, Rainier Vista provides one of the most dramatic views on the campus with views to the south of Mount Rainier which is framed by trees lining the vista, as well as Drumheller Fountain. Red Square also affords views of the Olympic Mountains and territorial views of NE Campus Parkway and Portage Bay to the west and southwest. Partial Views of Union Bay, Lake Washington and the Cascade Mountains are afforded from Stevens Way. The Campus Green/Parrington Lawn provides views from the campus to the University District. Both the Campus Green/Parrington Lawn and Memorial Way also afford views into the Central Campus sector from adjacent areas.

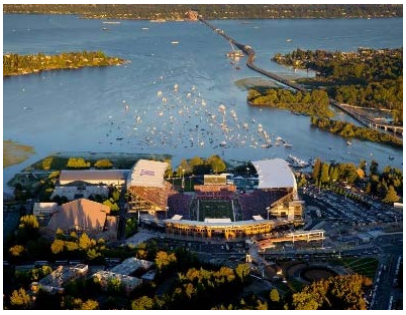
Rainier Vista

15th Avenue NE and NE 45th Street are designated as scenic routes by the City of Seattle and are located adjacent to the Central Campus sector. 15th Avenue NE provides views to the south of Portage Bay (primarily in the south portion of the roadway near NE Pacific Street)

and NE 45th Street provides views of Lake Washington and the Cascade Mountains (primarily from the NE 45th Street bridge over 25th Avenue NE). Three existing City of Seattle landmark buildings are also located in the vicinity and are visible and/or have views of the Central Campus sector, including: the University Presbyterian Church, the Wilsonian Apartment building, and Sigma Kappa Mu house.

East Campus

Aesthetic Character



Husky Stadium and East Campus

The East Campus sector is separated from Central Campus by Montlake Boulevard NE and connections to the campus are limited to three pedestrian bridges and campus entrance at NE 44th Place. The East Campus sector is generally bounded by NE 45th Street to the north, Union Bay to the east, the Lake Washington Ship Canal to the south, and Montlake Boulevard to the west. The existing character of the East Campus sector is primarily defined by athletic facilities/recreational uses, surface parking and open space/natural areas. Development with the area is primarily located in the south portion of the area, along Montlake Boulevard, and includes Husky Stadium, Alaska Airlines Arena at Hec Edmundson Pavilion, the Intermural Activities Building, the golf driving range, and several sports fields; the existing E1 parking area also comprises a large portion of the area along Montlake Boulevard. Instructional/research uses are located along the eastern boundary of the area, as well as student housing (Laurel Village). Buildings over 50 years of age in the area include Alaska Airlines Arena at Hec Edmundson Pavilion, and the Center for Urban Horticulture.

A large portion of the East Campus sector is undeveloped and comprised of the Union Bay Natural Area, which is an environmentally sensitive area along the shoreline of Union Bay. Some waterfront developments are located along the shoreline, including the Waterfront Activities Center, the Conibear Shellhouse, and the Canoe House.

Views

NE 45th Street Scenic Route

The East Campus sector includes views of Union Bay, Lake Washington, cities along the eastern shore of Lake Washington (i.e., Bellevue, Medina, and Kirkland), and partial views of the Cascade Mountains. Views of Lake Washington are afforded from many locations in the East Campus sector, including from Husky Stadium. Montlake Boulevard NE runs north-south along the western boundary of the area and provides limited view

opportunities, primarily near the southern portion at the Montlake Bridge.

NE 45th Street is designated as scenic route by the City of Seattle and located in the vicinity of the East Campus sector. This scenic route provides views of over the East Campus sector towards Lake Washington and the Cascade Mountains (primarily from the NE 45th Street bridge over 25th Avenue NE).

Surrounding Area (including Primary & Secondary Impact Zone Area)

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

The area surrounding the University of Washington campus is reflective of both natural and built features. The primary natural features in the area are Union Bay, Portage Bay and the Lake Washington Ship Canal that form the southern and eastern boundaries of the campus. These waterways also separate the University of Washington campus, the University District and the Laurelhurst neighborhood from the communities to the south (Mountlake, Broadmoor and Capitol Hill neighborhoods).

Prominent built features that influence the aesthetic character of the area consist primarily of transportation routes, including Interstate 5 (I-5) and State Route 520 (SR-520). I-5, the major north/south vehicular travel corridor west of Lake Washington, effectively separates the communities in the vicinity of the University of Washington on the east side of I-5 from the communities of Wallingford, Fremont and Green Lake on the west side of I-5. SR-520, a major east/west vehicle travel corridor across Lake Washington, provides an additional separation between the areas immediately north and south of the Ship Canal and Portage Bay.

Below is a discussion on areas in the Primary Impact Zones as they relate to the individual campus sectors. Aesthetics Conditions in the Secondary Impact Zone are similar to those described for the Primary Impact Zone, although views to the University of Washington campus are more distant than those in the Primary Impact Zone.

West Campus

The area adjacent to the West Campus sector is generally characterized by retail/commercial uses within the University District neighborhood, including retail shops/restaurants, offices, churches, multifamily residences, and hotels. Buildings in the area generally range from one to four stories in height, with several high-rise structures such as the 22-story UW Tower, the 14-story Hotel Deca, and several multifamily residential structures ranging from 7 to 11 stories. Further to the west is Interstate 5. It should be noted that the City of Seattle is currently evaluating changes to the Comprehensive Plan and Zoning for the University District area as part of the *2015 University District Urban Design EIS* which would allow for increased building heights and building density, particularly within the areas adjacent to the University of Washington campus and the future light rail station. The *2015 University District Urban Design EIS* evaluated a range of increases in maximum building heights in the area from up to 125-160 feet (Alternative 1) to 240-320 feet (Alternative 2). Potential future development in the University District associated with zoning changes could result in changes to the aesthetic character of the University District.

University District Urban Design EIS – Alternative 1

University District Urban Design EIS – Alternative 2

South Campus

To the immediate south of the South Campus sector is the Lake Washington Ship Canal and Portage Bay. Further to the south are Interstate 520 and the Montlake, Broadmoor and Madison Park residential neighborhoods, which are primarily comprised of low density single family residences. Several parks are located in this area, including the Washington Park Arboretum, Montlake Park and Playground, Interlaken Park, Louisa Boren Park and Volunteer Park; the Broadmoor Golf Club is also located in the area. Industrial uses are also located to the southwest of the campus, along NE Northlake Way.

Central Campus

The area to the north of the Central Campus sector is primarily comprised of residential uses, including multifamily apartment buildings, fraternity/sorority houses and single family residences (many of which are rented to University of Washington students); several churches are also located within this area, including the University Presbyterian Church, the University Congregational United Church of Christ, the University Christian Church, and the Prince of Peace Catholic Newman Center. Buildings in this area are generally two- to four-stories in height. Retail and commercial uses in the University District are primarily located to the west of the Central Campus sector and are generally one- to four-stories in height.

University Village

East Campus

To the north of the East Campus sector are commercial/retail uses associated with the University Village shopping center which includes retail/restaurant uses and structured parking; additional commercial uses (retail, hotels, offices, etc.) are also located surrounding the shopping center. Buildings are generally two to five-stories in height in this area. To the east of the East Campus sector is Lake Washington/Union Bay and the Laurelhurst residential neighborhood. The Laurelhurst neighborhood generally consists of low density single family residences and park uses (Laurelhurst Park and Laurelhurst Community Center). Buildings in this area are generally two to three-stories in height. Children's Hospital and commercial uses are also located near Sand Point Way NE.

3.9.2 Impacts

This section of the Draft EIS identifies the potential impacts on existing aesthetic character and views on the University of Washington campus and in the surrounding areas that could occur with development under the EIS Alternatives.

Under the *2018 Seattle Campus Master Plan*, new development of approximately 6.0 million gsf of building area on the campus would result in increased density and building heights, particularly within the West Campus sector where maximum building heights would increase from 105 feet to 240 feet. Development standards would be included as part of the *2018 Seattle Campus Master Plan* to ensure that new development would minimize visual impacts and be compatible with the existing aesthetic character of the campus.

Existing view corridors (i.e., Rainier Vista, Memorial Way, Parrington Lawn, Portage Bay Vista, etc.) would be preserved as part of the *2018 Seattle Campus Master Plan*. In addition, areas reserved for planned open space such as the planned West Campus Green would allow for the development of an additional view corridor along Brooklyn Avenue NE towards Portage Bay.

No Action Alternative

Under the No Action Alternative, it is assumed that the approximately 6.0 million gsf of net new development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *CMP Seattle 2003* would be developed (approximately 211,000 gsf). Increased campus population of approximately 422 FTEs would occur under the No Action Alternative through the remaining development under the *CMP Seattle 2003*.

Due to the lower level of development compared to Alternatives 1, 2 and 3, impacts to aesthetics and views would be substantially lower under the No Action Alternative, and the aesthetic and view conditions on the campus would remain similar to the existing conditions.

Alternative 1 – CMP Proposed Allocation with Requested Height Increase

Under Alternative 1, which most closely reflects the preferred distribution of building development under the *2018 Seattle Campus Master Plan*, approximately 6.0 million gsf of net new building space would be developed throughout the campus with a focus of this development in the West and South Campus sectors and more limited development in the Central and East Campus sectors.

The *2018 Seattle Campus Master Plan* contemplates increased maximum building height for the West Campus sector from the current 37 to 105 feet[2] to 30 to 240 feet[3] in order to allow for a level of building development in the West Campus sector sufficient to meet forecasted population growth, allow for the reservation of areas for open space improvements (including the planned West Campus Green and other open spaces), and provide for building space in staggered towers to allow for view corridors.

[2] *Maximum building height limit of 37 feet along the shoreline to 105 feet in the area north of NE Campus Parkway.*
[3] *Maximum limit of 30 feet along the shoreline to 240 feet in the area north of NE Pacific Street.*

West Campus

Aesthetic Character

Potential future development under Alternative 1 would change the aesthetic character of the West Campus sector which is primarily comprised of low- to mid-rise buildings (one- to six-stories in height), to a denser environment with taller buildings (see **Figure 3.9-1** for illustration of potential building massing under Alternative 1). Approximately 3.0 million gsf of development would occur in the West Campus sector under Alternative 1. Maximum building height in the areas outside of the shoreline jurisdiction would range from 160 feet in the southern portion of the West Campus sector to 240 feet in the northern portion (within areas north of NE Pacific Street). Future development up to the maximum height limit would be similar to some of the tallest existing buildings within the University District area (i.e. the UW Tower, Hotel Deca, multifamily residential buildings, etc.).

Although these increased heights would represent an increase in building heights when compared to the majority of the current buildings in the area, they would be consistent with the vision for potential future development that is identified for the University District. As part of the City of Seattle's *University District Urban Design Framework Plan*, maximum buildings heights up to 320 feet may be allowed within certain areas of the University District, including areas adjacent to the West Campus sector.

West Campus Green

Increased building heights under Alternative 1 would allow for smaller building footprints and the use of fewer development sites to accommodate the 3.0 million gsf of development in the West Campus sector. This, in turn, would create the potential opportunity for more open space surrounding potential future building development and allow for the reservation of space for the potential new five-acre West Campus Green that would connect with Portage Bay Park. The potential new open space in the West Campus sector would enhance the aesthetic character of the area and provide new areas for recreation and gathering.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the *2018 Seattle Campus Master Plan* would minimize potential aesthetic impacts associated with increased density and increased building heights in the West Campus sector.

Note: This illustration represents a conceptual plan and massing for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-1
Alternative 1—Conceptual Building Massing

Views

Existing Brooklyn Avenue NE

Potential development under Alternative 1 would modify views in the West Campus sector to reflect the increased density and building heights under the *2018 Seattle Campus Master Plan*. However, pursuant to development standard provisions identified in the *2018 Seattle Campus Master Plan*, new development would be intended to minimize visual impacts and preserve existing view corridors within the campus.

2018 CMP Brooklyn Avenue NE

NE Campus Parkway is identified as a primary view corridor on the campus and potential future development adjacent to NE Campus Parkway would be considered to have a high potential for view impacts. Potential development located adjacent to the NE Campus Parkway scenic route and would have a high potential to affect the character of views along the scenic route. Territorial views to the west along NE Campus Parkway would be preserved under the *2018 Seattle Campus Master Plan*. Development under Alternative 1 would also create an additional north-south view corridor along Brooklyn Avenue NE and through the potential West Campus Green which would provide additional views of Portage Bay and enhance the visual character of the West Campus sector.

Existing landmarks in the vicinity of the West Campus sector (University Methodist Episcopal Church and the Neptune Building) would be located to the north of potential development sites in the West Campus sector and potential impacts to views of these landmarks are not anticipated. The view of existing landmarks to the south (i.e., Seattle Yacht Club, Montlake Bridge, and Montlake Community Center) would not change with potential development, but distant views from their respective locations would change to reflect new development and increased density and building height under Alternative 1. Views from the south would also reflect the planned West Campus Green located along Portage Bay. However, these changes in views are not anticipated to result in significant adverse impacts to the existing landmarks.

In addition, potential development along the 15th Avenue NE scenic route could also affect the character of views along the roadway. Potential development along 15th Avenue NE would be intended to activate the street level within this area and would preserve the view corridor to the south associated with the existing scenic route designation. While potential future development in this area would have a high potential to impact the view corridor, provisions are identified in the *2018 Seattle Campus Master Plan* to maintain the views

along these corridors and significant impacts would not be anticipated (refer to the Visual Simulations provided later in this Alternative 1 discussion).

South Campus

Aesthetic Character

Existing Bridge to Health Sciences

2018 Seattle CMP South Campus

Development under Alternative 1 as part of the *2018 Seattle Campus Master Plan* would include approximately 1.35 million gsf of net new building space. Because the South Campus is currently a highly developed area, a substantial amount of building demolition would be required to accommodate the new building space and increased density. Potential demolition of existing buildings and development of new buildings would change the aesthetic character of the South Campus sector to reflect newer building facilities with increased open space opportunities. Potential future development under the *2018 Seattle Campus Master Plan* would allow for building heights up to 240 feet in the north portion of the South Campus sector (adjacent to NE Pacific Street). While the provision of taller building heights would represent a slight increase over the *CMP Seattle 2003* (small portions of the South Campus sector are allowed up to 240 feet in the *CMP Seattle 2003*), it would also create the opportunity for the increased building density to be accommodated by compact, high density development which would free up additional campus areas for use as open space, circulation and/or landscaping. This provision of new open space, circulation and landscaping would enhance the aesthetic character of the South Campus sector along NE Pacific Street which is predominantly currently comprised of building development. The allowance of taller buildings would also allow for the reservation of space for a view corridor and open space area within the central portion of the South Campus sector (the planned South Campus Green Corridor) which would enhance the aesthetic character and allow for additional views of Portage Bay.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height in this area. Implementation of these development standards as part of the *2018 Seattle Campus Master Plan* would minimize potential aesthetic impacts associated with increased density and increased building heights in the South Campus sector.

Views

Potential future development would modify views of the South Campus sector to reflect the increased density and building heights under the *2018 Seattle Campus Master Plan*. Potential development that would be located adjacent to the existing Portage Bay Vista would have a potential to change the view of the area adjacent to the vista; however, existing views through Portage Bay Vista towards the waterfront would be maintained as part of the *2018 Seattle Campus Master Plan*. The allowance of more compact, taller development would also allow for the reservation of area for an additional view corridor through the central portion of the South Campus sector towards Portage Bay (the South Campus Green Corridor) which would provide enhanced opportunities for views of the waterfront area.

Distant views from existing landmarks to the south of the South Campus sector, beyond Portage Bay (i.e., Seattle Yacht Club, Montlake Bridge, and Montlake Community Center), would experience a change in views to reflect new development and increased density and building height in the South Campus sector. These changes in views are not anticipated to result in significant adverse impacts to the existing landmarks (refer to the Visual Simulations provided later in this Alternative 1 discussion).

Central Campus

Aesthetic Character

Approximately 0.9 million gsf of net new building space would be provided in the Central Campus sector under Alternative 1. Potential future development under the *2018 Seattle Campus Master Plan* would allow for maximum building heights that would be the same as those identified in the *CMP Seattle 2003* (primarily 105-foot maximum heights with 160-foot maximum heights in the northeast corner and southwest corner and 65-foot maximum heights adjacent to Rainier Vista). Potential future development would increase the overall density in the Central Campus sector but would not substantially change the aesthetic character of the area due to the similar maximum building heights and the provision of development standards identified in the *2018 Seattle Campus Master Plan*. Existing open spaces within the Central Campus sector would also be preserved, including Rainier Vista, the Liberal Arts Quad, Red Square, Parrington Lawn and Denny Yard.

Views

Future development under the *2018 Seattle Campus Master Plan* is intended to preserve existing primary view corridors in the Central Campus sector, including Rainier Vista, Memorial Way NE, the Liberal Arts Quad, Olympic Vista (along NE Campus Parkway) and Portage Bay Vista. Potential development that would be adjacent to these view corridor areas would be considered to have a potential for view impacts. Potential development that is located adjacent to Memorial Way NE would have a potential to affect the view of the

area adjacent to the view corridor; however, existing views to the north and south along Memorial Way would not be obstructed. Potential development located within the view shed area of the existing view corridor from the Paul G Allen Center towards Lake Washington would also have a potential to affect the views within this view corridor; however, development within this area would be limited to 65 feet in height to allow for continued views from the Paul G Allen Center.

Views from existing landmarks in the vicinity of the Central Campus sector (i.e., University Presbyterian building, Wilsonian Apartment building, and Sigma Kappa Mu building) would not change substantially with potential future development under Alternative 1. Potential development adjacent to the 15th Avenue NE scenic route would modify the character of views along 15th Avenue NE but would not obstruct views along this scenic route. The NE 45th Street scenic route is also located adjacent to the Central Campus sector but would not be affected by potential development due to the location of potential development sites and the retention of the existing vegetated buffer along the northern boundary of the Central Campus sector (refer to the Visual Simulations provided later in this Alternative 1 discussion).

East Campus

Aesthetic Character

Approximately 0.75 million gsf of net new building space would be provided in the East Campus sector under Alternative 1. Potential future development could replace a portion of existing surface parking areas (including the E1 and/or E18 lots) and would increase the density in the area; however, this increase would be substantially lower than in other areas of the campus. Maximum building heights in the East Campus sector would be similar to those identified in the existing *CMP Seattle 2003*, but increases in building height would be provided along Montlake Boulevard NE (maximum height of 130 feet). Due to the lower level of potential development in the East Campus sector under Alternative 1, it is anticipated that changes to the aesthetic character would not be significant.

Views

In general, views of the East Campus sector would not be anticipated to change substantially due to the lower level of development that is assumed for the area under Alternative 1. While no existing primary view corridors are located within the East Campus sector, views of Lake Washington are available from several areas in the East Campus sector and adjacent areas. The *2018 Seattle Campus Master Plan* allows for the potential for an East Campus Land Bridge that would provide new open space area, as well as creating a view corridor from the bridge. Potential development sites have been situated to create a continuous view corridor from the bridge towards Lake Washington to provide enhanced views from the East Campus sector. Potential future development under Alternative 1 could

have a potential to affect certain views of Lake Washington; however, with the lower amount of development assumed for the East Campus sector and provision of development standards and maximum building heights in the *2018 Seattle Campus Master Plan*, it is anticipated that potential impacts to views would not be anticipated.

No existing landmarks are located in or adjacent to the East Campus sector that could have their views affected by potential future development. Views to the east along a portion of the NE 45th Street scenic route could be affected by potential future development within the East Campus sector. Taller buildings (potential future development up to 105 feet) could be located within the field of view from this scenic route towards Lake Washington and the Cascade Mountains and could modify the foreground views but would not obstruct views of the lake or mountains (refer to the Visual Simulations provided below).

Visual Simulations

Visual massing simulations were also prepared for this DEIS based on photographs of the site from selected viewpoints and photo simulations of potential development from these viewpoints. The identification of viewpoints for the visual analysis considered several factors, including City of Seattle viewpoints and scenic routes, the primary viewer groups in the area and the potential for development to impacts views. Seven viewpoints were selected as being most representative of area viewpoints and/or were determined to have the greatest potential for potential development to change the character of the view. These viewpoints are listed in **Table 3.9-1** and shown on **Figure 3.9-2**.

Table 3.9-1
VIEWPOINT LOCATIONS

Viewpoint	Description
Viewpoint 1	View from I-5 Southbound (Scenic Route)
Viewpoint 2	View from I-5 Northbound (Scenic Route)
Viewpoint 3	View from 7th Avenue NE and NE 40th Street
Viewpoint 4	View from Peace Park
Viewpoint 5	View from University Way NE and NE 40th Street
Viewpoint 6	View from NE 45th Street Bridge (Scenic Route)
Viewpoint 7	View from Brooklyn Avenue NE and NE Pacific Street

Source: Sasaki Associates, Inc., 2016.

Based on these viewpoints, photo simulations of site redevelopment under the EIS Alternatives were prepared to represent massing based on assumed building elevations, locations, and heights. The visual analysis presented in this DEIS includes figures that incorporate the following:

Visual Simulation Locations

1. I-5 Southbound (Scenic Route)
2. I-5 Northbound (Scenic Route)
3. 7th Ave NE and NE 40th Street (Edge Condition)
4. Peace Park (Edge Condition)
5. University Way NE and NE 40th Street (Edge Condition)
6. NE 45th Street Bridge (Scenic Route)
7. Brooklyn Avenue NE and NE Pacific Street (View Corridor)

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-2
Viewpoint Location Map

- Photographs illustrating the existing visual condition as viewed from the respective viewpoints[4].
- Simulations of building massing envelopes representing the extent of building massing visible from the respective viewpoint, consistent with assumed total building square footage, setbacks, and maximum heights. The building massing envelopes are intended to represent the conceptual bulk and scale of potential development under each of the EIS Alternatives.

A description of the existing views to the site from the identified viewpoints are provided below, along with a description of the potential view from each location under Alternative 1.

Viewpoint 1 – I-5 Southbound

From Viewpoint 1, the existing view from Southbound I-5 includes a panoramic view of the University District, the University of Washington campus (including portions of all campus sectors), Portage Bay, and Capitol Hill. Distant background views of the east of Lake Washington (Bellevue/Kirkland) and the Cascade Mountains are also available from Southbound I-5 (see **Figure 3.9-3** for the existing views from this location under Alternative 1).

Under Alternative 1, views from Viewpoint 1 would continue to include views of the University District, the University of Washington campus (including portions of all campus sectors), Portage Bay, and Capitol Hill; green open space areas along the Portage Bay shoreline would also be visible. Assumed building development in the West Campus and South Campus sectors would be located prominently within the field of view; the proposed West Campus Green would also be prominently visible along the Portage Bay shoreline. Assumed buildings in the West and South Campus sectors would obstruct a portion of the views of existing development in the site vicinity (i.e. a portion of Husky Stadium could be obstructed from view). Views of Portage Bay and Capitol Hill, as well as background views of Bellevue/Kirkland and the Cascade Mountains would continue to be available (see **Figure 3.9-3** for a conceptual massing simulation of the views from this location under Alternative 1).

Viewpoint 2 – I-5 Northbound

Similar to Viewpoint 1, the existing view from Viewpoint 2 – Northbound I-5 also consists of a panoramic view of Portage Bay, the University of Washington campus, and the University District; background views of the Bellevue/Kirkland area and the Cascade Mountains are also available (see **Figure 3.9-4** for the existing view from this location under Alternative 1).

[4] Existing views from Viewpoints 1 and 2 are described via text. No existing conditions photographs are included for these viewpoints due to safety concerns associated with taking photographs on I-5.

Alternative 1

Alternative 2

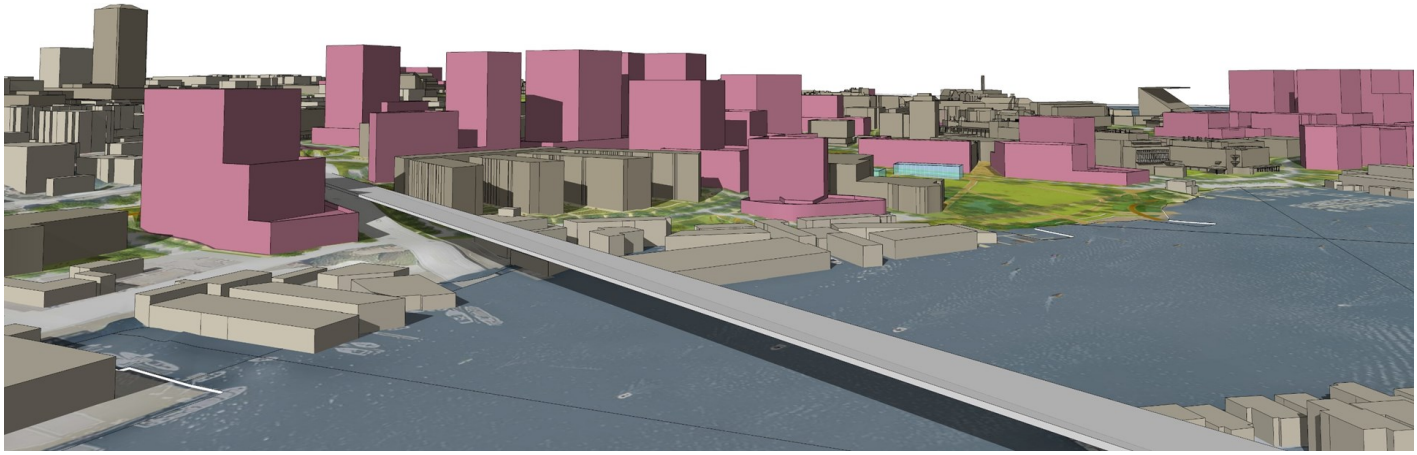
Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-3

Viewpoint 1: I-5 Southbound (Scenic Route)—Alternatives 1 and 2



Alternative 1

Alternative 2

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-4

Viewpoint 2: I-5 Northbound (Scenic Route)—Alternatives 1 and 2

Views from Viewpoint 2 would include prominent views of potential development under Alternative 1 (primarily in the West Campus and South Campus sectors). New development would likely obstruct the views of certain existing buildings within the University District and University of Washington campus. Views of Portage Bay and the adjacent shoreline area would continue to be available from northbound I-5, along with the area reserved for the planned West Campus Green. Background views of the Bellevue/Kirkland area and the Cascade Mountains would also remain (see **Figure 3.9-4** for a conceptual massing simulation of the views from this location under Alternative 1).

Viewpoint 3 – 7th Avenue NE and NE 40th Street

The existing view from Viewpoint 3 is primarily comprised for the 7th Avenue NE and NE 40th Street intersection and associated street trees and landscaping adjacent to the roadways. Existing development in the West Campus sector (Benjamin D Hall Interdisciplinary Research Building) is located in the mid-ground view. Partial views of Portage Bay and the Eastlake/ Capitol Hill area are located in the background within the view corridor created by the 7th Avenue NE right-of-way (see **Figure 3.9-5** for a photo of the existing view from Viewpoint 3).

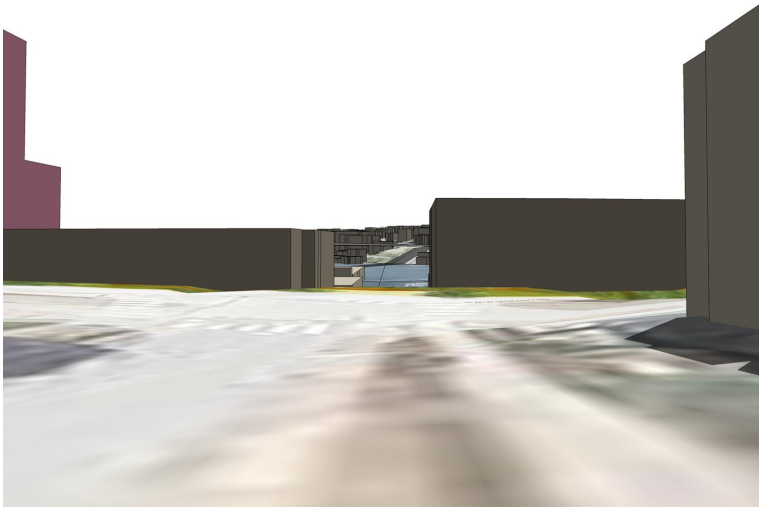
Under Alternative 1, the view from Viewpoint 3 would remain similar to the existing conditions. Potential future development in the West Campus sector would be visible within the left edge of the mid-ground view. Existing partial views to the south of Portage Bay and the Eastlake/Capitol Hill area would remain available from the 7th Avenue NE right-of-way (see **Figure 3.9.5** for a conceptual massing simulation of the view from this location under Alternative 1).

Viewpoint 4 – Peace Park

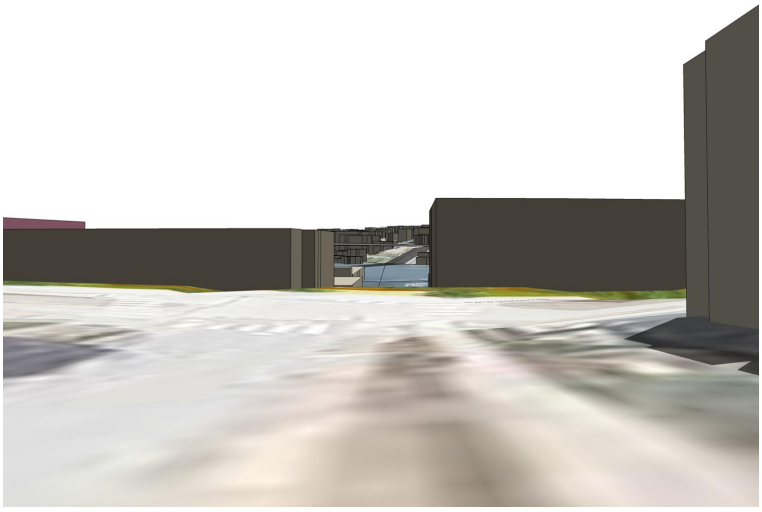
From Viewpoint 4, the existing view from Peace Park is generally limited to views toward the southeast, due to the presence of existing trees and vegetation on and adjacent to the park. The view to the southeast primarily consists of the University Bridge, the Mercer Court Apartments (student residences), and adjacent existing trees (see **Figure 3.9-6** for a photo of the existing view from Viewpoint 4).

The view to the southeast from Viewpoint 4 would remain generally similar with potential development under Alternative 1. The Mercer Court Apartments would continue to be the focal point of the views from this location. Potential future development in the West Campus sector would be adjacent to the apartment building and located within a portion of the background view as well. Potential development in the field of view would appear taller than existing development in the area from this location (see **Figure 3.9-6** for a conceptual massing simulation of the view from Viewpoint 4 under Alternative 1).

Existing



Alternative 1



Alternative 2

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

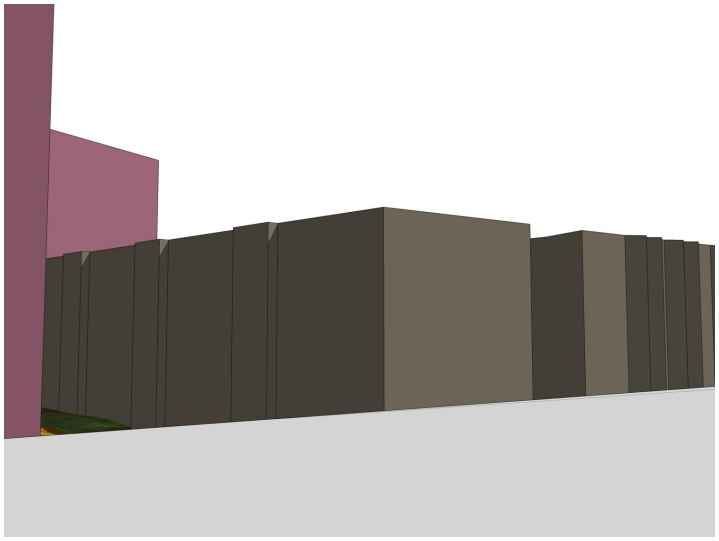
Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

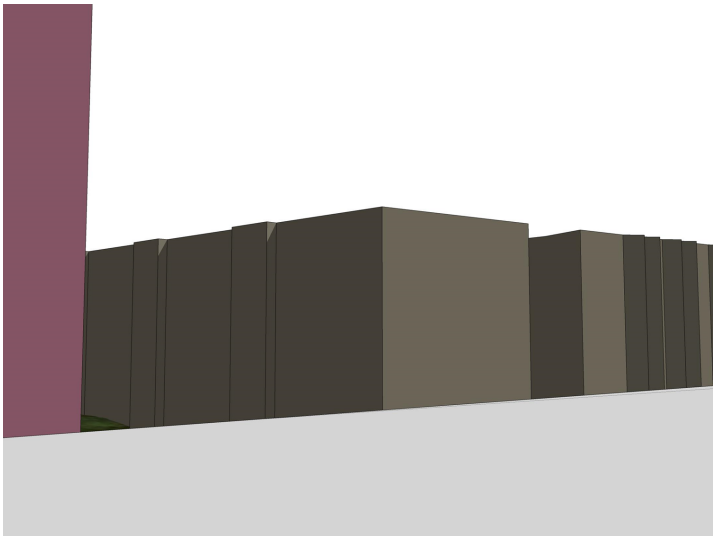
Figure 3.9-5

Viewpoint 3: 7th Ave NE and NE 40th Street (Edge Condition) —Alternatives 1 and 2

Existing



Alternative 1



Alternative 2

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-6

Viewpoint 4: Peace Park (Edge Condition)—Alternatives 1 and 2

Viewpoint 5 – University Way NE and NE 40th Street

The existing view from Viewpoint 5 consists of the University Way NE right-of-way, associated street landscaping and adjacent existing buildings to the east and west; these existing buildings are primarily one- to two-stories in height with some taller buildings such as Gould Hall and the West Campus Utility Plant (three to four-stories). Background views to the south include the Portage Bay Parking Facility and views of Capitol Hill (see **Figure 3.9-7** for a photo of the existing view from Viewpoint 5).

Under Alternative 1, the view from Viewpoint 5 would change to reflect taller, new development along the west side of University Way NE and in the background view. Potential development would change some of the aesthetic character of the view by replacing one- to two-story buildings with taller and denser development. The background views to the south along University Way NE would remain; however, a portion of the view of Capitol Hill would be obstructed by potential development to the south (see **Figure 3.9-7** for a conceptual massing simulation of the view from Viewpoint 5 under Alternative 1).

Viewpoint 6 – NE 45th Street Bridge

From Viewpoint 6, the existing view includes panoramic views to the southeast of the East Campus sector, including surface parking lots, the golf driving range, athletic facilities (Husky Stadium, soccer and baseball fields and the Intermural Activities Center) and Montlake Boulevard NE. Views of Mount Rainier, the SR-520 Bridge and the Bellevue/Kirkland area are available in the background from this location (see **Figure 3.9-8** for a photo of the existing view from Viewpoint 6).

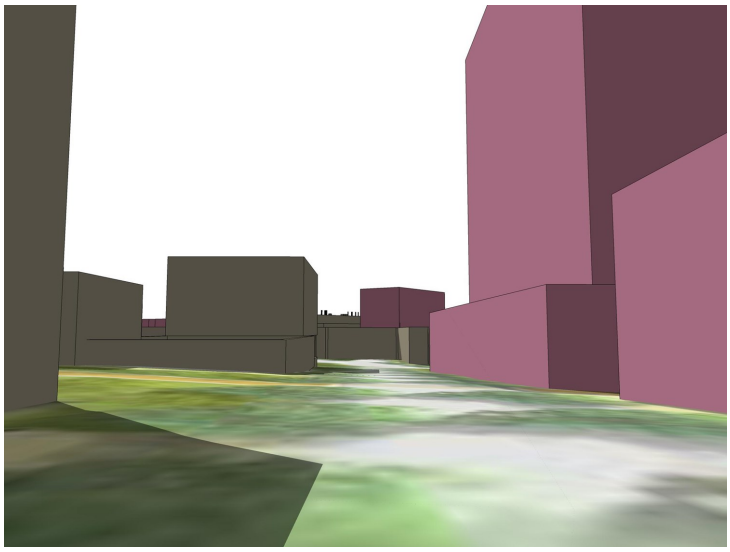
The view to the southeast from Viewpoint 6 would remain generally similar to the existing conditions under Alternative 1. Panoramic views of the East Campus sector and background

views of Mount Rainier, the SR-520 Bridge and the Bellevue/Kirkland area would remain from the NE 45th Street Bridge. Potential development in the East Campus sector under Alternative 1 would be located in the mid-ground view and would obstruct a portion of the view of Husky Stadium and the Intermural Activities Center from this location (see **Figure 3.9-8** for a conceptual massing simulation of the view from Viewpoint 6 under Alternative 1).

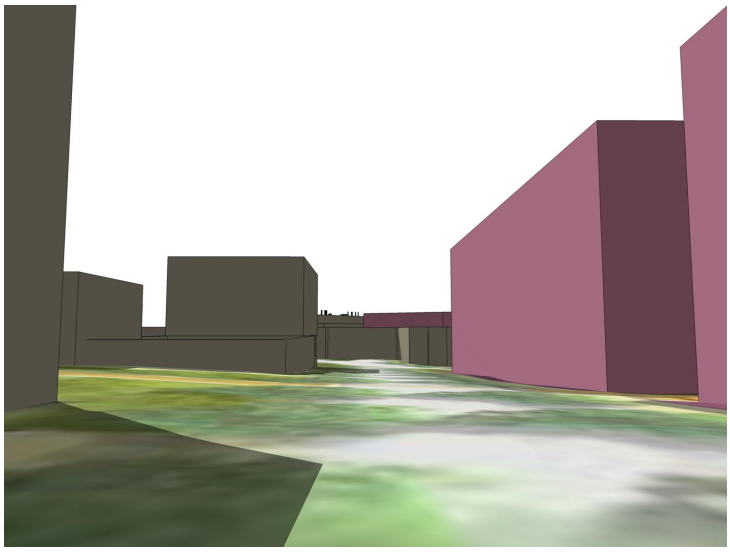
Viewpoint 7 – Brooklyn Avenue NE and NE Pacific Street

The existing view from Viewpoint 7 consists of the Brooklyn Avenue NE/NE Pacific Street intersection and existing street trees along Brooklyn Avenue NE and NE Pacific Street. A portion of the John M. Wallace Building is visible beyond the existing street trees. No views of Portage Bay are currently available due to the presence of existing development and trees/vegetation (see **Figure 3.9-9** for a photo of the existing view from Viewpoint 7).

Existing



Alternative 1



Alternative 2

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

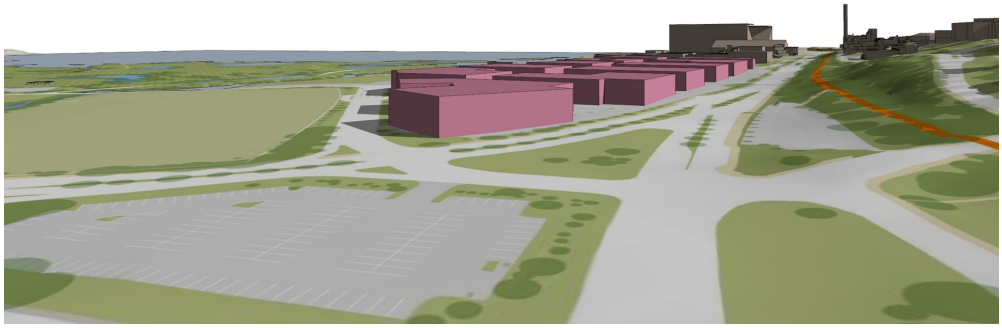
EA Engineering, Science, and Technology, Inc.

Figure 3.9-7

Viewpoint 5: University Way NE and NE 40th Street (Edge Condition) —Alternatives 1 and 2

Existing

Alternative 1



Alternative 2

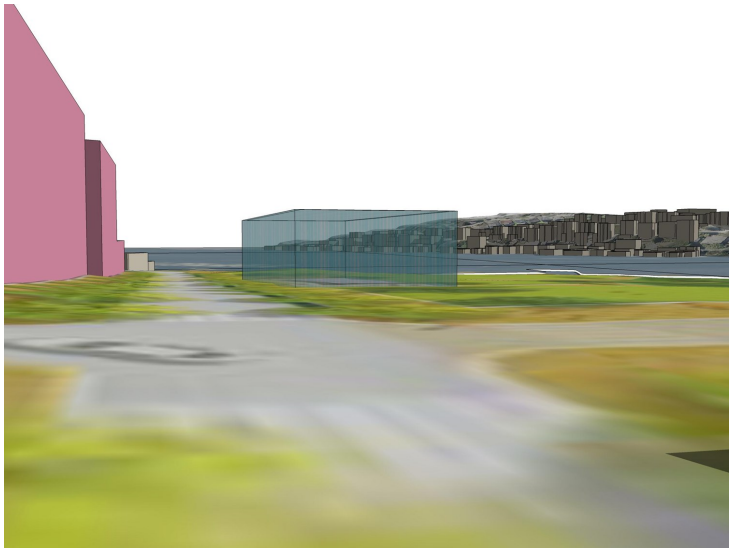
Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

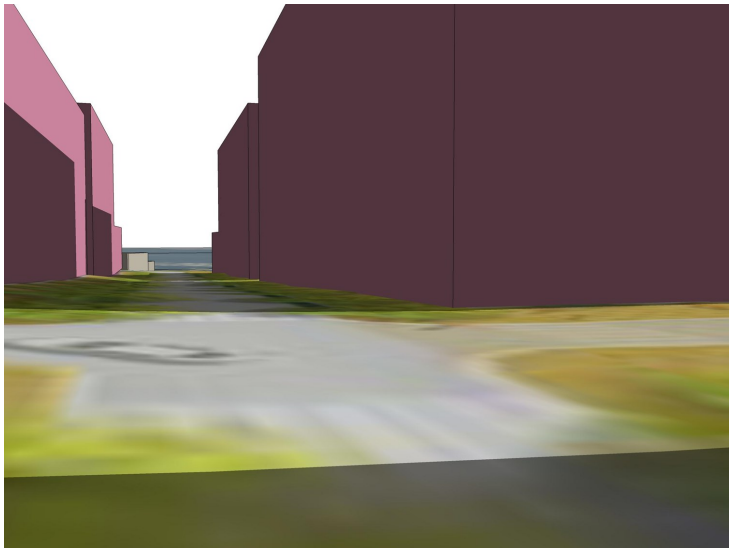
Figure 3.9-8

Viewpoint 6: NE 45th Street Bridge (Scenic Route)—Alternatives 1 and 2

Existing



Alternative 1



Alternative 2

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-9

Viewpoint 7—Alternatives 1 and 2

Under Alternative 1, the view from Viewpoint 7 would change to reflect the development of the planned West Campus Green and views of the water and shoreline area (views to Portage Bay currently obstructed by buildings would be afforded under Alternative 1). The view of the planned West Campus Green would potentially include green open space and views of Portage Bay and the shoreline area. Potential development would be located along the east side of Brooklyn Avenue NE, as well as within a portion of the West Campus Green. Background views of the Eastlake/Capitol Hill area would also be available from this location (see **Figure 3.9-9** for a conceptual massing simulation of the view from Viewpoint 7 under Alternative 1).

Summary of Impacts in Primary & Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. With the focus of development in the West Campus and South Campus sectors (73 percent of development under Alternative 1), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus sector) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus). Potential development would change the aesthetic character adjacent to these sectors and could result in a change in views from certain areas surrounding potential development sites.

Less development is assumed to occur in the Central Campus and East Campus sectors under Alternative 1. As a result, there would be less potential for change in aesthetic character and views that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, distant views of development could be available from certain areas of the Secondary Impact Zone but would not be anticipated to result in aesthetic impacts to those land uses.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential aesthetic impacts of increased density and increased building height associated with potential development.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 reflects accommodation of the requested 6 million gsf of building area developed generally consistent with the CMP proposed allocation without the height increases proposed in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1; thus, the existing CMP height limits are assumed. Without the proposed height increases, the development capacity of the West Campus sector is limited and additional development sites would be required to approach the 3.0 million gsf of net new development in the West Campus sector identified in the *2018 Seattle Campus Master Plan* and analyzed under Alternative 1. Given the developed nature of the West Campus sector, the opportunity for additional development sites in this sector is limited, and Alternative 2 assumes that additional development sites would be located in the area reserved for the West Campus Green under Alternative 1. Even with the additional development sites, the development capacity in the West Campus sector without the requested height increases is 2.4 million gsf of net new development (compared to 3 million gsf in the West Campus sector under Alternative 1) and the proposed CMP allocation for West Campus sector reflected in Alternative 1 cannot be achieved under Alternative 2. The approximately 0.6 million gsf of the net new development not accommodated by the West Campus sector development capacity is shifted to the East Campus sector under Alternative 2 (see **Figure 3.9-10** for an illustration of potential building massing under Alternative 2).

West Campus

Aesthetic Character

Under Alternative 2, potential future development in the West Campus sector would be more limited than under Alternative 1 because there would be no allowances for increased maximum building heights. Alternative 2 would include approximately 2.4 million gsf (compared with 3.0 million gsf under Alternative 1); however, since there would be no increase in maximum building heights on the campus, the development of less building space would actually require the use of more development sites, including building development within the area reserved for the potential West Campus Green that is included in Alternative 1. The aesthetic character of the West Campus sector would change to reflect increased development density in the area but building heights of the potential development under Alternative 2 would be similar to existing buildings in and around the West Campus sector. Compared to Alternative 1, the aesthetic character of West Campus sector under Alternative 2 would reflect shorter buildings with lesser amount of building modulation, reduction in north/south view corridors, and lesser amount of area reserved for open space.

Note: This illustration represents a conceptual plan and massing for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-10
Alternative 2—Conceptual Building Massing

Views

Due to the level of potential development density that would be provided under Alternative 2, potential impacts to views in the West Campus sector would be similar to Alternative 1 from certain locations in that existing view corridors within the campus would be preserved (i.e. NE Campus Parkway). Potential development under Alternative 2 would require the use of additional development sites in the West Campus sector when compared to Alternative 1, which would affect views from other locations on campus. For example, the potential building development within the area planned for the West Campus Green would result in a substantial reduction in view opportunities of Portage Bay and the shoreline area when compared with Alternative 1 and would result in a more limited view corridor to the south along Brooklyn Avenue NE (refer to the discussion on Visual Simulations provided later in this Alternative 2 discussion).

South Campus

Aesthetic Character

Development under Alternative 2 as part of the *2018 Seattle Campus Master Plan* would include the same amount of building development as Alternative 1 (1.35 million gsf of net new building space). It is anticipated that the aesthetic character of the South Campus sector would reflect a similar level of development density to Alternative 1, but building heights would be lower under Alternative 2 and would feature larger building footprints than under Alternative 1.

Views

Potential development in the South Campus sector under Alternative 2 would have a lower potential for impacts on views than under Alternative 1 due to the lower building heights. Potential development would not affect the existing Portage Bay Vista.

Views from existing landmarks to the south of the South Campus sector, beyond Portage Bay (i.e., Seattle Yacht Club, Montlake Bridge, and Montlake Community Center), would remain similar to the existing conditions (refer to the discussion on Visual Simulations provided later in this Alternative 2 discussion).

Central Campus

Aesthetic Character

Alternative 2 would include the same amount of development (approximately 0.9 million gsf of net new building space) and maximum building heights as Alternative 1. As under Alternative 1 substantial changes to the existing aesthetic character of the Central Campus sector would not be anticipated.

Views

The amount of development and maximum building heights under Alternative 2 is assumed to be the same as Alternative 1. Therefore, potential impacts to views in the Central Campus sector are anticipated to be the same as described under Alternative 1 (refer to the discussion on Visual Simulations provided later in this Alternative 2 discussion).

East Campus

Aesthetic Character

Approximately 1.35 million gsf of net new building space would be provided in the East Campus sector under Alternative 2, which would represent a substantial increase in building area when compared to Alternative 1 (0.75 million gsf of net new building space). Potential future development would replace a portion of existing surface parking areas (including the E1 and/or E18 lots) and would represent a substantial increase the density of the area when compared to the existing conditions. Under Alternative 2, the aesthetic character of the East Campus sector would change from an area primarily comprised of athletic/recreation facilities and surface parking areas to new academic building space. Potential future development under the *2018 Seattle Campus Master Plan* would be primarily located on existing surface parking lots and the majority of the existing athletic/recreation facilities would remain (i.e., Husky Stadium, Hec Edmundson Pavilion, Chaffey Field, UW Soccer Field, Husky Outdoor Track, Intermural Activities Building, etc.).

Maximum building heights in the East Campus sector would be the same as those identified in the existing *CMP Seattle* 2003 (maximum heights of 37 feet within the areas identified for potential development under Alternative 2). While these building heights would be lower than Alternative 1, the amount of overall building density and bulk provided within this area would be greater under Alternative 2 and would create a substantial difference when compared to the existing surface parking areas.

Views

In general, views of the East Campus sector would change under Alternative 2 to reflect increased building development (1.35 million gsf of net new building space) along Montlake Boulevard NE. While no existing primary view corridors are located within the East Campus sector, views of Lake Washington are available from several areas in the East Campus sector and adjacent areas. Potential future development under Alternative 2 could have a potential to affect certain views of Lake Washington. The *2018 Campus Seattle*

Existing East Campus

Master Plan allows for the potential for an East Campus Land Bridge that would provide new open space area, as well as creating a new view corridor from the bridge. Potential development sites have been situated to create a continuous view corridor from the potential East Campus Land Bridge towards Lake Washington and to provide enhanced views from the East Campus sector. Development sites have also been located to maintain views of Lake Washington from the existing view corridor from the Paul G Allen Center along Snohomish Lane in the Central Campus sector.

2018 CMP East Campus

No existing landmarks are located in or adjacent to the East Campus sector that could have their views affected by potential future development. Views to the east along a portion of the NE 45th Street scenic route could be affected by potential future development within the East Campus sector as taller buildings in the north and northwest portion of the East Campus sector could be within the field of view of the NE 45th Street scenic route. Potential future development in this area would have a medium potential for view impacts and could modify the foreground views. Views of the lake and mountains would continue remain available from that area (refer to the discussion on Visual Simulations provided below).

Visual Simulations

Visual massing simulations were also prepared for Alternative 2 based on photographs of the site from selected viewpoints and photo simulations of potential development from these viewpoints (see **Table 3.9-1** for list of viewpoints and **Figure 3.9-2** for a map of viewpoint locations). The following provides a description of the potential view from each location under Alternative 2.

Viewpoint 1 – I-5 Southbound

Under Alternative 2, views from Viewpoint 1 would continue to include views of the University District, the University of Washington campus (including portions of all campus sectors), Portage Bay, and Capitol Hill. Potential views would feature building development on an increased number of development sites than Alternative 1 and potential building heights would be more similar to existing development in the site vicinity. Views of existing development in the Central Campus and East Campus sectors would remain under Alternative 2, including views of Husky Stadium. Views of Portage Bay and Capitol Hill, as well as background views of Bellevue/Kirkland and the Cascade Mountains would also continue to be available. Compared to Alternative 1, the new buildings assumed under Alternative 2 would be less prominently visible. The view under Alternative 2 would reflect lower building heights, with less building modulation and tower setbacks than under

Alternative 1 (see **Figure 3.9-3** for a conceptual illustration of the views from this location under Alternative 2).

Viewpoint 2 – I-5 Northbound

Views from Viewpoint 2 would include prominent views of potential West Campus and South Campus development, similar to Alternative 1. However, development under Alternative 2 would be similar in height to existing surrounding development and would not obstruct the background views of certain existing buildings within the University District and University of Washington campus. Views of Portage Bay and the adjacent shoreline area would continue to be available from northbound I-5. Development within the planned West Campus Green area that is identified in Alternative 1 would also be visible and would create a more dense view of development in that area when compared to Alternative 1. Compared to Alternative 1, the new buildings under Alternative 2 would be less prominently visible (i.e. lower in height), although more individual buildings would be visible. The area reserved for the West Campus Green under Alternative 1 (which would be prominently visible along the Portage Bay shoreline under Alternative 1) would be in new buildings under Alternative 2. Under Alternative 2, the lower building heights would also reflect less building modulation and tower setbacks than under Alternative 1 (see **Figure 3.9-4** for a conceptual illustration of the views from this location under Alternative 2).

Viewpoint 3 – 7th Avenue NE and NE 40th Street

Under Alternative 2, the view from Viewpoint 3 would remain similar to the existing conditions. Potential future development in the West Campus sector would be visible within the left edge of the mid-ground view and would feature lower building heights than Alternative 1. Existing partial views to the south of Portage Bay and the Eastlake/Capitol Hill area would remain available from the 7th Avenue NE right-of-way. Compared to Alternative 1, the lower building heights under Alternative 2 results in less visible building area from this viewpoint (see **Figure 3.9.5** for a conceptual illustration of the view from this location under Alternative 2).

Viewpoint 4 – Peace Park

The view to the southeast from Viewpoint 4 would be generally similar with potential development under Alternative 1. The Mercer Court Apartments would continue to be the focal point of the views from this location. Potential future development in the West Campus sector would be adjacent to the apartment building and located within a portion of the background view to the north. The amount of new building area visible from this viewpoint under Alternative 2 would be similar to Alternative 1, with somewhat less building area visible (see **Figure 3.9-6** for a photo of the view from Viewpoint 4 under Alternative 2).

Viewpoint 5 – University Way NE and NE 40th Street

Under Alternative 2, the view from Viewpoint 5 would change to reflect taller, new development along the west side of University Way NE and in the background view when compared to the existing conditions. Potential development would change some of the aesthetic character of the view by replacing one- to two-story buildings with taller and denser development; however, this new development would feature shorter building heights than under Alternative 1. The background views to the south along University Way NE would remain. Compared to Alternative 1, Alternative 2 would reflect lower building heights with less potential for building modulation or tower setbacks than under Alternative 1 (see **Figure 3.9-7** for a photo of the view from Viewpoint 5 under Alternative 2).

Viewpoint 6 – NE 45th Street Bridge

The view to the southeast from Viewpoint 6 would reflect new development in the existing E1 surface parking area under Alternative 2. While this development would be visible within the mid-ground view, panoramic views of the East Campus sector and background views of Mount Rainier, the SR-520 Bridge and the Bellevue/Kirkland area would remain from the NE 45th Street Bridge. The amount of building development in East campus visible from this viewpoint under Alternative 2 would be substantially greater than under Alternative 1 (see **Figure 3.9-8** for a photo of the view from Viewpoint 6 under Alternative 2).

Viewpoint 7 – Brooklyn Avenue NE and NE Pacific Street

Under Alternative 2, the view from Viewpoint 7 would change to reflect building development within the area identified for the planned West Campus Green under Alternative 1; the north/south view corridor to Portage Bay in West Campus sector provided under Alternative 1 would not be provided under Alternative 2. The view would include new building development along the east and west sides of Brooklyn Avenue NE and would include minimal views of Portage Bay and the shoreline area when compared with Alternative 1. Background views of the Eastlake/Capitol Hill area would be available from this location, but only along the Brooklyn Avenue NE corridor (see **Figure 3.9-9** for a photo of the view from Viewpoint 7 under Alternative 2).

Summary of Impacts in Primary & Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. With the focus of development in the West, South and East Campus sectors (85 percent of development under Alternative 2), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus sector), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to the East Campus sector). Potential

development would change the aesthetic character adjacent to these sectors and could result in a change in views from certain areas surrounding potential development sites. Because of the lower building heights under Alternative 2, the potential for views to new buildings in the West and South Campus sectors from the Primary Impact Zone would generally be less than under Alternative 1. With the additional building area in East Campus, the potential for views to East Campus buildings from the Primary Impact Zone would generally be greater under Alternative 2 than under Alternative 1

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for change in aesthetic character and views that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, development could be visible from certain areas of the Secondary Impact Zone but would not be anticipated to result in aesthetic impacts to those land uses.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential aesthetic impacts of increased density and increased building height associated with potential development.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. This density under Alternative 3 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6.0 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West Campus sector (3.2 million gsf versus 3.0 million gsf under Alternative 1) and South Campus (1.65 million gsf versus 1.35 million gsf under Alternative 1) sectors. The proposed increase in maximum building heights in the West, South and East Campus sectors under Alternative 1 are also assumed under Alternative 3 (see **Figure 3.9-11** for a conceptual massing of Alternative 3).

West Campus

Aesthetic Character

Similar to Alternative 1, potential future development under Alternative 3 would change the aesthetic character of the West Campus sector which is primarily comprised of low- to mid-rise buildings (one- to six-stories in height), to a denser environment with taller buildings. Approximately 3.2 million gsf of development would occur in the West Campus sector and future development up to the maximum height limit would be similar to some of the tallest

Note: This illustration represents a conceptual plan and massing for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-11
Alternative 3—Conceptual Building Massing

existing buildings within the University District area (i.e. the UW Tower, Hotel Deca, multifamily residential buildings, etc.).

Increased heights would represent an increase in building heights when compared to the majority of the current buildings in the area but would be consistent with the vision for potential future development that is identified for the University District. Increased building heights under Alternative 1 would allow for potential opportunities for more open space surrounding potential future building development, as well as, allow for retention of area for the potential five-acre West Campus Green that would connect with Portage Bay Park. The potential open space in the West Campus sector would enhance the aesthetic character of the area and provide new areas for recreation and gathering.

Similar to Alternative 1, development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height in this area.

Views

Potential development under Alternative 3 would modify views in the West Campus sector to reflect the increased density and building heights, similar to Alternative 1. However, pursuant to development standard provisions identified in the *2018 Seattle Campus Master Plan*, new development would be intended to minimize visual impacts and preserve existing view corridors within the campus.

NE Campus Parkway is identified as a primary view corridor on the campus and potential development would have a high potential to affect the character of views along the scenic route. Territorial views to the west along NE Campus Parkway would be preserved under the *2018 Seattle Campus Master Plan*. Development under Alternative 1 would also create an additional north-south view corridor along Brooklyn Avenue NE and through the planned West Campus Green which would provide additional views of Portage Bay and enhance the visual character of the West Campus sector.

Potential development along 15th Avenue NE would be intended to activate the street level within this area and would preserve the view corridor to the south associated with the existing scenic route designation. While potential future development in this area would have a high potential to impact the view corridor, provisions are identified in the *2018 Seattle Campus Master Plan* to maintain the views along these corridors and significant impacts would not be anticipated (refer to the Visual Simulation discussion provided later in this Alternative 3 discussion).

South Campus

Aesthetic Character

Development under Alternative 3 would include 1.65 million gsf of net new building space (compared with 1.35 million gsf under Alternative 1). Changes in aesthetic character would be similar to Alternative 1 and reflect the demolition of existing building and development of new buildings with increased open space. The provision of additional areas with building heights up to 240 feet would create the opportunity for the increased building density to be accommodated by compact, high density development which would free up additional campus areas for use as open space, circulation, landscaping and/or view corridors.

As under Alternative 1, development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height in this area.

Views

Potential future development would modify views of the South Campus sector to reflect the increased density and building heights, similar to Alternative 1. Potential development that would be located adjacent to the existing Portage Bay Vista would have a potential to change the view of the area adjacent to the vista; however, existing views through Portage Bay Vista would be maintained. The allowance of more compact, taller development would also allow for the reservation of area for an additional view corridor through the central portion of the South Campus sector towards Portage Bay (the planned South Campus Green Corridor) which would provide enhanced opportunities for views of the waterfront area (refer to the Visual Simulation discussion provided later in this Alternative 3 discussion).

Central Campus

Aesthetic Character

Alternative 3 would include the same amount of development (approximately 0.9 million gsf of net new building space) and maximum building heights as Alternative 1. As under Alternative 1 substantial changes to the existing aesthetic character of the Central Campus sector would not be anticipated.

Views

The amount of development and maximum building heights is assumed to be the same as Alternative 1 and potential impacts to views in the Central Campus sector are also anticipated to be the same (refer to the Visual Simulation discussion provided later in this Alternative 3 discussion).

East Campus

Aesthetic Character

Approximately 0.25 million gsf of net new building space would be provided in the East Campus sector under Alternative 3 (compared with 0.75 million gsf under Alternative 1). Potential future development could replace a portion of existing surface parking areas; however, this increase building development in the East Campus sector would be lower than under Alternative 1. Due to the lower level of potential development in the East Campus sector under Alternative 3, it is anticipated that changes to the aesthetic character would less than Alternative 1.

Views

In general, views of the East Campus sector would not be anticipated to change substantially due to the lower level of development that is assumed for the area under Alternative 3. Similar to Alternative 1, potential development sites have been situated to create a continuous view corridor from the potential pedestrian bridge towards Lake Washington to provide enhanced views from the East Campus sector. Potential future development could affect certain views of Lake Washington; however, potential impacts to views would be lower than under Alternative 1 (refer to the Visual Simulation discussion below).

Visual Simulations

Visual simulations were also prepared for Alternative 3 based on photographs of the site from selected viewpoints and photo simulations of potential development from these viewpoints (see **Table 3.9-1** for list of viewpoints and **Figure 3.9-3** for a map of viewpoint locations). The following provides a description of the potential view from each location under Alternative 3.

Viewpoint 1 – I-5 Southbound

Under Alternative 3, Viewpoint 1 would continue to include views of the University District, the University of Washington campus (including portions of all campus sectors), Portage Bay, and Capitol Hill; green open space areas along the Portage Bay shoreline would also be visible. Similar to Alternative 1, potential development in the West Campus and South Campus sectors would be located prominently within the field of view and would obstruct a portion of the views of existing development in the site vicinity. Views of Portage Bay and Capitol Hill, as well as background views of Bellevue/Kirkland and the Cascade Mountains would continue to be available (see **Figure 3.9-12** for a conceptual illustration of the views from this location under Alternative 3).

Alternative 3

Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-12

Viewpoint 1: I-5 Southbound (Scenic Route)—Alternatives 3 and 4

Viewpoint 2 – I-5 Northbound

Views from Viewpoint 2 would include prominent views of potential development under Alternative 3 (primarily in the West Campus and South Campus sectors). As under Alternative 1, potential new development would likely obstruct the views of certain existing buildings within the University District and University of Washington campus. Views of Portage Bay and the adjacent shoreline area would continue to be available from northbound I-5, along with the planned West Campus Green. Background views of the Bellevue/Kirkland area and the Cascade Mountains would also remain (see **Figure 3.9-13** for a conceptual illustration of the views from this location under Alternative 3).

Viewpoint 3 – 7th Avenue NE and NE 40th Street

Under Alternative 3, the view from Viewpoint 3 would remain similar to the existing conditions and Alternative 1. Potential future development in the West Campus sector would be visible within the left edge of the mid-ground view. Existing partial views to the south of Portage Bay and the Eastlake/Capitol Hill area would remain available from the 7th Avenue NE right-of-way (see **Figure 3.9.14** for a photo of the view from this location under Alternative 3).

Viewpoint 4 – Peace Park

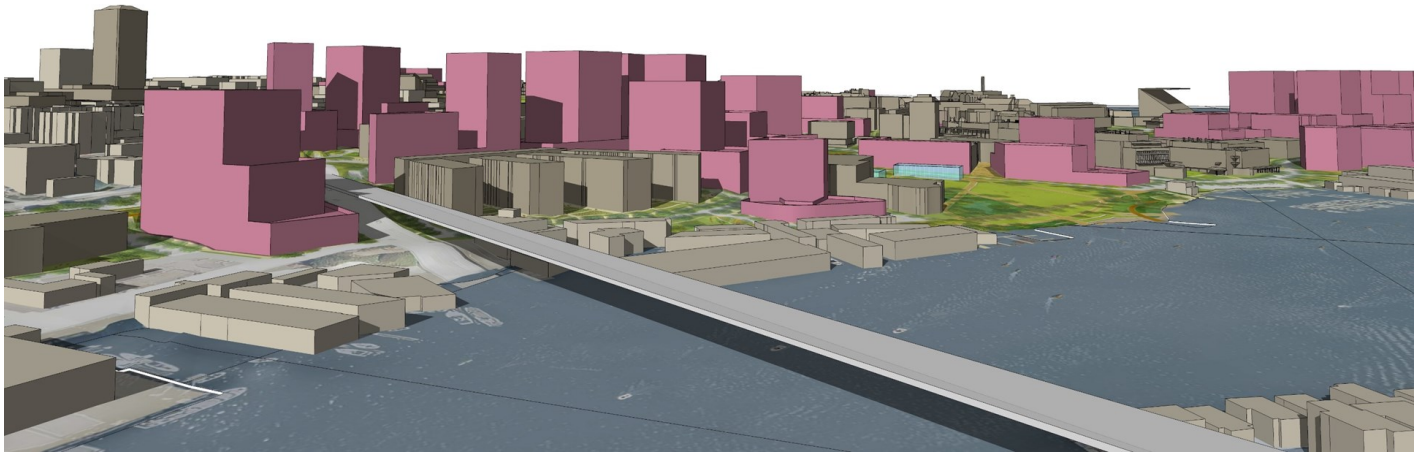
The view to the southeast from Viewpoint 4 under Alternative 3 would remain generally similar to the existing conditions and Alternative 1. The Mercer Court Apartments would continue to be the focal point of the views from this location. Potential future development in the West Campus sector would be adjacent to the apartment buildings and would appear taller than existing development in the area from this location (see **Figure 3.9-15** for a photo of the view from Viewpoint 4 under Alternative 3).

Viewpoint 5 – University Way NE and NE 40th Street

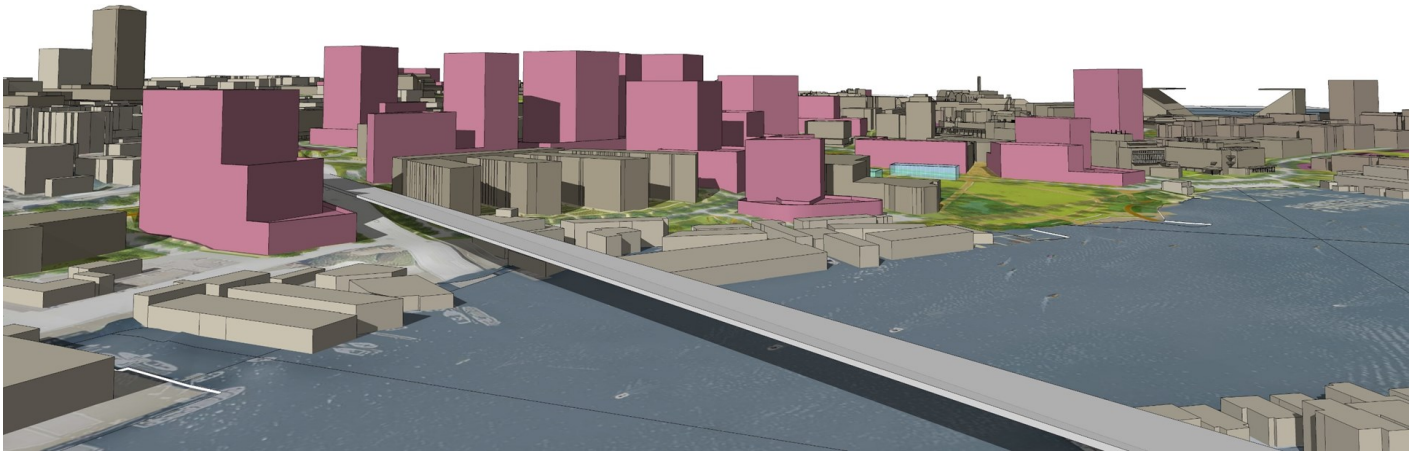
Under Alternative 3, the view from Viewpoint 5 would change to reflect taller, new development along the west side of University Way NE and in the background view. Potential development would appear similar to Alternative 1 and would change some of the aesthetic character of the view by replacing one- to two-story buildings with taller and denser development. The background views to the south along University Way NE would remain; however, a portion of the view of Capitol Hill would be obstructed by potential development to the south (see **Figure 3.9-16** for a photo of the view from Viewpoint 5 under Alternative 3).

Viewpoint 6 – NE 45th Street Bridge

The view to the southeast from Viewpoint 6 would remain generally similar to the existing conditions under Alternative 3 but would reflect a level of development in the East Campus sector that is lower than Alternative 1. Panoramic views of the East Campus sector and



Alternative 3



Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

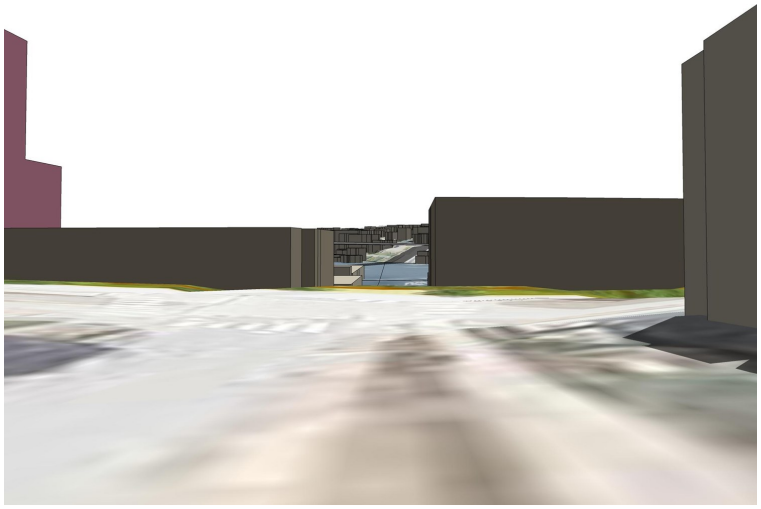
Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-13

Viewpoint 2: I-5 Northbound (Scenic Route)—Alternatives 3 and 4

Existing



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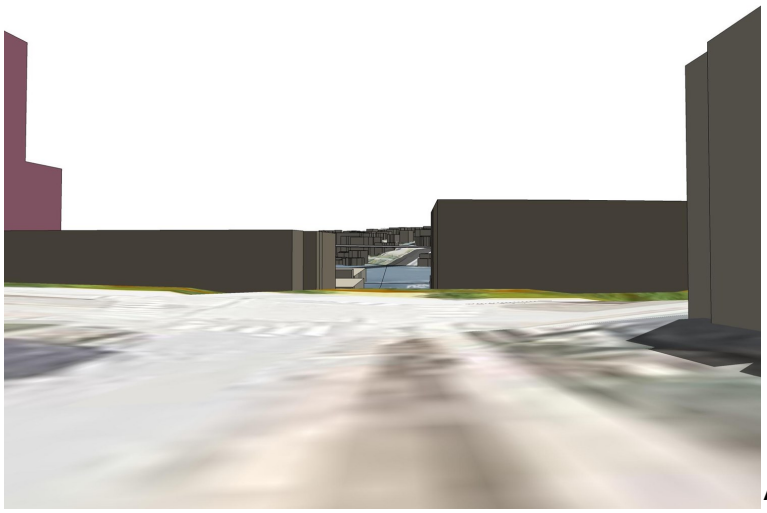


Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

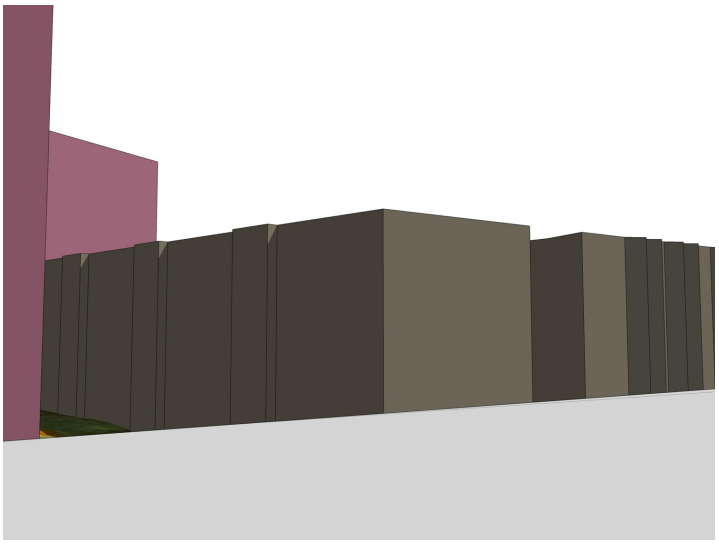
Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

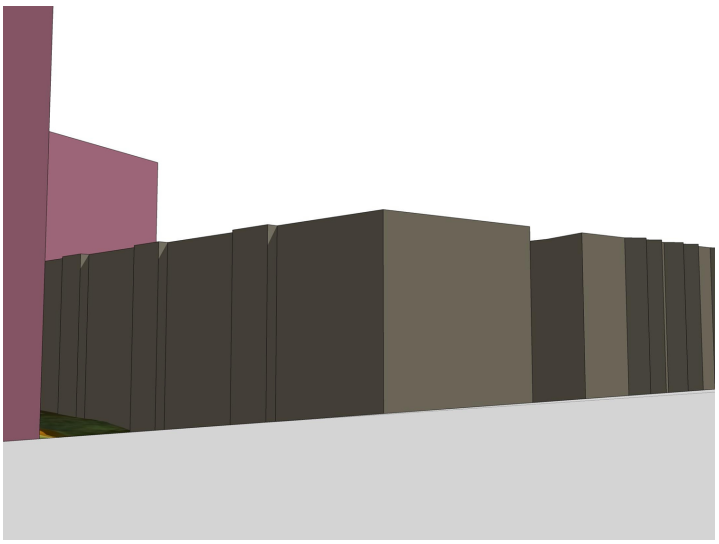
Figure 3.9-14

Viewpoint 3: 7th Ave NE and NE 40th Street (Edge Condition) —Alternatives 3 and 4

Existing



Alternative 3



Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

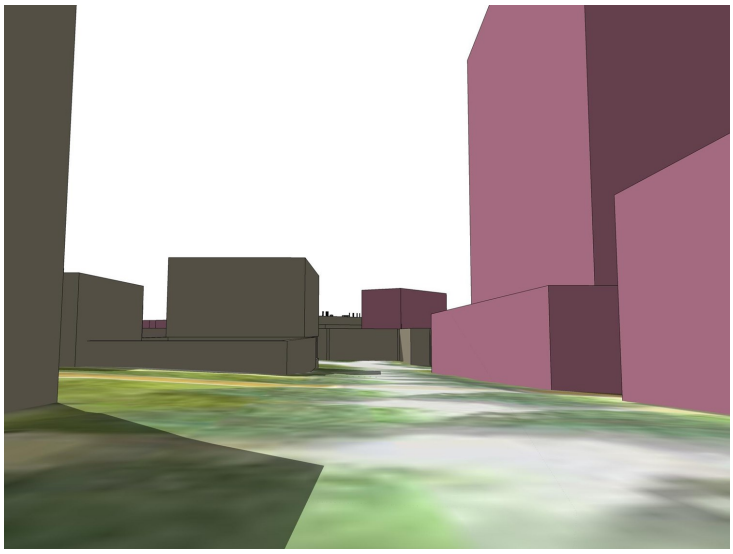
Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

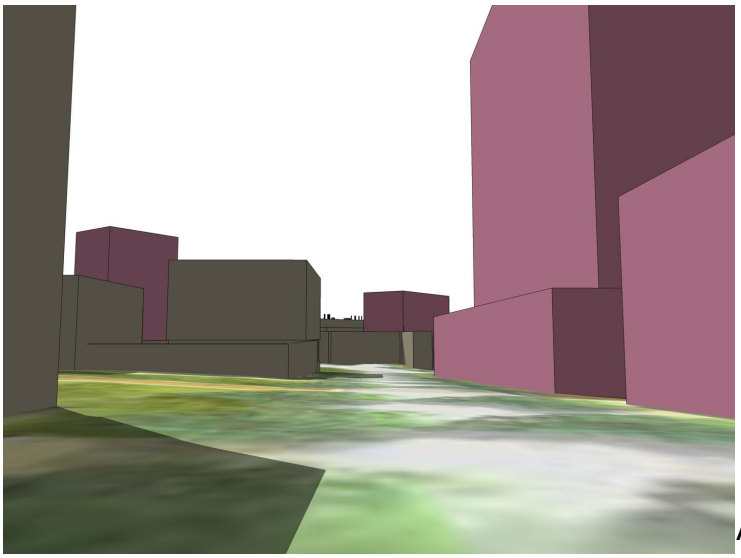
Figure 3.9-15

Viewpoint 4: Peace Park (Edge Condition)—Alternatives 3 and 4

Existing



Alternative 3



Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-16

Viewpoint 5: University Way NE and NE 40th Street (Edge Conditions) —Alternatives 3 and 4

background views of Mount Rainier, the SR-520 Bridge and the Bellevue/Kirkland area would remain from the NE 45th Street Bridge. Potential development in the East Campus sector under Alternative 3 would be located in the background view similar to Alternative 1, but would not obstruct views of Husky Stadium and the Intermural Activities Center from this location (see **Figure 3.9-17** for a photo of the view from Viewpoint 6 under Alternative 3).

Viewpoint 7 – Brooklyn Avenue NE and NE Pacific Street

Under Alternative 3, the view from Viewpoint 7 would change to reflect the development of the planned West Campus Green and views of the water and shoreline area. Similar to Alternative 1, the view of the planned West Campus Green would potentially include green open space and views of Portage Bay and the shoreline area. Potential development would be located along the east side of Brooklyn Avenue NE, as well as within a portion of the West Campus Green. Background views of the Eastlake/Capitol Hill area would also be available from this location (see **Figure 3.9-18** for a photo of the view from Viewpoint 7 under Alternative 3).

Summary of Impacts in Primary & Secondary Impact Zone Areas

As under Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to the these sectors, including the University District (adjacent the West Campus sector) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus), and would change the aesthetic character adjacent to these sectors and could result in a change in views from certain areas surrounding potential development sites.

Less development is assumed to occur in the Central Campus and East Campus sectors under Alternative 3. As a result, there would be less potential for change in aesthetic character and views that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, development could be visible from certain areas of the Secondary Impact Zone but would not be anticipated to result in aesthetic impacts to those land uses.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential aesthetic impacts of increased density and increased building height associated with potential development.

Existing

Alternative 3

Alternative 4

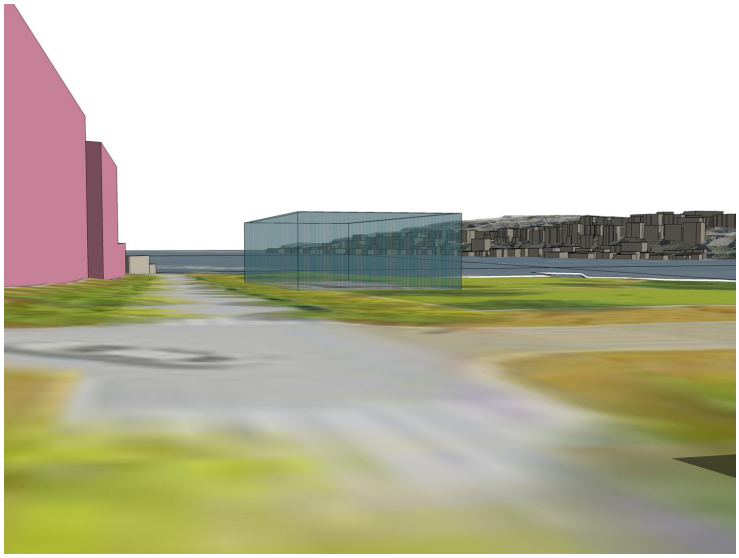
Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

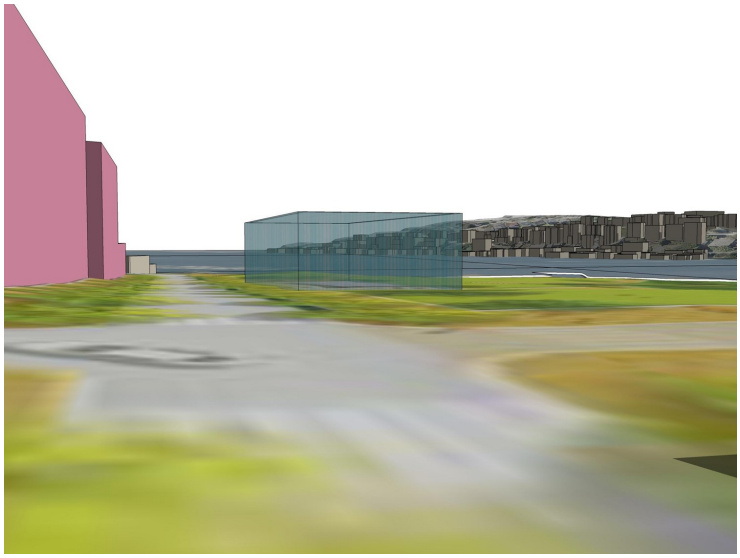
Figure 3.9-17

Viewpoint 6: NE 45th Street Bridge (Scenic Route)—Alternatives 3 and 4

Existing



Alternative 3



Alternative 4

Note: These maps are intended to represent a conceptual plan and massing for EIS analysis purposes and are not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016.

Figure 3.9-18

Viewpoint 7: Brooklyn Avenue NE and NE Pacific Street (View Corridor) —Alternatives 3 and 4

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 includes a focus of campus development in the West and East Campus with increased density in the Central Campus and East Campus sectors when compared with Alternative 1. This density under Alternative 4 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6.0 million gsf of net new development for the campus during the planning horizon. Alternative 4 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the Central Campus (1.1 million gsf versus 0.9 million gsf under Alternative 1) and East Campus (1.7 million gsf versus 0.75 million gsf under Alternative 1) sectors (see **Figure 3.9-19** for a conceptual massing of Alternative 4).

West Campus

Aesthetic Character

Development in the West Campus sector under Alternative 4 would include the same level of potential future development as Alternative 1 (3.0 million gsf) and the same increases in maximum building height limits. Therefore, potential changes to the aesthetic character of the West Campus sector are anticipated to be the same as those described under Alternative 1. Similar to Alternative 1, development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential impacts of increased density and increased building height in this area.

Views

The amount of development and maximum building heights is assumed to be the same as Alternative 1 and potential impacts to views in the West Campus sector are also anticipated to be the same (refer to the Visual Simulation discussion provided later in this Alternative 4 discussion).

South Campus

Aesthetic Character

Development in the South Campus sector under Alternative 4 would include approximately 0.2 million gsf of net new building space (compared with 1.35 million gsf under Alternative 1). The changes in aesthetic character would be substantially less than Alternative 1 due to the lower level of building development that is assumed for South Campus under Alternative 4.

Note: This illustration represents a conceptual plan and massing for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-19
Alternative 4—Conceptual Building Massing

Views

Potential development that would be located adjacent to the existing Portage Bay Vista would have a potential to change the view of the area adjacent to the vista. However, when compared with Alternative 1, potential impacts to views in the South Campus sector would be much lower due to the lower amount of development that is assumed for the sector (refer to the Visual Simulation discussion provided later in this Alternative 4 discussion).

Central Campus

Aesthetic Character

Approximately 1.1 million gsf of net new building space would be provided in the Central Campus sector under Alternative 4 (compared to 0.9 million gsf under Alternative 1). Potential future development would allow for maximum building heights that would be the same as those identified in the *CMP Seattle 2003* (primarily 105-foot maximum heights with 160-foot maximum heights in the northeast corner and southwest corner and 65-foot maximum heights adjacent to Rainier Vista). Similar to Alternative 1, potential future development would increase the overall density in the Central Campus sector but would not substantially change the aesthetic character of the area due to the similar maximum building heights and the provision of development standards identified in the *2018 Seattle Campus Master Plan*. Existing open spaces within the Central Campus sector would also be preserved, including Rainier Vista, the Liberal Arts Quad, Red Square, Parrington Lawn and Denny Yard.

Views

Similar to Alternative 1, future development is intended to preserve existing primary view corridors in the Central Campus sector, including Rainier Vista, Memorial Way NE, the Liberal Arts Quad, Olympic Vista (along NE Campus Parkway) and Portage Bay Vista. Potential development that would be adjacent to these view corridor areas would be considered to have a potential for view impacts. Potential development that is located adjacent to Memorial Way NE would have a potential to affect the view of the area adjacent to the view corridor; however, existing views to the north and south along Memorial Way would not be obstructed. Potential development located within the view shed area of the existing view corridor from the Paul G Allen Center towards Lake Washington would also have a potential to affect the views within this view corridor; however, development within this area would be limited to 65 feet in height to allow for continued views from the Paul G Allen Center.

Potential development adjacent to the 15th Avenue NE scenic route would modify the character of views along 15th Avenue NE but would not obstruct views along this scenic route. The NE 45th Street scenic route is also located adjacent to the Central Campus sector but would not be affected by potential development due to the retention of the existing

vegetated buffer along the northern boundary of the Central Campus sector (refer to the Visual Simulation discussion provided later in this Alternative 4 discussion).

East Campus

Aesthetic Character

Approximately 1.7 million gsf of net new building space would be provided in the East Campus sector under Alternative 4 (compared with 0.75 million gsf under Alternative 1). Potential future development could replace a portion of existing surface parking areas (including the E1 and/or E18 lots) and would increase the development density and building heights in the area. Maximum building heights in the East Campus sector would be similar to those identified in the existing *CMP Seattle 2003*, but increases in building height would be provided along Montlake Boulevard NE (maximum height of 105 feet). The aesthetic character of the area along the north portion of Montlake Boulevard would change from the existing surface parking to reflect new academic building development and would feature similar or taller building heights when compared with existing campus development to the south and existing commercial development to the north (University Village shopping center).

Views

In general, views of the East Campus sector would change under Alternative 4 to reflect increased building development along Montlake Boulevard NE (1.7 million gsf of net new building space compared with 0.75 million gsf under Alternative 1). While no existing primary view corridors are located within the East Campus sector, views of Lake Washington are available from several areas in the vicinity and potential future development under Alternative 4 could have a potential to affect certain views of Lake Washington. The potential East Campus Land Bridge would provide new open space area, as well as creating a new view corridor from the bridge, and potential development would be situated to create a continuous view corridor from the planned East Campus Land Bridge towards Lake Washington and to provide enhanced views from the East Campus sector. Development sites have also been located to maintain views of Lake Washington from the existing view corridor from the Paul G Allen Center along Snohomish Lane in the Central Campus sector.

Views to the east along a portion of the NE 45th Street scenic route could be affected by potential future development within the East Campus sector as taller buildings in the north and northwest portion of the East Campus sector could be within the field of view of the NE 45th Street scenic route (see the Visual Simulation discussion below for further details). Views of the lake and mountains would continue remain available from that area (refer to the Visual Simulation discussion below).

Visual Simulations

Visual simulations were prepared for Alternative 4 based on photographs of the site from selected viewpoints and photo simulations of potential development from these viewpoints (see **Table 3.9-1** for list of viewpoints and **Figure 3.9-3** for a map of viewpoint locations). The following provides a description of the potential view from each location under Alternative 4.

Viewpoint 1 – I-5 Southbound

Under Alternative 4, the view from Viewpoint 1 would be the same as under Alternative 1 (see **Figure 3.9-12** for a conceptual illustration of the views from this location under Alternative 4).

Viewpoint 2 – I-5 Northbound

Under Alternative 4, the view from Viewpoint 2 would be the same as under Alternative 1 (see **Figure 3.9-13** for a conceptual illustration of the views from this location under Alternative 4).

Viewpoint 3 – 7th Avenue NE and NE 40th Street

Under Alternative 4, the view from Viewpoint 3 would be the same as under Alternative 1 (see **Figure 3.9-14** for a conceptual illustration of the views from this location under Alternative 4).

Viewpoint 4 – Peace Park

Under Alternative 4, the view from Viewpoint 4 would be the same as under Alternative 1 (see **Figure 3.9-15** for a conceptual illustration of the views from this location under Alternative 4).

Viewpoint 5 – University Way NE and NE 40th Street

Under Alternative 3, the view from Viewpoint 5 would be generally similar to Alternative 1 (see **Figure 3.9-16** for a photo of the view from Viewpoint 5 under Alternative 4).

Viewpoint 6 – NE 45th Street Bridge

The view to the southeast from Viewpoint 6 would be similar to Alternative 1 and includes panoramic views of the East Campus sector and background views of Mount Rainier, the SR-520 Bridge and the Bellevue/Kirkland area would remain from the NE 45th Street Bridge. Potential development in the East Campus sector under Alternative 4 would be located in the mid-ground and background view and would obstruct a portion of the view of Husky Stadium and the Intermural Activities Center from this location (see **Figure 3.9-17** for a photo of the view from Viewpoint 6 under Alternative 4).

Viewpoint 7 – Brooklyn Avenue NE and NE Pacific Street

Under Alternative 4, the view from Viewpoint 7 would be the same as under Alternative 1 (see **Figure 3.9-18** for a conceptual illustration of the views from this location under Alternative 4).

Summary of Impacts in Primary & Secondary Impact Zone Areas

Similar to Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. With the focus of development in the West, Central and East Campus sectors (97 percent of development under Alternative 4), potential development would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West and Central Campus), a portion of the residential neighborhood to the north of 45th Street NE (adjacent to Central Campus), and University Village and the Laurelhurst neighborhood (adjacent to the East Campus sector). Potential development under Alternative 4 would change the aesthetic character adjacent to these sectors and could result in a change in views from certain areas surrounding potential development sites.

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential for change in aesthetic character and views that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, development could be visible from certain areas of the Secondary Impact Zone but would not be anticipated to result in aesthetic impacts to those land uses.

Development standards are identified in the *2018 Seattle Campus Master Plan* and are intended to minimize potential aesthetic impacts of increased density and increased building height associated with potential development.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of development would occur as under Alternatives 1 through 4, but none of the assumed street or aerial vacations would occur. As a result, it is anticipated that the aesthetic character and view impacts associated with potential building development under Alternative 5 would be similar to those analyzed under Alternatives 1 through 4. However, while no potential development sites are dependent on the approval of the proposed street and aerial vacations, without them the aesthetic character and view opportunities within the campus areas are different than under Alternatives 1 through 4 (see **Figure 3.9-20** for an illustration of potential building massing under Alternative 5).

Note: This illustration represents a conceptual plan and massing for development and areas reserved for planned open space. It is intended for EIS analysis purposes and is not intended to represent specific projects.

Source: Sasaki Associates, Inc., 2016

EA Engineering, Science, and Technology, Inc.

Figure 3.9-20
Alternative 5—Conceptual Building Massing

The retained portion of NE Boat Street that would not be vacated under Alternative 5 would separate the Portage Bay Park and the potential West Campus Green and the aesthetic character of these areas would not reflect the continuous open space area as under Alternatives 1 through 4.

The aesthetic character of the East Campus sector would also be different without the aerial vacation over NE Montlake Boulevard. Under this alternative, the planned East Campus Land Bridge would not occur and the associated view corridor and open space from this area would not be provided. Potential future development under Alternative 5 would have less open space and more limited view corridors than under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

To the extent that potential future development of the *2018 Seattle Campus Master Plan* under Alternatives 1 through 5 occur in the vicinity of other development projects in the site area (i.e. University District, University Village, etc.), it could result in a cumulative change in the aesthetic character of the area. However, the existing campus and site vicinity are already highly developed, urban areas and significant cumulative aesthetic impacts would not be anticipated.

The *2015 University District Urban Design EIS* indicates that overall, the development pattern in the University District would reinforce the highly urban visual character. To the extent that campus development under the *2018 Seattle Campus Master Plan* contributes to growth in the University District, campus development could contribute to this visual character.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA threshold analysis/determination for individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements

identified in the 2*018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.9-21**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For example, areas of campus that are located within or adjacent to identified view corridors/vistas are identified as having a "High" potential for aesthetics/view impacts, which areas that are located at a distance from those areas are identified as having a "Low" potential for impacts.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.9.3 Mitigation Measures

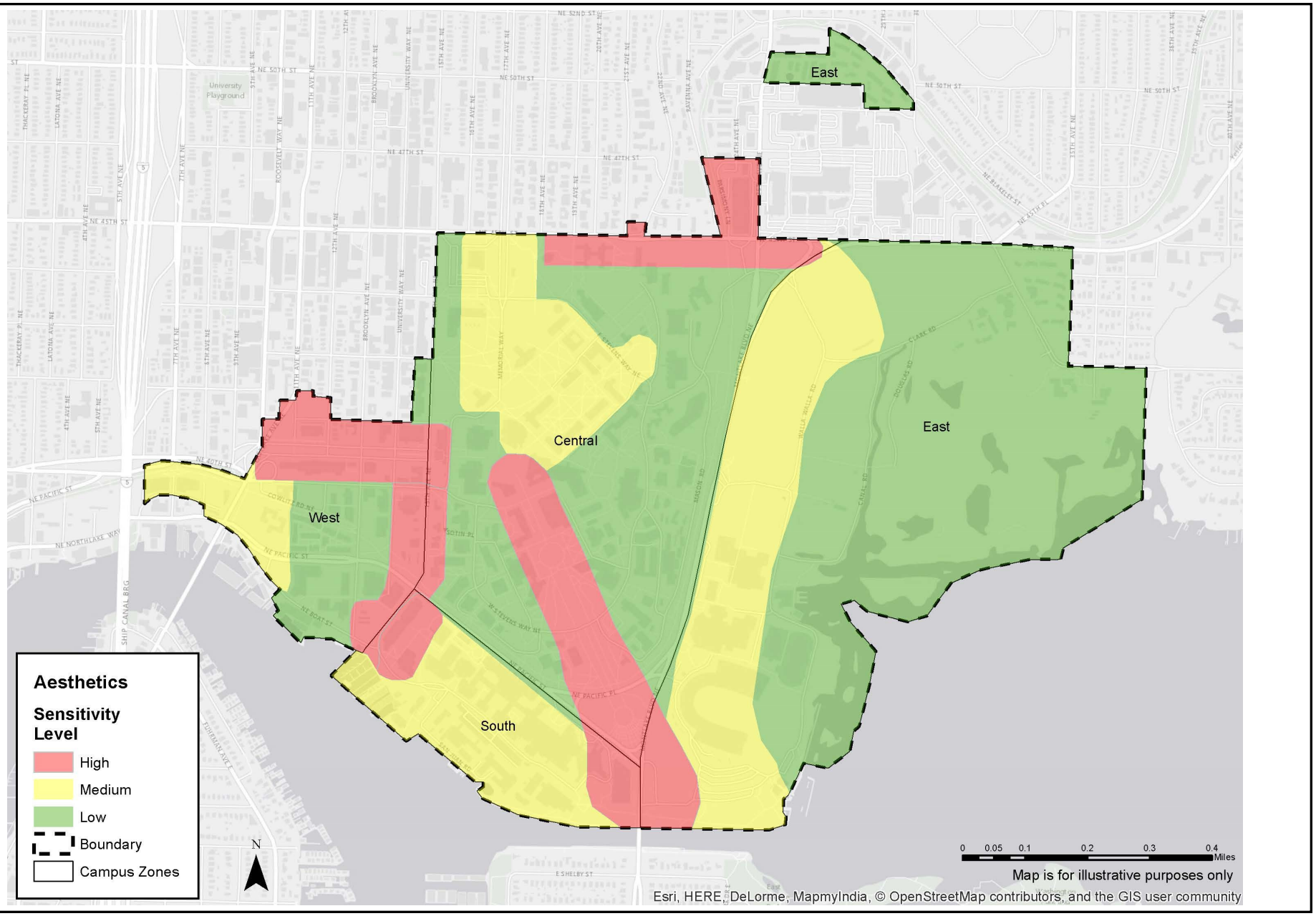
The following measures would minimize potential aesthetic impacts that could occur with the implementation of the *2018 Seattle Campus Master Plan*.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- Potential future development projects would be consistent with the development guidelines and development standards identified in the *2018 Seattle Campus Master Plan*.
- The University of Washington's existing design review processes (architectural, landscaping and environmental review) would continue to review all building projects on campus and consider views as part of individual projects.

Additional Measures Applicable to Medium and High Potential Campus Areas

- Potential future development projects under the *2018 Seattle Campus Master Plan* that are located proximate to existing identified primary view corridors and vistas would require project-specific coordination to determine potential aesthetic/view-related issues associated with development on those sites, and could require additional aesthetics/view analysis and mitigation measures (if necessary).



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.9-21
Aesthetics Sensitivity Map

3.9.4 Significant Unavoidable Adverse Impacts

Development under the *2018 Seattle Campus Master Plan* would result in changes to the aesthetic character of the campus, including increased density and building heights in the West Campus, South Campus, and East Campus sectors. With the implementation of general policies, development programs, and development standards in the *2018 Seattle Campus Master Plan*, the changes to aesthetic character could be interpreted as positive changes and significant aesthetic impacts would not be anticipated.

3.10 RECREATION AND OPEN SPACE

This section of the Draft SEIS describes the existing recreation uses and open spaces areas on the University of Washington campus and the surrounding off-campus area, and evaluates the potential impacts to recreation uses and open space areas that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.10.1 Affected Environment

University of Washington Campus

The University of Washington campus includes a diverse mix of open space features and recreational facilities on the campus. Open space areas are located throughout the campus and provide passive recreation space and areas for informal gatherings.

University Golf Driving Range

The majority of the active recreation facilities on the campus are located in the East Campus sector area (east of Montlake Boulevard NE) and are generally restricted for student and staff use. Four Intramural Activities (IMA) sports fields are located in this area and provide space for a variety of intramural sports leagues (softball, flag football, soccer, rugby, ultimate frisbee, etc.) as well as drop-in student use on a space available basis. The University's IMA Building provides numerous recreation opportunities for students and staff, including a fitness center, five gyms (basketball, volleyball and badminton courts), a climbing center, a swimming pool, racquetball/handball courts, squash courts, fitness studios, cycling studios, personal training studios, and a jogging/walking track. The University golf driving range is also located in this area and is available for student and staff use, as well as use by the general public.

The intercollegiate athletic program generally involves organized spectator sports such as football, basketball, baseball, soccer, gymnastics, softball and track. Facilities include the Graves Building, Alaska Airlines Arena at Hec Edmundson Pavilion, Husky Stadium and, on occasion, the Intermural Activities (IMA) Building. These facilities are also used to host community and national athletic events.

The University of Washington campus is, in part, defined by significant landscaped open space. The primary existing significant landscapes and open spaces identified in the *2018 Seattle Campus Master Plan* are listed below.

- Burke-Gilman Trail
- Center for Urban Horticulture
- Denny Field
- Denny Yard
- Drumheller Fountain
- Forest Resources Courtyard
- Grieg Garden
- Hansee Hall Courtyards
- HUB Yard
- Island Grove
- Liberal Arts Quad
- Medicinal Herb Garden
- Memorial Gateway
- Memorial Way
- Parrington Lawn
- Physics Courtyard
- Portage Bay Vista
- Rainier Vista
- Red Square
- Sakuma Viewpoint
- Sol Katz Memorial Garden
- Sylvan Theater
- Union Bay Natural Area
- Whitman Court/Woodland Walk

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact Zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones.

Several off-campus recreation uses are located in the Primary and Secondary Impact Zones in the vicinity of the University of Washington campus. The Burke Gilman Trail is a heavily used regional multi-use trail that connects the City of Seattle with the Cities of Kenmore and Bothell to the northeast. The approximately 20-mile trail travels through a portion of the University of Washington campus, including an approximately 1.75-mile stretch along the southern and eastern edge of University of Washington campus, as well as traveling through the Primary and Secondary Impact Zones to the east and west of the University of Washington campus. Identified off-campus recreation uses in the Primary and Secondary Impact Zones include:

<u>Primary Impact Zone</u>

- University Playground
- University Heights Park
- Ravenna Woods Park
- Union Bay Boglands #1 and #2
- East Montlake Park
- Montlake Playfield
- West Montlake Park

<u>Secondary Impact Zone</u>

- Ravenna Park (Cowen Park)

- Burke-Gilman Playground Park
- Laurelhurst Park
- Washington Park and Arboretum
- Roanoke Park
- Gas Works Park
- Meridan Park
- Ravenna-Eckstein Community Center

3.10.2 Impacts

Participation in active recreation activities and the use of intramural facilities would increase as the campus population increases. This anticipated increase in use could lead to demand for additional active recreational facilities and/or lead to a need for additional maintenance staff and equipment for existing facilities.

Under the *2018 Seattle Campus Master Plan*, all existing significant landscaped open space would be preserved and respected. New development would allow for the potential development of new open space and/or the reconfiguration of existing open space. Opportunities to gain landscaped open space would also be pursued where possible. Potential areas reserved for potential new open space identified in the *2018 Seattle Campus Master Plan* would primarily be located in the West, South and East Campus sectors, where the need for additional open space and recreational opportunities would be greatest.

West Campus Green

In the West Campus sector, areas reserved for open space and passive recreational improvements under the *2018 Seattle Campus Master Plan* would include a potential approximately 5-acre West Campus Green connecting Portage Bay Park on the Portage Bay shoreline with West Campus and the Seattle community to the north (the planned West Campus Green would extend to approximately NE 40th Street). Other potential West Campus open space and passive recreational improvements would include potential open space improvements along NE Campus Parkway and potential pedestrian improvements along 11th Avenue NE, 12th Avenue NE and Brooklyn Avenue NE.

South Campus open space and passive recreational improvements would include areas reserved for the creation of a potential approximately 3-acre South Campus Green Corridor connecting NE Pacific Street with the waterfront. Potential South Campus improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront; this trail would also be located in the West and East Campus sectors.

Potential East Campus improvements would include the planned East Campus Land Bridge over Montlake Boulevard NE which would provide pedestrian connections between Central Campus and sports fields. Replacement tennis courts would be provided to replace any courts displaced by development.

No Action Alternative

Under the No Action Alternative, the increase in campus population would primarily be related to the approximately 211,000 gsf of building development under the current *2003 CMP-Seattle*. The approximately 211,000 gsf of building development would represent approximately three percent of the amount of development on campus assumed under Alternatives 1 through 5, and the potential for increased demand on the University of Washington campus recreational and open space uses would be substantially less than under Alternatives 1 through 5.

The open space and recreational uses proposed for the West, South and East Campus sectors of the University of Washington campus would not occur under the No Action Alternative.

Alternative 1 – Campus Development with West and South Campus Focus

Alternative 1 reflects the preferred allocation of building development under the *2018 Seattle Campus Master Plan* and includes development of 6.0 million gsf of net new building space throughout the campus with a focus of development in the West and South Campus sectors and more limited development in the Central and East Campus sectors. The *2018 Seattle Campus Master Plan* identifies 85 potential development sites on the campus. However, because future funding levels and program needs are fluid the individual sites to be developed have not been determined. Development could occur on any of the sites, but not all of the sites would be developed. Development under Alternative 1 is assumed to be as follows:

- West Campus: 3.0[1] million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.75 million gsf

Up to nine (9) acres would be reserved for new potential open space areas under Alternative 1. Potential opportunities for new open spaces would include the potential

[1] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

approximately 5-acre West Campus Green, approximately 3-acre South Campus Green Corridor, and the approximately 1-acre of open space associated with the East Campus Land Bridge. The Continuous Waterfront Trail would enhance existing open space areas in the West, South and East Campus sectors. In addition, open spaces in the form of plazas and landscape areas would be provided with certain individual development projects. Existing passive recreational open spaces in the Central Campus sector would be retained.

Increased campus population under Alternative 1 would increase the demand for use of recreational facilities surrounding the University of Washington campus. Given the provision of potential new open spaces and passive recreational features on campus, however, the increase in demand would not be anticipated to result in significant impacts to off-campus recreation and open space uses.

West Campus

Approximately 3.0 million gsf of net new building space, representing approximately 50 percent of the total six million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided in the West Campus sector under Alternative 1.

In the West Campus sector, the primary open space and passive recreational improvement under Alternative 1 (and in the *2018 Seattle Campus Master Plan)* would include the potential new 5-acre West Campus Green connecting Portage Bay Park on the Portage Bay shoreline with West Campus and the Seattle community to the north (the West Campus Green would extend to approximately NE 40th Street). Other potential West Campus open space and passive recreational improvements would include potential open space improvements along NE Campus Parkway and potential pedestrian improvements along 11th Avenue NE, 12th Avenue NE and Brooklyn Avenue NE. Potential West Campus improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront. Additionally, open space opportunities could be provided with individual development projects in the West Campus sector.

The increased population associated with building development in the West Campus sector under Alternative 1 (representing 50 percent of the Alternative 1 total) would increase the demand for use of recreation facilities surrounding the University of Washington campus. Given the provision of new open space and passive recreational features on campus, and within the West Campus sector, the increased demand would not be anticipated to result in significant on-campus impacts.

Existing recreational and open space facilities in the off-campus area in proximity to the West Campus sector include the University Playground, Gasworks Park and the Burke-Gilman Trail. Increased campus population in West Campus under Alternative 1 would

contribute to use of these facilities, but would not be anticipated to result in significant impacts to these facilities. The West Campus Green and other open spaces in the West Campus sector would be available to the general public, including to the University District, and would provide a new recreational opportunity in the area.

South Campus

Approximately 1.35 million gsf of net new building space, representing approximately 23 percent of the total 6.0 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be added in the South Campus sector under Alternative 1.

In the South Campus sector, the primary open space and passive recreational improvement under Alternative 1 (and in the *2018 Seattle Campus Master Plan)* would include the potential approximately 3-acre South Campus Green Corridor connecting NE Pacific Street with the waterfront. Potential South Campus improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront; this trail would also be located in the West and East Campus sectors. Additionally, open space opportunities could be provided with individual development projects in the South Campus sector.

The increased population associated with building development in the South Campus sector under Alternative 1 (representing 23 percent of the Alternative 1 total) would increase the demand for use of recreation facilities surrounding the University of Washington campus. Given the anticipated provision of new open space and passive recreational features on campus, and within the South Campus sector, the increased demand would not be anticipated to result in significant on-campus impacts.

Existing recreational and open space facilities in the off-campus area in proximity to the West Campus sector include the West Montlake Park, East Montlake Park, Montlake Playfield and the Burke-Gilman Trail. Increased campus population in South Campus under Alternative 1 would contribute to use of these facilities, but would not be anticipated to result in significant impacts to these facilities. The South Campus Green would be available to the general public and would provide a new recreational opportunity in the area.

Central Campus

Approximately 0.9 million gsf of net new building space, representing approximately 15 percent of the total 6.0 million gsf of development anticipated to be needed to meet the forecasted growth in demand for building space, would be provided by the Central Campus sector under Alternative 1.

In the Central Campus sector, the primary open space and passive recreational opportunity under Alternative 1 (and in the *2018 Seattle Campus Master Plan)* would be the retention of the identified significant landscapes on campus, many of which are located in Central Campus (see the listing provided in the Affected Environment discussion above). Additionally, open space opportunities could be provided with individual development projects in the Central Campus sector.

The increased population associated with new building development in the Central Campus sector under Alternative 1 (representing 15 percent of the Alternative 1 total) would increase the demand for use of recreation facilities surrounding the University of Washington campus. Given the retention of open space and passive recreational features on campus, and within the Central Campus sector, the increased demand would not be anticipated to result in significant on-campus impacts.

Existing recreational and open space facilities in the off-campus area in proximity to the Central Campus sector include the Ravenna Woods Park and University Heights Park. Increased campus population in Central Campus under Alternative 1 would contribute to use of these facilities, but would not be anticipated to result in significant impacts to these facilities.

East Campus

Approximately 0.75 million gsf of net new building space, representing approximately 13 percent of the total 6.0 million gsf of development anticipated to be needed to meet the anticipated growth in demand for building space, would be provided by the East Campus sector under Alternative 1.

In the East Campus sector, the primary open space and passive recreational improvement under Alternative 1 (and in the *2018 Seattle Campus Master Plan)* would include the potential East Campus Land Bridge over Montlake Boulevard NE which would provide one acre of open space as well as pedestrian connections between Central Campus and sports fields. Replacement tennis courts would be provided to replace any courts displaced by development. Potential East Campus improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront. Additionally, open space opportunities could be provided with individual development projects in the East Campus sector.

The increased population associated with new building development in the East Campus sector under Alternative 1 (representing 13 percent of the Alternative 1 total) would increase the demand for use of recreation facilities surrounding the University of Washington campus. Given the anticipated provision of new open space and passive

recreational features on campus, and within the East Campus sector, the increased demand would not be anticipated to result in significant on-campus impacts.

Existing recreational and open space facilities in the off-campus area in proximity to the East Campus sector include the Union Bay Boglands #1 and #2, and Laurelhurst Park. Increased campus population in East Campus under Alternative 1 would contribute to use of these facilities, but would not be anticipated to result in significant impacts to these facilities. The East Campus sector open space and Continuous Waterfront Trail would be available to the general public, and would provide a new recreational opportunity in the area.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone** identified in the City-University Agreement, it is anticipated that potential recreation and open space impacts under Alternative 1 would be as described for adjacent off-campus land uses above for each of the campus sectors and primarily include demand for off-campus facilities associated with increased campus population. The use of off-campus recreational and open space facilities would be anticipated to be similar to current conditions. New open space features on the campus under Alternative 1 would be available to the public, including to residents within the Primary and Secondary Impact Zones.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be anticipated to be less than in the Primary Impact Zone.

Alternative 2 – Campus Development Consistent with CMP and Existing Height Limits

Alternative 2 reflects accommodation of the requested 6 million gsf of net new building area developed generally consistent with the CMP proposed allocation without the height increases proposed in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1; thus, the existing CMP height limits are assumed. Without the proposed height increases, the development capacity of the West Campus sector is limited and additional development sites would be required to approach the 3.0 million gsf of net new development in the West Campus sector identified in the *2018 Seattle Campus Master Plan* and analyzed under Alternative 1. Given the developed nature of the West Campus sector, the opportunity for additional development sites in this sector is limited, and Alternative 2 assumes additional development sites in the area reserved for the West Campus Green under Alternative 1. Even with the additional development sites, the development capacity in the West Campus sector without the requested height increases is 2.4 million gsf of net

new development (compared to 3 million gsf in the West Campus sector under Alternative 1) and the proposed CMP allocation for West Campus reflected in Alternative 1 cannot be achieved under Alternative 2. The approximately 0.6 million gsf of the net new development not accommodated by the West Campus sector development capacity is shifted to the East Campus sector under Alternative 2. The anticipated building development by campus sector under Alternative 2 is as follows:

- West Campus: 2.4 million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 1.35 million gsf

West Campus

Under Alternative 2, development in the West Campus sector would be less than under Alternative 1 (approximately 2.4 million gsf compared with 3.0 million gsf) and the maximum building heights for the campus would remain (currently 37 to 105 feet). Because there would be no increase in maximum building heights, the development of 2.4 million gsf in the West Campus sector would actually require the use of more development sites within the West Campus sector and would result in building development within the area that was reserved for the West Campus Green under Alternative 1. This planned open space is intended, in part, to connect the West Campus sector, and the University District, to the waterfront would not be provided under Alternative 2.

The increased population associated with new building development in the West Campus sector under Alternative 2 would be less than under Alternative 1. Because the West Campus Green would not be provided, the increased population in West Campus would result in a greater demand than under Alternative 1 on on-campus open spaces, as well as on Portage Bay Park.

Existing recreational and open space facilities in the off-campus area in proximity to the West Campus sector include the University Playground, Gasworks Park and the Burke-Gilman Trail. Increased campus population in West Campus under Alternative 2 would contribute to use of these facilities at a greater level than under Alternative 1, but would not be anticipated to result in significant impacts to these facilities.

South Campus

Development in the South Campus sector under Alternative 2 would include the same amount of development as Alternative 1 (approximately 1.35 million gsf of net new building space) and open space opportunities as described under Alternative 1 and potential impacts

to on-campus and off-campus recreational resources would be similar to that under Alternative 1.

Central Campus

Development in the Central Campus sector under Alternative 2 would include the same level of potential development as Alternative 1 (approximately 0.9 million gsf.) and open space opportunities as described under Alternative 1. Potential impacts to on-campus and off-campus recreational resources would be similar to that under Alternative 1.

East Campus

Under Alternative 2, lower building heights in the West Campus sector when compared with Alternative 1 would result in the need to develop additional areas of the East Campus sector in order to achieve 6 million gsf of development on the overall campus as identified in the *2018 Seattle Campus Master Plan*. Increased development in the East Campus sector would include approximately 1.35 million gsf of building space (compared to 0.75 million gsf under Alternative 1) which would represent approximately 23 percent of the total development anticipated to be needed to meet the anticipated growth in demand for building space.

As under Alternative 1, the primary open space and passive recreational improvement in the East Campus sector under Alternative 2 would include the planned East Campus Land Bridge over Montlake Boulevard NE which would provide one acre of open space as well as pedestrian connections between Central Campus and sports fields. Replacement tennis courts would be provided to replace any courts displaced by development. Potential East Campus improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront. Additionally, open space opportunities could be provided with individual development projects in the East Campus sector.

The population in the East Campus sector would increase under Alternative 2 and would be greater than under Alternative 1 (1.35 million gsf of building space compared to 0.75 million gsf under Alternative 1). This increased population would be anticipated to result in a corresponding increase in the demand for use of recreation facilities surrounding the University of Washington campus when compared to Alternative 1. Given the anticipated provision of new open space and passive recreational features on campus, and within the East Campus, sector the increased demand would not be anticipated to result in significant on-campus impacts.

Existing recreational and open space facilities in the off-campus area in proximity to the East Campus sector include the Union Bay Boglands #1 and #2, and Laurelhurst Park. Increased campus population in East Campus under Alternative 1 would contribute to use of these facilities, but would not be anticipated to result in significant impacts to these

facilities. The East Campus sector open space and Continuous Waterfront Trail would be available to the general public, and would provide a new recreational opportunity in the area.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone** identified in the City-University Agreement, it is anticipated that potential recreation and open space impacts under Alternative 2 would be as described for adjacent off-campus land uses above for each of the campus sectors and primarily include demand for off-campus facilities associated with increased campus population. The use of off-campus recreational and open space facilities would be anticipated to be similar to current conditions. Many of the new open space features on the campus under Alternative 2 would be available to the public, including to residents within the Primary and Secondary Impact Zones.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be anticipated to be less than in the Primary Impact Zone.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 reflects development of the 6.0 million gsf of net new building space consistent with the *2018 Seattle Campus Master Plan* but assumes that an increased amount of density would be provided in the West Campus and South Campus sectors, as follows:

- West Campus: 3.2 million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

West Campus

Under Alternative 3, development in the West Campus sector would feature a similar type and layout of land uses with the same maximum building heights as Alternative 1; however, Alternative 3 would include an increased amount of density within the West Campus sector compared to Alternative 1 (approximately 3.2 million gsf compared with 3.0 million gsf). With the assumed increase in allowable building heights, Alternative 3 includes the reservation of land for the 5-acre West Campus Green. As under Alternative 1, the Continuous Waterfront Trail would be provided West Campus under Alternative 3.

New population associated with new building development in West Campus sector would be greater under Alternative 3 than under Alternative 1, with somewhat greater potential to increase demand for off-campus recreational facilities; however, significant impacts to off-campus open space and recreational facilities would not be anticipated. As under Alternative 1, the West Campus Green and Continuous Waterfront Trail would be available to the general public.

South Campus

Development in the South Campus sector under Alternative 3 would also feature a similar type and layout of land uses as Alternative 1 with the same maximum building heights, but would represent an increase in development density when compared with Alternative 1 (approximately 1.65 million gsf versus 1.35 million gsf of net new building space). As under Alternative 1, the South Campus Green Corridor and Continuous Waterfront Trail would be provided.

New population associated with new development in South Campus would be greater under Alternative 3 than under Alternative 1, with somewhat greater potential to increase demand for off-campus recreational facilities; however, significant impacts to off-campus open space and recreational facilities would not be anticipated. As under Alternative 1, the South Campus Green Corridor and Continuous Waterfront Trail would be available to the general public.

Central Campus

Development in the Central Campus sector under Alternative 3 would include the same level of potential development as Alternative 1 (approximately 0.9 million gsf) and open space opportunities as described under Alternative 1. Potential impacts to on-campus and off-campus recreational resources under Alternative 3 would be similar to that under Alternative 1.

East Campus

Under Alternative 3, development in the East Campus sector would reflect a reduced amount of development within this campus sector. Approximately 0.25 million gsf would be provided under Alternative 3, compared with 0.75 million under Alternative 1. As under Alternative 1, the primary open space and passive recreational improvement under Alternative 1 (and in the *2018 Seattle Campus Master Plan)* would include the planned East Campus Land Bridge over Montlake Boulevard NE which would provide one acre of open space as well as pedestrian connections between Central Campus and sports fields. Replacement tennis courts would be provided to replace any courts displaced by

development. Potential East Campus improvements would also include the Continuous Waterfront Trail.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone** identified in the City-University Agreement, it is anticipated that potential recreation and open space impacts under Alternative 3 would be as described for adjacent off-campus land uses above for each of the campus sectors and primarily include demand for off-campus facilities associated with increased campus population. The use of off-campus recreational and open space facilities would be anticipated to be similar to current conditions. New open space features on the campus under Alternative 3 would be available to the public, including to residents within the Primary and Secondary Impact Zones.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be anticipated to be less than in the Primary Impact Zone.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Alternative 4 reflects development of the 6.0 million gsf of net new building space consistent with the *2018 Seattle Campus Master Plan*. The focus of development would be in the West and East Campus, but an increased amount of density would be provided in the Central Campus and East Campus sectors when compared to Alternative 1.

- West Campus: 3.0 million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf
- East Campus: 1.7 million gsf

West Campus

Development in the West Campus sector under Alternative 4 would include the same level of potential development as Alternative 1 (approximately 3.0 million gsf) and open space opportunities as described under Alternative 1. Potential impacts to on-campus and off-campus recreational resources under Alternative 4 would be similar to that under Alternative 1.

South Campus

Development in the South Campus sector under Alternative 4 would represent a substantial decrease in development density when compared with Alternative 1 (approximately 0.2

million gsf under Alternative 4 versus 1.35 million gsf of net new building space under Alternative 1). Open space and recreational features in the South Campus sector under Alternative 4 would be as described under Alternative 1 and would include the South Campus Green Corridor and Continuous Waterfront Trail. Potential impacts to on-campus and off-campus recreational resources under Alternative 4 in the South Campus sector would be similar to or less than that under Alternative 1.

Central Campus

Under Alternative 4, development in the Central Campus sector would represent an increase in development density when compared with Alternative 1 (approximately 1.1 million gsf versus 0.9 million gsf of net new building space). As under Alternative 1, the primary open space and passive recreational initiative under Alternative 4 would be the retention of the identified significant landscapes on campus, many of which are located in Central Campus (see the listing provided in the Affected Environment discussion above).

New population in Central Campus would be greater under Alternative 4 than under Alternative 1, with somewhat greater potential to increase demand for off-campus recreational facilities; however, significant impacts to off-campus open space and recreational facilities would not be anticipated. As under Alternative 1, the retained open space features of Central Campus would continue to be available to the general public.

East Campus

Development in the East Campus sector under Alternative 4 would provide an increased amount of development within this campus sector (1.7 million gsf versus 0.75 million gsf under Alternative 1).

As under Alternative 1, the primary open space and passive recreational improvement in the East Campus sector under Alternative 4 would include the potential East Campus Land Bridge over Montlake Boulevard NE which would provide one acre of open space as well as pedestrian connections between Central Campus and sports fields. Replacement tennis courts would be provided to replace any courts displaced by development. Potential East Campus sector improvements would also include the Continuous Waterfront Trail providing numerous connections to the waterfront. Additionally, open space opportunities could be provided with individual development projects in the East Campus sector.

The population in the East Campus sector increase associated with new building development under Alternative 2 would be greater than under Alternative 1 (1.7 million gsf of building space compared to 0.75 million gsf under Alternative 1) would represent a corresponding greater increase the demand for use of recreation facilities surrounding the University of Washington campus. Given the anticipated provision of new open space and

passive recreational features on campus, and within the East Campus sector, the increased demand would not be anticipated to result in significant on-campus impacts.

Primary and Secondary Impact Zones

Within the **Primary Impact Zone** identified in the City-University Agreement, it is anticipated that potential recreation and open space impacts under Alternative 4 would be as described for adjacent off-campus land uses above for each of the campus sectors and primarily include demand for off-campus facilities associated with increased campus population. The use of off-campus recreational and open space facilities would be anticipated to be similar to current conditions. New open space features on the campus under Alternative 4 would be available to the public, including to residents within the Primary and Secondary Impact Zones.

Due to the distance between the **Secondary Impact Zone** and the campus, potential impacts to the Secondary Impact Zone would be anticipated to be less than in the Primary Impact Zone.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street, alley or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in the West Campus sector, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in the East Campus sector, would occur.

In the West Campus sector, retention of the existing NE Boat Street alignment and configuration would result in a roadway and traffic separator between the Portage Bay Park and the potential West Campus Park. This separator could limit the recreational value provided by a larger, unified open space, and could reduce the perceived connection to the shoreline from the planned West Campus Park.

In the East Campus sector, the lack of a land bridge over Montlake Boulevard NE would substantially limit the ability to provide a pedestrian connection between Central Campus and the sports fields in East Campus and could limit the ability to provide the proposed one-acre of open space in the East Campus.

The relationship between increased campus population and off-campus recreational and open space uses would be similar to those under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall level of population in the area and, in combination with future new development in the area, would contribute to demand on campus and off-campus open space and recreational uses.

Development under Alternatives 1 through 5 would contribute to the cumulative employment and population growth in the area surrounding the University of Washington campus. The *University District Urban Design Draft EIS* indicates that "growth in the neighborhood could out-pace the expansion of open spaces and recreational facilities," and to the extent that University of Washington populations utilize off-campus facilities, growth under the *2018 Seattle Campus Master Plan* could add to this pressure. However, development under Alternatives 1 through 5 would include substantial acreage reserved for planned open space and passive recreational area on campus, many of which would be available for use by the general public (including increased growth in the University District), and potentially meeting a portion of the demand for open space and passive recreational use area associated with growth in the area surrounding the University of Washington campus.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low", and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For recreation and open space, a portion of the East Campus sector where existing recreational facilities

are located on identified potential development sites is identified as "High" potential to encounter sensitive recreational or open space conditions (see **Figure 3.10-1**).

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.10.3 Mitigation Measures

The following measures would minimize potential recreation and open space impacts that could occur with the implementation of the *2018 Seattle Campus Master Plan*.

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The *2018 Seattle Campus Master Plan* includes substantial areas that would be reserved for potential open space features, including the planned West Campus Park, South Campus Green Corridor, East Campus Land Bridge, and Continuous Waterfront Trail.

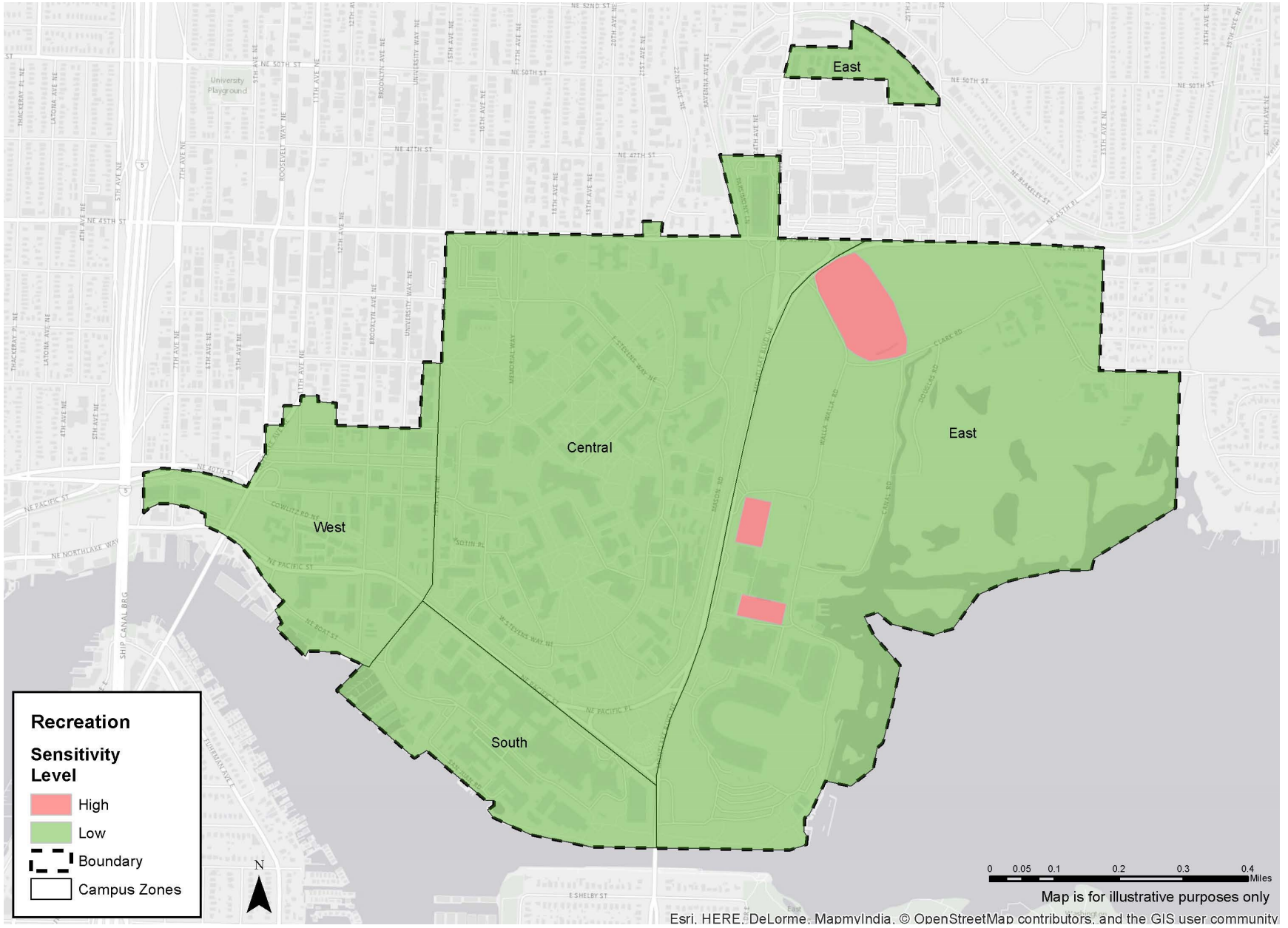
- Additional maintenance staff and acquisition of equipment for existing recreational facilities could be needed to effectively address the increase in use of active and passive recreational resources.

Additional Measures Applicable to Medium and High Potential Campus Areas

- Existing campus tennis courts located in the East Campus sector would be replaced if development were to occur on these sites.

3.10.4 Significant Unavoidable Adverse Impacts

With proposed mitigation measures, significant unavoidable adverse impacts to recreational and open space resources are not expected to occur.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.10-1
Recreation and Open Space Sensitivity Map

3.11 CULTURAL RESOURCES

This section characterizes the cultural resources history of the region (including the area encompassing the University of Washington campus), identifies the areas on campus that have the highest potential to contain cultural resources, and identifies potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*. This section is based on the Archaeological Predictive Model report for the University of Washington campus prepared by Historic Research Associates, Inc. in March 2016 (**Appendix D**).

3.11.1 Affected Environment

Environmental Context

The following provides an overview of the cultural resources environment, including topography and geology, climate and fauna, and how these elements relate to cultural resources.

Topography and Geology

The University of Washington campus is located north of the Montlake Cut and east of the modern-day shoreline of Lake Union and west of the current shoreline of Lake Washington. Elevation of the campus ranges from approximately 30 to 60 feet (ft) above mean sea level (amsl).

Historic Map of Puget Sound Basin

The campus is located within the Southern Puget Sound Basin, within a portion of the Puget Trough. The north–south trough of the Puget Lowland separates the Olympic Mountains to the west from the Cascade Range on the east. The lowland was carved out during the last major glaciation of western Washington which ended approximately 16,000 years before present (B.P.). As glaciers retreated, they left thick sediment deposits. This sediment forms the parent material of many soils throughout this part of King County including the University of Washington campus. Sediments at the surface across the campus are glacially deposited, but also include historic fill especially in the eastern and southern portions of campus. As glaciers retreated, the land on which they rested began to rebound, and would have become available for colonization by plant and animal communities as the climate began to stabilize.

Climate

Between approximately 13,000 and 12,000 years B.P., the region had a cooler and drier climate, which supported an ecosystem characterized by lodgepole pine (*Pinus contorta*), sedges (*Cyperaceae* sp.), sage (*Artemisia*), and a variety of grasses and herbs. After 12,000 years B.P., the climate warmed while continuing to dry, and Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and red alder (*Alnus rubra*) became evident. By around 6,000 years ago, the climate of the region cooled and moistened to levels comparable to today's maritime regime, producing the current western hemlock vegetation zone. Presently, uplands are moderately to heavily forested with Douglas fir, western hemlock, and western red cedar (*Thuja plicata*). Red alder and big-leaf maple (*Acer macrophyllum*) represent secondary species in forested habitats and are dominant in disturbed areas.

Fauna

During the late Pleistocene (from approximately 2 million to 11,700 years B.P.), western North America would have provided habitat for a number of animals not found in the region after about 11,000 B.P. These animals would have done well in the developing forested environment in the Puget Sound region, which would have provided food for both grazers and browsers and, in turn, food for large carnivores. Climatic changes undoubtedly reduced the habitat for these animals, which would eventually become extinct across North America.

Throughout the Holocene (approximately 11,700 years B.P. to present), and prior to extensive Euroamerican influence in the area, larger terrestrial mammals would have included elk (*Cervus elaphus*), deer (*Odocoileus* spp.), black bear (*Ursus americanus*), coyote (*Canis latrans*), and mountain lion (*Felis concolor*). Smaller mammals that inhabited the area included snowshoe hare (*Lepus americanus*), raccoon (*Procyon lotor*), and beaver (*Castor canadensis*). Avifauna found in the Puget Sound region include raptors such the bald eagle (*Haliaeetus leucocephalus*) and waterfowl (*Aix* and *Anas* species). Freshwater fish including trout (*Salmo* sp.), suckers (*Castomidae* spp.), and minnows (*Gila* sp.) would have been readily available in in Lake Washington and Lake Union. Pacific salmon and trout (*Onchorhynchus* spp.), including land locked Kokanee (*O. nerka*), would have also been readily available in the region and in waterways near the current campus site. Freshwater mussels (*Unionidea*) are found in Lake Washington and Lake Union.

Cultural Context

The following provides a brief overview of nearly 14,000 years of human occupation in North America, focusing specifically on western Washington and the Puget Sound area where possible.

Precontact Background

The current understanding of Pacific Northwest precontact life is derived from the archaeological record, which is constantly changing as knowledge grows.

The chronological sequence is typically divided into three basic developmental periods: Paleoindian, Archaic, and Pacific. The archaeological evidence from these periods suggests a gradual shift from small nomadic groups relying on generalized hunting and gathering to larger sedentary groups with increased social complexity and specialized reliance on marine and riverine resources.

Paleoindian (~12,500 B.C. to 10,500 B.C.)

Evidence for Paleoindian occupation of western North America comes from a very small number of archaeological sites, including Paisley 5-miles Cave in Oregon and sites on California's Channel Islands. Data from these sites have reinforced the idea that these first inhabitants of the region lived in small groups, were probably highly mobile, and followed the migration patterns of animals across the landscape.

The earliest sites in the Pacific Northwest are commonly associated with Clovis points, an iconic large spear point found across much of North America during this time. These sites are said to represent the remains of mobile hunting activities. Early western Washington sites dating to this period include the Manis Mastodon Site (45CA218) near Sequim, and 45KI839 on Bear Creek in Redmond. The Manis Site dates from roughly 11,800 B.P., and consists of the remains of a mammoth found in a peat bog with a human-made bone point lodged in a rib fragment. Site 45KI839 dates from approximately 10,000 to 12,000 B.P., and consists of a highly diverse stone tool kit. This site has been interpreted as a short term occupation site and has yielded evidence of mammal, fish, and plant exploitation. The Manis and Bear Creek Sites have demonstrated that the earliest inhabitants of western Washington were not simply big game hunters who used large stone tools to kill game. These sites demonstrate the implementation of diverse toolkits and subsistence strategies, signaling a working knowledge of the landscape and available resources.

Archaic (10,500 B.C. to 4400 B.C.)

Sites dating to the Archaic period, especially prior to 5000 B.P., are rare, in part because of natural processes such as sea-level rise, which have obscured sites that are currently underwater.

Lifeways during the Archaic period are thought to have changed little from the Paleoindian period. People are thought to have hunted game and lived in small highly mobile egalitarian groups, as foragers.

The most discussed sites dating to the Archaic period are often referred to as "Olcott" sites. These sites typically lack good absolute dates, are highly disturbed, are located near rivers,

and contain tools such as scrapers, flaked cobbles, and debitage[1] in addition to large lanceolate and stemmed projectile points (refer to **Appendix D** for additional discussion).

A number of Archaic period sites have been recorded in King County. For example, the Marymoor site near Marymoor Park yielded a large array of Archaic period artifacts, including large projectile points, modified cobbles, and microblades. The earliest component of the West Point Sites (discussed below) also falls into the Archaic period. Additionally, projectile points that probably date to this period have been identified at Foster Island, just outside the current campus site (45KI1107).

Pacific (4400 B.C. to A.D. 1775)

Based on the archaeological record, the Pacific period is the most culturally dynamic precontact period in the Pacific Northwest. Over time, changing technologies and site locations suggest increased specialization in the use of particular environments and resources. During this period, shell middens (deposit of shells, animal bones, etc.) become a prominent site type across Puget Sound. After about 5000 B.P., populations on or near the Puget Sound coast grew and became more complex in organization. Technological organization and subsistence practices became increasingly complex during the Pacific period. During this period, there is apparent increasing emphasis on the use of plants including berries and root-vegetables. Social stratification and inequality, a hallmark of Northwest coast cultures, is thought to be less pronounced in the Puget Sound than in other parts of the Pacific Northwest; however, objects like labrets[2], indicative of social stratification, appear early in the Pacific period in the Puget Sound at sites like West Point (45KI248). By shortly after 2500 B.P., a variety of bone, chipped stone, and groundstone artifacts represent coastal marine-oriented cultures and inland hunting/fishing/gathering cultures.

Shell midden sites dating to the past several thousand years have been recorded in and around the Puget Sound area. The most well studied shell middens are found around Seattle. The West Point Sites (45KI428 and 45KI429), located at Discovery Park in Magnolia, have been interpreted as long-term camping and food-processing activity areas. The West Point Sites also yielded a highly diverse tool kit, including bone as well as ground and chipped stone implements used for capturing and processing prey, including sea mammals, fish, terrestrial mammals, birds, and shellfish.

Ethnographic Background

The University of Washington campus site is located within the traditional territory of the Duwamish Indians, members of the Coast Salish cultural group that spoke Southern Lushootseed. The Duwamish traditionally lived in winter villages on the shores of Elliott Bay,

[1] Sharp-edged waste material left over creating a stone tool.
[2] A small piece of shell, bone or stone that is inserted into the lip as an ornament.

Salmon Bay, Lake Washington, and Lake Union, as well as along the Black, Cedar, and Duwamish.

Ethnographic and archaeological evidence suggests that the Salish Lushootseed-speaking Duwamish, whose name means "inside [the bay] people," practiced their life way of hunting, fishing, and gathering for centuries before contact with white settlers. Duwamish settlement and subsistence were inextricably linked throughout the year.

The Duwamish, like other Coast Salish groups, spent the majority of the winter inside large longhouses made from cedar planks that had "shed" roofs. These houses could be massive, providing room for very large extended families and much of the food they would need for the cold months. The houses were often arranged into villages of two to five structures. The Duwamish occupied extended family villages and established a flexible system of intermarriage with the surrounding peoples, including the Sammamish and Snohomish. Winter was spent engaged in storytelling and ceremonial performances.

During spring, fall, and summer, people from the winter villages dispersed to hunt, fish, and gather plant foods for immediate consumption and winter storage. Summer camps usually consisted of small, temporary reed or grass-mat structures occupied by a single family, although several families might join together to build a larger mat house. Upland forested environment, not only attracted and supported deer and elk populations for hunting, but likely also provided a variety of plant resources such as berries, nuts, and root foods.

Historic Background

European visitation to the Puget Sound region began in 1792 when George Vancouver and his crew explored the region. Within the next 100 years, native populations would plummet due to repeated outbreaks of introduced diseases such as smallpox, influenza, and typhoid fever. Fort Nisqually, located approximately 40 miles southeast of the Duwamish River headwaters, was established as a trading post by the Hudson's Bay Company in 1833. The Treaty of Washington in 1852 conveyed the territory to the United States, and the Donation Land Claim Act drew settlers into land occupied by the Duwamish and their neighbors. In 1855, members of the Duwamish and neighboring Puget Sound tribes signed the Treaty of Point Elliott, which provided for the removal of tribal members to reservations, including the Port Madison Reservation (Suquamish/Fort Kitsap). Some Duwamish people continued to live in and around Seattle, maintaining friendly relations, working for, and trading with incoming settlers. Many others relocated to the Port Madison Reservation, but due to undesirable conditions were compelled to leave. Many then attempted to return to their ancestral lands, and a few were able to claim or purchase land.

Tribal lands and fishing rights continued to be eroded through the late 1800s and 1900s, culminating, in the late 1900s, in a series of lawsuits and court cases that upheld certain

treaty rights. The Duwamish Tribe is not currently federally recognized, but continues to fight for this distinction.

Predictive Model

Archaeological sites are often expected to be found on particular topographic landforms and adjacent to specific resources, and predictive models have been developed that reflect these expectations. Typically, assumptions about potential locations of cultural resources have been derived from previous archaeological data, from ethnographic literature, and from field experience. These models rely on the understanding of past human behavior to select environmental variables such as slope, distance to water, land cover, geology, and proximity to previously mapped sites or historic features. Once pertinent context has been established, it is then determined which variables are most predictive for the occurrence of archaeological sites. The variables are then weighted toward those having the most influence on past human settlement patterns, resource acquisition locations and strategies, etc.

Sensitivity analysis is achieved through the use of environmental variables that, when assessed in conjunction with one another, indicate the likelihood of potential site locations within the campus to contain cultural resources (i.e., High, Medium, and Low potential for the discovery of cultural resources). See **Appendix D** to this Draft EIS for additional detail on predictive model methodology.

Below is a discussion of ethnographic locations and the potential for the discovery of cultural resources within the campus sectors and within the Primary and Secondary Impact Zones.

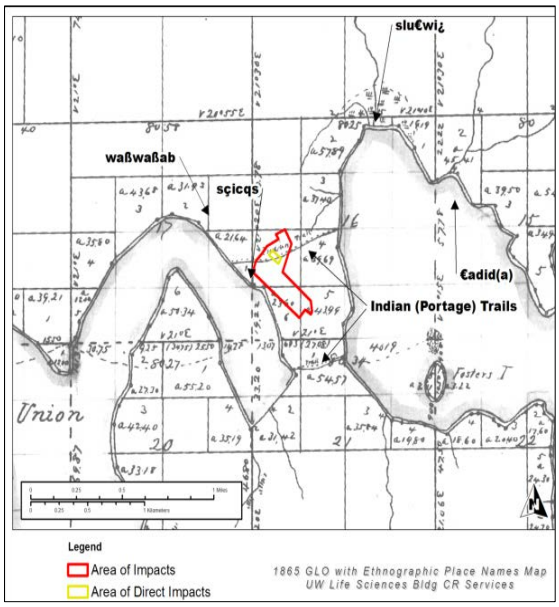
West Campus

Near the western extent of the campus, in the West Campus sector, is an ethnographic location in Lushootseed called *waßwaßab*, which translates to “like a frog.” At this location, a small creek drains into Portage Bay.

Based on the predictive model described above, substantial portions of the West Campus sector contain areas with Low and Medium potential for containing cultural resources. Areas with a Low potential generally contain buildings and other facilities, or are areas where substantial modification to the landscape have taken place. These areas are primarily located in the central and northern portions of the sector. Some isolated areas with High potential for containing cultural resources are located in West Campus, mostly in the southern and western portions of the sector (**see Figure 3.11-1** at the end of this section for a map of these areas).

South Campus

An "Indian Trail" depicted on the 1865 GLO plat connected Lake Washington and Lake Union and was located in the vicinity of the modern day Montlake Cut, partially in the South Campus sector. The trail was recorded in Lushootseed as *sùac¢¨i¿*, or to lift a canoe/pull a canoe. This trail, along with one located slightly farther to the north in the Central Campus sector -- both likely canoe portage routes -- are evidence of the heavily used transportation corridor stretching between Shilshole Bay and Lake Washington, bringing people from various neighboring tribes into and through the area vicinity.



Indian Trail Location

Based on the predictive model, the majority of the South Campus sector is in areas with Low and Medium potential for containing cultural resources. The areas with Low potential are largely located along the shoreline of Portage Bay and the Ship Canal, and generally contain buildings and other facilities, or are areas where substantial modification to the landscape have taken place (see **Figure 3.11-1** later in this section).

Central Campus

Another "Indian Trail" depicted on the 1865 GLO plat connected Lake Washington and Lake Union and passed through the northern portion of Central Campus. As described under South Campus, the trail was recorded in Lushootseed as *sùac¢¨i¿*, or to lift a canoe/pull a canoe.

Based on the predictive model, the majority of the Central Campus sector is in areas with Low and Medium potential for containing cultural resources. Areas with a Low potential generally contain buildings and other facilities, or are areas where substantial modification to the landscape have taken place. Some areas with High potential for containing cultural resources are present in this sector, primarily along the eastern boundary of the sector (see **Figure 3.11-1** later in this section).

East Campus

A number of ethnographic locations have been identified in the East Campus sector, including:

- The "Indian Trail" known in Lushootseed as *sùac¢¨i¿*, or to lift a canoe/to pull a canoe, mentioned under South Campus, was partially located in the East Campus sector.
- Along the Portage Bay shoreline, a small promontory (now the location of the University of Washington Waterfront Activities Center) is known in Lushootseed as *sçicqs*, which translates to "down river promontory."
- The marsh between Laurel Point and the University of Washington, now filled in, and the location of parking lots (including parking lot E-1) and athletic facilities, was known in Lushootseed as *slu€wi¿*, translated as "perforation for a canoe." A village with at least five longhouses was located here, along with a fish weir.
- The small cove west of Laurel Point was referred to in Lushootseed as *€adid(a)*, or "dear me/for gosh sakes."
- Webster Point and Laurel Point on Lake Washington were referred to in Lushootseed as *sabal€tù,* which translates to "dry house."
- The southernmost of the two promontories of Lake Washington that forms Union Bay was referred to in Luhootseed as *b¢sk^{w}i€k^{w}il,* or "a place that has skate fish."

Based on the predictive model, the northern approximately two-thirds of the East Campus sector is primarily in areas with High potential for containing cultural resources. Previous East Campus development of the parking areas and sports complexes has dramatically modified the precontact and historic-period landscape; however, given that a number of important ethnographic places are located in the vicinity, this portion of campus has a high potential for containing cultural resources. The southern approximately one-third of the sector is largely in areas with Low and Medium potential for containing cultural resources, with pockets of High potential (see **Figure 3.11-1** later in this section).

Primary and Secondary Impact Zones

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS.

The **Primary Impact Zone** includes commercial areas (e.g. the University District and University Village) and residential areas, major highways (e.g., I-5 and SR 520), and water features (e.g., Portage Bay, the Ship Canal, and Union Bay). As mentioned previously, the Duwamish Indians, members of the Coast Salish cultural group that spoke Lushootseed, traditionally lived in winter villages on the shorelines of Lake Washington and Lake Union, within the Primary Impact Zone.

The **Secondary Impact Zon**e includes commercial areas (e.g., in Wallingford) and residential areas, major highways (e.g., I-5 and SR 520), water features (e.g., Lake Union, Portage Bay,

the Ship Canal, and Union Bay), and open space (e.g., Ravenna/Cowen Park, Cavalry Cemetery, Laurelhurst Park, Foster Island, the Arboretum, and Montlake Playfield). Similar to the Primary Impact Zone, winter villages for the Duwamish Indians were located on the shorelines of Lake Washington and Lake Union, within the Secondary Impact Zone. Foster Island has been identified by numerous investigators through Native American testimony as an area of particular importance to Native American groups in the area. Foster Island holds special importance as the location of precontact and ethnographic period burials. The area is considered a Traditional Cultural Property, is held in high regard, and is thought of as sacred landscape.

3.11.2 Impacts

This section of the Draft EIS describes the results of the predictive model and identifies how development under the EIS Alternatives relates to the cultural resources environment at the campus.

No Action Alternative

Under the No Action Alternative, potential impacts on cultural resources would primarily be related to the approximately 211,000 gsf of building development under the current *2003 CMP-Seattle*. Given that the location and extent of development would be controlled by the provisions of the current *2003 CMP-Seattle*, and that the amount of development would be approximately four (4) percent of the development assumed under Alternatives 1 through 5, the potential for cultural resources-related impacts on the University of Washington campus would be less than under Alternatives 1 through 5.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 matches the preferred allocation of building development under the *2018 Seattle Campus Master Plan* and includes approximately 6.0 million gsf of building area throughout the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors. Development on the campus under Alternative 1 would result in the potential for impacts on cultural resources as described below.

West Campus

The West Campus sector is one of the focus areas of development under Alternative 1 (3.0 million gsf of assumed development). This development could impact cultural resources in this sector, if they are present. However, substantial portions of the West Campus sector contain areas with Low and Medium potential for containing cultural resources. Therefore,

assumed development in these areas would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, the project would follow pertinent cultural resources regulations. There are several isolated areas with High potential to contain cultural resources in the West Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeology survey would be conducted as a part of any proposed project in these High potential areas.

South Campus

Similar to the West Campus sector, the South Campus sector is a focus area of development under Alternative 1 (1.35 million gsf of assumed development). This development could impact cultural resources in this sector, if they are present. However, the majority of the South Campus sector is in areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in this sector would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There is one pocket located along the Portage Bay shoreline in the South Campus sector with a High potential to contain cultural resources where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

Central Campus

Less development is assumed in the Central Campus sector than in the West and South Campus sectors under Alternative 1 (0.9 million gsf assumed). As a result, this development would have less potential to impact cultural resources in this sector. Also, the majority of the Central Campus sector is in areas with Low and Medium potential for containing cultural resources, further reducing the potential to impact cultural resources during development. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. Some areas with High potential for containing cultural resources are located in the Central Campus sector along the eastern boundary of this sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

East Campus

Less development is assumed in the East Campus sector than in the West, Central, and South Campus sectors under Alternative 1 (0.75 million gsf assumed). As a result, this development would have less potential to impact cultural resources in this sector.

However, the northern approximately two-thirds of the East Campus sector is primarily in areas with High potential for containing cultural resources (the southern one-third is in areas with Low and Medium potential for containing cultural resources). Therefore, even though less development is assumed in this sector, there would be a potential to encounter cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in the High potential areas.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact Zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this Drat EIS.

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. Any impacts to cultural resources that could be located in the Primary and Secondary Impact Zones would largely be associated with land disturbing activities during construction.

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), more development and associated potential for impacts on cultural resources would occur in proximity to the portions of the **Primary Impact Zone** located proximate to these sectors. The Duwamish Indians traditionally lived in winter villages on the shorelines of Lake Union in the Primary Impact Zone adjacent to these sectors. Therefore, there would be a greater potential for impacts on cultural resources in these areas (e.g., in the University District along Portage Bay and in the Montlake neighborhood along the Ship Canal).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. No shoreline areas are located in the Primary Impact zone adjacent to the Central Campus sector could be impacted by development. Shoreline areas along the Montlake neighborhood and along a small portion of the Washington Park Arboretum are located adjacent to the East Campus sector could contain cultural resources.

Winter villages of the Duwamish Indians located along Lake Union and Lake Washington shorelines are in the **Secondary Impact Zone**. Foster Island, which has been identified as culturally significant, is also located in this zone. Given the distance of potential cultural resources in the Secondary Impact Zone from development assumed under Alternative 1, construction activities associated with Alternative 1 development would not be anticipated to result in impacts on cultural resources in the Secondary Impact Zone.

Alternative 2 – Campus Development Consistent with CMP and Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West, South, and East Campus sectors, and lesser levels of development in the Central Campus sector. Existing building heights would be retained under this alternative.

West Campus

Similar to Alternative 1, the West Campus sector is one of the focus areas of development under Alternative 2. Less development would occur in this sector than under Alternative 1 (2.4 million gsf compared to 3.0 million gsf of assumed development under Alternative 1). This development could impact cultural resources in this sector, if they are present. However, substantial portions of the West Campus sector contain areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in these areas under Alternative 2 would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There are several isolated areas with High potential to contain cultural resources in the West Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeology survey would be conducted as a part of any proposed project in these High potential areas.

South Campus

As under Alternative 1, the South Campus sector is a focus area of development under Alternative 2 (1.35 million gsf of assumed development, the same amount as under Alternative 1), this development could impact cultural resources in this sector, if they are present. However, the majority of the South Campus sector is in areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in this sector would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There is one pocket located along the Portage Bay shoreline in the South Campus sector with a High potential to contain cultural resources where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

Central Campus

Similar to Alternative 1, less development is assumed in the Central Campus than in the West and South Campus sectors under Alternative 2 (0.9 million gsf assumed, the same

amount as under Alternative 1). As a result, this development would have less potential to impact cultural resources in this sector, if they are present. Also, the majority of the Central Campus sector is in areas with Low and Medium potential for containing cultural resources, further reducing the potential to impact cultural resources during development. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. Some areas with High potential for containing cultural resources are located along the eastern boundary of this sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

East Campus

The East Campus sector is one of the focus areas of development under Alternative 2. More development would occur in this sector than under Alternative 1 (1.35 million gsf compared to 0.75 million gsf of assumed development under Alternative 1) which could result in an increased potential to impact cultural resources in this sector, if they are present. The northern approximately two-thirds of the East Campus sector is primarily in areas with High potential for containing cultural resources; the southern one-third is in areas with Low and Medium potential for containing cultural resources. During development, there would be a potential to encounter cultural resources, particularly in the northern portion of the sector. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in the High potential areas. If a project is proposed in an area identified as having Medium potential to contain cultural resources, the project would follow pertinent cultural resources regulations.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact Zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS.

Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. Any impacts to cultural resources that could be located in the Primary and Secondary Impact Zones would largely be associated with land disturbing activities during construction.

With the focus of development in the West, South, and East Campus sectors (85 percent of development under Alternative 2), more development and associated potential for impacts on cultural resources would occur in proximity to the portions of the **Primary Impact Zone** located proximate to these sectors. The Duwamish Indians traditionally lived in winter villages on the shorelines of Lake Union in the Primary Impact Zone adjacent to these sectors. Therefore, there would be a greater potential for impacts on cultural resources in these areas (e.g., in the University District along Portage Bay, in the Montlake

Neighborhood along the Ship Canal, and in a small portion of the Washington Park Arboretum along Union Bay).

As under Alternative 1, less development is assumed to occur in the Central Campus sector under Alternative 2. The Duwamish Indians traditionally lived in winter villages along the shorelines of Lake Union and Lake Washington. However, no shoreline areas are located in the Primary Impact zone adjacent to the Central Campus sector that could be impacted by development.

Winter villages of the Duwamish Indians located along Lake Union and Lake Washington shorelines are in the **Secondary Impact Zone**. Foster Island, which has been identified as culturally significant, is also located in this zone. As under Alternative 1, given the distance of potential cultural resources in the Secondary Impact Zone from development assumed under Alternative 2, construction activities associated with Alternative 2 development would not be anticipated to result in impacts on cultural resources in the Secondary Impact Zone.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

West Campus

The West Campus sector is one of the focus areas of development under Alternative 3. Slightly more development would occur in this sector than under Alternative 1 (3.2 million gsf compared to 3.0 million gsf of assumed development under Alternative 1). This development could impact cultural resources in this sector, if they are present. However, substantial portions of the West Campus sector contain areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in these areas under Alternative 3 would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There are several isolated areas with High potential to contain cultural resources in the West Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeology survey would be conducted as a part of any proposed project in these High potential areas.

South Campus

Similar to Alternative 1, the South Campus sector is a focus area of development under Alternative 3. Slightly more development would occur in this sector than under Alternative 1 (1.65 million gsf compared to 1.35 million gsf of assumed development under Alternative 1). This development could impact cultural resources in this sector, if they are present. However, the majority of the South Campus sector is in areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in this sector would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There is one pocket located along the Portage Bay shoreline in the South Campus sector with a High potential to contain cultural resources where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

Central Campus

As under Alternative 1, less development is assumed in the Central Campus sector than in the West and South Campus sectors under Alternative 3 (0.9 million gsf assumed, the same amount as under Alternative 1). As a result, this development would have less potential to impact cultural resources in this sector. Also, the majority of the Central Campus sector is in areas with Low and Medium potential for containing cultural resources, which would reduce the potential to impact cultural resources during development. If a project is proposed in an area identified as having Medium potential to contain cultural resources, the project would follow pertinent cultural resources regulations. Some areas with High potential for containing cultural resources are located along the eastern boundary of the Central Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

East Campus

Similar to Alternative 1, less development is assumed in the East Campus sector under Alternative 3. Slightly less development would occur in this sector than under Alternative 1 (0.25 million gsf compared to 0.75 million gsf of assumed development under Alternative 1). This development would have less potential to impact cultural resources in this sector, if they are present. The northern approximately two-thirds of the East Campus sector is primarily in areas with High potential for containing cultural resources; the southern one-third is in areas with Low and Medium potential for containing cultural resources. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in the High potential areas. If a project is proposed in an area

identified as having Medium potential to contain cultural resources, the project would follow pertinent cultural resources regulations.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact Zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS.

Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. Any impacts to cultural resources that could be located in the Primary and Secondary Impact Zones would largely be associated with land disturbing activities during construction.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), more development and associated potential for impacts on cultural resources would occur in proximity to the portions of the **Primary Impact Zone** located proximate to these sectors. The Duwamish Indians traditionally lived in winter villages on the shorelines of Lake Union in the Primary Impact Zone adjacent to these sectors. Therefore, there would be a greater potential for impacts on cultural resources in these areas (e.g., in the University District along Portage Bay and in the Montlake Neighborhood along the Ship Canal).

As under Alternative 1, less development is assumed to occur in the Central and East Campus sectors under Alternative 3, which would result in less potential for impacts on cultural resources. The Duwamish Indians traditionally lived in winter villages along the shorelines of Lake Washington. No shoreline areas are located in the Primary Impact zone adjacent to the Central Campus sector. Shorelines along a small portion of the Washington Park Arboretum are located adjacent to the East Campus sector that could contain cultural resources.

Winter villages of the Duwamish Indians were located along Lake Union and Lake Washington shorelines in the **Secondary Impact Zone**. Foster Island, which has been identified as culturally significant, is also located in this zone. As under Alternative 1, given the distance of potential cultural resources in the Secondary Impact Zone from development assumed under Alternative 3, construction activities associated with Alternative 3 development would not be anticipated to result in impacts on cultural resources in the Secondary Impact Zone.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the

West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

West Campus

As under Alternative 1, the West Campus sector is one of the focus areas of development under Alternative 4 (3.0 million gsf of assumed development, the same amount as under Alternative 1). This development could impact cultural resources in this sector, if they are present. However, substantial portions of the West Campus sector contain areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in these areas under Alternative 4 would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There are several isolated areas with High potential to contain cultural resources in the Central Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any proposed project in these High potential areas.

South Campus

Considerably less development would occur in the South Campus sector under Alternative 4 than under Alternative 1 (0.2 million gsf, compared to 1.35 million gsf of assumed development under Alternative 1). This development could result in less impacts on cultural resources in this sector, if they are present. The majority of the South Campus sector is in areas with Low and Medium potential for containing cultural resources. Therefore, assumed development in this sector would not be likely to impact cultural resources. If a project is proposed in an area identified as having Medium potential to contain cultural resources, then the project would follow pertinent cultural resources regulations. There is one pocket located along the Portage Bay shoreline in the South Campus sector with a High potential to contain cultural resources where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

Central Campus

Similar to under Alternative 1, less development is assumed in the Central Campus sector than in the West Campus sector under Alternative 4. Slightly more development would occur in this sector than under Alternative 1 (1.1 million gsf compared to 0.9 million gsf of assumed development under Alternative 1); this development could impact cultural resources in this sector, if they are present. However, the majority of the Central Campus sector is in areas with Low and Medium potential for containing cultural resources, which would reduce the potential to impact cultural resources during development. If a project is proposed in an area identified as having Medium potential to contain cultural resources, the

project would follow pertinent cultural resources regulations. Some areas with High potential for containing cultural resources are located along the eastern boundary of the Central Campus sector where cultural resources could be encountered during construction. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in this High potential area.

East Campus

The East Campus sector is one of the focus areas of development under Alternative 4. More development is assumed in the East Campus sector than under Alternative 1 (1.7 million gsf compared to 0.75 million gsf of assumed development under Alternative 1), which could result in a higher potential to impact cultural resources in this sector, if they are present. The northern approximately two-thirds of the East Campus sector is primarily in areas with High potential for containing cultural resources; the southern one-third is in areas with Low and Medium potential for containing cultural resources. Therefore, even though less development is assumed in this sector, there would be a potential to encounter cultural resources. Pertinent cultural resource regulations and an archaeologic survey would be conducted as a part of any project proposed in the High potential areas. If a project is proposed in an area identified as having Medium potential to contain cultural resources, the project would follow pertinent cultural resources regulations.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact Zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS.

Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. Any impacts to cultural resources that could be located in the Primary and Secondary Impact Zones would largely be associated with land disturbing activities during construction.

With the focus of development in the West, Central, and East Campus sectors (97 percent of development under Alternative 4), more development and associated potential for impacts on cultural resources would occur in the portions of the **Primary Impact Zone** located proximate to these sectors. The Duwamish Indians traditionally lived in winter villages on the shorelines of Lake Union and Lake Washington in the Primary Impact Zone adjacent to the West and East Campus sectors. Therefore, there would be a greater potential for impacts on cultural resources in these areas (e.g., in the University District along Portage Bay, the Montlake Neighborhood along the Ship Canal, and a small portion of the Washington Park Arboretum along Union Bay). No shoreline areas with potential cultural resources are located adjacent to the Central Campus sector.

Less development is assumed to occur in the South Campus sector under Alternative 3, which would result in less potential for impacts on cultural resources in the Primary Impact

Zone adjacent to this sector. The Duwamish Indians winter villages along Portage Bay were located adjacent to this sector (e.g., in the Montlake Neighborhood along the Ship Canal).

Winter villages of the Duwamish Indians were located along Lake Union and Lake Washington shorelines in the **Secondary Impact Zone**. Foster Island, which has been identified as culturally significant, is also located in this zone. As under Alternative 1, given the distance of potential cultural resources in the Secondary Impact Zone from development assumed under Alternative 4, construction activities associated with Alternative 4 development would not be anticipated to result in impacts on cultural resources in the Secondary Impact Zone.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus sector, nor the aerial vacation for the land bridge over Montlake Boulevard NE in the East Campus sector, would occur. Because construction associated with the proposed street and aerial vacations would not entail a substantial amount of excavation beyond that anticipated under Alternatives 1 through 4, the potential for impacts to cultural resources under Alternative 5 would generally be similar to those identified under Alternative 1 through 4. To the extent that construction of the land bridge over Montlake Boulevard NE would require excavation in the East Campus sector, the potential for cultural resources in this specific area would be less than under Alternatives 1.

Potential Indirect/Cumulative Impacts

To the extent that the focus of any new development in the area would be the University District, and assuming that the majority of the University District has a Medium to Low potential of containing cultural resources, future off-campus development in the area would be anticipated to reflect a Medium to Low potential to encounter cultural resources.

All construction activities in the area would be required to follow applicable regulations, and significant impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in **Chapter 2** of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies,

plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.11-1**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For example, for future projects on sites identified as having a "High" potential to encounter sensitive cultural resource conditions, archaeological inventory work consisting of a survey would be provided.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.11.3 Mitigation Measures

The following measures would be available for development under the *2018 Seattle Campus Master Plan*.

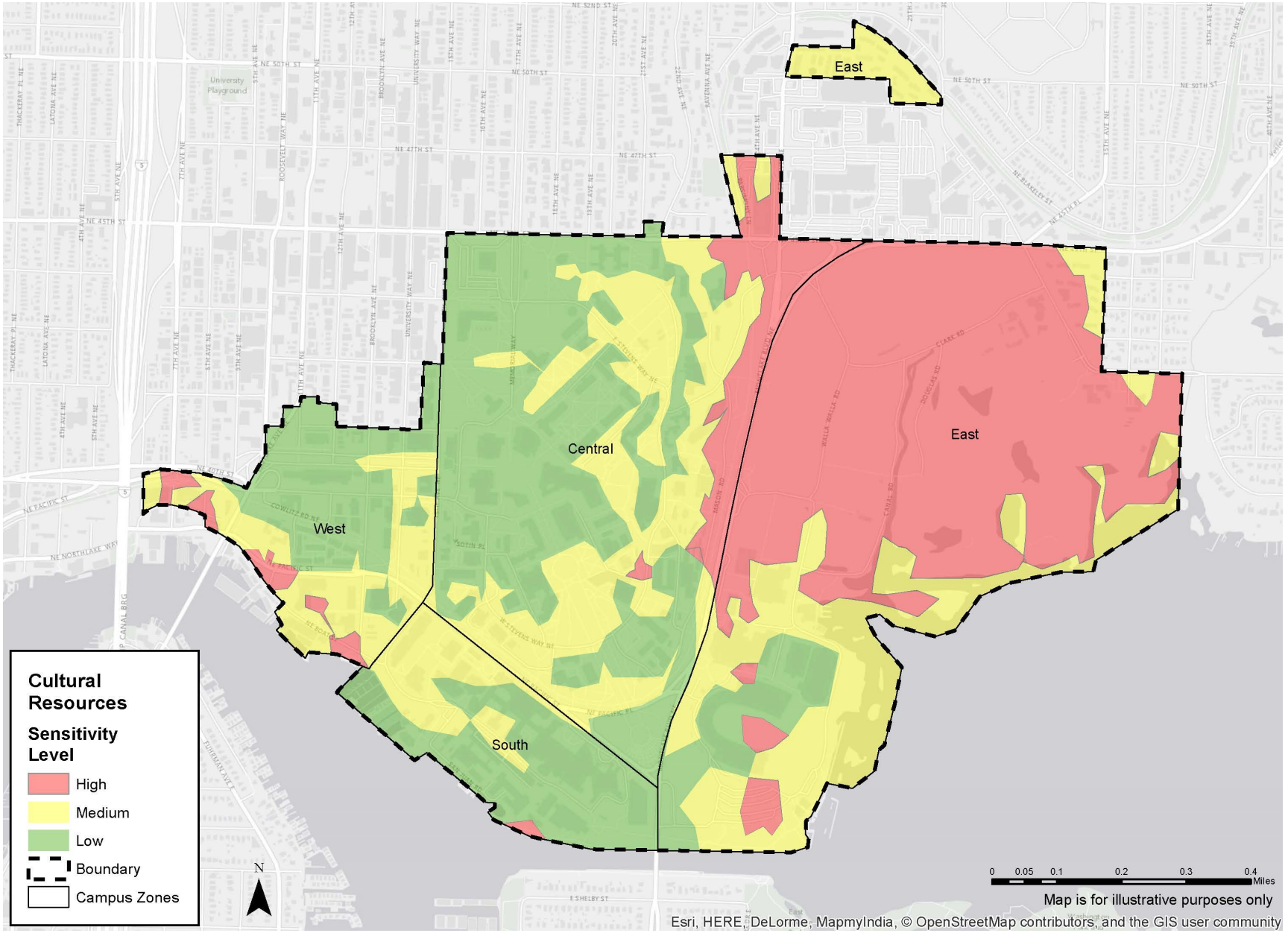
Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Inadvertent Discovery of Archaeological Resources

- In the event that archaeological deposits are inadvertently discovered during construction of at a potential development site, ground-disturbing activities would be halted immediately, and University of Washington ahall be notified. The University would then contact DAHP and the interested Tribes, as appropriate, and as described in the recommended inadvertent discovery plan.

Discovery of Human Remains

- Any human remains that are discovered during construction at a potential development site would be treated with dignity and respect.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.11-1
Cultural Resources Sensitivity Map

- If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause further disturbance to those remains must cease, and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the county coroner and local law enforcement in the most expeditious manner possible. The remains shall not be touched, moved, or further disturbed.

- The county coroner will assume jurisdiction over the human skeletal remains, and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, they will report that finding to the DAHP. DAHP will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian, and report that finding to any appropriate cemeteries and the affected tribes. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

Additional Measures Applicable to Medium and High Potential Areas

- If a project is proposed in an area identified as having Medium Potential to contain cultural resources, the project should follow pertinent cultural resources regulations and project specific desktop analysis accompanied by a project site visit by a Secretary of Interior Qualified archaeologist and an inadvertent discovery plan prepared. The project site visit should be geared toward assessing and documenting obvious signs of landscape modification. An archaeological inventory may be needed if no obvious signs of landscape modification are observed.

- Noticing and coordination with Native American tribes will take place on projects conducted by the University of Washington as the lead agency under the State Environmental Policy Act (SEPA) and/or Governor's Executive Order 05-05.

Additional Measure Applicable to High Potential Areas

- If a project is proposed in an area identified as having High Potential to contain cultural resources, the project would follow pertinent cultural resources regulations (as identified for low and medium potential areas) and additionally include archaeological inventory work consisting of a survey.

3.11.4 Significant Unavoidable Adverse Impacts

Campus development under EIS Alternatives 1 through 5 would occur within the context of a campus with potential cultural resources. With implementation of the identified mitigation measures, no significant adverse impacts to cultural resources are anticipated.

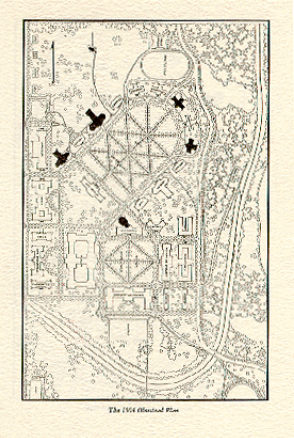
3.12 HISTORIC RESOURCES

This section of the Draft EIS describes the existing historic resources on University of Washington campus and in the site vicinity and evaluates the potential impacts to historic resources that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.12.1 Affected Environment

The University of Washington was established in 1861 by an act of the Territorial Legislature[1]. The University's first campus was a 10-acre area[2] in wilderness roughly six blocks north of what was then "downtown." That site is now located near the center of downtown Seattle. Classes at the Territorial University began November 4, 1861—almost ten years exactly after the Denny party landed at what was to become Alki Point in West Seattle[3], seven months after the first engagement of the Civil War[4], and eight years before the City of Seattle was incorporated.[5] The territorial University of Washington was the first public institution of higher learning on the West Coast. The campus consisted of a prominent 2-story structure, which contained classrooms; a two-story building for the University's first president and a dormitory structure for men (women resided in the president's house).

As a result of a combination of factors, by the late 1880s and early 1890s, it was concluded that the University's location and facilities were no longer adequate and a much larger campus was needed—one removed from the early City's encroaching "downtown." Three sites were considered –Jefferson Park, Ft. Lawton and the present location. The present site of the campus was selected (roughly four miles north of the initial campus) and in 1893 the State Legislature authorized purchase of what was to become the present site (Johnston, 1995). A section[6] of land was allocated and the first building on the University's new campus began. By that time the City limits had been extended north to N. 85th St.[7]



The 1914 Olmsted Plan

[1] The University was a Territorial University because Washington had not been granted statehood; that would occur in 28 years.
[2] The campus included an 8.5-acre parcel that was donated by Arthur Denny and a 1.5-acre parcel that was donated by Charles and Mary Terry and Edward Lander (Johnston, 1995). The boundaries of the 10-acre area extended roughly from what is now Union St. on the north to Seneca St. on the south and from the mid-block alley between Third and Fourth avenues on the west to the mid-block alley between Fifth and Sixth avenues on the east. The University has retained ownership of the land.
[3] November 13, 1851
[4] Ft. Sumter – Charleston, South Carolina, April 12, 1861
[5] The City of Seattle was incorporated by an act of the Territorial Legislature on December 2, 1869.
[6] 640 acres
[7] Boundary expansion of June 1, 1891.

The University of Washington has been at its present location for approximately 120 years. A number of campus master plans have influenced the siting of buildings on campus and the landscaped open spaces between buildings. Early influences came from the 1891 Boone Plan, a 1900 Oval Plan, and the 1904 Olmsted Plan. Later influences came from such campus plans as the 1915 Regents Plan, the 1920 Bebb & Gould Plan, the 1935 Jones & Bindon Plan, a 1940 Plan, a 1948 Plan, the 1962 Thiry Plan, the 1963 Walker & McGough Plan, the 1983 Land Use Plan, the 1991-2001 General Physical Development Plan, the 1995 Southwest Campus Plan, the 1997 North Campus Sector Plan, and the 1997 East Campus Sector Plan.

AYP Exposition Arial View, 1909

Perhaps the largest event that shaped the character of the south portion of the Central Campus—and the siting of buildings and open spaces in that area—was the 1909 Alaska—Yukon—Pacific Exposition (AYP), which occurred on-campus from June 1, 1909 to October 16, 1909. Similar to other expositions that occurred around the turn of the century, the 1909 AYP Exposition was inspired by Chicago's Columbia Exposition of 1893, which influenced town planning and architectural design. The focus of Seattle's Exposition was to "showcase Seattle as an ambitious port city, the up-and-coming commercial center of the Pacific coast,"[8] the port nearest to Japan and China, and the gateway to Alaska. Numerous cities, states and foreign governments sponsored exhibits. The AYP was attended by 3,740,551 people, including President Taft, as well as numerous foreign dignitaries (Warren, 1997). The site of the Exposition was chosen in 1906 and the layout of building sites, vistas and open spaces occurred, based on a 1909 Olmsted Brothers Plan for the Exposition. Most notable in Rainier Vista. Like most international expositions, the 1909 AYP Exposition included several permanent structures along with temporary buildings. Structures that have remained include the present Frosh Pond/Drumheller Fountain,[9] Architecture Hall, Cunningham Hall, the Engineering Annex, and the Statue of George Washington (unveiled on Flag Day June 14, 1909).

For more than a century, the University of Washington Board of Regents has been the steward of the University of Washington campus. The Regents recognize the value of the campus to the University, the greater University area community, the City of Seattle, the state of Washington, and future generations. The campus provides a sense of permanency and place. It is a place of civic pride and beauty. The architecture and open spaces demonstrate and preserve the accomplishments of the past, while providing for the future and allowing for the development of architectural innovations.

[8] Boswell & McConaghy, 1996

[9] During the Exposition this was known as Geyser Basin. It was a focal point of what was the Arctic Circle, a six-"white" building complex located at the center of the A-Y-P Exposition. Drumheller Fountain was added in 1962.

While fostering continuous use, required improvements, and innovations for significant buildings, the University works to insure that historic significance, value, and association of the campus is preserved for the community, City, State and nation. To insure that this occurs on a project by project basis, the University utilizes a multi-step process involving several review points: the Capital Projects Design Review Board, the Campus Landscape Advisory Committee, the University Architectural Commission and the Board of Regents. Advice is sought from faculty with expertise on University campus history and architecture. While the University is particularly sensitive to historical structures over 50 years old, these same considerations are applied to all campus development through the University's Design Review process.

The University prepares a Historic Resources Addendum (HRA) for any project that makes exterior alterations to a building that more than 50 old and for specific historic campus features over 50 old. An HRA typically includes discussion of the historic context, architectural design, evaluation of historic significance, and recommendations regarding minimizing historic impact (if applicable). Approximately 196 of the University's buildings are presently 50 years of age or older or will become 50 years of age during the *2018 Seattle Campus Master Plan* planning horizon (through 2028).[10]

In addition, two buildings on the University campus and four buildings/structures proximate to the campus are listed on the National Register of Historic Places,[11] seven campus structures are listed on the Washington Heritage Register,[12] and various City of Seattle designated historical landmarks are located in the vicinity. A description of these historic building/structures is provided below according to campus sector.

West Campus

The West Campus sector contains one building that is listed on the National Register of Historic Places, "Ye College Inn" which is located immediately north of Gould Hall (4000 University Way N.E.). The privately-owned "Ye College Inn" is also a City of Seattle designated historic landmark. Additionally, 21 percent of the buildings 50 years and older are located in West Campus.

South Campus

There are no buildings/structures listed on the National Register of Historic Places nor the Washington Heritage Register located in South Campus. However, 14 percent of the buildings 50 years or older are located in this campus sector.

[10] Data as of April 2016; includes 151 buildings 50 years of age or older as of 2015 and 45 buildings that would become 50 years of age or older during the timeframe of the Master Plan Update (2028).

[11] Washington Office of Archaeology & Historic Preservation, 1998.

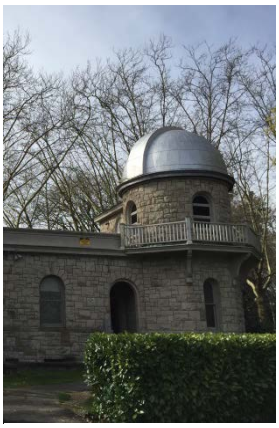
[12] The Washington Historic Register is a statewide listing of historic properties. It includes listings of structures/places of State significance, National Historic Landmarks, and listings of the National Register of Historic Places.

Central Campus

The Central Campus sector contains a majority of the historic resources on campus, as many of the buildings constructed in the early years of the Territorial University are located in this sector. Seven campus structures located in Central Campus are listed on the Washington Heritage Register,[13] they include Denny Hall, the Observatory, Lewis Hall, Clark Hall, Parrington Hall, Architecture Hall and the University of Washington Columns.

Denny Hall

- ***Denny Hall*** – This is the oldest building on-campus and was the first building on the present campus of the University. Construction of Denny Hall[14] began with ceremonies on July 4, 1894 and the building was occupied in 1895. Denny Hall contains 85,667 sq.ft. of floor area (footprint is 19,794 sq.ft.) and has a building height of roughly 55 feet. The building was designed by Charles Saunders, one of Seattle's leading architects, in the style of the "early French Renaissance chateaux of the Loire Valley" (Johnston, 1995). The building's appearance is symmetrical, with a central entry flanked by two conical-capped towers, balanced placement of windows, a cupola located above the central portion of the building, and curved wings at each side of the building.[15] The exterior of Denny Hall is sandstone and brick and the roof is slate with copper. The cupola formerly housed Denny Bell,[16] which has been removed due to seismic concerns regarding the cupola. The bell is in storage until the seismic retrofit occurs.


Theodore Jacobsen Observatory

- ***Observatory*** – The Observatory is the second oldest building on campus. This building contains 2,147 sq.ft. of floor area (footprint is 1,688 sq.ft.) and has a building dome height of roughly 25 feet; the remainder of the structure is about 15 feet high. Like Denny Hall, it was designed by Saunders, was completed in 1895, and has an exterior of sandstone. As noted by Johnston, "the telescope dome rotates on cannon balls left over from the Civil War". The 6-inch telescope is one of the few

[13] The Washington Historic Register is a statewide listing of historic properties. It includes listings of structures/places of State significance, National Historic Landmarks, and listings of the National Register of Historic Places.
[14] The original name of the building – Administration Building – was changed in 1910 to Denny Hall. Denny Hall is named for Arthur A. Denny and the Denny family. Arthur Denny donated 8.5 acres of the University's original 10-acre site in downtown Seattle.
[15] U.S. Department of the Interior; NPS, 1972
[16] Denny Bell was originally located in the Territorial University downtown. The bell was fabricated in New York and transported to the downtown location by ship via Cape Horn. It was installed in the Territorial University in 1862 and has been rung for weddings, funerals, fog warnings and to alert the city of the Great Seattle Fire (1889). Now Denny Bell is used to announce autumn quarter's homecoming. The sound of chimes that emanates from the cupola is the new digital carillon, installed in 1995.

such historical telescopes remaining in the United States and the only public telescope in Seattle[17]. The Observatory is still in use with viewing hours. Normal evening attendance is 10 – 25 people of all ages; during an eclipse, attendance is typically 400 – 500 people.

- ***Lewis Hall*** – Construction of Lewis Hall began in 1896 and was completed in 1899. The building was originally named Lyon Hall (1903). In 1909 the building was renamed Lewis Hall, in honor of Meriwether Lewis, co-leader of the Lewis & Clark Expedition. Lewis Hall contains 23,220 sq.ft. of floor area (footprint is 6,178 sq.ft.) and has a building height of roughly 46 feet. The building was designed by the firm of Josenhans & Allan (Seattle). Representative of late Victorian architecture, the building is of brick construction with masonry walls that are 14 inches thick. Lewis Hall served as a 50-person dormitory for men until 1918 when it was converted to the women's dormitory. Briefly during the Alaska—Yukon—Pacific Exposition, the building was used as a display hall. In 1936, the building was renovated to provide classrooms and office space (NPS, 1969).

Lewis Hall

- ***Clark Hall*** – Like Lewis Hall, construction of Clark Hall began in 1896 and was completed in 1899. This building was originally named Pierepont Hall and around 1917 the name of the building was changed to Clark Hall, in honor of the co-leader of the Lewis and Clark Expedition. Like Lewis Hall, it was designed by Josenhans & Allan and is of brick construction. This building contains 30,568 sq.ft. of floor area (footprint is 19,478 sq.ft.) and has a building height of roughly 52 feet. Clark Hall served as the women's dormitory until 1936,[18] as the University's first Student Center between 1936 and 1952; and since 1952, the building has housed the University's four R.O.T.C. programs.

- ***Parrington Hall*** – Originally named Science Hall, Parrington Hall was renamed for Vernon Parrington, a University professor of English (21 years) and Pulitzer Prize winner (1928). Like Lewis Hall, Parrington Hall was designed by Josenhans & Allan and was completed in 1902 (Ochsner, 1994). It contains 48,880 sq.ft. of floor area (footprint is 12,078 sq.ft.) and has a building height of roughly 57 feet. The building is red brick with sandstone trim and a shingle roof. Following the 1909 Alaska—Yukon—Pacific Exposition, the building's façade was painted. Parrington Hall underwent restoration in 1996; part of which included removing the paint from the red brick exterior.

[17] Personal communication. Penny Buffo, Department of Astronomy (October 2, 1996)

[18] For a period during World War I, women were housed off-campus and the building was loaned to the U.S. Navy for use as a hospital for Naval officers.

- ***Architecture Hall*** – This is the last permanent building remaining that was originally built for the 1909 Alaska—Yukon—Pacific Expansion. During the Exposition, it served as the Fine Arts Building. Architecture Hall was designed by Howard & Galloway and is of similar design and materials (cream-colored brick) as was used for the Exposition's Auditorium Building (later the original Meany Hall). The building was originally designed to serve as the University's chemistry building. Following completion of the Exposition, the name of the building became Bagley Hall and it was the University's chemistry building. In 1937 the name of the building was changed to Physiology Hall, although other departments also occupied space in the building. In 1957, the name of the building was again changed to Architecture Hall. Architecture Hall contains 47,485 gross sq.ft. and has a footprint of 17,256 sq.ft. This building has undergone several restorations—the most notable occurring in 1987.

Architecture Hall

- ***University Columns*** – The four white columns located in Sylvan Theater are from the original University building when it was located in downtown Seattle.

Approximately 61 percent of the buildings on campus that are 50 years of age or older are located in the Central Campus sector. Several particularly noteworthy Central Campus buildings/structures include Memorial Way, Suzzallo Library, Glenn Hughes Penthouse Theatre, Cunningham Hall and University Club, below is a description of each.

- ***Memorial Way*** – This is the University's ceremonial entrance to campus from NE 45th St. (an extension of 17th Ave. NE). While not a designated historic site, Memorial Way is historic from the standpoint that London Plane trees were planted to border both sides of this main entrance to the University, forming an allee' to represent the 58 University students, faculty and staff that were killed during World War I.[19][20]

- ***Suzzallo Library*** – Perhaps one of the most photographed buildings on-campus is Suzzallo Library. The building is named for Henry Suzzallo, the University's fifteenth president. Originally designed by the firm of Bebb & Gould, construction of the building began in 1923 and the building was completed in 1926. It replaced a wood-frame structure, which served as the University's library. That building was one of the "temporary" structures that were built for the 1909 Alaska—Yukon—Pacific Exposition.

[19] Names of the deceased are listed on the pylons at the Memorial Way entrance to the University from N.E. 45th St.
[20] Today there are 101 London plane trees along the one-quarter-mile segment of Memorial Way extending from N.E. 45th St. south to the campus flagpole.

That early library facility provided seating for 300 – at a University with a population of roughly 6,600 (Johnston, 1995).

Suzzallo Library

Suzzallo Library was originally designed as an equilateral triangle (as viewed in plan view), consistent with the 1915 Regents Plan for the campus. The west-facing wing was the first portion of the building that was constructed. Design of that wing is collegiate-Gothic with brick, terracotta, and cast stone. One of the most-impressive features of this façade is the eleven 35-foot high Gothic-traceried stained-glass windows. In 1935, the south-facing component of the building was completed. The design of the addition is also collegiate-Gothic with brick, terracotta, cast stone and Gothic-traceried stained-glass windows. The north-facing wing addition, which occurred in the 1960s, deviated from the original equilateral triangle design and the collegiate-Gothic style. The style of this wing is classic curtain wall, modeled on the work of Yanasaki. In the 1980s, a fourth addition to Suzzallo Library was added – the Allen Library. Although it is not collegiate-Gothic, it does reflect the form, scale, massing, texture, details and materials of other nearby campus buildings.

- ***Glenn Hughes Penthouse Theatre*** – The Penthouse Theater is located northeast of the Observatory. This building was originally located in the southwest corner of the Central Campus (present site of the Physics & Astronomy Building). The Penthouse Theatre contains approximately 14,000 sq.ft. of floor area[21] (footprint is 7,082 sq.ft.) and has a building height of 15 – 25 feet. In 1991, it was moved to the present site to provide site area for the Physics & Astronomy building complex. While not a historic structure, the Penthouse Theatre is considered to be "architecturally significant."[22] Built in 1940, the building is considered the first "arena" style[23] theatre in the nation. The Penthouse Theatre is "closely associated with the career of Glenn Hughes, the distinguished director and teacher[24] who served as Northwest regional director of the Federal Theatre Project during the Great Depression".

- ***Cunningham Hall*** – Besides the Engineering Annex[25], Cunningham Hall is the sole remaining "temporary" building from the 1909 Alaska—Yukon—Pacific Exposition (AYP). It is located in the Central Campus sector immediately east of Architecture Hall. It is a

[21] Including basement area
[22] Boyle Wagoner, 1989
[23] Theatre-in-the-round
[24] University of Washington faculty member from 1919 to 1964
[25] This is a wood-frame building, built in 1909. It is located immediately east of the Mechanical Engineering Building.

wood-frame building (approximately 5,100 gross sq.ft.; 2,500 sq.ft. lot coverage) that was built as the Women's Building for the Exposition. The original architects was Saunders & Lawton. After the Exposition, the building served many campus users. In 1974, it was recommended for demolition, however, instead the decision was made to rehabilitate the structure. Rehab was completed in 1979 (The Hastings Group), the building was named for Imogen Cunningham, the internationally known photographer and UW graduate, and the building was designed as the campus Women's Center (Johnston, 1995).

- ***University Club*** - This building was constructed in 1960 as the University's Faculty Club, from designs prepared by Seattle architects Paul Hayden Kirk & Associates with Victor Steinbrueck. It replaced the former Hoo Hoo House, designed by architect Ellsworth Storey for the AYP. The Faculty Club is considered a hallmark of the Pacific Northwest regional Modernism interpreted in steel and glass. It has generous eastern glazing offering near and distant vistas toward the lower campus, the Cascade Mountains, and the Evergreen Point Floating Bridge. Renovations designed by Victor, Eckbo, Dean and Williams were subsequently implemented. The University of Washington Club was placed in the National Register in November 2009.

University Club

East Campus

Approximately four percent of the buildings on campus 50 years of age or older are located in the East Campus sector.East Campus contains one building listed on the National Register of Historic Places, the University Shell House. The Naval Military Hanger-University Shell House—now known as the Canoe House; is located southeast of Husky Stadium at the entrance to the Lake Washington Ship Canal from Union Bay. The Canoe House was built in 1918 by the U.S. Navy to serve as a hanger for the Aviation Training Corps., but apparently was never used as such.[26] It is a frame-constructed building with shingle siding; it contains 13,199 gross sq.ft. with a building footprint of 10,633 sq.ft. Eventually, the building was donated to the University as was used as the Shellhouse for the rowing team.

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement. These zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones. Several buildings/structures in the campus vicinity have been deemed historic, they are described below according to proximity to the University of Washington campus.

[26] Johnston, 1995

Primary Impact Zone

Several City-designated historic landmarks are located in the Primary Impact Zone, including:

- Sigma Kappa Mu Chapter House
- Montlake Bridge and Montlake Cut.
- University Bridge.
- University Methodist Episcopal Church.
- University Presbyterian Church.
- University Library
- Fire Station #17
- Neptune Theatre
- Seattle Yacht Club
- Benton's Jewelers Street Clock

Secondary Impact Zone

The Secondary Impact Zone also contains several historic buildings/structures, including:

- The Chittenden Locks and Lake Washington Ship Canal Historic District running from Lake Washington (southeast of Campus) to the Puget Sound (southwest of Campus) are listed on the National Register of Historic Places[27].
- The Sand Point Historic District, located in the Sand Point neighborhood northeast of Campus, is a City of Seattle designated historic landmark.
- Arboretum Sewer Trestle and Aqueduct.
- Montlake School
- Roanoke Park Historic District
- Battelle Research/Talaris Conference Center
- Laurelhurst Community Center

3.12.2 Impacts

Development under the *2018 Seattle Campus Master Plan* is not anticipated to result in significant impacts to historic resources – either to on-campus or off-campus structures. A comparison of potential development sites to the recognized historic structures indicates that no recognized historic structures would have the potential to be directly impacted (i.e. demolished). Several of the potential development sites on campus (primarily in Central Campus) are located in proximity to recognized historic structures, including:

- Glenn Hughes Penthouse Theater and Memorial Way;
- Denny Hall;

[27] Washington Office of Archaeology & Historic Preservation, 1998.

- Lewis Hall;
- Clark Hall;
- Suzzallo Library;
- Architecture Hall;
- Ye College Inn;
- University Bridge;
- Montlake Cut; and,
- Canoe House.

Construction of future development proximate to the University's historic structures could be expected to result in temporary indirect impacts, which could impact those buildings including localized increases in suspended particulates (dust), noise, vibration, disruption of pedestrian and bicycle circulation and loss of surface parking.

As noted in the *2018 Seattle Campus Master Plan* and in *Chapter 2* of this Draft EIS, the University of Washington has identified the following as a guiding principle for campus development under the updated Master Plan:

- ***Stewardship of Historic and Cultural Resources*** *– Continue responsible and proactive stewardship of University of Washington's campus assets through preservation of its historic and cultural resources and managed strategy of property development.*

The University's planning process for capital projects involves Capital Projects Design Review, review by the University's Architectural Commission, the Campus Landscape Advisory Committee, and the Board of Regents. The Board of Regents is ultimately responsible for the stewardship of historic and cultural resources on the campus. In addition, advice is sought from faculty with expertise concerning University campus history and architecture. As noted earlier in this section, the University of Washington has several processes that ensure consideration of historic resources. Each review body is responsible for raising issues for consideration and balancing the desirability and means of protecting, enhancing and perpetuating historic, cultural, engineering and architectural campus resources in terms of buildings, spaces and elements of the environment.

While the University of Washington is particularly sensitive to historical structures over 50 years old, these same considerations are applied to all campus development. The University's Design Review process is an important tool utilized by the University for early, continuous, consistent and documented consideration of the impact of a proposed development on historic features of the campus. The Design Review Board assesses the architectural context of the site location, its historic context, as well as environmental considerations, Master Plan guidelines, and landscape/open space context.

To further insure that historic resources are considered, the University would prepare an Historic Resources Addendum (HRA) for any project that makes exterior alterations to a building that is over 50 years of age, or is located adjacent to campus buildings or features over 50 years of age.

During the planning horizon of the *2018 Seattle Campus Master Plan,* approximately 45 buildings would become HRA qualifying, and the total number of buildings 50 years of age or older would increase to approximately 196 buildings.

No Action Alternative

Under the No Action Alternative, historic resources-related impacts would primarily be related to the approximately 211,000 gsf of building development under the current 2003 CMP. Given that the location and extent of development would be controlled by the provisions of the current *2003 CMP-Seattle*, and that the amount of development would be approximately four (4) percent that that under Alternatives 1 through 5, the potential for historic related impacts on of adjacent to the University of Washington campus would be less than under Alternatives 1 through 5.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 matches the preferred allocation of building development under the *2018 Seattle Campus Master Plan* and assumes development of 6.0 million gsf of net new building space throughout the campus, with a focus of development in the West and South Campus sectors, with more limited development assumed in the Central and East Campus sectors. Assumed development under Alternative 1 would not result in demolitions or additions to any recognized historic structures on campus. Construction of future development proximate to the University's historic structures could result in temporary indirect impacts such as dust, noise, and vibration (refer to Section 3.16**, Summary of Construction Conditions**, for a listing of mitigation measures). The establishment of new buildings in direct proximity to historic structures and features can affect the character of historic resources. A discussion of potential impacts to historic resources by campus sector is provided below.

West Campus

As indicated previously, the privately-owned "Ye College Inn" is the only listed historic building located in West Campus. Assumed development under Alternative 1 could result in indirect impacts during the construction phase, including localized increases in suspended particulates (dust), noise, vibration, disruption of pedestrian and bicycle circulation and loss of surface parking. With adherence to measures related to limiting dust, noise and vibration

during construction, the potential for indirect impacts to historic resources in the West Campus sector is low.

Considering the amount of new development assumed for the West Campus sector under Alternative 1, new development could be located adjacent to historic structures (Ye College Inn) or to buildings 50 years old or older, and would follow the University of HRA process to insure that historic resources are considered.

South Campus

Indirect impacts to historic resources related to development of South Campus under Alternative 1 are not anticipated due to limited historic resources located in this campus sector. Given the potential for a substantial amount of building demolition, however, the potential for buildings/structures 50 years or older located in South Campus to be directly impacted is high. Any new development located adjacent to buildings 50 years old or older would follow the University of HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Central Campus

As indicated earlier, the Central Campus sector represents the historic core of the University of Washington Seattle campus and contains the majority of recognized historic structures on campus. Although the amount of assumed building development in the Central Campus sector is limited to 0.9 million gsf (15 percent of total development) under Alternative 1, assumed development in the Central Campus sector has the highest potential to occur in proximity to recognized historic structures, and corresponding potential to result in indirect construction related impacts (including temporary localized increases in dust, noise and vibration). Historic resources that may be indirectly impacted include, Glenn Hughes Penthouse Theater and Memorial Way, Denny Hall, Lewis Hall, Clark Hall, Suzzallo Library and Architecture Hall. Adherence with measures related to limiting dust, noise and vibration during construction would limit the potential for indirect impacts to historic structures in Central Campus (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures).

Considering the number of historic structures in Central Campus, the potential for new development in Central Campus to be located in proximity to historic structures is high. Any new development proposed adjacent to historic structures or to buildings 50 years old or older, would follow the University of HRA process to insure that historic resources are considered.

East Campus

As indicated previously, the Canoe House is the only listed historic building located in the East Campus sector. Similar to impacts identified in the other campus sectors, the Canoe

House could be affected by indirect construction impacts including temporary localized increases in dust, noise and vibration. Adherence with measures related to limiting dust, noise and vibration during construction would limit the potential for indirect impacts to the historic structure (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures).

Considering the relatively limited amount of new development assumed for the East Campus sector under Alternative 1, it is not anticipated that new development would be located in proximity to historic structures (Canoe House). However, any development located adjacent to buildings 50 years old or older would follow the University of HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones.

The potential for indirect impacts to identified off-campus historic resources is relatively low given the limited number of potential development sites located in proximity to the off-campus resources. Historic resources located within the **Primary Impact Zone** that could be affected by potential development include: the University Bridge, University Methodist Episcopal Church, University Presbyterian Church, University Library, Fire Station #17, and Neptune Theater (in proximity to West Campus development); the Montlake Cut (in proximity to South Campus development); the Montlake Bridge and Montlake Cut, and Benton's Jewelers Street Clock (in proximity to East Campus development); and Sigma Kappa Mu Chapter House (in proximity to Central Campus). Under Alternative 1, given the focus of development in the West and South Campus sectors, there is a potential for development to occur in proximity to identified off-campus historic resources. However, all new construction on the University of Washington campus would be conducted consistent with measures identified to minimize indirect impacts to adjacent uses and structures (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures) and the University of Washington HRA process.

Given the distance of historic resources in the **Secondary Impact Zone** from development assumed under Alternative 1, construction and operational activities associated with this alternative would not be anticipated to affect historic resources in the Secondary Impact Zone. Off-campus historic resources within the Secondary Impact Zone include the Lake Washington waterway, Arboretum Trestle and Aqueduct, Montlake School, Roanoke Park Historic District, Battelle Research/Talaris Conference Center and Laurelhurst Community Center located in the general vicinity of West, South and East Campus sectors.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 reflects accommodation of 6.0 million gsf of net new building area developed generally consistent with the CMP proposed allocation without the proposed allowable height increases in the *2018 Seattle Campus Master Plan* and assumed under Alternative 1; thus, the existing CMP height limits are assumed.

As under Alternative 1, assumed development under Alternative 2 would not result in demolition or additions to any recognized historic structure on campus.

West Campus

Because Alternative 2 assumes a lower level of of development for the West Campus sector than under Alternative 1 (2.4 million gsf compared to 3.0 million gsf under Alternative 1) the potential for indirect impacts to recognized historic structures (privately-owned Ye College Inn) would be less than under Alternative 1. As under Alternative 1, any development adjacent to historic structures, or to buildings 50 years old or older would follow the University of HRA process to insure that historic resources are considered.

South Campus

As under Alternative 1, indirect impacts to historic resources related to development of South Campus under Alternative 2 are not anticipated due to limited historic resources located in this campus sector. Given the potential for a substantial amount of building demolition, however, the potential for buildings/structures 50 years or older located in South Campus to be directly impacted is high under Alternative 2, similar to Alternative 1. Any new development located adjacent to buildings 50 years old or older would follow the University of HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Central Campus

Because Alternative 2 assumes the same level of development in the Central Campus sector as under Alternative 1, potential impacts to historic resources in Central Campus would be as identified under Alternative 1.

As under Alternative 1, considering the number of historic structures in Central Campus, the potential for new development in Central Campus to be located in proximity to historic structures is high. Any new development proposed adjacent to historic structures, or to buildings 50 years old or older, would follow the University of HRA process to insure that historic resources are considered.

East Campus

Because the amount of development assumed for the East Campus sector would be greater than under Alternative 1 (1.35 million gsf compared to 0.75 million gsf under Alternative 1), the potential for indirect impacts to identified historic resources, such as the Canoe House would be greater than under Alternative 1. For example, because assumed development under Alternative 2 in East Campus assumes potential development south of Husky Stadium, there is a potential for indirect impacts to the Canoe House. Any development located adjacent to the Canoe House or to buildings 50 years old or older, would follow the University of HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones.

The potential for indirect impacts to identified off-campus historic resources is relatively low given the limited number of potential development sites located in proximity to the off-campus resources. Historic resources located within the **Primary Impact Zone** that could be affected by potential development include: the University Bridge, University Methodist Episcopal Church, University Presbyterian Church, University Library, Fire Station #17, and Neptune Theater (in proximity to West Campus development); the Montlake Cut (in proximity to South Campus development); the Montlake Bridge and Montlake Cut, and Benton's Jewelers Street Clock (in proximity to East Campus development); and Sigma Kappa Mu Chapter House (in proximity to Central Campus). Under Alternative 2, given the focus of development in the West, South and East Campus sectors, there is a potential for development to occur in proximity to identified off-campus historic resources. However, all new construction on the University of Washington campus would be conducted consistent with measures identified to minimize indirect impacts to adjacent uses and structures (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures) and the University of Washington HRA process.

Given the distance of historic resources in the **Secondary Impact Zone** from development assumed under Alternative 2, construction and operational activities associated with this alternative would not be anticipated to affect historic resources in the Secondary Impact Zone. Off-campus historic resources within the Secondary Impact Zone include the Lake Washington waterway, Arboretum Trestle and Aqueduct, Montlake School, Roanoke Park Historic District, Battelle Research/Talaris Conference Center and Laurelhurst Community Center are located in the general vicinity of West, South and East Campus sectors.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

As under Alternative 1, assumed development under Alternative 3 would not result in demolition or additions to any recognized historic structure on campus.

West Campus

Because the amount of development assumed for the West Campus sector would be greater than under Alternative 1 (3.2 million gsf compared to 3.0 million gsf under Alternative 1), the potential for indirect impacts to identified historic resources, such as the privately-owned "Ye College Inn", would be greater than under Alternative 1. As under Alternative 1, any development adjacent to historic structures or to buildings 50 years old or older would follow the University HRA process to insure that historic resources are considered.

South Campus

Similar to West Campus, the amount of development assumed for the South Campus sector would be greater than under Alternative 1 (1.65 million gsf compared to 1.35 million gsf under Alternative 1), therefore, the potential for indirect impacts to identified historic resources would be greater than under Alternative 1. However, due to limited historic resources located in South Campus, impacts to historic buildings/structures are considered low. Any new development located adjacent to buildings 50 years old or older would follow the University of HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Central Campus

Potential impacts to historic resources in the South Campus sector would be similar to those identified under Alternative 1, as proposed development in this sector is assumed to be the same under both alternatives.

As under Alternative 1, considering the number of historic structures in Central Campus, the potential for new development in Central Campus to be located in proximity to historic structures is high. Any new development proposed adjacent to historic structures, or to buildings 50 years old or older, would follow the University of HRA process to insure that historic resources are considered.

East Campus

Due to the decreased amount of development assumed for the East Campus sector under Alternative 3 (0.25 million gsf compared to 0.75 million gsf under Alternative 1) the potential for indirect impacts to affect recognized historic structures would be less than under Alternative 1.

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones.

The potential for indirect impacts to identified off-campus historic resources under Alternative 3 is relatively low given the limited number of potential development sites located in proximity to the off-campus resources. Historic resources located within the **Primary Impact Zone** that could be affected by potential development include: the University Bridge, University Methodist Episcopal Church, University Presbyterian Church, University Library, Fire Station #17, and Neptune Theater (in proximity to West Campus development); the Montlake Cut (in proximity to South Campus development); the Montlake Bridge and Montlake Cut, and Benton's Jewelers Street Clock (in proximity to East Campus development); and Sigma Kappa Mu Chapter House (in proximity to Central Campus). Under Alternative 3, given the focus of development in the West and South Campus sectors, there is a potential for development to occur in proximity to identified off-campus historic resources. However, all new construction on the University of Washington campus would be conducted consistent with measures identified to minimize indirect impacts to adjacent uses and structures (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures) and the University of Washington HRA process.

Given the distance of historic resources in the **Secondary Impact Zone** from development assumed under Alternative 3, construction and operational activities associated with this alternative would not be anticipated to affect historic resources in the Secondary Impact Zone. Off-campus historic resources within the Secondary Impact Zone include the Lake Washington waterway, Arboretum Trestle and Aqueduct. Montlake School, Roanoke Park Historic District, Battelle Research/Talaris Conference Center and Laurelhurst Community Center are located in the general vicinity of West, South and East Campus sectors.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of net new building area would be developed on the University of Washington Seattle campus, with a focus of development in the West and East Campus sectors. Alternative 4 refelcts an increase in development in the Central and East Campus sectors compared to Alternative 1.

As under Alternative 1, assumed development under Alternative 4 would not result in demolition or additions to any recognized historic structure on campus.

West Campus

Potential impacts to historic resources in the South Campus sector would be similar to those identified under Alternative 1, as proposed development in this sector is assumed to be the same under both alternatives.

South Campus

Potential impacts to historic resources in the South Campus sector would be substantially less than those identified under Alternative 1 due to the decreased assumed development in South Campus under Alternative 4 (0.2 million gsf compared to 1.35 million gsf under Alternative 1), and the limited number of historic buildings/structures located in the South Campus sector.

Central Campus

Potential impacts to historic resources in the Central Campus sector would be greater than those identified under Alternative 1 due to the increased development assumed in Central Campus under Alternative 4 (1.1 million gsf compared to 0.9 million gsf under Alternative 1). As previously indicated, many of the historic resources found on the University of Washington Campus are located in the Central Campus sector, some of the building/structures that could be indirectly impacted by development include, Glenn Hughes Penthouse Theater and Memorial Way, Denny Hall, Lewis Hall, Clark Hall, Suzzallo Library and Architecture Hall. Adherence with measures related to limiting dust, noise and vibration during construction would limit the potential for indirect impacts to historic structures in Central Campus (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures).

Considering the number of historic structures in Central Campus, the potential for new development in Central Campus to be located in proximity to historic structures is high. Any new development proposed adjacent to historic structures, or to buildings 50 years old or

older, would follow the University of HRA process to insure that historic resources are considered.

East Campus

Because the amount of development assumed for the East Campus sector would be greater than under Alternative 1 (1.7 million gsf compared to 0.75 million gsf under Alternative 1), the potential for indirect impacts to identified historic resources, such as the Canoe House would be greater than under Alternative 1. For example, because assumed development under Alternative 4 in East Campus assumes potential development south of Husky Stadium, there is a potential for indirect impacts to the Canoe House under Alternative 4. Any development located adjacent to the Canoe House, or to buildings 50 years old or older, would follow the University HRA process to document historic features associated with these buildings, and identify mitigation, as appropriate.

Surrounding Primary and Secondary Impact Zone Area

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones.

The potential for indirect impacts to identified off-campus historic resources under Alternative 4 is relatively low given the limited number of potential development sites located in proximity to the off-campus resources. Historic resources located within the **Primary Impact Zone** that could be affected by potential development include: the University Bridge, University Methodist Episcopal Church, University Presbyterian Church, University Library, Fire Station #17, and Neptune Theater (in proximity to West Campus development); the Montlake Cut (in proximity to South Campus development); the Montlake Bridge and Montlake Cut, and Benton's Jewelers Street Clock (in proximity to East Campus development); and Sigma Kappa Mu Chapter House (in proximity to Central Campus). Under Alternative 4, given the focus of development in the West, Central and East Campus sectors, there is a potential for development to occur in proximity to identified off-campus historic resources. However, all new construction on the University of Washington campus would be conducted consistent with measures identified to minimize indirect impacts to adjacent uses and structures (refer to Section 3.16, **Summary of Construction Conditions**, for a listing of mitigation measures) and the University of Washington HRA process.

Given the distance of historic resources in the **Secondary Impact Zone** from development assumed under Alternative 4, construction and operational activities associated with this alternative would not be anticipated to affect historic resources in the Secondary Impact Zone. Off-campus historic resources within the Secondary Impact Zone include the Lake

Washington waterway, Arboretum Trestle and Aqueduct. Montlake School, Roanoke Park Historic District, Battelle Research/Talaris Conference Center and Laurelhurst Community Center are located in the general vicinity of West, South and East Campus sectors.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in East Campus, would occur. Because construction associated with the assumed vacations would not directly impact any recognized historic structures, and construction associated with the vacations is relatively minor, indirect impacts to historic resources under Alternative 5 would be similar to Alternatives 1 through 4. The potential for indirect impacts to identified off-campus historic resources would be as identified for Alternative 1 through 4.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall construction in the area and, in combination with future new development in the area, would contribute to indirect construction-related impacts to historic resources including short-term, localized traffic congestion, noise and dust. To the extent that increased campus population and development increase the pressure for supporting development in the surrounding area (primarily in the University District), campus growth could contribute to historic resources related impacts in the area.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the building development necessary to accommodate increased campus population, potentially transferring a portion of the indirect historic resource-related impacts from the University of Washington campus to surrounding areas.

The *University District Urban Design EIS* identifies the University Bridge and privately-owned Ye College Inn as National Register of Historic Places, the University Methodist Episcopal Church as listed on the Washington Heritage Register, and identifies other structures in the University District that are on or eligible for other historic designations. The *University District Urban Design EIS* indicates that rezoning and associated population growth "could accelerate the real estate market pressures in the area and potentially impact the older character buildings, as well as the recognized historic buildings." To the extent that the University of Washington development adds to market pressure in the University District, development under the *2018 Seattle Campus Master Plan* could contribute to pressure to convert older buildings in the area.

All construction activities in the area would be required to follow applicable regulations, and significant impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

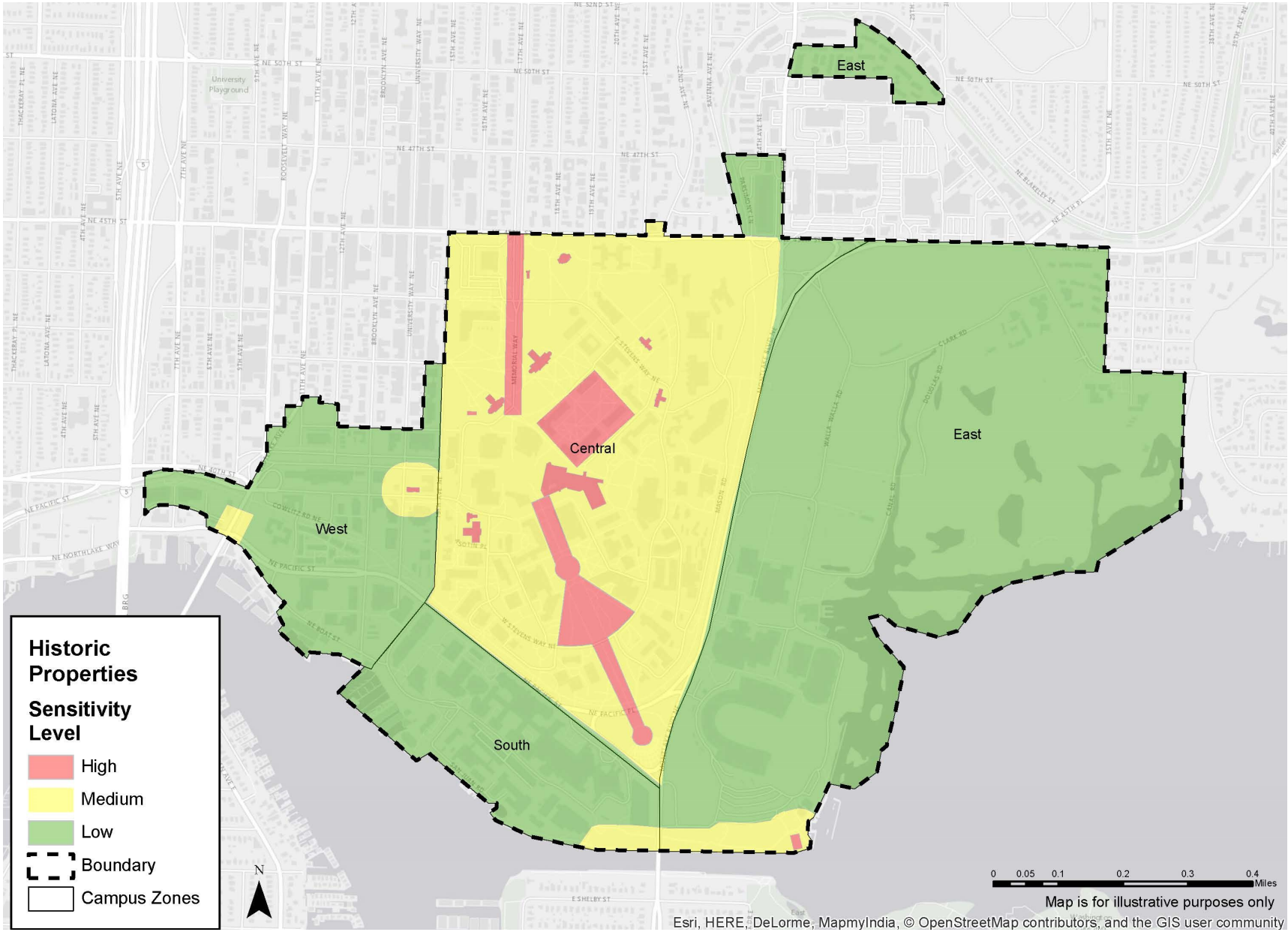
The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan*.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.12-1**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For example, areas of campus located in proximity to recognized historic resources are identified as having a "Medium" potential to encounter sensitive historic resources conditions, while areas of campus located at a distance from recognized historic resources are identified as having a "Low" potential to encounter sensitive historic resources.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.12.3 Mitigation Measures

The following measures would be available for development under the *2018 Seattle Campus Master Plan*.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.12-1
Historic Resources Sensitivity Map

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

- The University of Washington's existing internal design review processes (architectural, landscape, environmental review, and Board or Regents) would continue to review and authorize major building projects in terms of siting, scale, and the use of compatible materials relative to recognized historic structures.

- The University of Washington would continue to follow the Historic Resources Addendum (HRA) process for all proposed projects that include exterior alterations to buildings over 50 years old, or are located adjacent to buildings or features over 50 years old. The HRA is intended to insure that important elements of the campus, its historic character and value, environmental considerations and landscape context are valued.

- The potential for indirect impacts to on-campus and identified off-campus historic resources associated with construction noise, dust, and pedestrian/bicycle circulation distribution would be mitigated by the following the measures identified in Sections 3.2 (Air Quality), 3.6 (Environmental Health) and 3.16 (Transportation).

3.12.4 Significant Unavoidable Adverse Impacts

Campus development under EIS Alternatives 1 through 5 would occur within the context of a campus with historic buildings and spaces. With implementation of the identified mitigation measures, no significant adverse impacts are anticipated.

3.13 PUBLIC SERVICES

This section of the Draft EIS describes the existing public services (fire and police services) that serve the University of Washington campus and in the site vicinity and evaluates the potential impacts to public services that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*. It is not anticipated that development associated with the *2018 Seattle Campus Master Plan* would have the potential to significantly impact area public and private schools, and analysis of schools is not included in this Draft EIS.

3.13.1 Affected Environment

Fire and Emergency Services

Seattle Fire Department

The Seattle Fire Department (SFD) provides fire prevention, education, fire suppression, medical services, and other related emergency and non-emergency services to the University of Washington. The SFD is staffed by approximately 981 uniformed personnel, with an on-duty strength of 207 staff members; all uniformed personnel are emergency medical technician (EMT) certified. SFD responds to University fire alarms, chemical spills and medical emergencies. The University of Washington is located within the Battalion 6 service area and units from five different stations are typically available to respond to the campus, including: Station 17 (1050 NE 50th Street); Station 22 (901 E Roanoke St.); Station 38 (4004 NE 55th St.); Station 9 (3829 Linden Ave. N); Station 16 (6846 Oswego Place NE). If the first assigned units are not available, backup units are dispatched accordingly.

Apparatus available at each of the stations that serve the campus, include:

- Station 9 – Engine 9
- Station 16 – Engine 16
- Station 17 – Engine 17, Ladder 9, Medic 16, Battalion 6
- Station 22 – Engine 22
- Station 38 – Engine 38

When special hazardous conditions warrant it, a hazardous response team is dispatched, as well as a full response team. The hazardous response team consists of an additional engine company, a ladder company, a Hazardous Materials Emergency Unit and a deputy chief.

The type of response assigned by the SFD's alarm center is determined by the nature of the received emergency request. Approximate response time to the University ranges from

three to five minutes. **Table 3.13-1** provides a summary of city-wide emergency responses by the Seattle Fire Department from 2010 through 2014.

Table 3.13-1
SEATTLE FIRE DEPARTMENT EMERGENCY RESPONSES – 2010 to 2014

	2010	2011	2012	2013	2014
Emergency Medical Service (EMS)	64,107	64,595	69,082	71,948	75,720
Fire	13,395	12,709	12,651	13,388	14,260
Total Calls	77,502	77,304	81,733	85,336	89,980

Source: Seattle Fire Department, 2016.

As noted in **Table 3.13-1**, calls for service for the Seattle Fire Department city-wide have increased by approximately 16 percent since 2010, with the greatest increase coming from the amount of EMS calls.

The University maintains a comprehensive fire safety program for the campus. Staffing includes fire protection engineers, fire safety specialist, environmental health and safety technologists, fire alarm control technicians, facilities operations maintenance specialists and a utilities maintenance staff. The fire safety engineers are fire safety specialists provide life safety consulting and monitoring services for the University, as well as review of documents for all fire systems and approval of installations.

Facilities operations maintenance specialists and Environmental Health and Safety staff are responsible for maintaining and testing all University fire suppression systems. Fire alarm control technicians test and maintain the fire alarm systems, and utility workers service portable fire extinguishers.

Most of the major buildings on campus are equipped with a monitored fire alarm system. Alarms are monitored by an approved central station as well as local monitoring system that is owned, operated and maintained by the University. The University of Washington Police Department (UWPD) operates a proprietary Central Communication Center to coordinate University Police, Environmental Health and Safety, and Facilities Services support to the SFD.

The University has historically built and maintained fire resistant buildings meeting, and in some cases exceeding, minimum code requirements. Fire loss history at the University is favorable.

Police

The University of Washington Police Department (UWPD) employs approximately 85 staff members. All commissioned members of the Department have completed training at the Washington State Criminal Justice Training Commission Academy. The Department has its

own conflict management, firearm, and first aid instructions. UWPD maintains an executive division, operations division, professional standards and training division, security services and a technical services division. The entire campus is patrolled 24 hours a day by three patrol cars.

Table 3.13-2 summarizes the total crimes responded to by the UWPD between 2010 and 2014. The UWPD has responded to an increasing number of crimes on the University of Washington campus over the past five years and the number of total crimes responded to have increased by approximately 10 percent since 2010. As noted in the table, the majority of the crimes on campus are Part II Crimes.

University of Washington Police Dept.

Table 3.13-2
UWPD CRIME SUMMARY – 2010 to 2014

	2010	2011	2012	2013	2014
Part I Crimes[1]	541	607	575	660	692
Part II Crimes[2]	709	721	728	716	682
Total Crimes	1,250	1,328	1,303	1,376	1,374

Source: University of Washington Police Department, 2016.

[1] Part I Crimes include more serious crimes such as robbery, aggravated assault, rape, and motor vehicle theft.

[2] Part II Crimes include simple assault, vandalism, drug abuse violations, driving under the influence, and disorderly conduct.

The Seattle Police Department (SPD) provides backup service to the University Police Department for major emergencies and planned special events, such as Husky football games. The University of Washington Medical Center Hospital also maintains a security guard force of eight employees to provide security services for most hospital shifts. In addition, funding is being considered for four security guards to provide security service in the Health Sciences complex.

SPD currently has 1,388 sworn officer positions from the rank of police officer through police chief.[1] The University of Washington Campus is located within the North Precinct of the SPD. The North Precinct headquarters is located approximately three miles to the northwest of the campus (located at 10049 College Way N). The North Precinct is divided

[1] Personal Communication with SPD, Captain Jim Dermody, Field Support Bureau, Data-Driven Policing Section Commander. Seattle Police Department. September 2015.

into five sectors and 15 beats. The University of Washington campus is located within Sector U and Beats U2 and U3[2].

Table 3.13-3 illustrates the total Part I Crimes (homicide, robbery, assault, rape, arson, burglary, theft, and vehicle theft) responded to by SPD from 2011 to 2015. As indicated in the table, the North Precinct represents approximately 34 percent of the Part I Crimes that SPD responds to in a given year. Over the past year, Part I Crimes in the North Precinct have decreased by approximately five percent.

Table 3.13-3
SPD PART I CRIME SUMMARY – 2011 to 2015

	2011	2012	2013	2014	2015
North Precinct	10,993	10,653	12,473	13,823	13,181
Total SPD	32,222	32,284	36,895	40,749	37,748
North Precinct as a Percentage of SPD	34%	33%	34%	34%	35%

Source: Seattle Police Department, 2016.

Existing Campus

For analysis purposes, the distribution of existing public service demand has been estimated based on the percentage of overall campus development that is located within each campus sector

West Campus

The West Campus sector has approximately 3.8 million gsf of building space which equates to approximately 23 percent of the overall building space on campus (approximately 16.6 million gsf). The West Campus sector currently has the third highest percentage of building space behind the South and Central Campus sectors and would therefore be anticipated to have the third highest demand for public services. Calls for public services would typically be generated by existing student housing, academic and administrative uses in the West Campus sector.

South Campus

The South Campus sector currently contains approximately 4.2 million gsf of building space which equates to approximately 25 percent of the overall building space on campus. It currently has the second highest percentage of building space on the campus (behind the Central Campus) and is anticipated to have the second highest demand for public services. Calls for service would be generated by existing health sciences, medical center and academic uses in the South Campus sector.

[2] City of Seattle Police Department. North Precinct Website http://www.seattle.gov/police/precincts/north/about.htm

Central Campus

The Central Campus sector has approximately 7.1 million gsf of building space which equates to approximately 43 percent of the overall building space on campus. The Central Campus sector currently has the highest percentage of building space on campus and would therefore be anticipated to have the highest demand for public services. Calls for public services would typically be generated by existing student housing, academic and administrative uses in the Central Campus sector.

East Campus

The East Campus sector currently contains approximately 1.5 million gsf of building space which equates to approximately nine percent of the overall building space on campus. It currently has the lowest percentage of building space on the campus and is anticipated to have the lowest demand for public services. Calls for service would be generated by existing academic/student support, administrative and athletic facility uses in the East Campus sector. Although service calls in East Campus can spike during sporting events.

Primary and Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement. These zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones (see **Figure 2-3**).

Fire and emergency services for the **Primary and Secondary Impact zone** are also provided by the SFD. Police services for the Primary and Secondary Impact zones are provided by the SPD.

3.13.2 Impacts

This section of the Draft EIS identifies the potential impacts of the *2018 Seattle Campus Master Plan* on public services that could occur with development under the EIS Alternatives.

No Action Alternative

Under the No Action Alternative, it is assumed that the approximately 6.0 million gsf of potential future development on the campus under the *2018 Seattle Campus Master Plan* would not occur and that only the remaining development capacity under the *CMP Seattle* 2003 would be developed (approximately 211,000 gsf). Some level of increased campus population would occur under the No Action Alternative through the remaining development under the *CMP Seattle 2003*, which would result in an increase in demand for public services. However, due to the lower level of development that would occur on

campus when compared to Alternatives 1 through 5, it is anticipated that impacts to fire/emergency services and police service would be lower under the No Action Alternative.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Under Alternative 1, which reflects the preferred allocation of building development under the *2018 Seattle Campus Master Plan*, approximately 6.0 million gsf of net new building area would be developed on the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors.

Fire and Emergency Services

Potential future development under the *2018 Seattle Campus Master Plan* would result in increased demand for fire and emergency services over the life of the plan. Over the 10-year planning horizon, construction projects on potential development sites would require fire department review for applicable project development permits and inspection services prior to occupancy. All development projects on the campus would be constructed in accordance with applicable City of Seattle Fire Code requirements and would include fire alarms and fire suppression systems in accordance with applicable standards. During construction of specific development projects, vehicle access through and surrounding potential development sites could be affected and require the implementation of detour routes, which could affect emergency vehicle responses times in the vicinity of potential development sites.

Under Alternative 1, the increase in building development and associated campus population would result in an incremental increase in demand and service calls for fire and emergency services over the 10-year planning horizon. Given that the amount of building space on campus is estimated increase by approximately 35 percent during this timeframe, it is assumed that the number of fire service and emergency medical service calls would also increase by approximately 35 percent; however, with the incorporation of fire suppression systems into new buildings, the increase in calls could be substantially less.

As development occurs, it is anticipated that SFD would have adequate staffing to serve the campus and greater Seattle area, and that increases in SFD staffing could be provided as necessary though the Department's annual planning processes.

Police Service

Under the *2018 Seattle Campus Master Plan,* potential future development under Alternative 1 and associated increases in campus population would result in an increased demand for campus security and police services. Similar to the existing conditions, UWPD

would continue to provide campus security and police services for the University of Washington with SPD providing backup service for major emergencies and special events. Potential future building development and increases in campus population would occur incrementally over the 10-year planning horizon and would generate an incremental increase in demand for security services and calls for service for the UWPD and potentially the SPD North Precinct.

Under Alternative 1, potential future development would primarily occur in the West Campus and South Campus sectors and could generate the largest increase in demand for police services; however, the potential for police service calls would not be limited to one specific area and could occur throughout the campus over the life of the plan. As potential future development occurs and campus population increases, the UWPD would continue to serve the campus and any future increases in Department staffing levels could be provided, as necessary, as part of the UWPD planning processes.

Campus Sectors

West Campus

With potential development under Alternative 1, approximately 3.0 million gsf would be added to the West Campus sector. This sector would contain a total of approximately 6.8 million gsf of building space which would equate to approximately 30 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 1, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for public services.

South Campus

Approximately 1.35 million gsf of development would be included in the South Campus sector under Alternative 1. In total, this sector would contain approximately 5.55 million gsf of building space, which would equate to approximately 25 percent of the overall building space on campus. Under Alternative 1, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for public services.

Central Campus

With potential development under Alternative 1, approximately 0.9 million gsf of new development would be added to the Central Campus sector. This sector would have a total of approximately 8.0 million gsf of building space which would equate to approximately 35 percent of the overall building space on campus. Under Alternative 1, the Central Campus sector would have the highest percentage of building space on campus and would be anticipated to have the highest demand for public services.

East Campus

Approximately 0.75 million gsf of new development would be added to the East Campus sector under Alternative 1. In total, this sector would contain approximately 2.25 million gsf of building space, which would equate to approximately 10 percent of the overall building space on campus. Under Alternative 1, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for public services.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), these sectors would have the greatest increase in development and associated increase in demand for public services on the campus, and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. As a result, there would be less potential for increased demand for public services in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, impacts from increased public service demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for public service impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 2 – Campus Development Consistent with CMP and Existing Height Limits

Under Alternative 2, approximately 6.0 million gsf of net new building area would be developed on the University of Washington Seattle campus under current allowable building heights, with a focus of development in the West, South, and East Campus sectors, and lesser levels of development in the Central Campus sector. Existing building heights would be retained under this alternative.

Fire and Emergency Services

Similar to Alternative 1, potential future development on campus under Alternative 2 would result in an increased demand for fire and emergency services, including fire department review for applicable project development permits and inspection services prior to occupancy as well as modified access routes during construction which could affect emergency vehicle responses times in the vicinity of potential development sites. Potential future development would create an incremental increase in demand and service calls for fire and emergency services over the 10-year planning horizon. Assuming that the calls for service would correlate to the amount of increased building space, the overall increase in calls for service would be similar to Alternative 1 and would represent an approximately 35 percent increase.

Development in the West Campus, South Campus and East Campus sectors could generate the largest increase in fire and emergency service demand; however, the potential for increased demand could occur throughout the campus and would not be limited to one specific area. As development occurs, it is anticipated that SFD would have adequate staffing to serve the campus and the greater Seattle area, and that increases in SFD staffing would be provided as necessary though the Department's annual planning processes.

Police Service

Under Alternative 2, potential future building development and associated increases in campus population would occur incrementally over the 10-year planning horizon and would generate an incremental increase in demand for security services and calls for service for the UWPD, similar to Alternative 1. Under Alternative 2, potential future development would primarily occur in the West Campus, South Campus and East Campus sectors and these areas could generate the largest increase in demand for police services; however, the potential for police service calls would not be limited to one specific area and could occur throughout the campus. As described under Alternative 1, as potential future development occurs and campus population increases, the UWPD would continue to serve the campus and any future increases in Department staffing levels could be provided, as necessary, as part of the UWPD planning processes.

Campus Sectors

West Campus

With potential development under Alternative 2, approximately 2.4 million gsf would be added to the West Campus sector. This sector would contain a total of approximately 6.2 million gsf of building space which would equate to approximately 27 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 2, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for public services. However, the

potential increase in demand for public services would be anticipated to be less than under Alternative 1.

South Campus

The amount of potential development in the South Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in public service demand would also be the same as under Alternative 1.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in public service demand would also be the same as under Alternative 1.

East Campus

Approximately 1.35 million gsf of potential new development would be added to the East Campus sector under Alternative 2. In total, this sector would contain approximately 2.85 million gsf of building space, which would equate to approximately 13 percent of the overall building space on campus. Under Alternative 2, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for public services. However, the potential increase in demand for public services in the East Campus sector would be greater than under Alternative 1 due to the increased amount of development.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, South and East Campus sectors (85 percent of development under Alternative 2), these sectors would have the greatest increase in development and associated potential increase in demand for public services on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to the East Campus sectors).

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for increased demand for public services in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, impacts from increased public service demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for public service impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of net new building area would be developed on the University of Washington Seattle Campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

Fire and Emergency Services

Similar to Alternative 1, an increase in building development and associated campus population under Alternative 3 would result in an incremental increase in demand and service calls for fire and emergency services over the 10-year planning horizon. Given that the amount of building space on campus is estimated to increase by approximately 35 percent during this timeframe, it is assumed that the increase in demand and number of fire service and emergency medical service calls would also increase by approximately 35 percent.

Police Services

Similar to Alternative 1, potential future development under Alternative 3 would primarily occur in the West and South Campus sectors and could generate the largest increase in demand for police services; however, the potential for police service calls would not be limited to one specific area and could occur throughout the campus over the life of the plan. Given that the amount of building space on campus is estimated increase by approximately 35 percent during this timeframe, it is assumed that the increase in demand and number of fire service and emergency medical service calls would also increase by approximately 35 percent.

Campus Sectors

West Campus

With potential development under Alternative 3, approximately 3.2 million gsf of net new development would be added to the West Campus sector. This sector would contain a total of approximately 7.0 million gsf of building space which would equate to approximately 31 percent of the overall building space on campus. Under Alternative 3, the West Campus

sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for public services. The increase in public service demand is anticipated to be greater than under Alternative 1 due to additional development density assumed in this sector under Alternative 3.

South Campus

Approximately 1.65 million gsf of development would be added in the South Campus sector under Alternative 3. In total, this sector would contain approximately 5.85 million gsf of building space, which would equate to approximately 26 percent of the overall building space on campus. Under Alternative 3, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for public services. But, the increase in demand under Alternative 3 would be greater than Alternative 1 due to additional development density assumed in this sector under Alternative 3.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 3 would be the same as Alternative 1. Potential increases in public service demand would also be the same as under Alternative 1.

East Campus

Approximately 0.25 million gsf of new development would be added to the East Campus sector under Alternative 3. In total, this sector would contain approximately 1.75 million gsf of building space, which would equate to approximately eight percent of the overall building space on campus. Under Alternative 3, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for public services. The potential increase in demand in the East Campus sector would be lower than under Alternative 1 due to the lower amount of development density assumed in this sector under Alternative 3.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), these sectors would have the greatest increase in development and associated potential increase in demand for public services on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus)

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3. As a result, there would be less potential for increased demand for public services in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, impacts from increased public service demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for public service impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of net new building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

Fire and Emergency Services

Under Alternative 4, an increase in building development and associated campus population would result in an incremental increase in demand and service calls for fire and emergency services over the 10-year planning horizon, similar to Alternative 1. Given that the amount of building space on campus is estimated to increase by approximately 35 percent during this timeframe, it is assumed that the increase in demand and number of fire service and emergency medical service calls would also increase by approximately 35 percent.

Police Services

Potential future development under Alternative 4 would primarily occur in the West and South Campus sectors and could generate the largest increase in demand for police services, similar to Alternative 1. The potential for police service calls would not be limited to one specific area and could occur throughout the campus over the life of the plan. Given that the amount of building space on campus is estimated to increase by approximately 35 percent during this timeframe, it is assumed that the increase in demand and number of fire service and emergency medical service calls would also increase by approximately 35 percent.

Campus Sectors

West Campus

The amount of potential development in the West Campus sector under Alternative 4 would be the same as Alternative 1. Potential increases in public service demand would also be the same as under Alternative 1.

South Campus

Approximately 0.2 million gsf of development would be added in the South Campus sector under Alternative 4. In total, this sector would contain approximately 4.4 million gsf of building space, which would equate to approximately 20 percent of the overall building space on campus. Under Alternative 4, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for public services. The increase in demand for public services under Alternative 4 would be less than under Alternative 1 due to the lower amount of potential development.

Central Campus

With potential development under Alternative 4, approximately 1.1 million gsf of new development would be added to the Central Campus sector. This sector would have a total of approximately 8.2 million gsf of building space which would equate to approximately 36 percent of the overall building space on campus. Under Alternative 4, the Central Campus sector would have the highest percentage of building space on campus and would be anticipated to have the highest demand for public services. The potential increase in demand for public services would also be greater than under Alternative 1 due to increased amount of development density under Alternative 4.

East Campus

Approximately 1.7 million gsf of potential new development would be added to the East Campus sector under Alternative 4. In total, this sector would contain approximately 3.2 million gsf of building space, which would equate to approximately 14 percent of the overall building space on campus. Under Alternative 4, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for public services. However, the potential increase in demand for public services in the East Campus sector would be greater than under Alternative 1 due to the increased development density in the sector under Alternative 4.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, Central, and East Campus sectors (97 percent of development under Alternative 4), these sectors would have the greatest increase in development and associated potential increase in demand for public services on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus), the residential neighborhood north of NE 45th Street (across from the Central Campus) and the Laurelhurst neighborhood and University Village (adjacent to the East Campus).

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential for increased demand for public services in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, impacts from increased public service demand would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for public service impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of development and associated increase in population would occur as under Alternatives 1 through 4; however, none of the assumed street or aerial vacations would occur. As a result, it is anticipated that the public service impacts under Alternative 5 would be similar to those analyzed under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

To the extent that potential future development of the *2018 Seattle Campus Master Plan* under Alternatives 1 through 5 occur in the vicinity of other development projects in the site area (i.e. University District, etc.), it could result in a cumulative increase in demand for fire and emergency services from the SFD. Although the level, timing, and specific location of future development in the University District is not defined, it is possible that some level of concurrent and proximate development would occur on the University of Washington campus and in the University District, especially given the focus of development in the West Campus sector. The University of Washington and the University District are served by SFD Battalion 6 and fire service increases associated with growth in these areas would be considered through SFD's annual planning process.

Cumulative increases in demand for police services from the SPD North Precinct could also occur, albeit at a lower level, due to provision of service by UWPD on the University of Washington campus.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

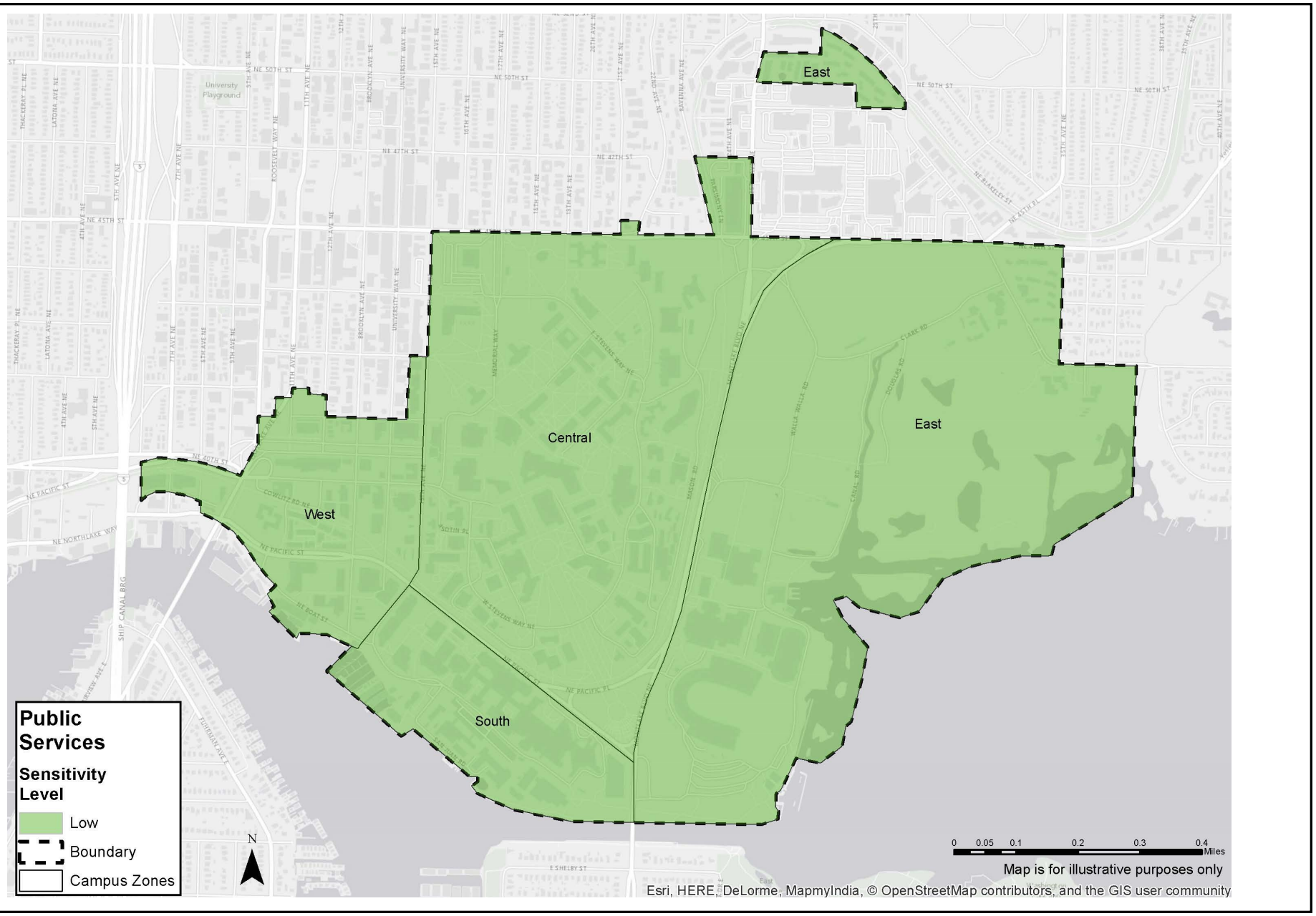
The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA analysis/threshold determination on individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.13-1**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are defined. For public services (fire and police), the entire University of Washington campus is identified as having a "Low" potential for sensitive public service conditions, or result in impacts to public services.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.13.3 Mitigation Measures

The following measures would be available for development under the *2018 Seattle Campus Master Plan*.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.13-1
Public Services Sensitivity Map

Measures Applicable to All Campus Areas (Low Potential)

- All potential future development under *2018 Seattle Campus Master Plan* would be constructed in accordance with applicable City of Seattle Fire Code requirements and would include fire alarms and fire suppression systems in accordance with applicable standards.
- During the construction process for potential future development, the SFD would be notified of any major utility shutdowns or campus street closures/detours.
- In the case of an emergency, during the construction process for potential future development, the UWPD could provide police escort services for fire and emergency service vehicles.
- The University of Washington would review the designs of specific development projects for potential life/safety and personnel security issues.
- The UWPD would increase its law enforcement staff capacity and expand operations, as necessary, to meet the increased security needs associated with development and increased population under the *2018 Seattle Campus Master Plan*.

3.13.4 Significant Unavoidable Adverse Impacts

Potential future development and the associated increase in campus population under the *2018 Seattle Campus Master Plan* would result in an increase in demand for fire and emergency services and police services on the University of Washington campus. With the implementation of mitigation measures identified above, significant unavoidable impacts to public services would not be anticipated.

3.14 UTILITIES

This section of the Draft EIS provides discussion on the existing water, sewer, stormwater drainage and solid waste systems serving the University of Washington campus, and describes potential impacts that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan*.

3.14.1 Affected Environment

Water Supply

Water for domestic use and fire suppression in the City of Seattle, including the University of Washington, is provided by Seattle Public Utilities (SPU). Primary sources of water for the SPU system include the Cedar River and Tolt River watersheds. Water from these watersheds is treated and delivered to Seattle via a number of large transmission mains. Smaller pipes branch off the transmission mains to water storage tanks and reservoirs located at higher elevation locations throughout the City; the reservoirs/tanks are located at higher elevations to allow water to the distributed from the reservoirs/tanks primarily by gravity. The SPU water distribution system is divided into approximately 45 pressure zones (PZ) that operate within a pressure range of approximately 30 to 130 pounds per square inch (psi), which is a pressure range that is suitable for drinking water and fire flow.

Water to the University of Washington campus and immediately surrounding area is provided from the Maple Leaf Reservoir located at Roosevelt Way and NE 83rd Street.

From the SPU supply system, the University of Washington campus is served through a series of meters located on and adjacent to campus.[1]

The University of Washington campus currently consumes approximately 478 million gallons of water annually[2] and implements aggressive conservation methods. There are no known capacity issues associated with the water system serving the University of Washington campus.

It should be noted that the East Campus sector contains the majority of the University's athletic facilities and that these facilities typically generate a temporary increase in water demand during sporting events (football games, basketball games, etc.)

[1] Water service to the University of Washington is provided through a 20-inch main in NE 55th St., 32-inch mains in 7th and 10th Avenues NE, and 12- and eight-inch lines to the NE Pacific Street and NE 40th Street entrances. The 25th Avenue NE service line and the connection at Montlake and NE Pacific Street tie to the City's 54-inch line to the Maple Leaf Reservoir.

[2] Assumes 29 gallons per building square foot per year.

Sanitary Sewer

Overview

Sanitary sewer service at the University of Washington campus is provided by a series of systems owned by the University, King County Metro and the City of Seattle (refer to **Appendix E** for a map indicating the University, City of Seattle and King County Metro systems).

In general, the Central, South and East Campus sectors are served by the University of Washington system, with the West Campus sector served by a combination of the University and Seattle Public Utilities systems. All sewer flows generated on campus are directed via the various systems to the King County Metro trunk line that follows Montlake Boulevard NE and NE Pacific Street.

The total existing amount of sewage generated on the University of Washington campus is illustrated in **Table 3.14-1** below.

Table 3.14-1
CURRENT SEWER DEMAND

Current Campus Building Square Footage	Annual Gallons Produced[1]
16,500,000	363,000,000

Source: University of Washington Capital Projects Office, 2016

[1] *29 gallons per building square foot assumed.*

Sanitary sewer systems can generally be categorized as either combined or dedicated sanitary piping systems. In a dedicated sanitary system, wastewater flows to a dedicated sanitary sewer piping system then to a trunk line and eventually to a wastewater treatment facility prior to outfall to a water body; stormwater runoff is directed to a separate drainage piping system. A combined system collects stormwater and wastewater in the same piping system and transports the combined flows to a trunk line and eventually to a treatment facility. At certain times, including certain large rainfall events, combined stormwater/wastewater flows can exceed the system capacity, and combined overflow can be discharged via a combined sewer overflow pipe to a nearby water body.

A more detailed discussion of the sewer systems serving the University of Washington campus is provided below, followed by a summary of how the sewer systems relate to the campus sectors.

University of Washington-Owned System

As indicated in the sanitary sewer distribution map included in **Appendix E**, the University of Washington owns and operates the majority of the sanitary sewer system on the campus. The University of Washington system ties to either the King County Metro trunk sewer or the City of Seattle collection system (described later in this section), with treatment and disposal at Metro's West Point sewage treatment facility located next to Discovery Park approximately, three miles west of the University of Washington campus.

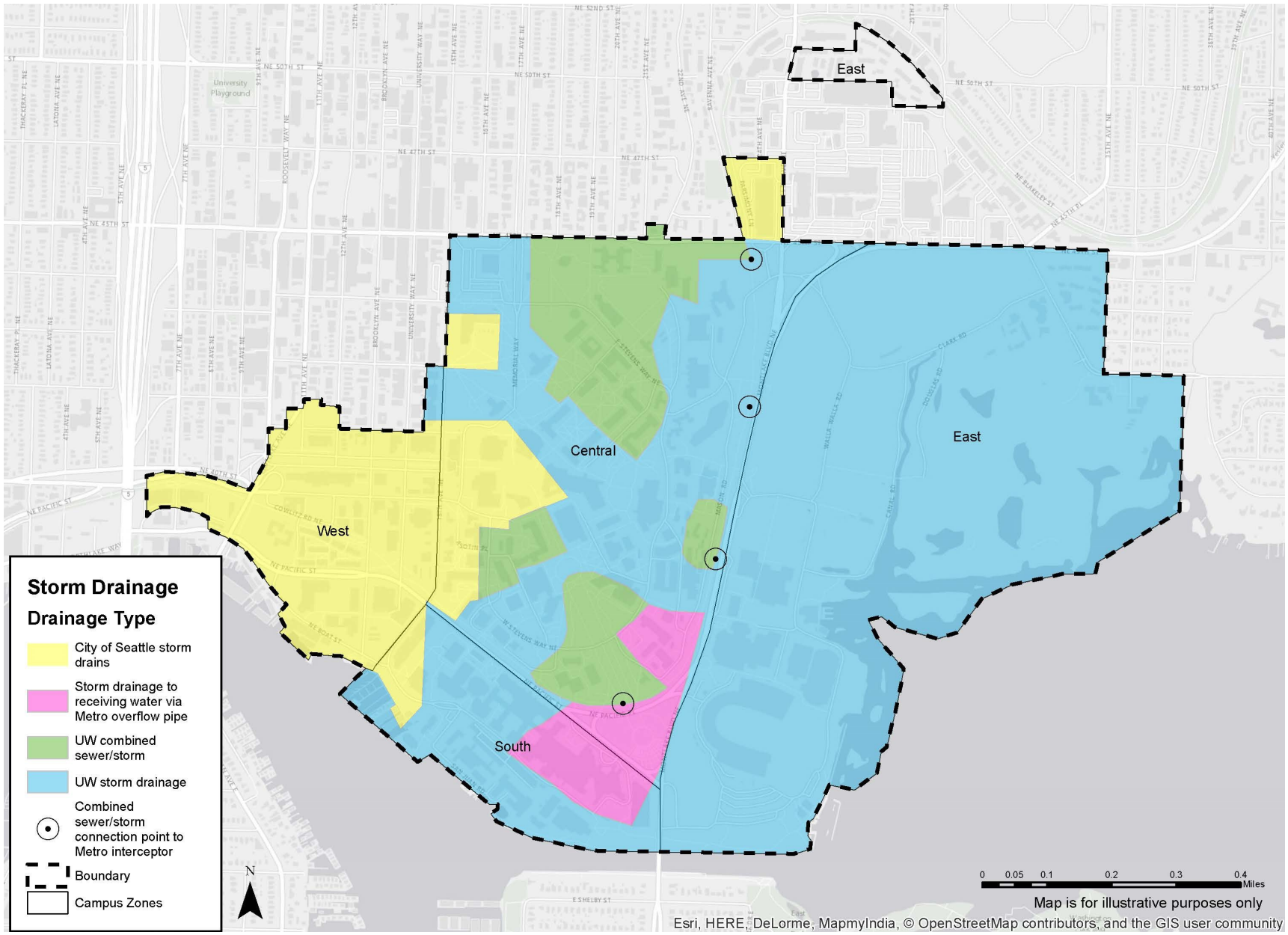
As indicated in **Table 3.14-1** total daily sewage flows generated on the University of Washington campus is estimated to total approximately 363 million gallons annually, or approximately two million gallons per day on average.[3]

For campus area north of NE Pacific Street and west of Montlake Boulevard NE (i.e. central and northern portions of West Campus), piping generally follows natural gradients and generally gravity flows to the south and southeast to the 138- to 108-inch diameter King County Metro-Northlake trunk sewer that follows Montlake Boulevard NE and NE Pacific Street. Given the lower elevation of the South Campus sector and portions of the East Campus sector, and the West Campus sector south of NE Pacific Street, sanitary flows are collected and lifted to the King County Metro trunk sewer by means of a series of lift stations.

As indicated in the sewer system map in **Appendix E** and in **Figure 3.14-1** provided in the stormwater discussion later in this section, the majority of the University of Washington campus (approximately 90 percent of the campus area) is served by dedicated sanitary systems. Because the Central Campus sector contains the historic core of the University of Washington campus, the Central Campus sector contains the oldest stormwater and sewer piping systems on campus, including some combined sewer/stormwater piping; approximately 67-acres of the Central Campus sector is currently served by combined piping, representing approximately 10 percent of the campus. In an effort to reduce the volume of combined flows generated on campus, the University of Washington is working to convert the older combined systems to dedicated sanitary systems as an element of individual development projects. (Refer to the *Campus Area Sewer System* Summary discussion later in this section for additional detail.)

There are no known capacity issues associated with the University of Washington sewer piping system or lift stations (also see the discussions related to the King County Metro and City of Seattle systems below).

[3] Assumes 22 gallons per building square foot per year and 180 days of peak use.



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.14-1
Storm Drainage Systems Map

Seattle Public Utilities-Owned System

As indicated in **Figure 3.14-1**, Seattle Public Utilities owns and operates the majority of the sewer system in the West Campus sector. Consisting of both sanitary and combined systems, sewage drains to the King County Metro trunk line by gravity where possible. Otherwise, sanitary flows are collected and lifted back into the Metro trunk sewer in NE Pacific Street by means of the University South Campus sewage lift station located at Brooklyn Avenue NE and NE Boat Street. The Seattle Public Utility sanitary sewer system is considered adequately sized to meet current demands.

Metropolitan King County-Owned System

Metropolitan King County is responsible for treating wastewater in the City of Seattle. Wastewater from the University of Washington campus (and surrounding area) is routed to the West Point Treatment.

King County Metro owns and operates the 138- to 108-inch diameter King County Metro-Northlake trunk sewer that follows Montlake Boulevard NE to the south and NE Pacific Street to the west. This trunk sewer transmits flows to the West Point Treatment Plant. King County also owns and operates the 84-inch diameter combined sewer overflow pipe to Portage Bay.[4] All campus sewer flows are eventually directed to the King County Metro-Northlake trunk line (see the Campus Area System Summary discussion later in this section).

The King County Metro trunk line is considered adequate to accommodate current sewer flows from the University of Washington. However, as indicated earlier, at various times (including following certain large rainfall events), combined flows within the King Country Metro line can exceed capacity, and combined overflow is discharged to Portage Bay via the 84-inch diameter combined sewer overflow pipe.

A summary of the sewer systems serving each of the campus areas is provided below.

Campus Sewer System Summary

The following describes the relationship of the campus sewer systems to the various campus sectors:

West Campus

The sewer piping system serving the West Campus sector consists of City of Seattle sewer mains with University of Washington lateral lines serving individual buildings. Flows in the West Campus sector north of NE Pacific Street gravity flow to the King County Metro trunk line in NE Pacific Street, while flows in the area south of NE Pacific Street flow to the City of

[4] Valves, remotely controlled by King County, within the King County Regulation Station are used to control the diversion of flow from the Metro trunk line to the 84-inch diameter overflow pipe.

Seattle lift station at NE Boat Street and Brooklyn Avenue NE before connecting to the King County Metro trunk line. There are no known capacity issues associated with the existing West Campus piping or lift station system.

South Campus

The sewer system serving the South Campus sector is owned and operated by the University of Washington. The system consists of dedicated sanitary sewer pipes and a series of five lift stations with connections to the King County Metro trunk line in NE Pacific Street. The King County Metro trunk combined sewer outfall pipe also travels through South Campus to Portage Bay. There are no known capacity issues associated with the existing South Campus piping and lift station system.

Central Campus

The sewer piping system serving the Central Campus sector is owned and operated by the University of Washington. The majority of the Central Campus system consists of dedicated sanitary system pipes. Because the Central Campus sector contains the historic core of the University of Washington and contains the oldest sewer piping on campus, Central Campus contains isolated areas of combined piping (see **Figure 3.14-1** under Stormwater Drainage for an illustration of these areas). Sewer flows in Central Campus gravity flow to the southeast and south to the King County Metro trunk line in Montlake Avenue NE and NE Pacific Street.

In an effort to reduce the volume of combined flows generated on campus and directed to the King County Metro trunk line, the University of Washington works to convert combined systems to dedicated sanitary systems as an element of individual development projects.

There are no known capacity issues associated with the existing system serving Central Campus.

East Campus

The sewer system serving the East Campus sector is owned and operated by the University of Washington. Given the dispersed nature of development in the East Campus sector, East Campus can be described as containing two separate systems.

One system, associated with the athletic facilities generally located south of NE Wahkiakum Road, largely consists of piping and five lift stations directing flows to the King County Metro trunk system in Montlake Boulevard NE.

The other system is associated with the facilities along NE Clark Road and Mary Gates Memorial Drive NE (including Golf Driving Range, Environmental Safety buildings, Laurel Village, and the Center for Urban Horticulture), and generally consists of piping and four lift

stations directing flows to the City of Seattle main line in Mary Gates Memorial Drive NE, and eventually to the King County Metro trunk line.

There are no known capacity issues associated with the existing East Campus piping and lift station system.

It should be noted that the East Campus sector contains the majority of the University's athletic facilities and that these facilities typically generate a temporary increase in sewer demand during sporting events (football games, basketball games, etc.).

Stormwater Drainage

Stormwater Control

Stormwater runoff on the University of Washington campus is collected from street and sidewalks, surface parking areas, building rooftops, plazas and other areas of impervious surfaces by catch basins, with stormwater carried by a combination of dedicated stormwater and combined piping systems; the combined system is described in the *Sanitary Sewer* discussion above.

Table 3.14-2 illustrates the amount of impervious surfaces on the University of Washington campus in 2015. As indicated in the below table, the University of Washington campus contained approximately 340 acres of impervious surfaces in 2015 (representing approximately 49 percent of the 694-acre campus).

Table 3.14-2
CURRENT (2015) IMPERVIOUS SURFACES (ACRES)

Streets	Surface Parking	Building Area	Paths/Walkways	TOTAL
65	64	134	77	**340**

Source: Sasaki Architects, 2016.

Figure 3.14-1 illustrates the stormwater systems serving the University of Washington campus. In general, the stormwater drainage systems for the, South, East and majority of the Central Campus sectors are managed by the University of Washington, and the system for the West Campus sector and isolated portions of the Central Campus sector are managed by Seattle Public Utilities.

The following describes the relationship of campus stormwater drainage systems to the campus sectors:

West Campus

Stormwater in the West Campus sector is collected and controlled by SPU via a dedicated stormwater system. Stormwater collected by the SPU system in West Campus is conveyed to an outfall to Portage Bay.

South Campus

Stormwater in the South Campus sector is collected and controlled by the University of Washington via a dedicated stormwater system (i.e. no contribution to combined stormwater/sewer flows). Stormwater from the majority of the South Campus sector is directed the Ship Canal and/or Portage Bay. Stormwater from an approximately 12-acre portion of the South Campus sector immediately west of the Montlake Bridge is directed to the 84-inch King County Metro overflow pipe to Portage Bay (see **Figure 3.14-1**).

Central Campus

Stormwater runoff in the Central Campus sector is collected and conveyed by systems operated by the University of Washington and Seattle Public Utilities (SPU). The majority of the Central Campus sector is served by the University of Washington system, with the exception of the southwest corner of the Central Campus sector (generally the area from Red Square to the intersection of 15th Avenue NE and NE Pacific Street), and the Parrington Lawn area, are served by the SPU system (see **Figure 3.14-1**). The SPU stormwater system is separated from the sewer system and stormwater runoff from the SPU system in Central Campus does not contribute to combined stormwater/sewer flows.

The Central Campus sector contains the historic core of the University of Washington and accordingly contains the oldest stormwater and sewer systems on campus. Thus, the University of Washington system serving the Central Campus sector consists of a combination of separated and combined piping systems, with stormwater from approximately 67 acres (approximately 10 percent of the total campus area) conveyed by combined sewer/stormwater piping systems to the King County Metro trunk line. As indicated in **Figure 3.14-1**, the largest area of Central Campus served by combined system consists of the area generally bounded by NE 45th Street on the north, Memorial Way on the west, Whitman Court on the east, and the Quad on the south. Other Central Campus areas served by University of Washington combined systems include: an area in the vicinity of Rainier Vista north of Stevens Way NE; an area south of Red Square; and, an area east of the HUB (refer to **Figure 3.14-1**).

The University of Washington is working to reduce the campus area served by combined stormwater/sewer systems and strives to separate older systems as development projects (and associated funding) occur in areas with combined systems. Stormwater collected by the dedicated University of Washington stormwater system in the Central Campus sector is

directed to an outfall to Portage Bay. Stormwater conveyance and discharge is conducted consistent with applicable regulations.

Stormwater from an approximately 15-acre area located above the Triangle parking garage and immediately east of Rainier Vista is directed to the 84-inch King County Metro overflow pipe to Portage Bay (see **Figure 3.14-1**).

East Campus

Stormwater in the East Campus sector is collected and controlled by University of Washington via a dedicated stormwater system. Stormwater collected by the University of Washington system in East Campus is conveyed either directly to Union Bay, or to the existing drainage canal and then to Union Bay. Stormwater conveyance and discharge is conducted consistent with applicable regulations.

Stormwater Quality

In general, stormwater runoff can contain contaminants such as suspended sediment, nutrients, heavy metals, pathogens and other pollutants. Stormwater runoff can carry pollutants to nearby bodies of water.

The National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permits regulate discharges from municipal systems, including public entities located within municipalities. The University of Washington stormwater discharges fall under these regulations, and University stormwater discharges are regulated under a Phase 1 Municipal Stormwater Permit (Secondary Permittee). As a Phase 1 Secondary Permittee, the University of Washington develops and implements a Stormwater Management Program (SWMP). The University of Washington SWMP, which is designed and implemented to reduce the discharge of pollutants from stormwater, includes provisions for the following: Public Education and Outreach; Public Involvement; Illicit Discharge Detection and Elimination; Construction Runoff Control; Post-Construction Stormwater Management; and, Pollution Prevention.

The University of Washington stormwater system also must comply with all relevant ordinances, rules and regulations, including the City of Seattle Stormwater, Grading, and Drainage Control Code (Chapter 22.800). The University of Washington is Salmon-Safe certified and follows Low Impact Development (LID) practices as a matter of policy and standard practice to reduce stormwater runoff and improve water quality associated with new construction, major renovations, and other projects.

Roof runoff from copper roofs can contain dissolved copper, which is a pollutant that can be conveyed via the stormwater system to the Lake Washington and Puget Sound system. Campus buildings containing copper roofing include the Ocean Teaching Building and the Marine Sciences Building; cupulas associated with Denny Hall and Ocean Sciences Building

also contain copper. In November 2015, the University of Washington conducted sampling and analysis of roof runoff from the Ocean Teaching and Marine Sciences buildings which indicated that runoff contained relatively high levels of dissolved copper, although the receiving body (Lake Union) met the freshwater criteria for copper. The University of Washington has identified potential measures in regards to copper roofs, including additional sampling and prohibitions on additional and/or new copper roofing on campus.

While approximately 90 percent of the campus is separated into sanitary and stormwater systems, the remaining approximately 10 percent is combined and flows to the King County Metro Northlake trunk line. As indicated in the Sanitary Sewer discussion above, during certain times, including periods of considerable stormwater runoff, the Metro Northlake trunk sewer overflows sanitary sewage into Portage Bay[5]. As indicated earlier, the University of Washington is working to reduce the campus area served by combined stormwater/sewer systems and strives to separate older systems as development projects (and associated funding) occur in areas with combined systems.

Solid Waste

The University's current solid waste management system consists of several different programs that handle both disposal and recycling of solid waste. Most of the mixed solid waste generated on-campus is collected by the University's solid waste collection service. The University's Recycling & Solid Waste Office (Division of Building Services) manages both programs. In addition, some campus facilities have their own trucks and haul waste generated on an occasional basis, such as for special events or for special projects. Most of this waste is taken to the North Transfer Station (N 34th Street).

The waste collected from those campus facilities that generate large quantities of waste and require larger containers and special equipment for loading and unloading the containers is handled by private contractors and hauled to a private transfer station or a City of Seattle approved transfer facility, and then to Columbia Ridge Landfill in Arlington, Oregon; some types of waste requiring special handling are hauled directly to the landfill. The University's collection services transport waste from numerous campus facilities that generate smaller quantities of waste to the City of Seattle's North Transfer Station for disposal. The City then hauls its waste to the Columbia Ridge Landfill in Arlington, Oregon.

The University has reduced solid waste generation by promoting recycling and composting. Starting in 1973 with the recycling of paper, the recycling program has evolved into a campus-wide collection of multiple recyclable waste products. In addition to paper products, the University recycles used motor oil, ferrous and non-ferrous metals, aluminum, glass, plastic, cardboard and batteries. The University also has an extensive compost program. Food waste, compostable packaging, landscape debris/yard waste, and clean

[5] Valves, remotely controlled by King County, within the King County Regulator Station are used to control the diversion of flow from the Metro trunk line to the 84-inch diameter overflow pipe.

wood are hauled on a weekly basis by a contracted vendor. Some leaves are composted on-campus for use on planting beds, and branches are reduced to chips and used in planter areas. Weekly pickup of waste and recycled products occurs in all major buildings. University solid waste and recycling volumes from 2010 to 2015 are shown in **Table 3.14-3**. As shown, the percentage of waste that is recycled has increased from 55 percent in 2010 to 66 percent in 2015.

Table 3.14-3
UNIVERSITY OF WASHINGTON SOLID WASTE GENERATION

Year	Landfill Solid Waste (tons)	Recycled Waste	
		Volume (tons)	Percent of Total Waste
2010	5,183	7,726	55%
2011	4,901	6,417	57%
2012	4,934	6,547	57%
2013	4,790	6,621	58%
2014	4,802	7,360	61%
2015	4,504	8,569	66%

Source: University of Washington, 2016.

It should be noted that the East Campus sector contains the majority of the University's athletic facilities and that these facilities typically generate a temporary increase in solid waste generation during sporting events (football games, basketball games, etc.)

3.14.2 Impacts

This section of the Draft EIS identifies the potential impacts to water, sewer, stormwater and solid waste utilities under the EIS Alternatives.

No Action Alternative

Under the No Action Alternative, utility-related conditions would primarily relate to the approximately 211,000 gsf of building development under the current *2003 CMP*. The approximately 211,000 gsf of building development would represent approximately three percent of the amount of development on campus assumed under Alternatives 1 through 5, and the potential for utility-related impacts on the University of Washington campus would be substantially less than under Alternatives 1 through 5. For example, the increase in

water and sewer demand under the No Action Alternative would be approximately one (1) percent compared to an approximately 26 percent increase under Alternatives 1 through 5.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 reflects the preferred allocation of building development and building heights under the *2018 Seattle Campus Master Plan* and includes the development of 6.0 million gsf of building area throughout the University of Washington Seattle campus, with a focus of development in the West and South Campus sectors, and lesser levels of development in the Central and East Campus sectors.

Water Supply

Assumed development under Alternative 1 would result in increased demands on the water supply and distribution system. The University of Washington has maintained a commitment to reduce water usage on campus and it is anticipated that new development on the campus would include efficient plumbing fixtures; water-conservation landscaping and water reuse opportunities that would meet current standards/regulations and could reduce water demand. The water distribution system on the University of Washington campus is considered adequately sized to meet current and anticipated future demands under Alternative 1.

Under Alternative 1, long-term operations under the *2018 Seattle Campus Master Plan* would generate additional demands on the water supply. Water demand would increase by an estimated 26 percent; **Table 3.14-4** shows the projected increase in water consumption by 2028.

Table 3.14-4
PROJECTED INCREASE IN WATER DEMAND - 2028

Net Increase in Sq. Ft.	Annual Gallon Increase	Percent Increase over 2015 levels
6.0 million	174.0 million[1]	26

Source: University of Washington Capital Projects Office, 2016.
[1] Assumes 29 gallons per building gsf per year at buildout in 2028.

The water distribution system on the University of Washington campus is considered adequately sized to meet current and anticipated future demands. Taps connecting new facilities to the existing system would be required as construction occurs.

Sanitary Sewer

Campus development under Alternative 1 would result in greater demands on the sewer systems serving the University of Washington campus. Given the focus of development in the West and South Campus sectors, increased sewer demands would be relatively equally distributed between the Seattle Public Utility system serving the West Campus (3.0 million gsf) and the University of Washington system serving the South, Central, and East Campus sectors (3.0 million gsf).

As indicated in **Table 3.14-5** below, a total increase in sewage outflow of approximately 132.0 million gallons annually (increase of approximately 26 percent over existing flows) is assumed under Alternative 1 by 2028.

Table 3.14-5
PROJECTED INCREASE IN SEWER DEMAND - 2028

Increase in Campus Building Area (GSF)	Annual Gallon Increase	Total Annual Gallons Generated on Campus	Percent Increase over 2015 levels
6.0 million	132.0 million	495.0 million	26

Source: University of Washington Capital Projects Office, 2016.

1. Assumes 22 gallons per building square foot per year at buildout in 2028.

New development assumed under Alternative 1 would connect to the current sanitary sewer systems owned and operated by the University of Washington and Seattle Public Utilities. The existing systems serving the University of Washington campus are considered adequately sized to meet current and anticipated future demands, although specific improvements could be required when individual projects are proposed.

Consistent with current University of Washington policy, as individual development projects in areas currently containing combined sewer/stormwater piping systems, the combined systems would be converted to separated sewer and stormwater systems, as feasible. As indicated in **Figure 3.14-2** (presented later in this section), portions of the Central Campus sector contain combined sewer/stormwater piping systems and the feasibility of separating the combined systems would be considered as elements of individual projects within those areas.

Stormwater Drainage

Stormwater runoff is directly related to the amount of impervious surfaces in a given area. As indicated in **Table 3.14-6**, under Alternative 1 development would result in an overall increase in impervious surfaces associated with buildings and paths/walkways; however, there would be a reduction in impervious surfaces associated with streets and surface

parking areas. The overall increase in impervious surfaces compared to 2015 conditions would be approximately two (2) percent.

Table 3.14-6
ALTERNATIVE 1 IMPERVIOUS SURFACE (ACRES)

	Streets	Surface Parking	Buildings	Paths/Walkways	TOTAL
2015 Conditions	65	64	134	77	**340**
Alt. 1 Conditions	61	22	162	104	**349**

Source: Sasaki Architects, 2016.
Note: Calculations for Alternative 1 reflect conditions with increases in maximum building heights.

The University of Washington and Seattle Public Utilities stormwater drainage systems are anticipated to have adequate capacity to accommodate the small increase in impervious surfaces and associated increase in stormwater runoff under Alternative 1. Development may require that new taps to the system(s) be established as construction occurs.

Additionally, the separation of the remaining combined sewer and stormwater systems throughout campus would occur as described under Sanitary Sewer. Any retrofits or changes to the current system would be undertaken according to City of Seattle standards.

Solid Waste

Solid waste generation rates associated with development under Alternative 1 would be anticipated to be consistent with current trends. It is estimated that approximately 60 percent or more of campus solid waste would continue to be recycled. Given the trend of increased percentage of recycled material, the amount of solid waste transferred to a landfill with campus development under Alternative 1 could be less on a proportional basis than the proportional increase in campus building area.

Campus Sectors

West Campus

With potential development under Alternative 1, approximately 3.0 million gsf would be added to the West Campus sector. This sector would contain a total of approximately 6.8 million gsf of building space which would equate to approximately 30 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 1, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for water, sewer, stormwater and solid waste service.

Utilities serving new development in the West Campus sector under Alternative 1 include the following: water – University of Washington conveying water from SPU; sewer – combination of University of Washington and SPU systems; stormwater – SPU; and, solid waste – University of Washington.

South Campus

Approximately 1.35 million gsf of development would be included in the South Campus sector under Alternative 1. In total, this sector would contain approximately 5.55 million gsf of building space, which would equate to approximately 25 percent of the overall building space on campus. Under Alternative 1, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for water, sewer, stormwater and solid waste.

Utilities serving new development in the South Campus sector under Alternative 1 include the following: water – University of Washington conveying water from SPU; sewer – University of Washington; stormwater – primarily University of Washington along with SPU and direct discharge; and, solid waste – University of Washington.

Central Campus

With potential development under Alternative 1, approximately 0.9 million gsf of new development would be added to the Central Campus sector. This sector would have a total of approximately 8.0 million gsf of building space which would equate to approximately 35 percent of the overall building space on campus. Under Alternative 1, the Central Campus sector would have the highest percentage of building space on campus and would be anticipated to have the highest demand for water, sewer, stormwater and solid waste.

Utilities serving new development in the Central Campus sector under Alternative 1 include the following: water – University of Washington conveying water from SPU; sewer – University of Washington; stormwater – primarily University of Washington along with SPU and direct discharge; and, solid waste – University of Washington.

As indicated above, because the Central Campus sector contains the historic core of the University of Washington and contains the oldest sewer piping on campus, Central Campus contains isolated areas of combined piping (refer to **Figure 3.14-1**). As individual development projects in portions of the Central Campus sector containing combined systems are proposed, the combined systems would be converted to separate sewer and stormwater systems, as feasible. The resulting sewer and stormwater systems would be sized consistent with applicable standards, and significant impacts would not be anticipated.

East Campus

Approximately 0.75 million gsf of new development would be added to the East Campus sector under Alternative 1. In total, this sector would contain approximately 2.25 million gsf of building space, which would equate to approximately 10 percent of the overall building space on campus. Under Alternative 1, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for water, sewer, stormwater and solid waste. It should be noted that the East Campus sector contains the majority of the University's athletic facilities and these facilities typically generate a temporary increase in water and sewer demand, as well as solid waste generation, during sporting events (football games, basketball games, etc.) Development under Alternative 1 would not generate any additional events beyond the existing conditions.

Utilities serving new development in the East Campus sector under Alternative 1 include the following: water – University of Washington conveying water from SPU; sewer – University of Washington; stormwater – University of Washington; and, solid waste – University of Washington.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Primary and Secondary Impact zones were identified as part of the City-University Agreement and these zones are included for discussion and analysis in this EIS. The University of Washington is centrally located within the Primary and Secondary Impact Zones

With the focus of development in the West and South Campus sectors (73 percent of development) under Alternative 1, these sectors would have the greatest increase in development and associated increase in demand for utilities on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sector under Alternative 1. As a result, there would be less potential for increased demand for utilities in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses and associated utilities in the **Secondary Impact Zone** from development assumed under Alternative 1, the potential for increased utility demands on campus to affect utilities would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utilities impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 2 – Campus Development with Existing Height Limits

Under Alternative 2, 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with a focus of development in the West, South, and East Campus sectors, and lesser levels of development in the Central Campus sector. Existing building heights would be retained under this alternative.

Water Supply

As under Alternative 1, assumed development under Alternative 2 would result in increased demands on the water supply and distribution system. It is anticipated that new development on the campus would include efficient plumbing fixtures, water-conservation landscaping and water reuse opportunities that can reduce water demand. The water distribution system on the University of Washington campus is considered adequately sized to meet current and anticipated future demands under Alternative 2.

Sanitary Sewer

As under Alternative 1, assumed development under Alternative 2 would result in increased demands on the sewer systems on campus at similar levels as under Alternative 1. As under Alternative 1, existing systems serving the University of Washington campus would be adequate to serve Alternative 2 sewer demands.

Stormwater

Stormwater runoff conditions under Alternative 2 would be generally similar to those under Alternative 1. However, it is anticipated that the amount of impervious surface area would increase when compared to Alternative 1 (i.e. no area reserved for the potential West Campus Green and additional potential development would occur in that area), and, accordingly, the amount of stormwater runoff generated by development would be greater. Even with this increase in impervious surface area, the stormwater drainage systems are anticipated to have adequate capacity to accommodate the small increase in impervious surfaces and associated increase in stormwater runoff.

Although Alternative 2 assumes more development in the East Campus sector (0.75 million gsf under Alternative 1 compared to 1.35 million gsf under Alternative 2), the amount of impervious surface in the East Campus sector would not substantially increase given the current impervious surface nature (i.e., parking area E1) associated with the majority of the potential development sites identified for the East Campus sector.

Solid Waste

Solid waste conditions under Alternative 2 would be similar to those under Alternative 1.

Campus Sectors

West Campus

With potential development under Alternative 2, approximately 2.4 million gsf would be added to the West Campus sector. This sector would contain a total of approximately 6.2 million gsf of building space which would equate to approximately 27 percent of the overall building space on campus (approximately 22.6 million gsf). Under Alternative 2, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for utilities. However, the potential increase in demand for utilities would be anticipated to be similar to or slightly less than under Alternative 1 due to the lower amount of potential development density. However, because the area reserved for the West Campus Green under Alternative 1 would be in impervious surfaces under Alternative 2, the amount of stormwater runoff would be greater than under Alternative 1.

South Campus

The amount of potential development in the South Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in utility demand would also be the same as under Alternative 1.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 2 would be the same as Alternative 1. Potential increases in utility demand would also be the same as under Alternative 1. The amount of new development in the Central Campus sector that could result in the separation of currently combined sewer and stormwater piping systems under Alternative 2 would be the same as under Alternative 1.

East Campus

Approximately 1.35 million gsf of potential new development would be added to the East Campus sector under Alternative 2. In total, this sector would contain approximately 2.85 million gsf of building space, which would equate to approximately 13 percent of the overall building space on campus. Under Alternative 2, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for utilities. However, the potential increase in demand for utilities in the East Campus sector would greater than under Alternative 1 due to the increased amount of development. It should be noted that the East Campus sector contains the majority of the University's athletic facilities and these facilities typically generate a

temporary increase in water and sewer demand, as well as solid waste generation during sporting events (football games, basketball games, etc.). Development under Alternative 2 would not be anticipated to generate any additional events beyond the existing conditions.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, South and East Campus sectors (85 percent of development under Alternative 2), these sectors would have the greatest increase in development and associated potential increase in demand for utilities on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to East Campus).

Less development is assumed to occur in the West Campus sector under Alternative 2. As a result, there would be less potential for increased demand for utilities in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses and associated utilities in the **Secondary Impact Zone** from development assumed under Alternative 2, the potential for increased utility demands on campus to affect utilities would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Under Alternative 3, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus, with an increase in development in the West and South Campus sectors compared to Alternative 1.

Water Supply

Assumed development under Alternative 3 would result in increased demands on the water supply and distribution system, similar to Alternative 1. It is anticipated that new development on the campus would include efficient plumbing fixtures, water-conservation landscaping and water reuse opportunities that can reduce water demand. The water distribution system on the University of Washington campus is considered adequately sized to meet current and anticipated future demands under Alternative 3.

Sanitary Sewer

Assumed development under Alternative 3 would result in increased demands on the sewer systems on campus at similar levels to Alternative 1. As under Alternative 1, existing systems serving the University of Washington campus would be adequate to serve Alternative 3 sewer demands.

Stormwater

Stormwater runoff conditions under Alternative 3 would be similar to those under Alternative 1.

Solid Waste

Solid waste conditions under Alternative 3 would be similar to those under Alternative 1.

Campus Sectors

West Campus

With potential development under Alternative 3, the approximately 3.2 million gsf would be added to the West Campus sector. This sector would contain a total of approximately 7.0 million gsf of building space which would equate to approximately 31 percent of the overall building space on campus. Under Alternative 3, the West Campus sector would have the second highest percentage of building space on campus and would be anticipated to have the second highest demand for utilities. The increase in utility demand is anticipated to be greater than under Alternative 1 due to additional development density under Alternative 3.

Given that area would be reserved for the potential West Campus Green under Alternative 3, the amount of impervious surface and corresponding stormwater runoff in the West Campus sector would be similar to or less than under Alternative 2 which assumed development of the area reserved for the West Campus Green.

South Campus

Approximately 1.65 million gsf of development would be included in the South Campus sector under Alternative 3. In total, this sector would contain approximately 5.85 million gsf of building space, which would equate to approximately 26 percent of the overall building space on campus. Under Alternative 3, the South Campus sector would have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for utilities. But, the increase in utility demand under Alternative 3 would be greater than Alternative 1 due to additional development density.

Central Campus

The amount of potential development in the Central Campus sector under Alternative 3 would be the same as Alternative 1. Potential increases in utility demand would also be the same as under Alternative 1. The amount of new development in the Central Campus sector that could result in the separation of currently combined sewer and stormwater piping systems under Alternative 3 would be the same as under Alternative 1.

East Campus

Approximately 0.25 million gsf of potential new development would be added to the East Campus sector under Alternative 3. In total, this sector would contain approximately 1.75 million gsf of building space, which would equate to approximately eight percent of the overall building space on campus. Under Alternative 3, the East Campus sector would have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for utilities. The potential increase in utility demand in the East Campus sector would be lower than under Alternative 1 due to the lower amount of development density.

It should be noted that the East Campus sector contains the majority of the University's athletic facilities and that these facilities typically generate a temporary increase in water and sewer demand, as well as solid waste generation during sporting events (football games, basketball games, etc.), but that development under Alternative 3 would not be anticipated to generate any additional events beyond the existing conditions.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), these sectors would have the greatest increase in development and associated potential increase in demand for utilities on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus)

Less development is assumed to occur in the Central and East Campus sector under Alternative 3. As a result, there would be less potential for increased demand for utilities in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses and associated utilities in the **Secondary Impact Zone** from development assumed under Alternative 3, the potential for increased utility demands on campus to affect utilities would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1.

Water Supply

Similar to Alternative 1, assumed development under Alternative 4 would result in increased demands on the water supply and distribution system. It is anticipated that new development on the campus would include efficient plumbing fixtures, water-conservation landscaping and water reuse opportunities that can reduce water demand. The water distribution system on the University of Washington campus is considered adequately sized to meet current and anticipated future demands under Alternative 4.

Sanitary Sewer

Assumed development under Alternative 4 would result in increased demands on the sewer systems on campus at similar levels to Alternative 1. As under Alternative 1, existing systems serving the University of Washington campus would be adequate to serve Alternative 4 sewer demands.

Stormwater

Stormwater runoff conditions under Alternative 4 would be similar to those under Alternative 1.

Solid Waste

Solid waste conditions under Alternative 4 would be similar to those under Alternative 1.

Campus Sectors

West Campus

The amount of potential development in the West Campus sector under Alternative 4 would be the same as Alternative 1. Potential increases in utility demand would also be the same as under Alternative 1.

South Campus

Approximately 0.2 million gsf of development would be included in the South Campus sector under Alternative 4. In total, this sector would contain approximately 4.4 million gsf of building space, which would equate to approximately 20 percent of the overall building space on campus. Under Alternative 4, the South Campus sector would still have the third highest percentage of building space on the campus and would be anticipated to have the third highest demand for utilities. However, the increase in demand for utilities under Alternative 4 would be less than under Alternative 1 due to the lower amount of potential development.

Central Campus

With potential development under Alternative 4, approximately 1.1 million gsf of new development would be added to the Central Campus. This sector would have a total of approximately 8.2 million gsf of building space which would equate to approximately 36 percent of the overall building space on campus. Under Alternative 4, the Central Campus sector would have the highest percentage of building space on campus and would be anticipated to have the highest demand for utilities. The potential increase in demand for utilities would also be greater than under Alternative 1 due to increased amount of development density under Alternative 4. The amount of new development in the Central Campus sector that could result in the separation of currently combined sewer and stormwater piping systems under Alternative 4 would be greater than under Alternative 1.

East Campus

Approximately 1.7 million gsf of potential new development would be added to the East Campus sector under Alternative 4. In total, this sector would contain approximately 3.2 million gsf of building space, which would equate to approximately 14 percent of the overall building space on campus. Under Alternative 4, the East Campus sector would still have the lowest percentage of building space on the campus and would be anticipated to also have the lowest demand for public services. However, the potential increase in demand for utilities in the East Campus sector would be greater than under Alternative 1 due to the increased development density under Alternative 4.

It should be noted that the East Campus sector contains the majority of the University's athletic facilities and these facilities typically generate a temporary increase in water and sewer demand, as well as solid waste generation during sporting events (football games, basketball games, etc.). Development under Alternative 4 would not be anticipated to generate any additional events beyond the existing conditions.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area.

With the focus of development in the West, Central, and East Campus sectors (97 percent of development under Alternative 4), these sectors would have the greatest increase in development and associated potential increase in demand for utilities on the campus and would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent to West Campus), the residential neighborhood north of NE 45th Street (across from Central Campus) and the Laurelhurst neighborhood and University Village (adjacent to East Campus).

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential for increased demand for utilities in the Primary Impact Zone adjacent to this sector.

Given the distance of land uses and associated utilities in the **Secondary Impact Zone** from development assumed under Alternative 2, the potential for increased utility demands on campus to affect utilities would be anticipated to be lower in the Secondary Impact Zone.

Compliance with existing University regulations and codes, and those of local agencies, would minimize the potential for utility impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street or aerial vacations would occur. Neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in East Campus, would occur. Alternative 5 would not result in an increase in building area compared to Alternatives 1 through 4, and utilities demand conditions under Alternative 5 would be similar to those identified under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall utility demand (water, sewer, stormwater control and solid waste) in the area and, in combination with future new development in the area, would contribute to the overall utility systems. To the extent that increased campus population and development increase

the pressure for supporting development in the area (primarily in the University District), campus growth could contribute to utility demands in the area.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to provide building development to accommodate a portion of anticipated demand, potentially transferring a portion of the utility demands from the University of Washington campus to surrounding areas.

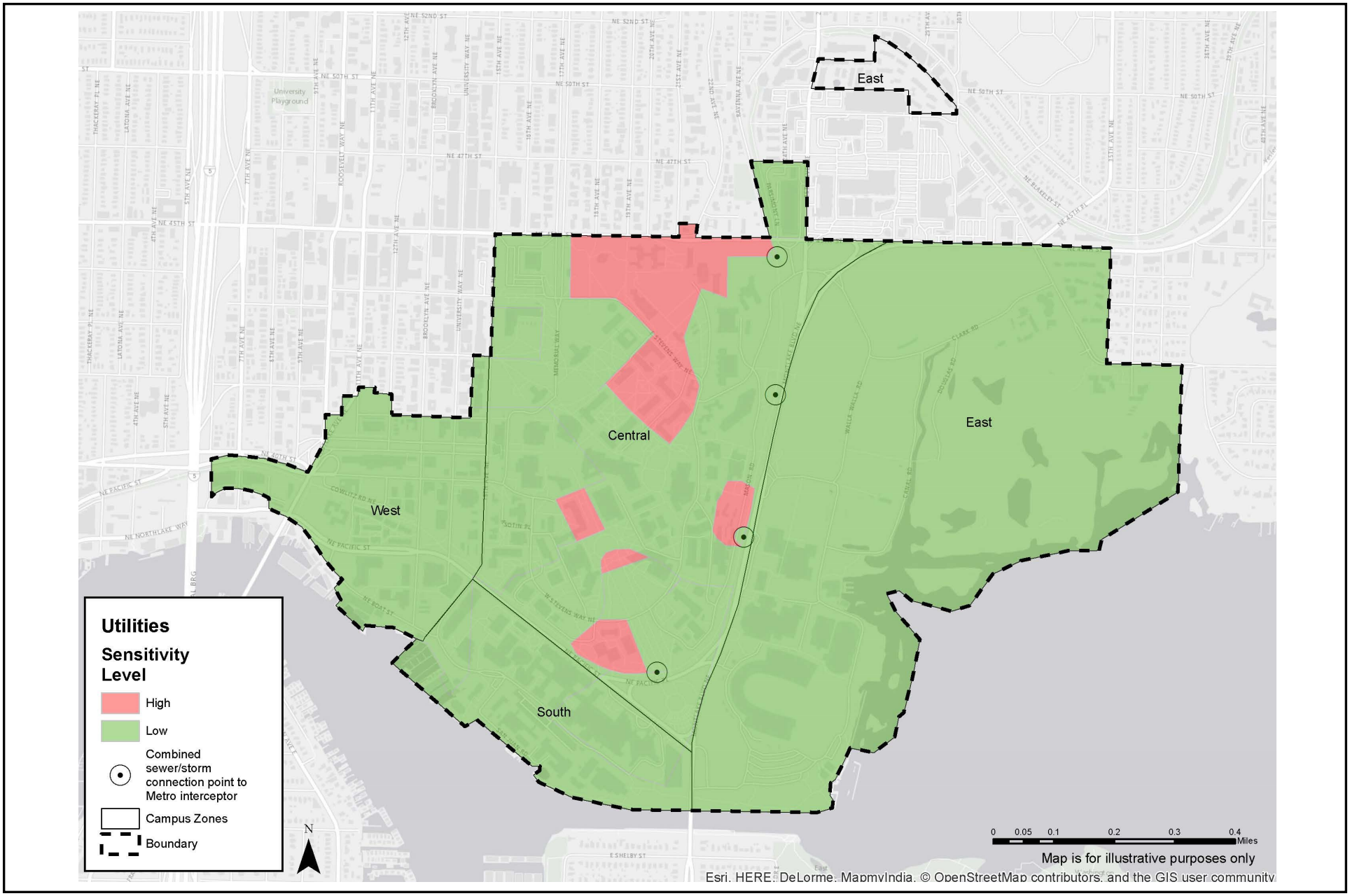
Potential changes in the zoning and development capacity of the University District could result in increased development and associated utilities demand in the vicinity of the University of Washington campus. Although the level, timing and specific location(s) of future development in the University District is not defined, it is possible that some level of concurrent development, and associated utility demand, would occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan*, especially given the proposed focus of development in the West Campus sector under Alternatives 1 through 5. The *University District Urban Design EIS* indicates that "development under any of the alternatives would create additional load on the utility infrastructure in the U District". The *University District Urban Design EIS* also indicates that "no significant unavoidable adverse impacts to utilities are anticipated."

All construction activities in the area, both on the University of the Washington campus and in the campus vicinity, would be required to follow applicable regulations, and significant impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts. The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects under the *2018 Campus Master Plan* and would complete a SEPA analysis/threshold determination on individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as "High", "Medium" or "Low" (see **Figure 3.14-2**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.14-2
Utilities Sensitivity Map

defined. For example, utilities issues associated with combined sewer/stormwater overflow associated with combined piping, the portions of the University of Washington campus served by combined sewer/stormwater piping system is identified as having a "High" potential to encounter sensitive utilities conditions. Areas of campus served by separated piping systems are identified as having a "Low" potential to encounter sensitive utilities conditions. For water, the entire University of Washington campus is considered to have a "Low" potential to encounter sensitive utilities conditions.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.14.3 Mitigation Measures

The proposed *2018 Seattle Campus Master Plan* includes goals and objectives to create a more sustainable environment. These policies would guide future campus development and would indirectly relate to the overall utilities demand. In addition to compliance with applicable regulations related to construction and operations, the following potential measures are intended to further reduce the potential for energy demand impacts.

Measures Applicable to All Campus Sectors (Low and High Potential)

Water

- Use of low- or no-flow fixtures and other water saving devices would be utilized as feasible.
- Collection and re-use of stormwater for non-potable uses (i.e. irrigation, toilet flushing, etc.) would be utilized as feasible to reduce public water supply demand.
- Drip watering or low precipitation systems would be utilized as feasible for irrigation, and types of ground cover that requires less irrigation could continue to be utilized

Stormwater

- Low-Impact Demand design features could be considered to minimize stormwater runoff quantity.

Solid Waste

- University efforts to encourage the recycling of solid waste materials would continue to be implemented in the construction and operation of new facilities. The University Facilities Services Department would to implement recycling programs on the campus, including paper recycling, paper towel composting, food waste composting, electronic media recycling, Husky Football Recycling Outreach, waste collection solar kiosks, and special event recycling programs.

Measures Applicable to High Potential Campus Sectors

Sewer and Stormwater

- As potential development sites in Central Campus sector currently containing combined sewer/stormwater piping systems are proposed for development, the combined systems would be converted to separate sewer and stormwater systems, as feasible.

3.14.4 Significant Unavoidable Adverse Impacts

With implementation of the identified mitigation measures, no significant unavoidable adverse utility impacts are anticipated.

3.15 TRANSPORTATION

This section of the Draft EIS describes the existing transportation system on the University of Washington campus and in the site vicinity and evaluates the potential to the transportation system that could occur as a result of the *University of Washington 2018 Seattle Campus Master Plan* through the 10-year planning horizon, as assumed under the Draft EIS alternatives.

The Transportation Discipline Report (Transpo Group, October 2016) includes data, methods, and analysis results to support this section of the EIS. The transportation system and analysis encompasses the various transportation modes utilized by campus population, including the students, faculty, staff, and visitors to the campus. This report is in **Appendix F** of this EIS.

3.15.1 Affected Environment

Overview

This section describes the current transportation system that serves the University of Washington in Seattle. This system extends beyond the Major Institution Overlay (MIO) boundary and connects the students, faculty, staff, and visitors to homes and other destinations.

To evaluate impacts of an updated Campus Master Plan, this analysis explores the potential impacts consistent with the City University Agreement[1] (CUA), which defines the primary and secondary impact zones. Evaluation and monitoring of the transportation related impacts of the University will be conducted within these zones. Thus, the primary and secondary impact zone boundaries serve as the project study limits. As the names suggest, growth at the University of Washington is expected to have greater impacts in the primary impact zone with lesser impacts in the secondary impact zone. For this reason, the analysis conducted in the primary impact zone is more detailed, while analysis in the secondary impact zone will be less detailed. The impact zone boundaries are shown in **Figure 2-3**.

CUA (City University Agreement) An agreement between the City of Seattle and the University of Washington, that defines maximum parking and peak period trip thresholds.

Major Institution Overlay (MIO): The Major Institution Overlay is a boundary defined by the City of Seattle Land Use and Zoning Code, noting the extents of the University of Washington.

[1] 1998, amended November 29, 2004

Like most large campuses, the University of Washington has a large resident student population living in residence halls or in nearby housing that can easily walk to campus. As a major institution in a large dense urban city, the University of Washington relies on a well-developed, multi-modal transportation system to support mobility. This well-developed transportation system, described in this section, includes opportunities for students, faculty and staff to have access to a broad range of transportation choices – regional trails, expansive sidewalks, expansive and well connected bicycle facilities, light rail, frequent and regional bus service, a well-developed grid of arterial streets, and close access to interstate and state highways.

For its part, the University has encouraged optimization of this transportation system for its student, faculty, and staff population with the implementation of a robust Transportation Management Plan that includes the U-PASS and monitors utilization of the system through regular surveys conducted by the University of Washington Transportation Services (UWTS). Through transportation demand management and operation programs like the U-PASS, the University maintains an exceptionally low drive alone access mode, which results in a more efficient and sustainable use of the transportation system.

This section describes the current transportation system utilized by the University population of students, faculty, and staff including vehicle and bicycle parking. Because effects of growth on the transportation system are tied to the modes used, the proportion of students, faculty and staff using specific modes of travel is described in detail. This section is organized by major modes of travel, consistent with the UWTS Mode Hierarchy triangle (right). Based on information found in the 2014 UWTS Climate Action Strategy for Transportation, mode hierarchy is determined from average emissions of travel modes. Travel modes with lower carbon emissions—including walk, bicycle, and telecommute modes—are included at the top of the hierarchy, while higher-carbon travel modes such as driving alone are included at the bottom of the hierarchy.

Figure 3.15-1 UWTS Mode Hierarchy Triangle, Source: UWTS Climate Action Strategies for Transportation, 2014

For each mode of access, a description of the system and how that system is used today including demand, capacity, safety, and overall operations follows.

Mode of Access or Mode Split

A key element of the transportation analysis relies on mode of access, or how the students, faculty and staff choose to travel to and within the MIO. The University of Washington supports various transportation choices, allowing students, faculty, and staff opportunities

to choose transit, rideshare, and non-vehicle transportation options. Transportation mode choices for commuters traveling to and from campus are traditionally measured through an annual representative survey and using traffic counts conducted by the University of Washington. Current modes for campus populations of students, faculty, and staff include driving alone, carpooling, taking transit, walking, and riding bicycles. Student, faculty, and staff campus populations differ in transportation mode choice; students heavily favor pedestrian and transit modes, while faculty and staff drive alone in addition to utilizing transit. Over time, with the addition of the U-PASS program, non-SOV (single occupant vehicle) travel has increased for all population groups, while driving alone has declined. The mode split for the campus suggests that approximately 20% of the campus population travels by drive alone vehicles (based on 2015 survey data of modes).

A summary of the most recently available headcount population (year 2014) by mode they take for each campus group (students, faculty and staff) is provided in **Table 3.15-1** below.

Table 3.15-1
EXISTING (2014) HEADCOUNT BY MODE (POPULATION)

Population	Drive Alone	Carpool	Transit	Walk	Bicycle	Other	TOTAL
Students	3,720	1,887	19,894	16,277	3,165	270	45,213
Faculty	3,539	583	1,988	557	1,113	171	7,951
Staff	5,683	1,966	7,280	693	1,300	411	17,333
Total Population	**12,942**	**4,436**	**29,162**	**17,527**	**5,578**	**852**	**70,497**

Source: Transpo Group, 2015.

Another illustration of this composition of a majority of trips by modes other than drive alone to campus is provided as a proportional graph showing the most recent mode split survey from 2015 by population. By size it reflects the high student population (as compared to faculty and staff). As shown, considering all trips that access the campus today, over 50% of the total campus trips are low impacting walk and transit trips (28% of all trips are student walk and 25% of are trips are student transit). This is due in large part to the University of Washington's aggressive and successful actions to promote lower impacting modes of travel.

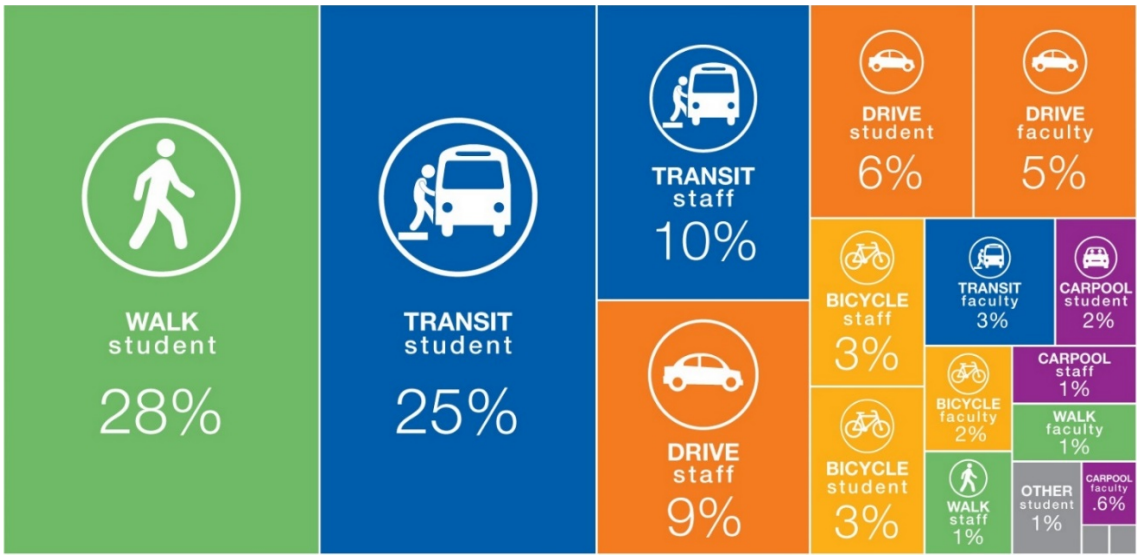
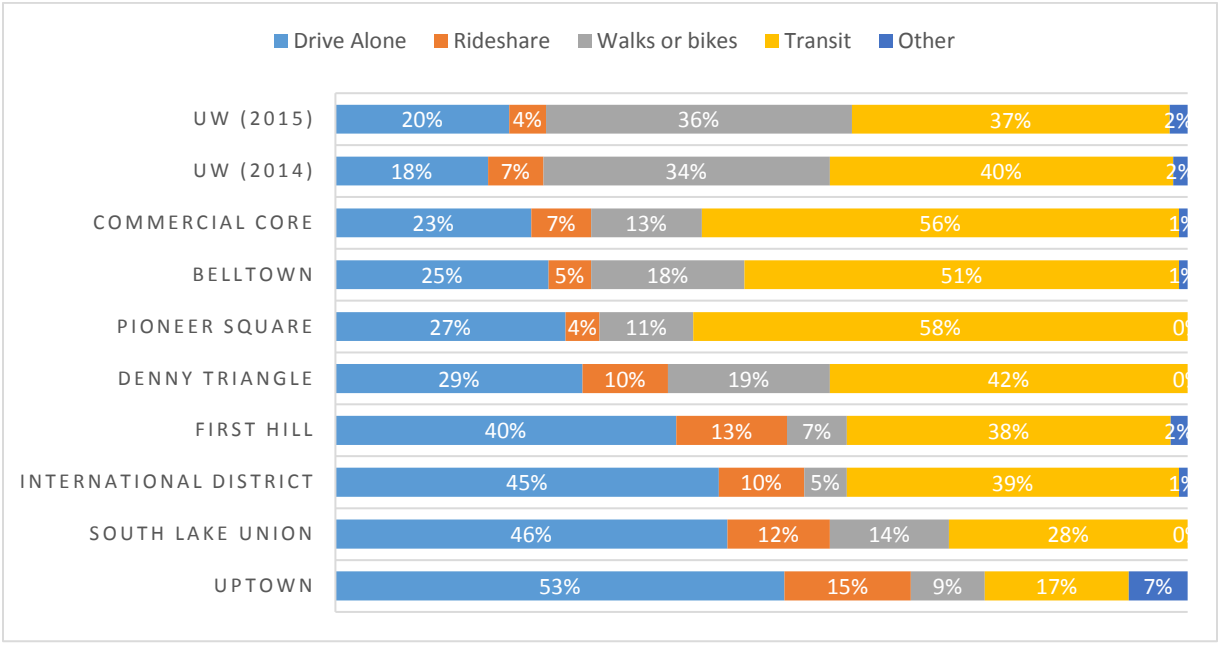


Figure 3.15-2 2015 Total Campus Mode Choice Visual Representation

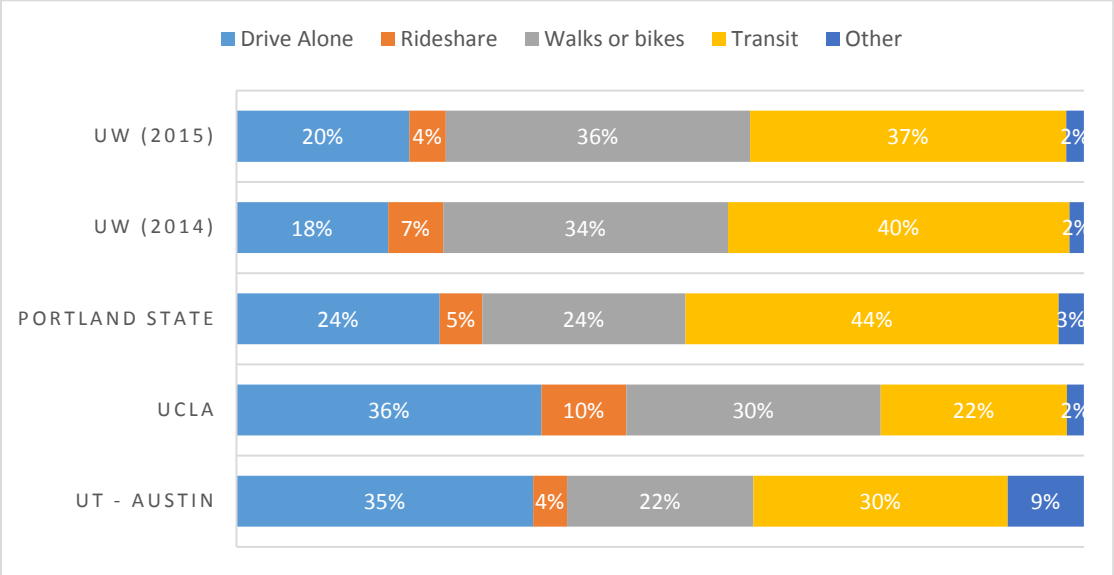
How Does the University of Washington Compare? The University of Washington performs very well locally compared to other urban neighborhoods and to peer institutions. As compared to other City of Seattle neighborhoods, the University of Washington has one of the most successful programs for limiting drive alone vehicular demand. **Figure 3.15-3** provides a comparison of the University of Washington mode splits to other neighborhoods in the City of Seattle. As shown, the campus operates with the lowest drive alone percentage (just 20%) as compared to these neighborhoods.



Source: Commute Seattle Center City Commuter Mode Split Survey, 2014 and University of Washington, 2015

Figure 3.15-3 Existing Neighborhood Mode Share Comparison

The University of Washington also compares well to large peer universities in urban cities with developing transit systems as shown in **Figure 3.15-4**. Compared to nearby Seattle University, another university in an urban neighborhood of Seattle, University of Washington has maintained a much lower drive alone percentage. For example, in 2007, Seattle University reported a 39% drive alone percentage as compared to 23% reported at University of Washington for the same year.



Source: Transpo, 2016; University of Washington, Portland State University, University of California – Los Angeles, and University of Texas – Austin

Figure 3.15-4 Existing Peer University Comparison

Background Improvements

For each of the transportation system elements, the analysis considers the existing and future facilities and volumes. The impacts of the development alternatives are measured based on a comparison of No Action conditions to conditions under the development alternatives. The degree of the impacts as reported inform the nature and level of mitigation that may be necessary to offset significant impacts. Where significant impacts cannot be mitigated, those are identified as significant unavoidable adverse impacts.

The Campus Master Plan reflects a 10-year planning horizon with a base year for development to begin in 2018 and extending to 2028. A general list of the City and regional investments anticipated between today (2016) and 2028 are noted below. These investments are considered as part of the background conditions for the different transportation modes.

Table 3.15-2
BACKGROUND IMPROVEMENTS BY 2028

Type of Improvements	Description
Pedestrians	New multiuse trail across the Montlake Cut connecting the University of Washington with the Washington Park Arboretum as part of the Move Seattle Levy. Continued modifications of the regional Burke-Gilman trail through the University of Washington. Green streets are intended to enhance and expand public open space give priority to pedestrian circulation and open space over other transportation uses. Green streets use treatments that may include sidewalk widening, landscaping, traffic calming, and other pedestrian-oriented features. Brooklyn Avenue, NE 43rd Street and NE 42nd Street are designated green streets in the University District.
Bicycles	As part of the Move Seattle Levy, protected bicycle lanes (PBL) on N 50th Street, 35th Avenue NE and bicycle lanes on Brooklyn Ave N are proposed. PBLs have also been identified along 15th Avenue; however, concepts have not been developed making it unclear how these lanes would be implemented. PBLs have not been identified in the Seattle Bicycle Master Plan 2016-2020 Implementation Plan.
Transit	The Transit Master Plan identifies Multimodal Transit Corridor enhancements along Roosevelt Way NE/11th Avenue NE/Eastlake Avenue NE, 15th Avenue NE/NE Pacific Street/23rd Avenue NE (extension of Montlake) and Market Street/NE 45th Street. Completion of Sound Transit 2 extension of Link Light rail from the University of Washington Station to Lynnwood including an additional light rail station near campus (University District at Brooklyn Avenue). Expansion of King County Metro Express, Frequent/Rapid Ride and Local service identified in Metro Connects the King County Metro Long Range Plan.
Vehicle	A second Montlake Boulevard Bascule Bridge has been identified as part of the SR 520 Bridge Replacement, which is funded as part of the Connecting Washington Partners Projects and is expected to be completed by 2027.
Freight	The draft Seattle Freight Master Plan includes designation of a network prioritized for use by freight. This plan identifies 45th Street, Pacific Street and Montlake Avenue, and the Roosevelt 11th Avenue couplet as Minor Truck Streets. There are not planned infrastructure investments identifies in the project area.

Source: State Route 520 Bridge Replacement and HOV Project High Capacity Transit Plan (2008), King County Metro Draft Long-Range Plan Summary (2016), Sound Transit 2 (2008), City of Seattle Draft Pedestrian Master Plan (2016), City of Seattle Bicycle Master Plan (2015), City of Seattle Transit Master Plan (2016), and City of Seattle Draft Freight Master Plan, U District Green Streets Concept Plan (2015).

Guiding future City infrastructure investments, the City of Seattle has also developed modal plans (Pedestrian Mobility Plan, Bicycle Mobility Plan, Transit Mobility Plan, and Freight Mobility Plan) that identify projects and corridor needs. These plans support an aspirational, long-range, often 20-year, horizon and may not include implementation timelines or details on how infrastructure could change. Where details are provided on implementation of investments, for example lane designations or modifications, those changes have been

reflected as part of the background analysis and carried forward in the analysis of alternatives.

Anticipated Background and Proposed Growth

The City has published a draft 2035 Comprehensive Plan (the "City 2035 Plan") as well as a U District Rezone Proposal that identifies increased density and heights in the University District surrounding the University District Station. The City 2035 plan includes an increase of 120,000 residents and 115,000 jobs, citywide by 2035. The U District Urban Design process suggests a potential increase in building heights over the Seattle 2035 Comprehensive Plan levels. The Comprehensive Plan measures traffic impacts using screenlines that aggregate growth across key screenlines. The two screenlines from the Comprehensive Plan that apply to the Primary Impact Zone are noted in **Table 3.15-3**.

Table 3.15-3
EXISTING SCREENLINE ANALYSIS

Screenline	Screenline Volume	Capacity	V/C	LOS Standard V/C
5.16 – Ship Canal, University and Montlake Bridges				
Northbound	3,340	3,850	0.87	1.20
Southbound	3,615	3,850	0.94	1.20
13.13 – East of I-5, NE Pacific Street to NE Ravenna Boulevard				
Eastbound	3,245	6,100	0.53	1.00
Westbound	3,620	6,100	0.59	1.00

Source: NACTO, Seattle Comprehensive Plan Update EIS, and Transpo Group, 2016.

Pedestrian Facilities

According to the UWTS survey, roughly one-third of trips accessing campus are walking trips.

The system of pedestrian facilities serving the University of Washington consists of a network of pathways and sidewalks throughout campus. The pathways have been designated as Major or Minor in the Campus Master Plan. Major pathways for pedestrians include the Burke-Gilman Trail, Stevens Way, Memorial Way NE/17th Avenue NE, and NE Campus Parkway, as well as connecting pathways through Red Square, Rainier Vista, and the Quad, among others. The Burke-Gilman Trail—although under City of Seattle jurisdiction in other neighborhoods—is owned and maintained by the University of Washington within the MIO boundary. Minor pedestrian pathways function as connections between major routes, including pedestrian pathways between the HUB and Drumheller

Fountain, and sidewalks along 19th Avenue NE and in the vicinity of Husky Stadium, among others.

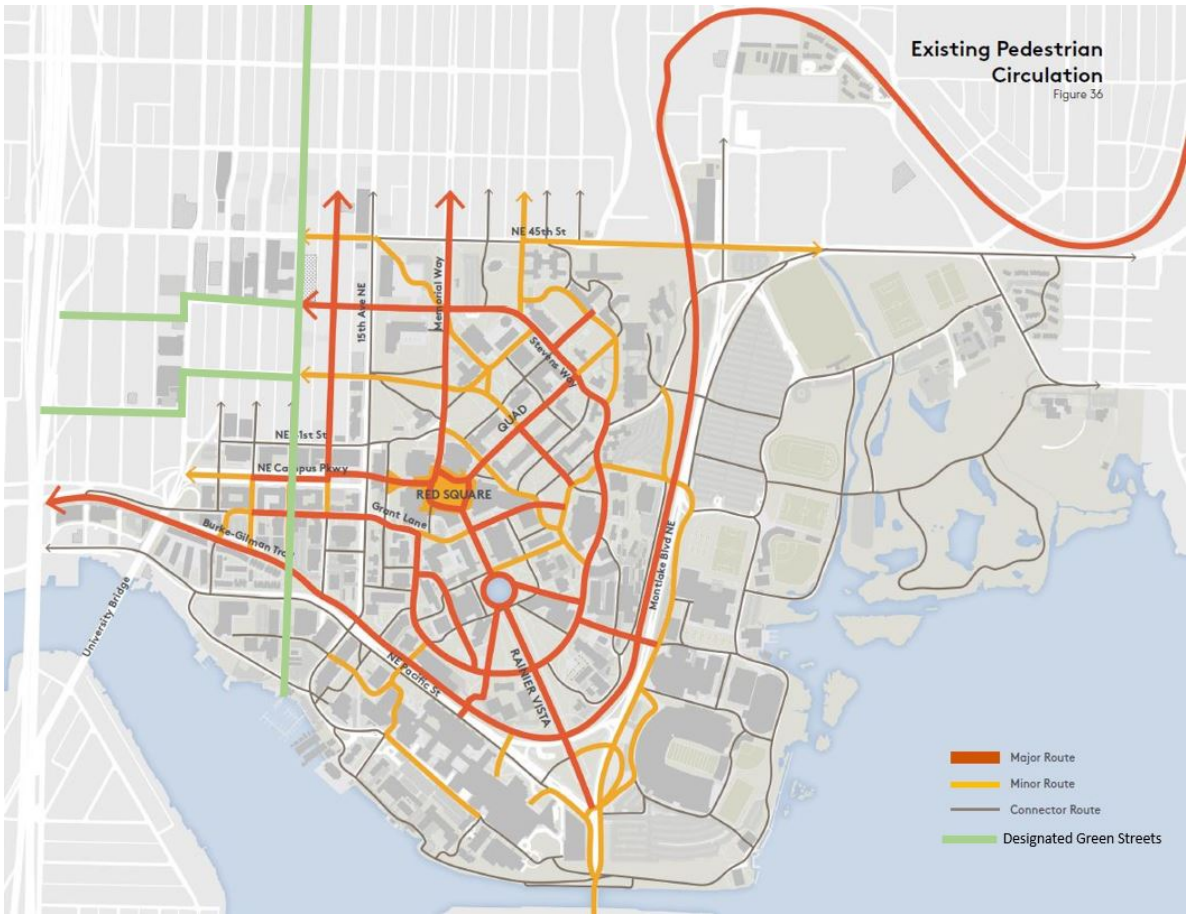
Central Campus is separated from other subareas of campus by a series of barriers including 15th Avenue NE, NE Pacific Street and Montlake Boulevard NE as well as topographical and ADA barriers. Some of these barriers are noted in **Figure 3.15-5.** The City of Seattle's Draft Pedestrian Master Plan Update identifies locations within the City with missing sidewalks, with widely spaced crosswalks and safety concerns; however, no specific projects have been identified to correct those barriers at this time.

Source: Sasaki, October 2016 CMP

Figure 3.15-5 Barriers and Existing Edge Conditions

Pedestrian connectors function as sidewalks and pathways less traveled than major and minor routes. For example, sidewalks along 18th Avenue NE and pedestrian pathways along Snohomish Lane and Walla Walla Road are classified as pedestrian connectors. The network of existing pedestrian facilities generally within the campus are shown in **Figure 3.15-6**. The pedestrian network outside the campus is also well developed and serves the pedestrians

commuting from nearby residential areas, generally north and west. Standard city sidewalks are provided along the major arterials in the area.



Source: Sasaki, October 2016 CMP

Figure 3.15-6 Existing Pedestrian Facilities Classifications

Bridges and pedestrian connection points provide pedestrian access throughout campus. Existing pedestrian bridges provide grade separated access with no vehicle conflicts over the arterials surrounding the campus. Across Montlake Boulevard pedestrian bridges are located at NE Pacific Place, Snohomish Lane N, Wahkiakum Road, and the E1 parking area. These pedestrian bridges provide access to Husky Stadium, Alaska Airlines Arena, and other University of Washington athletic facilities, as well as the University of Washington Link Light rail Station. Pedestrian routes between campus and University Village, the Center for Urban Horticulture, and neighborhoods east of Montlake Boulevard utilize these pedestrian bridges. Across NE Pacific Street, pedestrian bridges at the T-Wing overpass and the Hitchcock overpass connect the campus and Burke-Gilman trail with the University of Washington Medical Center. Aside from these connections there is only one at-grade crossing of NE Pacific Street for pedestrians. Across 15th Avenue NE there is one pedestrian

bridge at approximately Campus Parkway connecting Red Square and the Henry Art Gallery with Schmitz Hall. Other at-grade crossings of 15th Avenue occur at signal controlled intersections at Pacific/Burke-Gilman Trail, mid-block near Guthrie Annex, NE 40th/Stevens Way, NE 42st Street, NE 42nd Street, NE 43rd Street and NE 45th Street.

Through an evaluation of the Washington Department of Transportation (WSDOT) and the Seattle Department of Transportation (SDOT) information, there were 49 collisions that involved pedestrians. This results in an average of 16 per year for this 8-year period. Of the pedestrian collisions, 4 were reported at the Brooklyn Avenue NE/NE 50th Street, Roosevelt Way NE/NE 45th Street, and 11th Avenue NE/NE 45th Street intersections, and 6 were reported at the Brooklyn Avenue NE/NE 45th Street intersection. Continued focus on pedestrian safety through implementation of the City Pedestrian Master Plan and Vision Zero will continue to improve the existing conditions.

Bicycle Facilities

The existing University of Washington bicycle system includes designated streets and pathways as well as end-of-trip facilities such as short-term bicycle parking, secured and covered bicycle parking and shower/changing facilities.

Figure 3.15-7 shows the existing bicycle network, including protected and unprotected bicycle lanes, shared lanes, and greenways and trails. NE Campus Parkway, NE 40th Street, and Roosevelt Way NE include protected bicycle lanes, while 11th Avenue NE, parts of Brooklyn Avenue NE, and parts of University Way NE include unprotected bicycle lanes. Stevens Way NE, Pend Oreille Road NE, and NE 45th Street have shared marked lanes for bicyclists, and the Burke-Gilman Trail provides a paved, flat route for bicyclists to travel throughout campus.

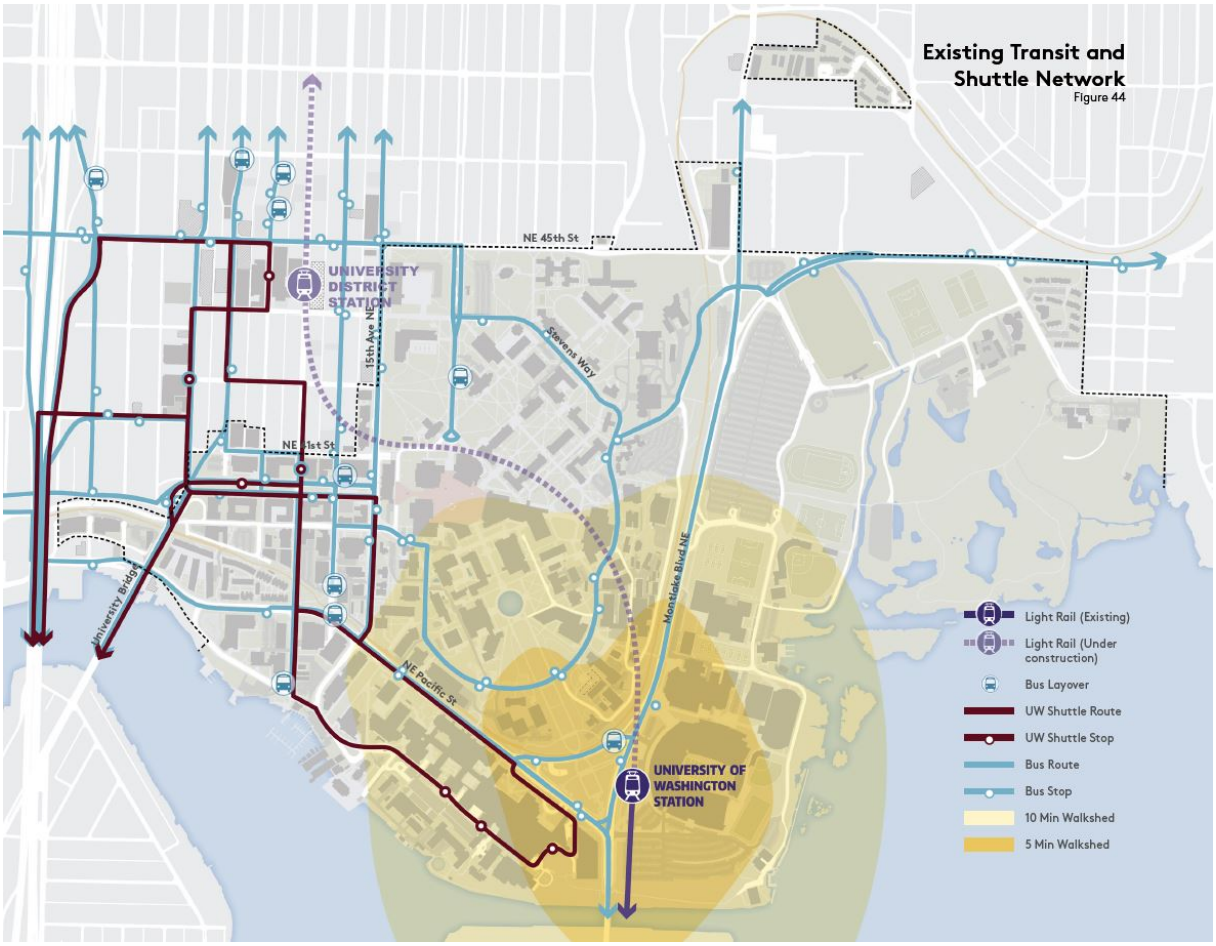
Figure 3.15-7 shows current bike facilities near or serving the campus. Bicycle facilities on campus are a priority. Stevens Way connects the protected bicycle lanes of NE Campus Parkway with the Burke-Gilman Trail, and provides a key opportunity for improving campus bicycle connectivity. Separating bicycle riders from other travel modes, as is done with protected bicycle lanes, can reduce vehicle- and pedestrian-involved collisions.

Source: Sasaki, October 2016 CMP

Figure 3.15-7 Existing (2015) Bicycle Facilities

Transit Facilities

The transit network throughout the University of Washington campus and surrounding University District incorporates King County Metro, Sound Transit, Community Transit, and the recent University of Washington Link Light rail station at Husky Stadium. **Figure 3.15-8** shows existing transit facilities throughout the University of Washington campus, including University of Washington shuttles and public transit. **Figure 3.15-8** also includes walksheds from the existing University of Washington Link Light rail station at Husky Stadium. Currently, the University of Washington Station operates as an end-of-line station and requires integration with all modes of travel to campus and surrounding neighborhoods.



Source: Sasaki, October 2016 CMP

Figure 3.15-8 Existing Transit Network and Light rail Walkshed

Shuttles serve as auxiliary transit, providing direct connections between University properties largely for staff, patients, and faculty. The University of Washington shuttle system extends throughout the Seattle campus, providing access to University of Washington Medical Center facilities on campus and in South Lake Union. Shuttles also travel between the University District and Seattle Children's Hospital as well as Harborview Medical Center. The University of Washington Shuttle system is fare free, with multiple funding partners.

Vehicle Facilities

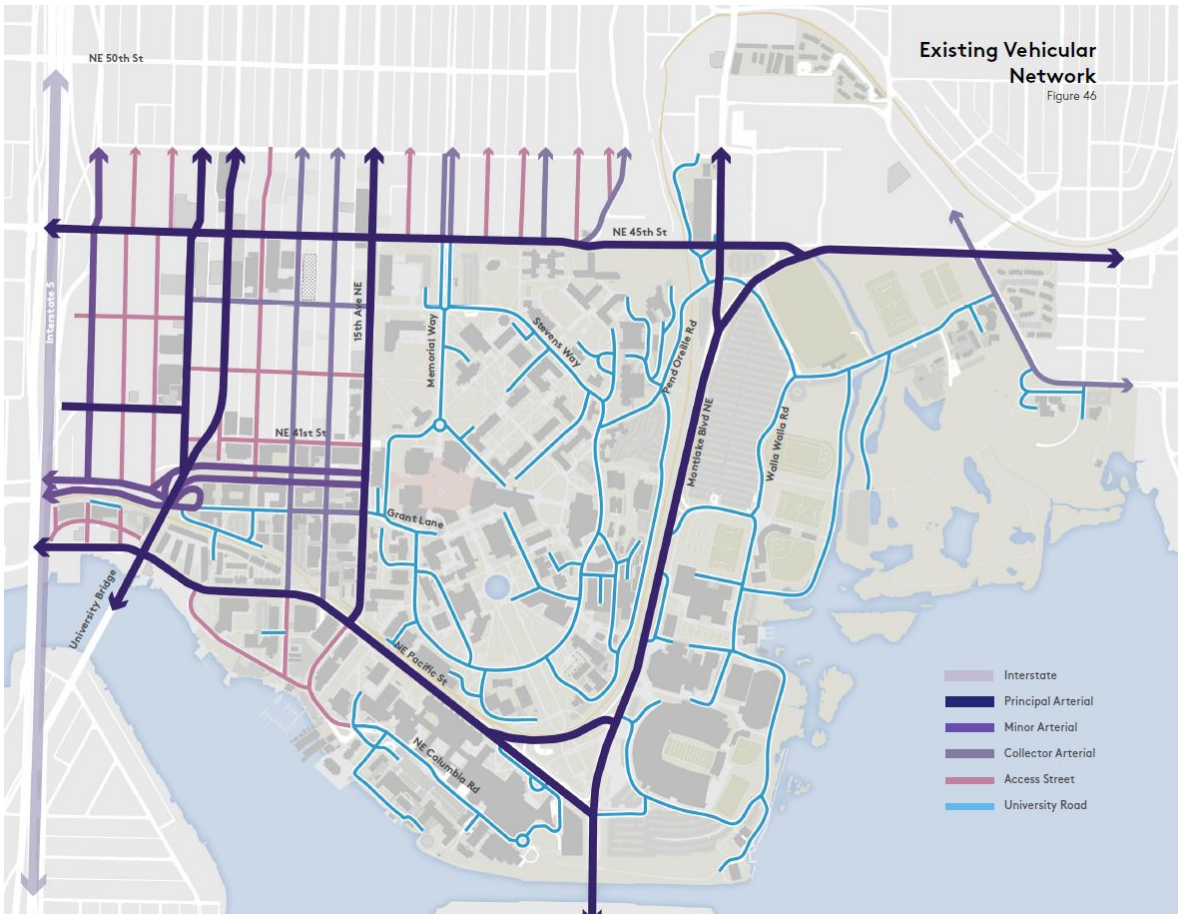
Shared use private car sharing services such as Car2Go and Zipcar and Transportation Network Companies (TNCs) including Uber and Lyft operate in the study area and provide an alternative to private auto use and parking for campus communities. In the future these car sharing and livery services can provide options that lessen reliance on cars and provide options for first and last mile access to transit.

The street system in the vicinity of the University of Washington campus is comprised of different classes of roadways serving multiple functions. City of Seattle roadways are classified as principal arterials, minor arterials, collector arterials, and local access streets while University of Washington owned roadways do not have separate functional classifications but are generally similar in nature to local access streets. Broader regional access to the University of Washington campus is provided via Interstate 5 (I-5) to the west and State Route 520 (SR 520) to the south with connections between the campus and these regional facilities generally provided via principal arterials.

Figure 3.15-9 shows the City's street classification in the study area and also identifies University owned roads. Specific characteristics of major corridors within the study area (principal and minor arterials) including each roadway's functional classification, speed limit, number of lanes, parking, and general characteristics of non-motorized facilities are noted in **Appendix F**, the Transportation Discipline Report. The City also designates streets with freight, pedestrian, and transit classifications. The current classifications for the streets included in the project study area are also noted in **Figure 3.15-9**.

In addition to functional classification, the City also classifies roadways as truck streets (Major and Minor), Greenways, and Green Streets. Major and Minor truck streets typically serve freight movement through the City between major freight traffic generators and the regional freeway network. Greenways are roadways parallel to arterials that include features to help make bicycles and pedestrians feel safer. Green Streets are roadways where pedestrian circulation and open space are prioritized over other transportation uses through design and operational features. Within the study area, NE Pacific Street, and Montlake Boulevard south of NE Pacific Street are designated as major truck routes. Several Neighborhood Green Streets are located within the study area and include Brooklyn Avenue NE, NE 43rd Street, and NE 42nd Street.

To enhance safety on City roadways, the City of Seattle recently adopted lowering speed limits by 5 miles per hour.



Source: Sasaki, October 2016 CMP

Figure 3.15-9 Arterial Classification in the Study Area

Existing Vehicle Traffic Operations

Intersection Operations

Intersection levels of service (LOS) are shown for all study area intersections for the weekday PM peak hour. Intersection summary tables for LOS results are included in Appendix C of the TDR. Detailed level of service worksheets are provided in the Transportation Discipline Report, **Appendix F** of this EIS. The number of intersections within the study area that are operating at LOS C or better, LOS D, LOS E, or LOS F is also summarized in **Figure 3.15-10**.

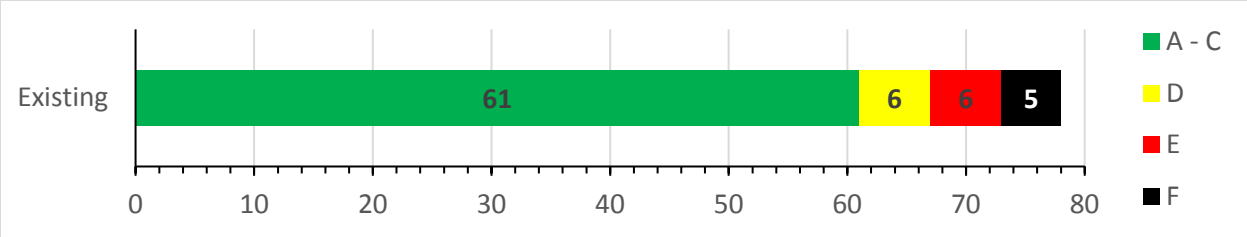


Figure 3.15-10 Existing (2015) Level of Service Summary

All study area intersections currently operate at LOS D or better, with the exception of the intersections that operate at LOS E or F or are anticipated to be impacted by development that are noted in **Table 3.15-4**. Operations of key corridors for travel times and speeds collected in the field and used to calibrate analysis models. Resulting travel times and speeds from operational models are shown in **Table 3.15-5**.

Table 3.15-4
EXISTING PM PEAK INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Existing PM Peak Hour	
	LOS[1]	Delay[2]
15. 7th Ave (I-5 NB) / NE 45th St	D	37
16. 9th Ave NE (South) / NE 45th St	E	38
17. 9th Ave NE (North) / NE 45th St	C	22
29. Montlake Blvd NE / Mary Gates Memorial Dr NE	D	54
30. Roosevelt Way NE / NE 43rd St (East)	E	48
31. Roosevelt Way NE / NE 43rd St (West)	E	36
46. Roosevelt Way NE / NE 41st St	E	39
47. 12th Ave NE / NE 41st St	E	41
49. University Way NE / NE 41st St	F	*
51. 7th Ave NE / NE 40th St	E	37
57. 6th Ave NE / NE 40th St	F	60
63. 6th Ave NE / NE Northlake Way	C	25
67. 15th Ave NE / NE Pacific St	D	38
71. Montlake Blvd NE / Wahkiakum Rd	F	295
72. Montlake Blvd NE / IMA exit	D	34

Intersection	Existing PM Peak Hour	
	LOS[1]	Delay[2]
73. Montlake Blvd NE / IMA Entrance	C	22
77. Montlake Blvd NE / NE Pacific St	C	24
78. Montlake Blvd NE / SR 520 WB Off-Ramp	F	214
79. Montlake Blvd NE / E Lake WA Blvd / SR 520 E	F	105

Source: Transpo Group, 2016.

*Volume exceeds capacity and Synchro could not calculate delay.

1. Level of service.
2. Average delay per vehicle in seconds rounded to the nearest whole second.

Arterial Operations

Table 3.15-5

EXISTING FACTORED WEEKDAY PM PEAK HOUR ARTERIAL TRAVEL TIMES AND SPEEDS

Corridor	Existing Factored Model Output[1]	
	Travel Time (m: ss)[2]	Average Speed (mph)
NE 45th Street—5th Avenue NE to Union Bay Place NE		
Eastbound	8:25	11.7
Westbound	7:51	12.0
NE Northlake Way/NE Pacific Street—6th Avenue NE to Montlake Boulevard E		
Eastbound	4:32	15.9
Westbound	3:30	20.6
Roosevelt Way NE—NE Campus Parkway to NE 50th Street		
Southbound	5:21	14.4
11th Avenue NE—NE Campus Parkway to NE 50th Street		
Northbound	4:19	8.5
Montlake Boulevard E—E Lake Washington Boulevard to NE 45th Street		
Southbound	11:01	8.0
Northbound	5:32	14.0

Source: Transpo Group, 2016.

1. Existing factored model output is Synchro output data that has been adjusted to account for existing field measurements and takes in to account operational impacts such as midblock crosswalks and parking maneuvers.
2. m: ss = minutes and seconds

As shown, the weekday PM peak travel speeds take into account free-flow travel times and intersection related delay. Overall the travel times and speeds indicate existing congestion in both directions along Montlake Boulevard, but particularly so in the southbound direction. With the addition of further traffic growth, all directional travel times would increase and travel speeds would decrease.

The arterial analysis was performed using the Synchro 9 software and determines arterial LOS based on travel speed between points. The results are summarized in **Table 3.15-6.** Detailed arterial LOS calculations are included in Appendix C of the TDR. Traffic conditions can be worse when extreme congestion on I-5 and SR 520 constrains access onto the freeway.

Table 3.15-6
EXISTING PM PEAK ARTERIAL LEVEL OF SERVICE SUMMARY

Corridor	Existing PM Peak Hour	
	LOS[1]	Speed[2]
NE 45th Street, Eastbound (5th Avenue NE to Union Bay Place NE)	D	11.7
NE 45th Street, Westbound (5th Avenue NE to Union Bay Place NE)	D	12.0
NE Pacific Street (NE Northlake Way), Eastbound (6th Avenue NE to Montlake Boulevard E)	D	15.9
NE Pacific Street (NE Northlake Way), Westbound (6th Avenue NE to Montlake Boulevard E)	C	20.6
11th Avenue NE, Northbound (NE Campus Parkway to NE 50th Street)	E	8.5
Roosevelt Way NE, Southbound (NE Campus Parkway to NE 50th Street)	C	14.4
15th Avenue NE, Northbound (NE Boat Street to NE 50th Street)	E	8.2
15th Avenue NE, Southbound (NE Boat Street to NE 50th Street)	D	9.4
Montlake Boulevard NE, Northbound (E Lake Washington Boulevard to NE 45th Street)	E	14.0
Montlake Boulevard NE, Southbound (E Lake Washington Boulevard to NE 45th Street)	F	8.0

Source: Transpo Group, 2016.
1 Level of service.
2 Average speed in miles per hour

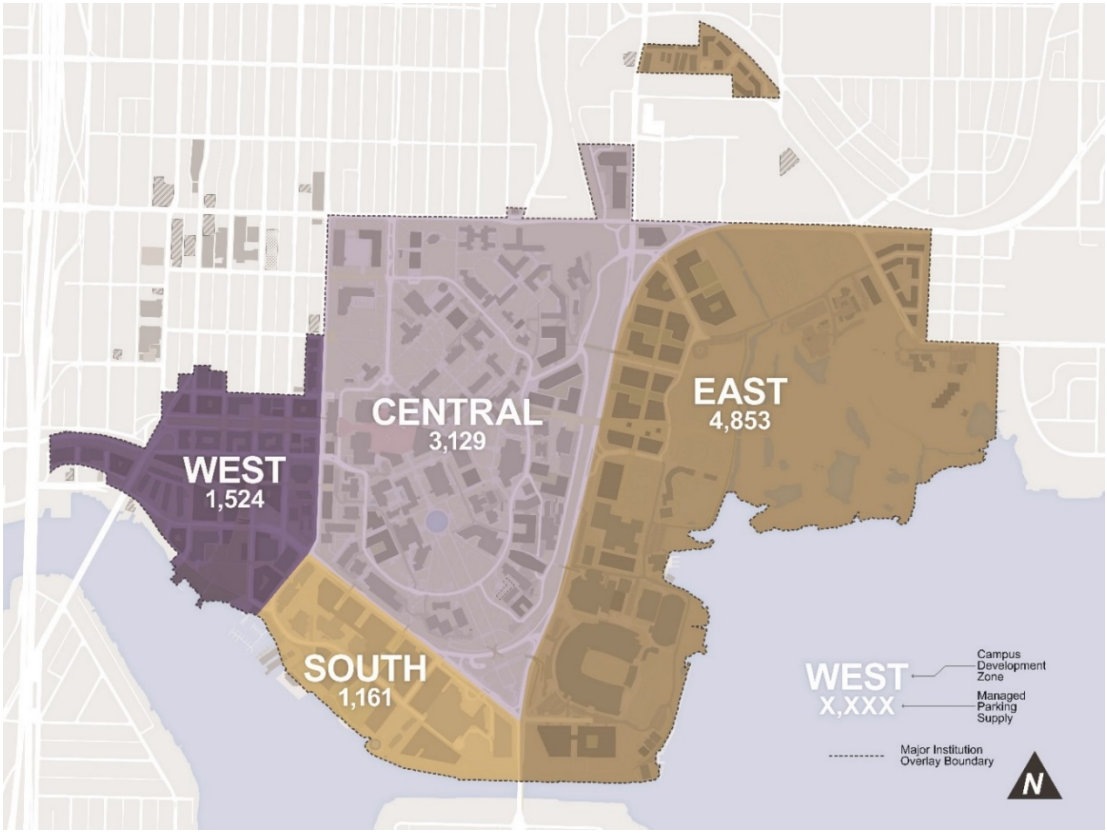
As shown in **Table 3.15-6**, all six arterials analyzed currently operate at either LOS D or better during the weekday PM peak hour conditions with the exception of the following: 11th Avenue NE in the northbound direction, 15th Avenue NE northbound, and Montlake Boulevard NE northbound which currently operate at LOS E and Montlake Boulevard NE southbound which currently operates at LOS F. These arterials serve as the main routes to/from I-5 and the University of Washington Campus and experience congestion during the peak periods resulting from heavy commuting traffic volumes.

For this analysis, background growth was interpolated from the 2035 Comprehensive Plan traffic volumes, which were developed using the City developed travel demand model, to reflect the 2028 horizon year. Land use and traffic as part of the U District Rezone Proposal

are assumed as part of a cumulative analysis. In addition to vehicle traffic, the City developed travel demand model provides background growth related to transit, pedestrians, and bicycles.

Existing Parking

This parking analysis focuses on the current supply of parking under the University's Parking cap described herein as this captures the supply available to accommodate campus growth.



Source: University of Washington Transportation Services.

Figure 3.15-11 Existing Campus Cap Parking Supply by Sector

City University Agreement – Trip and Parking Caps

The University of Washington has a continuing obligation as part of the City-University Agreement with the City of Seattle (CUA) to meet vehicle trip and parking caps consistent with traffic levels reached in 1990. With the introduction of the U-PASS program in 1991, and continuing attention to U-PASS and other measures identified in the existing Transportation Management Program (TMP), the University of Washington has maintained compliance with these goals every year since 1990, despite growing 35 percent in campus population.

Vehicle Trips. The University has a program of monitoring, evaluating, and reporting transportation conditions through data collection and survey. Through an annual telephone survey, students, faculty, and staff provide a basis for annual calculations of vehicle trips subject to limits (caps), and reported in the Annual CMP Monitoring Report. **Table 3.15-7** illustrates the 2015 campus surveys of students, faculty and staff results for peak period travel compared to the trip caps which reflect 1990 impact levels.

Transportation Management Program (TMP): A transportation management program provides strategies for limiting traffic impacts and promoting active communities by managing vehicle trips and parking, as well as accommodating transit and non-motorized travel modes.

Table 3.15-7
TRIP CAP SUMMARY – 2015

Location/Peak Period	Trip Cap (vph)	2015
UW Campus		
AM Peak Period Inbound (7:00-9:00)	*7,900*	*3,997*
PM Peak Period Outbound (3:00-6:00)	*8,500*	*7,562*
University District		
AM Peak Period Inbound (7:00-9:00)	*10,100*	*4,988*
PM Peak Period Outbound (3:00-6:00)	*10,500*	*9,329*

Note: 2016 Annual Report for 2015, UWTS.

Figure 3-15-12 illustrates the historical compliance with the University District trip caps dating back to 2009.

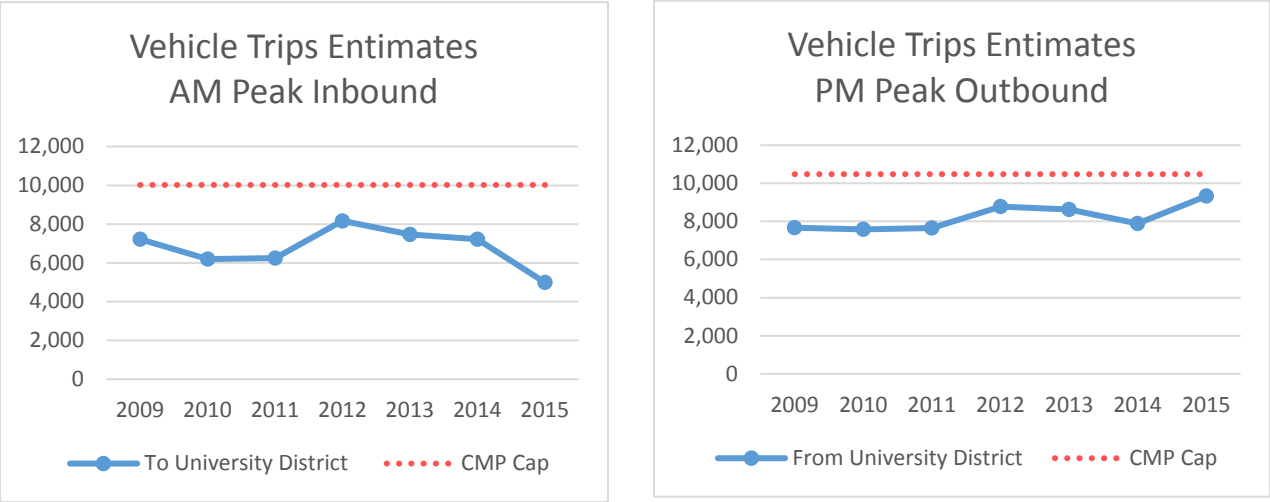


Figure 3.15-12 Historic AM and PM Trip Cap Summary

Parking Caps. In addition to the trip cap, which is monitored annually, the University has maintained a cap of 12,300 spaces of total parking supply for student, faculty, and staff

commuter parking. This parking space cap does not include handicapped or visitor spaces, service and load zones, cycle spaces, accessory off-campus leased spaces, and spaces associated with student housing. UW currently has 10,667 spaces included in the most recent parking cap calculation for CUA compliance.

3.15.2 Impacts

The evaluation of impacts on the transportation systems was conducted in accordance with University of Washington and City of Seattle SEPA standards and analyzes impacts on the following transportation elements:

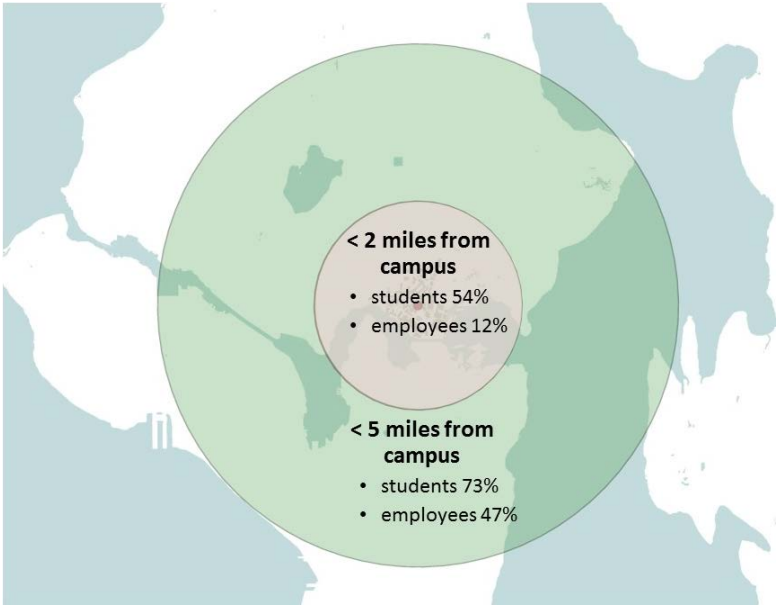
- Pedestrians (safety, connectivity, capacity)
- Bicycles (safety, connectivity, parking)
- Transit (connectivity and capacity)
- Traffic Operations (intersection and corridor operations)
- Traffic Safety (collision history, trends)
- Parking (demand vs. supply)
- Freight/Service (operations, patterns, locations)

Impacts are disclosed both in terms of the comparison to the identified No Action Alternative and also to the trip and parking caps as required by the City-University Agreement.

CUA (City-University Agreement) An agreement between the City of Seattle and the University of Washington, that defines maximum parking and peak period trip

The campus is a unique environment where a large number of students live near and on campus. General distribution patterns for students, faculty, and staff were estimated based on the City Travel Demand Model and campus surveys.

Survey data from the University of Washington indicates that many trips, especially those made by students, come from nearby. Currently, more than half of the students and over 10% of the employees (faculty and staff) live within 2 miles of the campus, as shown in **Figure 3.15-13** These amounts increase to almost 75% for students and almost half of employees when the distance increased to 5 miles. The 2035 City of Seattle travel demand model provides distribution patterns based on regional growth, changing modes and expansion of transit.



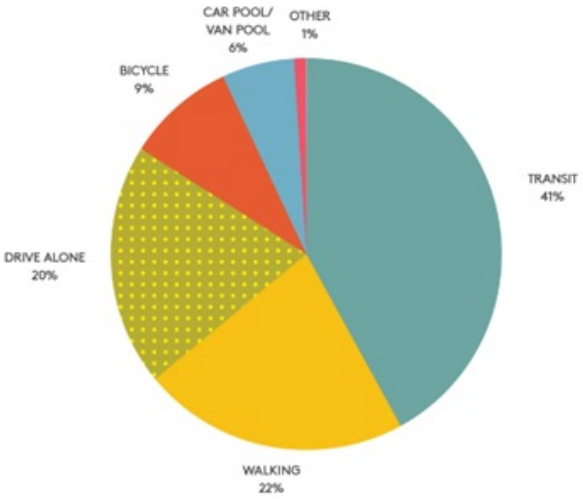
Source: Transpo 2016.

Figure 3.15-13 Proportion of Students and Employees within 5 Miles of Campus

Other assumptions that support this transportation analysis are also discussed in greater detail in **Appendix F**, the Transportation Discipline Report Appendix to this EIS. Key assumptions include:

- **Peak Analysis Period** – Data collected from traffic counts at area intersections indicates that the peak period for the study area is during the PM peak (as opposed to the AM peak) for most of the study area. This time coincides with the end of classes and the work day for much of the University as well as people travelling through the area. As a result, the PM Peak period was analyzed for all transportation operations.

- **Mode Split** – The mode split, or proportion of trips using a particular mode, is an important factor in evaluating the effects of growth. It is desirable to have travel made by students, faculty and staff use lower impacting and more sustainable modes such as walking, biking or taking transit. The University of Washington has a strong record of achieving an aggressive mode split with drive alone trips to the campus accounting for just 20 percent of all trips. This is significantly lower than other areas, employers, and communities. The drive alone percentage has stayed near 20 percent for several years. While mode split could fluctuate with the increased access to rail transit or other emerging trends, for the purposes of the Transportation Discipline Report (**Appendix F**) and this EIS, mode split is assumed to remain a conservative 20 percent drive alone trips through the year 2028 and for all alternatives.



Source: University of Washington Transportation Services and Sasaki, 2016 CMP

Figure 3.15-14 Existing Mode Split

- **Emerging Trends: Shared Use and Transportation Network Companies** – Anticipated trends in transportation that could affect the analysis of transportation for the Campus Master Plan include emerging Transportation Network Companies like Lyft, Uber, and shared use transportation providers such as Pronto (bicycle), Car2go, and Zipcar. While use of TNCs for travel is increasing, use and trend data for TNC companies is not broadly available. The Transportation Discipline Report (**Appendix F**) and this EIS includes information related to TNCs and shared use providers to the extent that is available, but assume it remains a small portion of overall travel.

  Impact Analysis and Performance Measures – Impact to transportation systems is generally assessed as a comparison between the No Action Alternative with permitted development and background growth and each action alternative (Alternatives 1-5). The CMP action alternatives consist of up to 6.0 million gross square feet of net new development allocated to different sectors of the campus as shown in **Figure 3.15-15**. Even though the amount of development is the same between all action alternatives, the impacts may vary for transportation depending on where on campus development occurs (i.e. depending on sector development). The City has a variety of measurements for assessing impact including screenlines as part of concurrency and the comprehensive plan. Performance measures applied in this analysis are noted in **Table 3.15-8**.

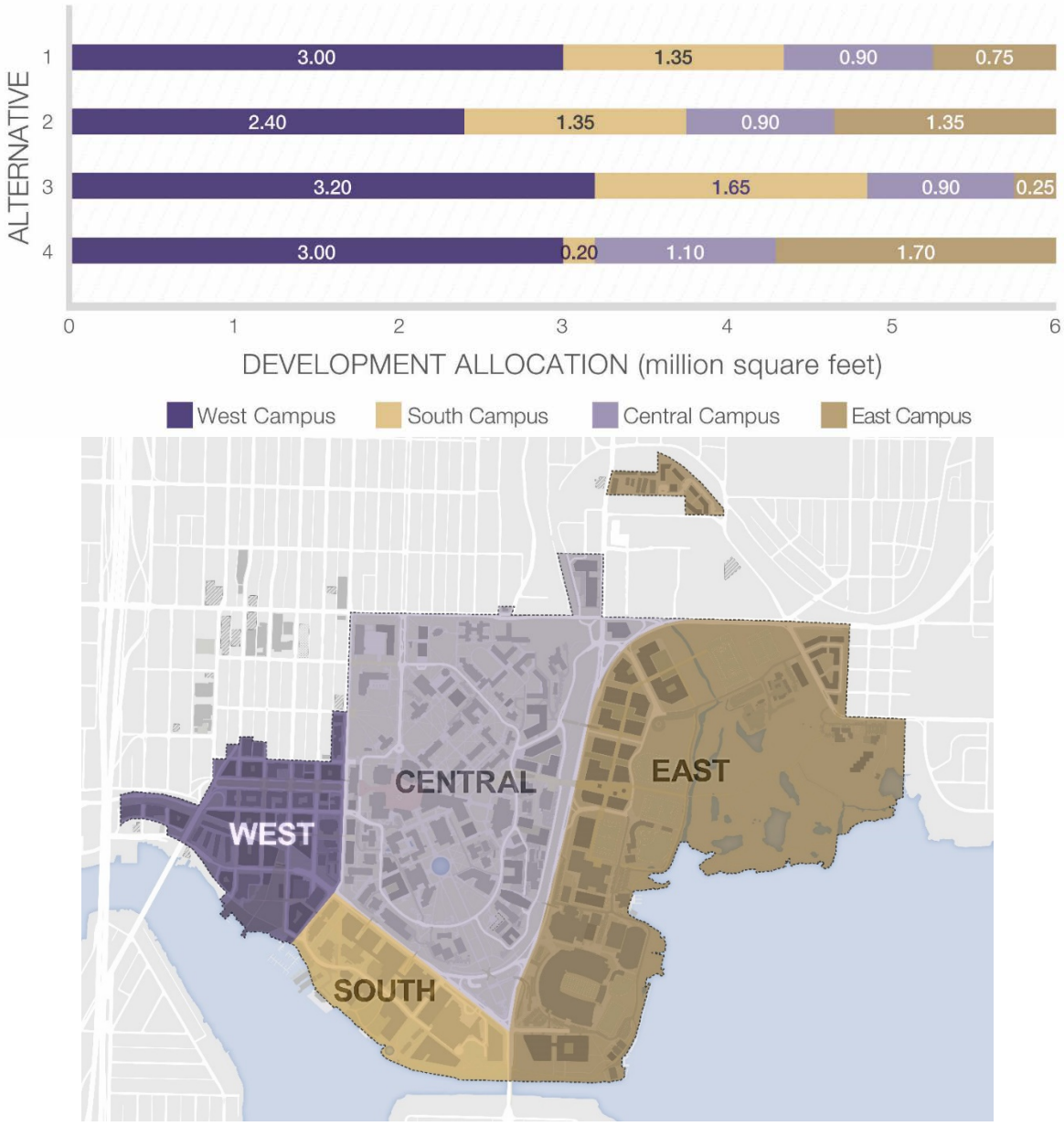
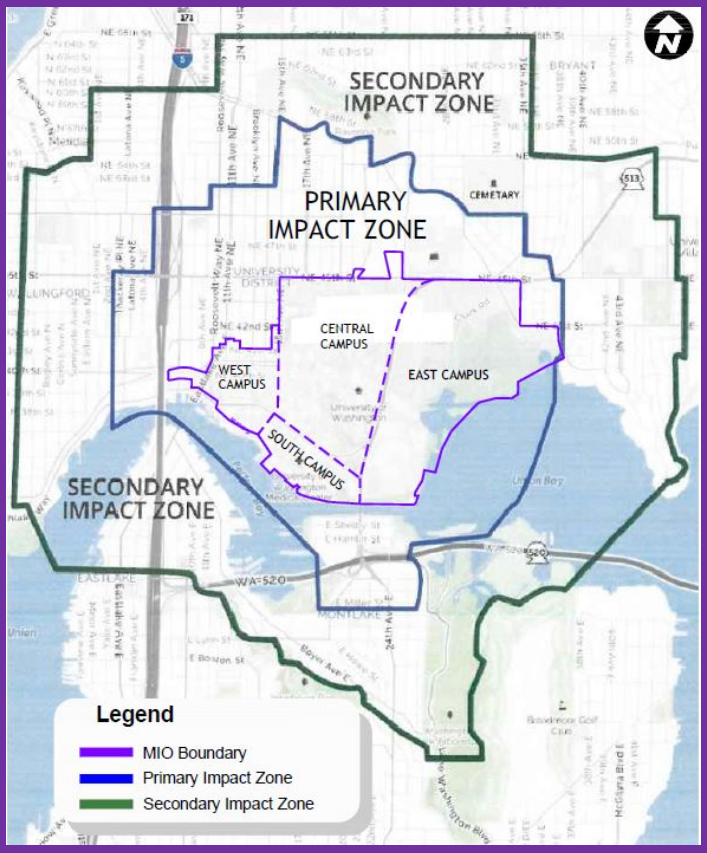


Figure 3.15-15 Development Allocation by Campus Sector

Performance Measures

Primary and Secondary Impact Zones –The CUA identifies a Primary and Secondary Impact Zone to be monitored related to campus growth and development. The Primary Impact zone includes within it an area also defined as the Major Institutions Overlay or MIO. The impact zones suggest that impacts dissipate as you get farther away from the campus. It is expected that there will be greater impacts identified in the Primary Impact zone and thus more fine grained analysis is conducted within this area. In the Secondary Impact zone impacts are expected to dissipate and thus more aggregate analysis is applied.

Major Institution Overlay (MIO): The Major Institution Overlay is a boundary defined by the City of Seattle Land Use and Zoning Code, noting the extents of the University of Washington. It is shown below in reference to the Primary and Secondary Impact Zones



Thresholds – For some performance areas there are defined and established measures of impact or thresholds such as intersection operational analysis and parking utilization. Thresholds specific to the University are described in the CUA and include maximum allowable caps for vehicle trips to the University facilities in the MIO (University Cap), to University area facilities (U District Cap) and University parking facilities in the MIO (Parking Cap). Where this is the case the thresholds are noted.

Table 3.15-8
PERFORMANCE MEASURES

	Measure	Period Evaluated	Description	Impact Zone	Threshold
Pedestrian	Proportion of Development within 1/2-mile of Multi-family Housing	All Day	Measures amount/proportion of development in a half mile proximity to multi-family housing	MIO/ Primary	Alternative comparison only
	Proportion of Development within 1/2-mile of University of Washington Residence Halls	All Day	Measures amount/proportion of development in a half mile proximity to University of Washington Residence Halls housing	MIO/ Primary	Alternative comparison only
	Quality of Pedestrian Environment	All Day	Qualitative assessment of the existing walking environment based on the Landscape Framework Plan	Primary/ Secondary	Information Only
Pedestrian & Bicycle	Burke-Gilman Trail Capacity	PM Peak Hour	Pedestrian & bicycle level of service analysis based on findings from the Burke-Gilman Trail Corridor Study	MIO/ Primary	Information only
Bicycle	Bicycle Parking & Utilization	Mid-day Peak	Bicycle parking utilization	MIO/ Primary	Information only
	Quality of Bicycle Environment	All Day	Qualitative assessment of bicycle environment based on demand, network connectivity, and safety	Primary/ Secondary	Information only
Transit	Proportion of Development within 1/2-mile of Rapid Ride	All Day	Measures amount/proportion of new development in a half mile proximity to proposed rapid ride	MIO/ Primary	Alternative comparison only
	Proportion of Development within 1/2-mile of Light rail	All Day	Measures amount/proportion of new development in a half mile proximity to proposed rapid ride	MIO/ Primary	Alternative comparison only
	Transit Service Guidelines	All Day	Measures amount/proportion of campus meeting proposed Metro Service Guidelines	Primary/ Secondary	Information only
Vehicles	Arterial Operations	Peak Hour	Measures travel times for various modes along adjacent corridors	Primary/ Secondary	Speed Travel Time
	Intersection Operations	Peak Hour	Measures delay and operations at intersections	Secondary	Intersection Capacity and LOS
	Comp Plan Screenlines	Peak Hour	Measures aggregate demand crossing a screenline as compared to the capacity	Primary/ Secondary	Comp Plan Screenline Capacity
	Cordon Screenlines	Peak hour	Measures aggregate comparative demand crossing a cordon around	Primary/ Secondary	

	Measure	Period Evaluated	Description	Impact Zone	Threshold
			the campus for arterials entering/exiting the campus		
	University Trip Cap[1]	AM Peak and PM Peak	Measures aggregate number of vehicle trips assumed to enter / exit parking areas on campus within the MIO	MIO	Trip Cap[1]
	University District Trip Cap[1]	AM Peak and PM Peak	Measures aggregate number of vehicle trips assumed to enter / exit campus parking areas in the University District	MIO/ Primary	Trip Cap[1]
	Parking Supply & Utilization	Mid-day	Measures the amount parking supply needs to accommodate alternative development scenarios assuming an 85% parking utilization	MIO	85% Utilization
	Parking Cap[1]	Mid-day	Maximum number of stalls permitted within the MIO	MIO	Parking Cap[1]

Source: The Transpo Group, 2016.

1. Caps as defined by the CUA agreement
2. All vehicles include vehicles, carpools, freight, and transit

For the purposes of the transportation analysis, campus growth reflective of increased building square footage is translated to trips related to the various campus population groups, specifically students, faculty, and staff. As noted previously, all Action Alternatives result in expanded development on campus of 6 million net new gross square feet (and remaining square footage in the 2003 Campus Master Plan) by the plan horizon year of 2028. **Table 3.15-9** below provides a summary of the growth in campus population resulting from this level of development.

Table 3.15-9
UNIVERSITY POPULATION AND FUTURE GROWTH

Population	Existing (2014) Headcount[1]	No Action 2028	Growth over Existing with No Action Alternative	All Action Alternatives 2028[2]	Growth over Existing with Action Alternatives[2]
Students	45,213	46,152	939	54,183	8,970
Faculty	7,951	8,117	166	9,528	1,577
Staff	17,333	17,693	360	22,462	5,129
Total Population	70,497	71,962	1,465	86,173	15,676

Source: The Transpo Group, 2016.

1. (2014 was the most recent available information)
2. Population numbers include No Action growth (consistent with the 2003 CMP)

An in-depth discussion and details related to the development of background growth, growth related to CMP development alternatives, and parking estimates analysis are provided in the Methods and Assumptions, Appendix B of the TDR (**Appendix F** of this EIS).

Headcount: A quantifiable count of individuals within the University of Washington population. Headcount differs from a Full Time Equivalent (FTE) count, which converts actual campus enrolled and employed students, faculty, and staff to a full time equivalency based on eight hour days and 40-hour work weeks.

As shown, total growth in development for all alternatives related to the 6 million square feet of growth results an increase in population of approximately 15,676 people over population from 2014. This growth includes remaining gross square footage permitted under the current (2003) Campus Master Plan. That square footage is assumed in the No Action Alternative.

Table 3.15-10
EXISTING (2014) AND ESTIMATED FUTURE (2028) UNIVERSITY POPULATION

Population	2014 (Actual)	2028 (Estimated)	Growth (Estimated)
Students	45,213	54,183	8,970
Faculty	7, 951	9,528	1,577
Staff	17,333	22,462	5,129
Total	**70,497**	**86,173**	**15,676**

Source: Sasaki Architects, Inc., 2016.

In general, this transportation analysis evaluates the growth in campus population for–students, faculty and staff to fully analyze transportation impacts. This method takes into account that each university population (students, faculty, and staff) have different travel behaviors. Analysis methods, and details of results are further described in the Transportation Discipline Report (Transpo Group, October, 2016)

Alternatives

The allocation of the 6 million square feet assigned to the sectors is shown in **Figure 3.15-15**.

Trip Generation

The following provides a summary of the anticipated trip generation for pedestrian, bicycle, transit, and vehicle trips to campus. The trip generation methodology used for assessing the increase in trips under Alternative 1 is consistent with that previously described in the No Action Alternative. The increase in trips anticipated with Alternative 1 is compared against the No Action forecasts to determine the net increase associated with the population growth. Weekday daily, AM, and PM peak hour vehicular trip generation including single occupant vehicles and carpools is summarized in **Table 3.15-11**.

Population Assumptions for Alternatives:
No Action Alternative assumes a population increase of 1,465 people. All of the Action Alternatives (Alternatives 1-5) assume an additional 6 million net new gsf of development and a population increase of 15,676 people (including the 1,465 anticipated with No Action).

A ***cumulative analysis*** is also included that addresses the Action Alternatives with the addition of the proposed U District Rezone.

Table 3.15-11
ALL ACTION ALTERNATIVES ESTIMATED VEHICLE TRIPS (WEEKDAY)

Trip Type	Daily Trips	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
No Action							
Student	8,710	1,485	635	2,120	670	955	1,625
Faculty	6,880	1,465	630	2,095	1,035	1,470	2,505
Staff	12,260	3,190	1,370	4,560	1,885	2,685	4,570
Total No Action	***27,850***	***6,140***	***2,635***	***8,775***	***3,590***	***5,110***	***8,700***
Future 2028 (Alt 1)							
Student	10,390	1,775	760	2,535	800	1,140	1,940
Faculty	8,230	1,750	750	2,500	1240	1,765	3,005
Staff	14,860	3,860	1,655	5,515	2,280	3,250	5,530
Total Future	***33,480***	***7,385***	***3,170***	***10,550***	***4,320***	***6,155***	***10,475***
Net New Trips							
Student	1,680	290	125	415	130	185	315
Faculty	1,350	285	120	405	205	295	500
Staff	2,600	670	285	955	395	565	960
Total Net New Trips	***5,630***	***1,245***	***530***	***1,775***	***730***	***1,045***	***1,775***

Source: Transpo Group, 2016.

Weekday daily, AM, and PM peak hour vehicular trip generation is summarized in **Table 3.15-12**.

Table 3.15-12
All ACTION ALTERNATIVES ESTIMATED NET NEW FUTURE VEHICLE TRIPS

Trip Type	Daily Trips	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Net New Trips							
Student	1,680	290	125	415	130	185	315
Faculty	1,350	285	120	405	205	295	500
Staff	2,600	670	285	955	395	565	960
Total Net New Trips	**5,630**	**1,245**	**530**	**1,775**	**730**	**1,045**	**1,775**
Visitors (10%)	565	125	55	180	75	105	180
Total UW Trips	**6,195**	**1,370**	**585**	**1,955**	**805**	**1,150**	**1,955**

Source: Transpo Group, 2016.

Table 3.15-13 summarizes trip generation by mode, including transit, walk, bicycle, and other trips.

Table 3.15-13
ESTIMATED 2028 ALL ACTION DAILY TRIPS BY MODE

	Transit	Walk	Bicycle	Other
No Action				
Student	34,890	14,270	2,775	240
Faculty	3,280	460	920	140
Staff	12,450	595	1,110	350
Total No Action	**50,620**	**15,325**	**4,805**	**730**
Future 2028				
Student	40,960	16,755	3,260	280
Faculty	3,850	540	1,080	165
Staff	15,810	755	1,410	445
Total Future	**60,620**	**18,050**	**5,750**	**890**
Net New Trips				
Student	6,290	2,570	500	45
Faculty	590	85	165	25
Staff	3,430	165	305	95
Total Net New Trips	**10,310**	**2,820**	**970**	**165**

Source: Transpo Group, 2016.

As shown in **Table 3.15-13**, the proposed campus development is anticipated to generate 10,310 net new daily transit trips, 2,820 walking trips, 970 bicycle trips, and 165 other trips.

Details of the background transportation conditions for each mode are summarized below and provided in greater detail in the Transportation Discipline Report (**Appendix F** of this EIS). Impacts for each performance measure are summarized below for all alternatives and organized by mode. Discussion of the impacts for each alternative within the Primary and Secondary Impact Zones are discussed after the modal performance summaries.

Pedestrian Operations

Pedestrian Background Conditions

Future enhancements to improve the pedestrian transportation system in the study area are planned by the City of Seattle and University of Washington. The City has recently published their Pedestrian Master Plan that includes policies and programs for improving pedestrian circulation. The Plan supports the development and designation of Green Streets. A Green Streets is a right of way that gives priority to pedestrian circulation and open space. The U District Urban Design Framework identifies Brooklyn Avenue and NE 42nd and NE 43rd Streets as Green Streets. These Green Streets are noted in **Figure 3.15-16**. Other pedestrian transportation investments will be incorporated within other Move Seattle capital investments such as the proposed Roosevelt High Capacity Transit Corridor improvements. In developing the University of Washington Link light rail station, local agencies coordinated to develop pedestrian improvements to support the station area including a new pedestrian/bicycle bridge over Montlake Avenue that connects the station with the campus, new bus stop improvements and signal timing at the intersection of Montlake Avenue and Pacific Street. Similar investments are planned to support the University District Station, planned to be opened in 2021. As part of the SR 520 improvements at Montlake, an additional trail crossing for pedestrians and bicycles is planned to cross the Montlake cut. The University of Washington recently completed construction of the Burke-Gilman Trail improvements on campus to create a separate bicycle and pedestrian pathways, greatly increasing the capacity of the trail. The University will also improve adjacent sidewalks as new campus buildings come on line. Other campus improvements are noted in the mitigation section.

Pedestrian Performance

Encouraging pedestrian travel, especially for students, will help maintain the current high pedestrian mode split. Performance measures applied to the campus reflect the effectiveness of the pedestrian network in providing safe and easy access to pedestrian destinations, specifically housing. Comparisons of future conditions with each alternative are provided for the development proximity within 1/2-mile of multi-family housing and University of Washington residence halls is provided in **Table 3.15-14**.

Table 3.15-14
NO ACTION AND ALL ACTION ALTERNATIVES PROPORTION OF DEVELOPMENT WITHIN 1/2-MILE OF MULTI-FAMILY HOUSING AND UNIVERSITY OF WASHINGTON RESIDENCE HALLS

Sector	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Proportion of development within 1/2 mile of Multi-Family Housing					
West	211,000 gsf	3,000,000 gsf	2,400,000 gsf	3,200,000 gsf	3,000,000 gsf
South	NA	1,350,000 gsf	1,350,000 gsf	1,650,000 gsf	200,000 gsf
Central	NA	900,000 gsf	900,000 gsf	900,000 gsf	1,100,000 gsf
East	NA	750,000 gsf	1,350,000 gsf	216,773 gsf	1,700,000 gsf
Total	**211,000 gsf**	**6,000,000 gsf**	**6,000,000 gsf**	**5,966,773 gsf**	**6,000,000 gsf**
Percent	***100%***	***100%***	***100%***	***99.4%***	***100%***
Proportion of development within 1/2 mile of University of Washington Residence Halls					
West	211,000 gsf	3,000,000 gsf	2,400,000 gsf	3,200,000 gsf	3,000,000 gsf
South	NA	1,350,000 gsf	1,350,000 gsf	1,650,000 gsf	200,000 gsf
Central	NA	900,000 gsf	900,000 gsf	900,000 gsf	1,100,000 gsf
East	NA	750,000 gsf	1,350,000 gsf	239,918 gsf	1,700,000 gsf
Total	**211,000 gsf**	**6,000,000 gsf**	**6,000,000 gsf**	**5,989,918 gsf**	**6,000,000 gsf**
Percent	***100%***	***100%***	***100%***	***99.8%***	***100%***

Source: The Transpo Group, 2016.
Note: Alternative 5 results would be the same as their related Action Alternative.

Bicycle Operations

Bicycle Background Conditions

Future enhancements to the bicycle system include investments proposed in Move Seattle and included on the Bicycle Master Plan. Planned bicycle network improvements included proposed protected bicycle lanes on Roosevelt Way, NE Campus Parkway, University Bridge, and Ravenna Place. As noted above, the University of Washington recently expanded the Burke-Gilman Trail to create separate pathways for pedestrians and bicycles. Availability of

convenient bicycle parking is another consideration for encouraging bicycle use. Current data and surveys suggest that availability of bicycle parking is often a consideration for encouraging bicycle use. Surveys also suggest that currently there is adequate bicycle parking. The University of Washington provides roughly twice the number of bicycle parking spaces as required by City of Seattle (SMCU 23.54.015.K.1). The University continues to add parking, especially parking that is covered and includes security features. As new buildings come on line and are developed, the University will continue to assess bicycle parking needs to meet anticipated demand.

Pronto Bike Share

Pronto is a bicycle share program currently managed by the City of Seattle to promote biking and reduce dependence on automobiles. Eleven Pronto bicycle-share stations are positioned within the Primary and Secondary Impact Zones. Pronto stations in the University District connect key destinations near light rail stations, residence halls, and key campus destinations. Increased bicycle use could occur as the Pronto system expands.

Future Burke-Gilman Trail

Bicycle traffic along the Burke-Gilman Trail is anticipated to increase with the No Action Alternative, due to citywide growth and growth in travel to and from the Link Light rail University of Washington station as ridership of the system increases. Local pedestrian traffic along and across the Burke-Gilman Trail is also anticipated to increase but by a lesser amount. As shown in **Table 3.15-15** below, bicycle and pedestrian volumes are projected to increase, between 1 and 6 percent per year, along the various segments due to overall area growth in the area, and changing mode choices as new transit investments are implemented including new light rail stations (University of Washington and University District).

Table 3.15-15
BURKE-GILMAN TRAIL FORECASTED GROWTH 2010 TO 2030

Trail Location	2010 Bicycle Counts	2010 Pedestrian Counts	2030 Bicycle Estimates *	2030 Pedestrian Estimates *	Bicycle % Annual Change	Pedestrian % Annual Change
West of University Bridge	408	174	1,321	260	6%	2%
West of 15th Avenue NE	479	249	1,548	351	6%	2%
Hitchcock Bridge	459	243	1,568	677	6%	5%
T-Wing Overpass	449	260	1,571	841	6%	6%
Rainier Vista West	474	298	1,520	364	6%	1%
Hec Edmundson Bridge	472	269	1,537	424	6%	2%

Trail Location	2010 Bicycle Counts	2010 Pedestrian Counts	2030 Bicycle Estimates *	2030 Pedestrian Estimates *	Bicycle % Annual Change	Pedestrian % Annual Change
Wahkiakum Lane	425	159	1,386	290	6%	3%
South of Pend Oreille Road	438	136	1,429	261	6%	3%
North of Pend Oreille Road	435	178	1,419	312	6%	3%

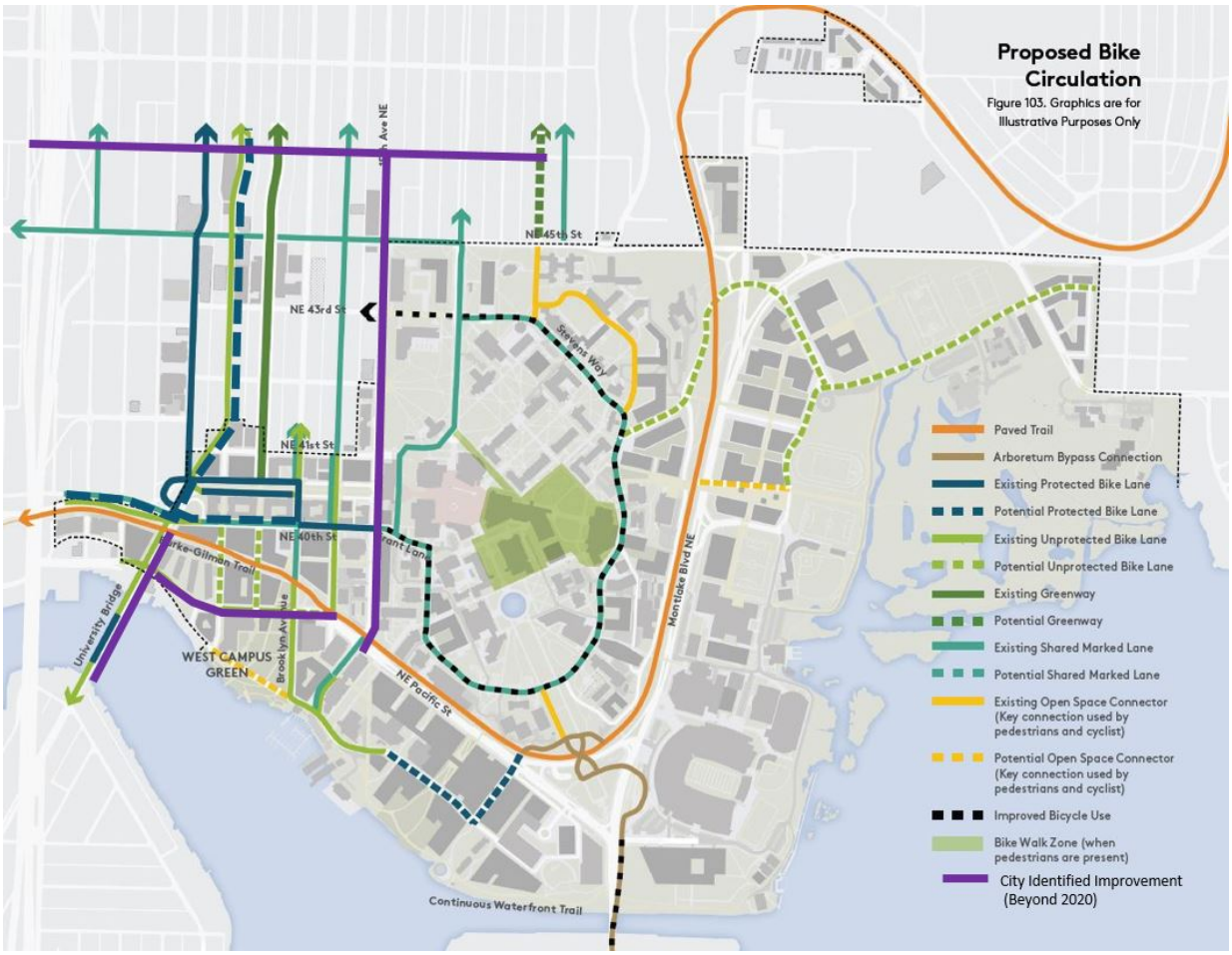
Source: University of Washington Burke-Gilman Trail Corridor Study, SvR 2011.
*Note: Estimates include background growth and growth related to University of Washington Link Station

As pedestrian and bicycle volumes increase, the operations along the trail are expected to become more congested along segments which have not been upgraded to separate pedestrian and bicycle travel. According to analysis from the Burke-Gilman Trail Corridor Study, without separating pedestrians and bicyclist, level of service for both pedestrians and bicyclists will operate poorly (LOS F) regardless of the width of the joint use trail. The study recommends separation of the trail into pedestrian and bicycle only facilities. A 2012 study (Burke-Gilman Trail Concept Design, Alta 2012) provided design options and recommendations for the trail. The University of Washington has completed expansion of two segments: a portion of the Neighborhood Reach from the University Street Bridge to Nordheim Court and the Campus Reach from 15th Avenue to Rainier Vista, which was completed in summer 2016. The University is continuing to expand the trail to meet future campus and other regional growth within their 1.7-mile ownership of the trail.

Burke-Gilman Trail Concept: The University of Washington has developed conceptual plans to expand the Burke-Gilman Trail, creating separated facilities along their 1.7-mile ownership. The Burke-Gilman Concept Design Plan, (ALTA 2012) creates segments or reaches of the Burke-Gilman Trail and defines design concepts. Some of these segments including portions of the Neighborhood Reach and the Campus Reach have been completed.

The City also supports establishing Greenways through neighborhoods. Greenways generally are one street off of main arterials with low volumes of cars going slowly enough so that people who walk or ride bicycles feel safe and comfortable

The proposed bicycle network is shown in **Figure 3.15-16**.



Source: Sasaki, October 2016 CMP

Figure 3.15-16 Future Bicycle Network

Bicycle Performance

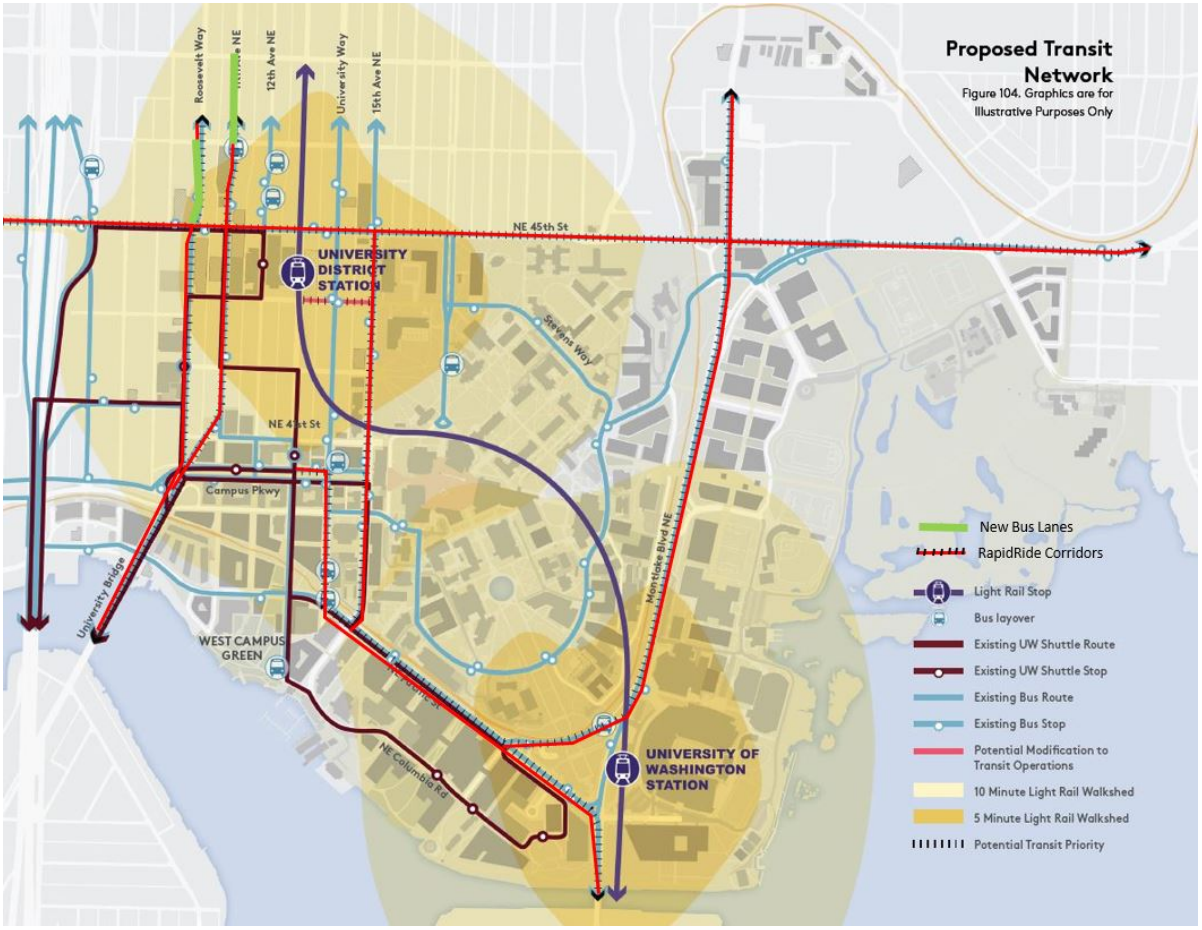
Two bicycle related performance measures have been identified to assess and compare alternatives; Burke-Gilman trail capacity and quality of the bicycle environment. Once completed the Burke-Gilman Trail is anticipated to operate at a good level of service for both pedestrians and bicyclists in the future and, will accommodate anticipated background increases in use anticipated from the new Light rail station (University of Washington Station) as well as anticipated bicycle and pedestrian growth in use related to the Campus Master Plan. Greater detail on bicycle and pedestrian growth is provided in **Appendix F**, the Transportation Discipline Report and appendices.

Transit Operations

Background Transit Conditions

Planned transit improvements in the coming years will dramatically alter the transit system framework in the University District. Sound Transit recently completed the extension of Link

light rail to the University of Washington in the spring of 2016 and plans to extend north, completing a segment to Northgate in 2021 that includes a station near the campus on Brooklyn Avenue. Other funded extensions include extensions north to Lynnwood, east to Redmond and Bellevue, and South to Federal Way by 2023. These extensions dramatically increase access to the campus via frequent and convenient Link light rail for students, faculty, staff and visitors and should help the University maintain or increase the proportion of trips that arrive by transit into the future. Just after opening of Link light rail, transit ridership saw a 13% increase in transit use via the U-PASS. Additionally, King County Metro recently published their Metro Connects plan that proposes RapidRide service through the University District on 15th Avenue, Montlake Avenue, 11th Avenue, NE 45th Street, and Pacific Street as part of the 2025 plan. Finally, the City of Seattle identifies Transit Priority Corridors in their Transit Master Plan along these same corridors that would provide amenities and capital investments such as transit lanes and transit signal priority to help transit function effectively. The proposed transit network and walksheds to light rail are shown in **Figure 3.15-17**.



Source: Sasaki, October 2016 CMP

Figure 3.15-17 Planned Transit Network and Walkshed

Transit Performance

Ensuring convenient access to transit service for campus development is important to help the University maintain or improve their high transit ridership. Impacts of action alternatives were measured in two performance measures: the proportion of development within 1/2-mile of RapidRide and the proportion of development within 1/2-mile of Light rail

Proportion of development within 1/2-mile of RapidRide and Link light rail

This measure, as well as the next measure, assesses proximity of campus development to high capacity transit service including RapidRide and Link light rail. This measure was calculated by determining the ratio of each sector within a 1/2-mile walk of a RapidRide stop. For future years the 2025 Draft King County Long Range Plan service network[2] was used to determine the location of RapidRide routes and stop locations were inferred based on existing high-ridership stops, Link station locations and desired stop spacing. The CMP identifies potential building sites within each sector. The ratio of the sector within 1/2-mile of RapidRide stops were estimate within the 1/2-mile buffer. With the advent of RapidRide in the future, generally all of the proposed growth in No Action and Alternative 4 have access to RapidRide within a 1/2-mile buffer area as shown in **Table 3.15-16**. Similarly, the proportion of development within a 1/2-mile buffer of Link light rail was measured to include both planned stations at University of Washington (currently operational) and University District (planned to open in 2021).

Table 3.15-16
NO ACTION, ALTERNATIVE 1, ALTERNATIVE 2, ALTERNATIVE 3, AND ALTERNATIVE 4
PROPORTION OF DEVELOPMENT WITHIN 1/2-MILE OF RAPIDRIDE AND LIGHT RAIL

Sector	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Proportion of development within 1/2 mile of Rapid Ride					
West	211,000 gsf	3,000,000 gsf	2,400,000 gsf	3,200,000 gsf	3,000,000 gsf
South	NA	1,350,000 gsf	1,350,000 gsf	1,650,000 gsf	200,000 gsf
Central	NA	900,000 gsf	900,000 gsf	900,000 gsf	1,100,000 gsf
East	NA	750,000 gsf	1,350,000 gsf	250,000 gsf	1,700,000 gsf
Total	**211,000 gsf**	**6,000,000 gsf**	**6,000,000 gsf**	**6,000,000 gsf**	**6,000,000 gsf**
Percent	***100%***	***100%***	***100%***	***100%***	***100%***
Proportion of development within 1/2 mile of light rail					
West	181,460 gsf	2,680,232 gsf	2,160,729 gsf	2,880,973 gsf	2,680,232 gsf
South	NA	1,350,000 gsf	1,350,000 gsf	1,650,000 gsf	200,000 gsf
Central	NA	900,000 gsf	900,000 gsf	900,000 gsf	1,100,000 gsf

Sector	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
East	NA	750,000 gsf	452,036 gsf	250,000 gsf	727,168 gsf
Total	**181,460 gsf**	**5,680,232 gsf**	**4,862,766 gsf**	**5,680,973 gsf**	**4,707,400 gsf**
Percent	***86%***	***95%***	***81%***	***96%***	***78%***

Source: The Transpo Group, 2016.
Note: Alternative 5 results would be the same as their related Action Alternative.

Vehicle System Operations and Parking

Performance for the vehicle system was measured including a cordon volume analysis, individual intersections, arterial corridors, screenlines, parking and compliance with the CUA. The evaluation of traffic operations within the study area included an analysis of intersection LOS (level of service) and arterial travel speeds and associated LOS. The methodologies are described in the Transportation Discipline Report including the assumed background investments.

Cordon Volume Analysis

To understand the volumes associated with the University of Washington Campus Master Plan growth, related to background volumes under the different Alternative scenarios, a cordon volume analysis was conducted. The cordon volume analysis focuses on the major roadways leading to and from the University. Volumes are shown in **Table 3.15-17** and indicate an increase in peak hour trips of 9-10 percent.

Cordon: An imaginary line used to evaluate traffic in and out of the University area and measure the change or increase in traffic associated with the proposed alternatives.

Table 3.15-17
PM PEAK HOUR CORDON VOLUME ANALYSIS SUMMARY

	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Inbound Cordon Volume	9,160	9,996	10,027	9,983	10,023
Percent Increase over No Action	0%	9%	9%	9%	9%
Outbound Cordon Volume	10,975	12,154	12,181	12,138	12,171
Percent Increase over No Action	0%	11%	11%	11%	11%
Total Cordon Volume	20,135	22,150	22,208	22,121	22,194
Percent Increase over No Action	0%	10%	10%	10%	10%

Source: The Transpo Group, 2016.
Note: Alternative 5 results would be the same as their related Action Alternative.

Individual Intersection Operations

Methodology – The methodology used in assessing intersection and corridor LOS is described in the Transportation Discipline Report.

Intersection LOS – Weekday PM peak hour intersection traffic operations for the year 2028 are analyzed for the intersections shown in **Figure 3.15-18.** The year 2028 geometry for all of the study-area intersections were assumed to remain the same as baseline No Action conditions except when modifications are expected as part of the alternative. For example, existing traffic was rerouted when impacted by proposed street vacations. Additionally, signal timing splits and offsets were optimized for all alternatives.

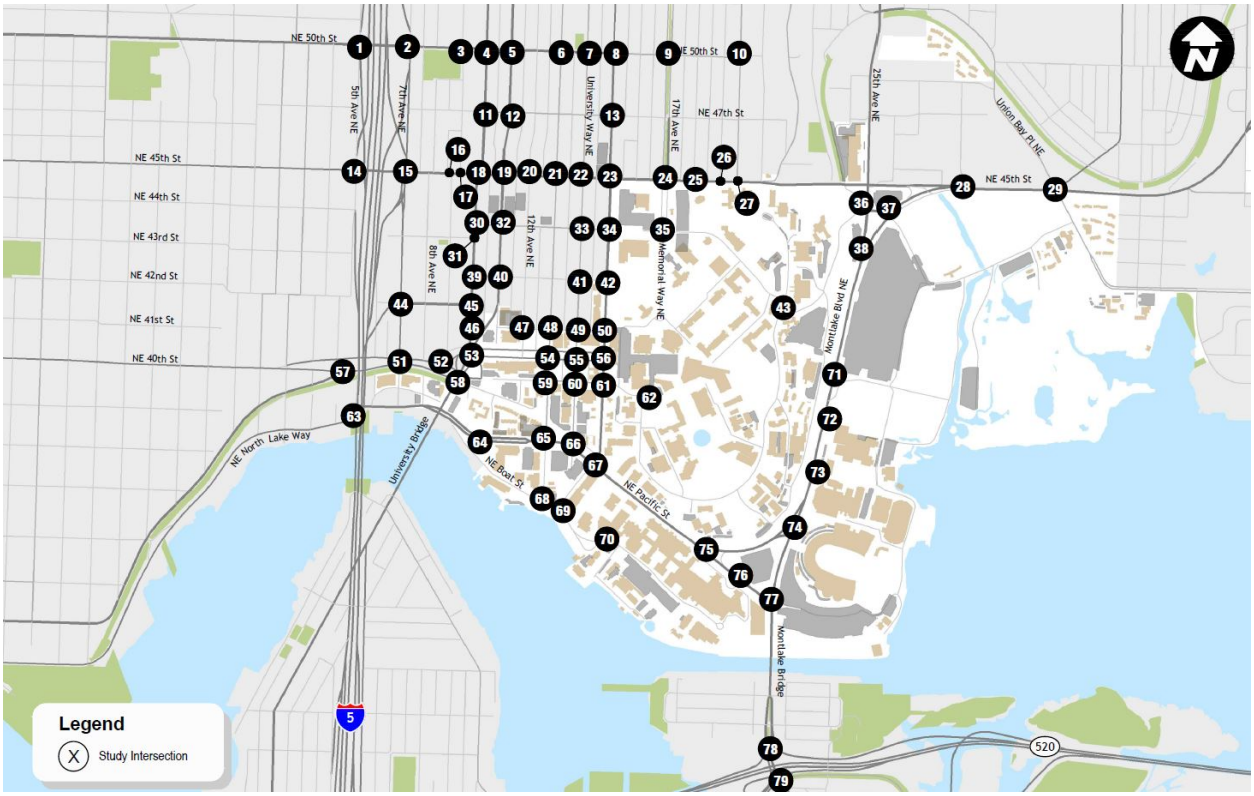
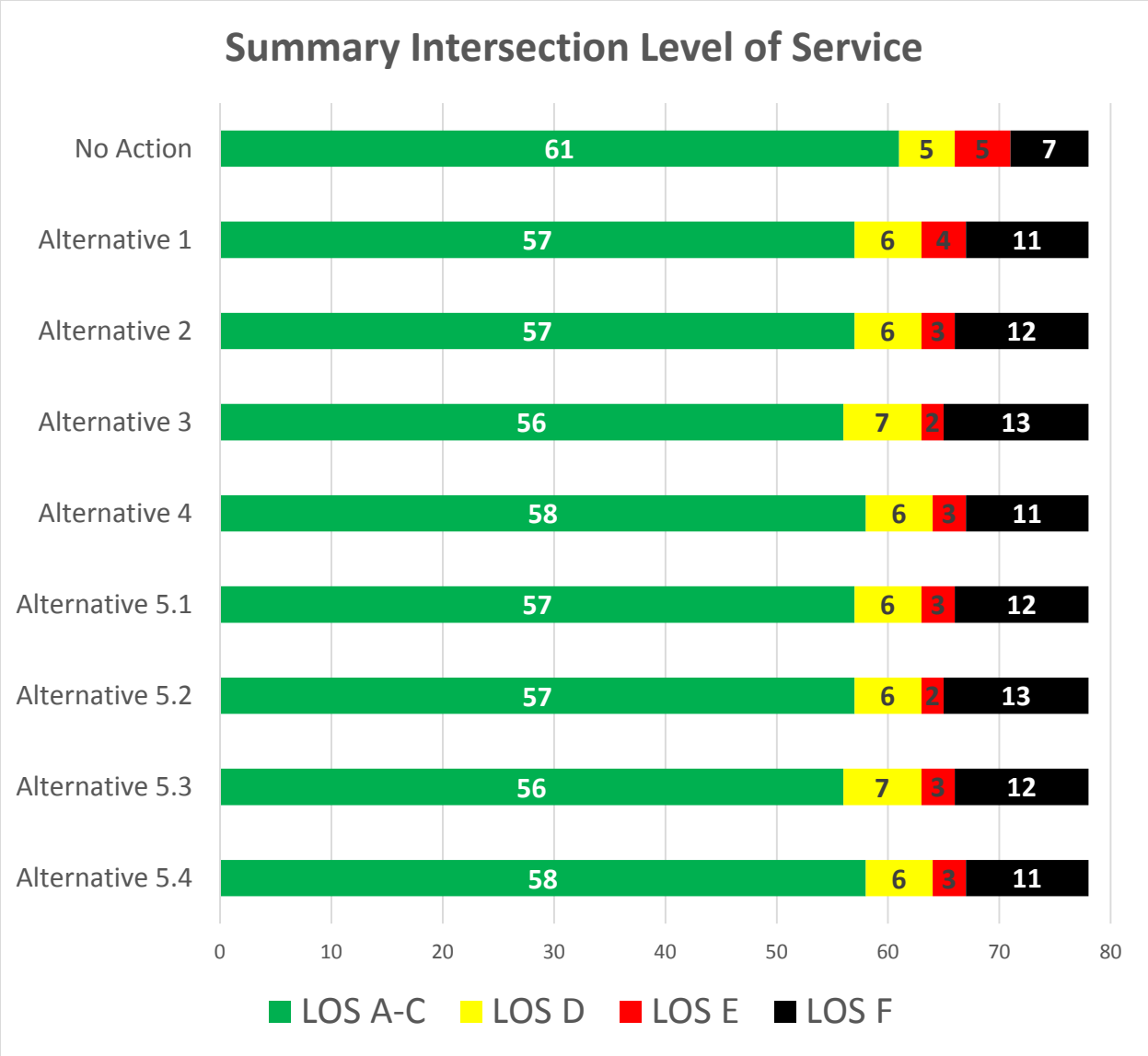


Figure 3.15-18 Study Intersections

Figure 3.15-19 compares the intersection operations for each alternative noting the number operating at acceptable (LOS A-C), poor (LOS D and E), and failing (LOS F) levels of service. As noted, the No Action case has the fewest number of intersections operating poorly at LOS F and the most operating with an acceptable LOS (A-C). **Figure 3.15-19** compares No Action and Alternatives 1-4 intersection operations at intersections where operations are expected to be LOS D or worse.



Source: The Transpo Group, 2016

Figure 3.15-19 Comparison of Intersection Level of Service

Table 3.15-18
COMPARISON OF POORLY OPERATING INTERSECTION LEVEL OF SERVICE

Intersection	No Action		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]
15. 7th Ave (I-5 NB) / NE 45th St	D	44	**E**	**61**	**E**	**61**	**E**	**61**	**E**	**64**
16. 9th Ave NE (North) / NE 45th St	E	48	**F**	**83**	**F**	**83**	**F**	**83**	**F**	**83**
17. 9th Ave NE (North) / NE 45th St	D	25	D	34	D	34	D	34	D	35
29. Montlake Blvd NE / Mary Gates Memorial Dr NE	E	56	**E**	**67**	**E**	**67**	**E**	**67**	E	66
30. Roosevelt Way NE / NE 43rd St (East)	F	68	**F**	**101**	**F**	**100**	**F**	**105**	**F**	**98**
31. Roosevelt Way NE / NE 43rd St (West)	E	45	**F**	**62**	**F**	**62**	**F**	**62**	**F**	**61**
46. Roosevelt Way NE / NE 41st St	F	434	**F**	**712**	**F**	**655**	**F**	**732**	**F**	**712**
47. 12th Ave NE / NE 41st St	F	76	***F***	***906***	**F**	**593**	***F***	***1056***	***F***	***1021***
49. University Way NE / NE 41st St	F	*	*F*	*	F	*	*F*	*	*F*	*
51. 7th Ave NE / NE 40th St	F	77	**F**	**101**	**F**	**98**	**F**	**103**	**F**	**95**
57. 6th Ave NE / NE 40th St	F	113	**F**	**135**	**F**	**131**	**F**	**137**	**F**	**132**
63. 6th Ave NE / NE Northlake Way	E	46	**F**	**105**	**F**	**105**	**F**	**107**	**F**	**102**
67. 15th Ave NE / NE Pacific St	D	37	***F***	***100***	***F***	***100***	***F***	***114***	**E**	**77**
69. 15th Ave NE / NE Boat St	C	15	***E***	***41***	***E***	***41***	***F***	***57***	B	14
70. Gate 6 turnaround / NE Boat St / Columbia Rd	B	12	C	24	C	24	D	34	B	13
71. Montlake Blvd NE / Wahkiakum Rd	F	463	**F**	**233**	**F**	**335**	**F**	**6951**	**F**	**376**
72. Montlake Blvd NE / IMA exit	E	38	**E**	**49**	**F**	**51**	**F**	**61**	**F**	**51**
73. Montlake Blvd NE / IMA Entrance	C	24	D	28	D	28	D	27	D	28
77. Montlake Blvd NE / NE Pacific St	C	31	D	40	D	41	D	38	D	41
78. Montlake Blvd NE / SR 520 WB Off-Ramp	C	34	D	43	D	41	D	42	D	42

Source: The Transpo Group, 2016
*Volume exceeds capacity and Synchro could not calculate delay.
Bolded LOS/Numbers indicate intersection where delay increases by more than 10 seconds.
Italicized LOS/Numbers indicate intersections where alternatives contribute more than 20% percent of the total trips
1. Level of service.
2. Average delay per vehicle in seconds rounded to the whole second.

Comparisons of the Alternatives 2 and 3 to the case with no street, alley, or aerial vacations (Alternative 5) to conditions with the No Action Alternative are shown in **Table 3.15-19**.

Table 3.15-19
FUTURE ALTERNATIVE 5 INTERSECTION LEVEL OF SERVICE COMPARISON SUMMARY

Intersection	No Action		Alt. 2		Alt. 5.2		Alt. 3		Alt. 5.3	
	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]
69. 15th Avenue NE/ NE Boat Street	C	15	E	41	F	62	F	57	F	90
72. Montlake Boulevard NE/ IMA exit	E	38	F	51	F	51	F	61	E	47

Source: The Transpo Group, 2016.

Note: Alternatives 1 and 4 experienced no change in traffic operations without the implementation of street vacations.

1. Level of service.
2. Average delay per vehicle in seconds rounded to the whole second.

Arterial Corridors

Arterial travel times and speeds along NE 45th Street, Pacific Street, 11th Avenue NE, Roosevelt Way NE, 15th Avenue NE, and Montlake Boulevard NE were evaluated with the addition of project generated traffic, consistent with the previously described methodology for existing and future No Action conditions. This includes the application of the adjustment factors described in detail in the Transportation Discipline Report. Study area corridors are shown in **Figure 3.15-20**.

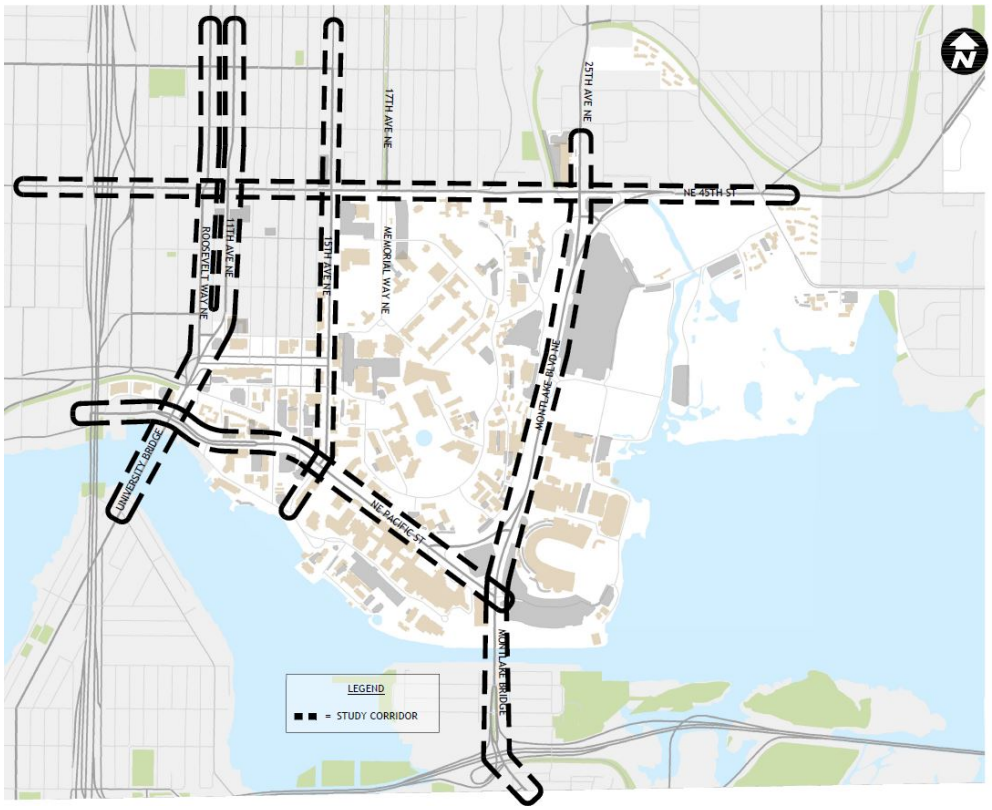


Figure 3.15-20 Study Corridors

Table 3.15-20
FUTURE NO ACTION AND ALL ACTION ALTERNATIVES WEEKDAY PM PEAK HOUR ARTERIAL OPERATIONS SUMMARY

Corridor	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	LOS[1]/ Speed[2]	LOS[1]/Speed[2]	LOS[1]/Speed[2]	LOS[1]/Speed[2]	LOS[1]/Speed[2]
11th Avenue NE between NE Campus Parkway and NE 50th Street					
Northbound	D/11.7	D/10.7	**E/7.8**	**E/7.6**	**E/7.8**
15th Avenue NE between NE Boat Street and NE 50th Street					
Northbound	E/9.0	E/8.9	E/9.0	E/8.9	E/8.9
Southbound	D/9.2	**E/7.6**	**E/7.7**	**E/7.8**	**E/8.9**
Montlake Boulevard NE between E Lake Washington Boulevard and NE 45th Street					
Northbound	E/10.8	**F/9.5**	**F/9.7**	**F/9.7**	**F/9.7**
Southbound	F/8.4	F/8.4	F/8.2	F/8.4	F/8.1
NE 45th Street between 5th Avenue NE and Union Bay Place NE					
Eastbound	D/11.7	D/10.7	D/10.6	D/10.7	D/10.6
Westbound	D/10.8	D/9.8	D/9.8	D/9.9	D/9.6
NE Pacific Street (NE Northlake Way) between 6th Avenue NE and Montlake Boulevard E					
Eastbound	C/18.1	**F/9.5**	**F/9.0**	**F/8.2**	**E/10.9**
Westbound	D/10.8	D/9.8	C/20.3	C/19.7	C/19.5
Roosevelt Way NE between NE Campus Parkway and NE 50th Street					
Southbound	D/12.0	D/11.8	D/11.8	D/11.8	D/11.8

Source: The Transpo Group, 2016.
Bold LOS/Numbers indicate where arterial operations worsened with the addition of Alternative project traffic.
Alternative 5 results would be the same as the related Action Alternative.
1. Level of service.
2. Average speed in miles per hour

When comparing Alternatives 5.1-5.4 to those including street and aerial vacations, arterial operations change only on NE Pacific Street. NE Pacific Street improved from LOS F to LOS E between Alternatives 1 and 5.1, Alternatives 2 and 5.2, and Alternatives 3 and 5.3. There was no change in arterial operations between Alternatives 4 and 5.4.

Screenlines

Screenline: An imaginary line across which the number of passing vehicles is counted.

The following section describes the screenline analysis completed for two designated screenlines within the study area. In this study, screenlines were selected to count vehicle traffic entering and exiting the University of Washington Primary and Secondary Impact Zone. As part of the Mayor's Seattle 2035 Comprehensive Plan (City of Seattle, 2016), two screenlines are identified within the vicinity of the University of Washington, as shown in **Figure 3.15-21**. Screenline 5.16 is an east-west screenline, measuring north-south travel, and extending along the ship canal to include the University and Montlake Bridges. Screenline 13.13 is a north-south screenline, measuring east-west travel, and extending east of I-5 between NE Pacific Street and NE Ravenna Boulevard.

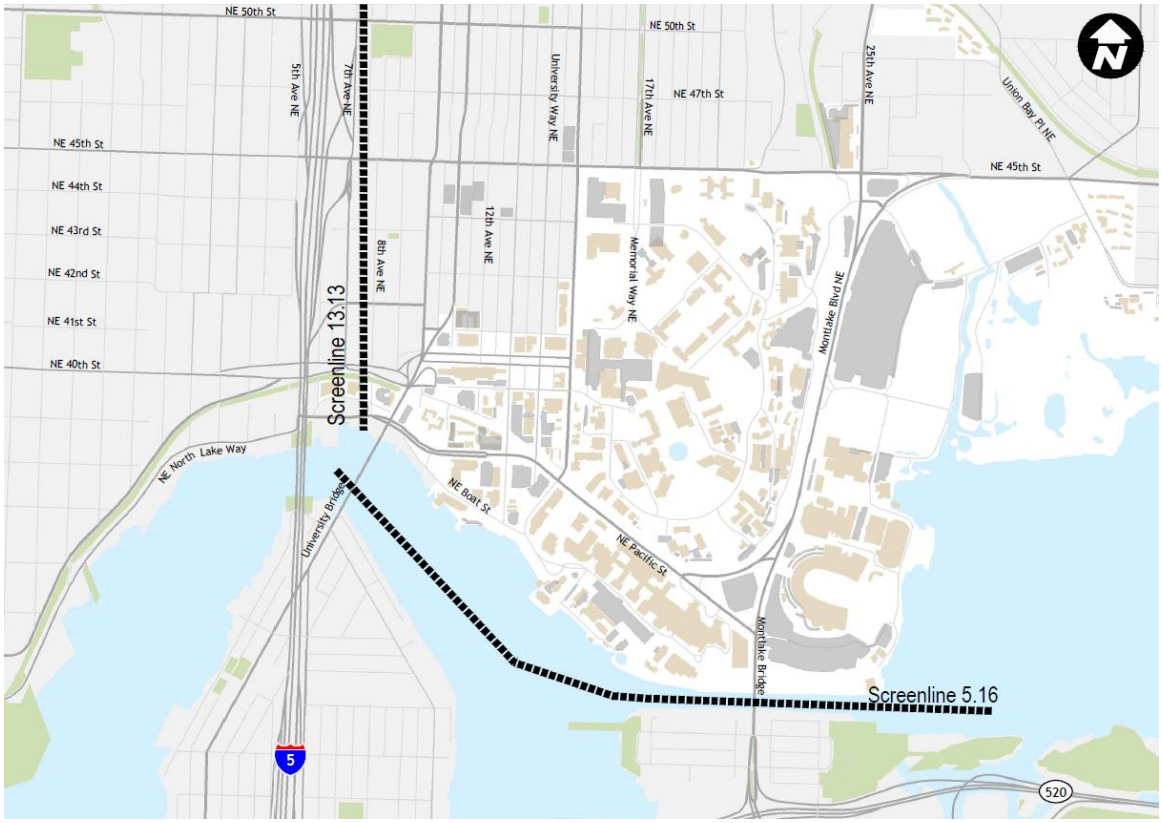


Figure 3.15-21 Study Area Screenlines

The screenline analysis includes volume to capacity (V/C) calculations for the vehicles traversing the screenlines using future (2028) Alternatives 1-4 traffic volumes and roadway capacity estimates. Alternative 5 (with no street, alley, and aerial vacations) would result in similar results to the related Action Alternatives. Roadway capacity for the 2028 future horizon year was interpolated using 2016 capacity estimates and 2035 capacity estimates referenced in the May 2016 Seattle Comprehensive Plan Update Final EIS. Future (2028)

roadway capacity estimates are shown in **Table 3.15-21** below. Detailed screenline volumes and volume to capacity calculations are included in **Appendix F**, the Transportation Discipline Report.

Table 3.15-21
FUTURE SCREENLINE CAPACITY

Screenline	Future (2028) Capacity
5.16 – Ship Canal, University and Montlake Bridges	
Northbound	4,210
Southbound	4,210
13.13 – East of I-5, NE Pacific Street to NE Ravenna Boulevard	
Eastbound	6,119
Westbound	6,119

Source: Transpo Group, 2016

Level of service standards for the screenline analysis are based on the volume to capacity ratio of a screenline. As described in the Seattle Comprehensive Plan Update EIS, the LOS standard volume to capacity ratio for Screenline 5.16 and Screenline 13.13 are 1.20 and 1.00, respectively. For this study, screenline volume to capacity ratios that do not exceed the LOS standard are acceptable. The screenline analysis for the No Action and all Action Alternatives is included in **Table 3.15-22**. Detailed screenline analysis calculations are included in **Appendix F**, the Transportation Discipline Report.

Table 3.15-22
FUTURE ALTERNATIVE SCREENLINE VOLUME AND VOLUME TO CAPACITY (V/C) ANALYSIS

Screenline	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Capacity V/C LOS Standard
5.16 – Ship Canal, University and Montlake Bridges						
NB Volume	3,805	4,015	4.022	4,066	4,028	4,210
NB V/C	0.90	0.95	0.96	0.95	0.96	1.20
SB Volume	3,775	4,097	4,107	4,094	4,095	4,210
SB V/C	0.90	0.97	0.98	0.97	0.97	1.20

Screenline	No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Capacity V/C LOS Standard
13.13 – East of I-5, NE Pacific Street to NE Ravenna Boulevard						
EB Volume	3,510	3,915	3,839	3,925	3,902	6,119
EB V/C	0.57	0.64	0.63	0.64	0.64	1.00
WB Volume	3,780	4,339	4,064	4,343	4,342	6,119
WB V/C	0.62	0.71	0.75	0.71	0.71	1.00

Source: NACTO

Note: Alternative 5 would be the same as the related Action Alternative

Parking

Supply

Similar the other Action Alternatives, it was assumed that parking supply would be increased or decreased within each Sector to achieve an 85 percent utilization without exceeding the parking cap for Alternative 4. Alternative 4 parking cap supply would be 10,240 spaces. The location of parking and strategies used to maintain the existing CUA parking cap would be consistent with those outlined for Alternative 1.

Demand

Overall parking demand for all Alternatives would be the same for all Action Alternatives. On-campus parking demand and utilization was reviewed by sector to provide context on where parking demand would occur (see **Table 3.15-23**). Allocation of parking demand by sector was based on projected development as documented in **Appendix F**, the Transportation Discipline Report. The evaluation assumes that on-street parking would be allocated to on-campus facilities given the increases and reallocation of parking supply to achieve an 85 percent utilization. In some cases, the 85 percent threshold for circulation may be exceeded by sector and parking would have to be encouraged in other sectors.

Table 3.15-23
FUTURE PEAK PARKING DEMAND COMPARISON FOR ALL ALTERNATIVES BY SECTOR

Sector	Future Cap Parking Supply	Parking Demand				
		No Action[1]	Alternative 1	Alternative 2	Alternative 3	Alternative 4
West	1.470	1,428	2,397	1,623	1,720	1,252
South	2,820	1,187	1,623	2,203	2,462	2,397
Central	3,580	2,689	2,980	2,980	1,545	3,044
East	2,370	1,464	1,706	1,900	2,979	2,013
Total	**10,240**	**6,768**	**8,706**	**8,706**	**8,706**	**8,706**

Action 5 results would be the same as the related Action Alternative.

Source: Transpo Group, 2016

1. On-campus parking demand for No Action based on projected increase in population. This does not include on-street parking demand increases noted in the previous table since these would not be parking within the Sectors.
2. Growth in parking demand based on projected increase in population for Alternative 4. The analysis assumes with the street vacation and reallocation of parking supply in Alternative 4, on-street parking demand would shift to on-campus parking.

As the table above reflects, reallocation of parking would result in a parking supply under the existing cap and an 85 percent utilization by sector and for the campus as a whole. The additional parking and reallocation of parking supply would provide a better relationship between localized supply and demand and thus reduce the likelihood of parking beyond the University facilities (i.e., within the neighborhoods).

Secondary Parking Impacts

Parking outside the primary impact zone surrounding the campus would likely continue with all Action Alternatives. This would include vehicles parking within transit served areas with unrestricted parking and then using transit to travel to campus. As the campus grows, this could occur at higher levels compared to the No Action Alternative.

Compliance with the CUA

Vehicle Trip Caps

Table 3.15-24 summarizes the potential trip cap compliance. Historic SOV mode splits are between 18 and 20 percent (2014-2015). Recent opening of University of Washington Link light rail station and anticipated expansion in 2021 of light rail in the University District would suggest 20 percent, the percent assumed in this analysis, is reasonable if not conservative for drive alone (SOV) modes. As shown from the summary, all Action

Alternatives are not expected to exceed the set vehicle trip caps, even with this conservative 20 drive alone mode split. The University will continue to find ways through the Transportation Management Plan demand management strategies to evolve and further reduce the amount of single occupant vehicles that are generated during the critical peak periods subject to the caps.

Table 3.15-24
FUTURE VEHICLE TRIP CAP SUMMARY

Location/Peak Period	Trip Cap (vph)	All Action Alternatives
UW Campus		
AM Peak Period Inbound (7:00-9:00)	*7,900*	*8,230*
PM Peak Period Outbound (3:00-6:00)	*8,500*	*8,230*
University District		
AM Peak Period Inbound (7:00-9:00)	*10,100*	*10,275*
PM Peak Period Outbound (3:00-6:00)	*10,500*	*10,275*

Source: The Transpo Group, 2016.

Transportation Management Plan (TMP): A transportation management program provides strategies for limiting traffic impacts and promoting active communities by managing vehicle trips and parking, as well as accommodating transit and non-motorized travel modes.

As described in Affected Environment, forecast 2028 trip cap outcomes are reflected as forecast *illustrations only,* and have no actual standing in the determination of compliance. They assume no change in mode split from 2015 levels, and thus may be considered conservative and worst case assumptions given the planned Link light rail expansions from the University of Washington to Northgate by 2021 and Lynnwood by 2023 When completed, these rail expansions greatly enhance access for students, faculty, and staff to reach the University by convenient transit and could reduce the overall proportion of drive alone travel to the University. While the approach is conservative and does not factor in the potential benefits of increased future light rail access, the University will continue to maintain compliance with the trip caps as part of their overall management effort, consistent with UW history, and implemented through the TMP. Assuming the more conservative 20 percent mode split would result in exceeding the University District cap in about 2025. As noted previously, growing trends in transit use for campus populations indicate this 20 percent drive alone mode split may be conservative. As this drive alone mode split goes down, it is likely that the caps would not be exceeded.

Parking Caps

Depending on the amount of new parking constructed to replace displaced parking and to provided additional parking more-proximate to actual new campus buildings, the on-campus parking supply would be managed to assure maintenance of the 12,300 total parking supply cap. This could require temporary or permanent elimination of some parking spaces, or repurposing the spaces during weekday conditions while maintaining their availability for use during major sporting events at Husky Stadium.

Summary of Impacts – No Action Alternative

The No Action Alternative assumes up to 211,000 net new gross square feet are developed in the West Sector of the campus. This results in a slight increase in campus population over the current (2014) student, faculty, and staff population. At the current, somewhat conservative mode split, that assumes 20% of this increased population access the campus through single occupant vehicles the anticipated increase in vehicle traffic and trips of other modes are noted in **Table 3.15-25** below.

Table 3.15-25
ESTIMATED NET NEW NO ACTION VEHICLE TRIPS

Trip Type	Daily Trips	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
No Action Trips	***150***	***35***	***15***	***45***	***20***	***30***	***50***
Visitors (10%)	*15*	*5*	*0*	*5*	*0*	*5*	5
Total UW *Trips*	***165***	***40***	***15***	***50***	***20***	***35***	***55***

Source: Transpo Group, 2016

Table 3.15-26
ESTIMATED NET NEW NO ACTION DAILY NON-VEHICLE TRIPS

Trip Type	Transit	Walk	Bicycle	Other
Student	220	290	55	5
Faculty	20	10	20	0
Staff	250	15	20	5
Total Trips	490	315	95	10

Impacts on the pedestrian, transit and bike system from this level of development are expected to be minimal as there is adequate capacity in these systems to accommodate this level of growth including the new green streets, the expanded Burke-Gilman Trail, a new light rail station and Rapid Ride Transit, and expanded and better connected bike lanes and greenways.

With increased background traffic and general area wide growth seven intersections operate poorly (with LOS E of F) and with a worse level of service in 2028 with the No Action Alternative as compared to existing conditions. The greatest change in operations occurs at the unsignalized intersection of Roosevelt Way and NE 41st Street.

Table 3.15-27
FUTURE NO ACTION INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Existing		No Action		Change in Delay (sec)
	LOS[1]	Delay[2]	LOS[1]	Delay[2]	
29. Montlake Blvd NE / Mary Gates Memorial Dr NE	D	54	E	56	2
30. Roosevelt Way NE / NE 43rd St (East)	E	48	F	68	20
46. Roosevelt Way NE / NE 41st St	E	39	F	434	395
47. 12th Ave NE / NE 41st St	E	41	F	76	35
51. 7th Ave NE / NE 40th St	E	37	F	77	40
63. 6th Ave NE / NE Northlake Way	C	25	E	46	21
72. Montlake Blvd NE / IMA exit	D	34	E	38	4

Source: Transpo Group 2016.

Other operational performance measures were evaluated including arterial travel time, cordon volumes entering the study area and screenline volumes as a measure in the secondary impact zone. For all of these measures the No Action Alternative is similar to the existing conditions. More details on these operations are included in **Appendix F**, the 2016 Transportation Discipline Report.

Table 3.15-28
COMPARISON OF EXISTING AND FUTURE NO ACTION ALTERNATIVE PEAK PARKING DEMAND

	Vehicles Parked							
	Students[1]		Faculty[1]		Staff[1]		Total	
	Existing[2]	No Action[3]	Existing[2]	No Action[3]	Existing[2]	No Action[3]	Existing[2]	No Action[3]
On-Campus	1,844	1,857	1,090	1,097	3,786	3,814	6,720	6,768
On-Street	134	134	49	49	93	94	276	277
Total	**1,978**	**1,991**	**1,139**	**1,146**	**3,879**	**3,908**	**6,996**	**7,045**

Source: Transpo Group, 2016

1. Demand by population and parking destinations based on 3-year average of University of Washington 2012-2014 Transportation Surveys consistent with Affected Environment.
2. Existing parking demand based on University of Washington 2015 parking counts.
3. No Action forecasts based on projected increase in population.

As shown in **Table 3.15-28**, a parking demand of less than 50 additional vehicles is expected from the development of the remaining building under the existing Campus Master Plan entitlements. With an increase in parking supply, the No Action Alternative parking utilization for the overall campus would be slightly less than existing conditions, and would not result in a significant adverse impact.

The No Action on-campus parking demand and utilization was also reviewed by Sector to provide context on where parking demand would occur. Allocation of No Action parking demand by Sector was based on projected growth by Sector. It was assumed that under the No Action scenario on-street parking would continue to occur.

Table 3.15-29
ON-CAMPUS NO ACTION ALTERNATIVE PEAK PARKING DEMAND BY SECTOR

Sector	Future Cap Parking Supply	Parking Demand			% Utilization
		Existing[1]	No Action		
			Growth[2]	Total	
West	1,524	1,428	+48	1,476	94%
South	1,400	1,139	+0	1,139	82%
Central	3,129	2,689	+0	2,689	86%
East	4,853	1,464	+0	1,464	30%
Total	**10,903**	**6,720**	**+48**	**6,768**	**62%**

Source: Transpo Group, 2016.

1. Existing parking demand based on University of Washington 2015 parking counts.
2. On-campus parking demand for No Action based on projected increase in population. This does not include on-street parking demand increases noted in the previous table since these would not be parking within the sector lot.

As indicated in the table above, the added parking demand with the new West Campus development under No Action conditions would result in an 85 percent parking utilization. West Campus would continue to have a 94 percent parking utilization consistent with existing conditions; however, given the parking utilization in other Sectors portions of this demand could be accommodated elsewhere on campus if it becomes difficult to find parking in West.

With the No Action Alternative, the campus as a whole would continue to have the ability to accommodate the total future parking demand within the existing parking supply and parking could be managed within the established parking cap constraints.

Secondary Parking Impacts

Parking outside the Primary Impact Zone surrounding the campus would likely continue with the No Action Alternative. This would include students, faculty, and staff parking their vehicles within transit served areas with unrestricted parking and then using transit and the U-PASS to travel to campus. Given the minimal growth of the No Action Alternative, it is likely that parking levels would be similar to existing conditions.

Impacts During Construction

During any construction as part of the remaining development in the current (2003) Campus Master Plan, potential construction impacts could include temporary closures of pathways and streets, reallocation or removal of bike and auto parking, increased truck traffic, or other temporary disruptions. While temporary in nature, potential mitigation for construction could include TMP strategies to minimize impacts. Specific impacts and mitigation for development would be addressed as part of the SEPA review.

CUA Compliance – Trip and Parking Caps

Vehicle Trip Caps – As described in Affected Environment, the University overall travel demand is subject to maintaining compliance with the trip caps consistent with 1990 UW vehicle demand levels. **Table 3.15-30** summarizes the trip cap summary for the No Action Alternative. No Action assumes that campus population growth would be limited to that associated with the completion of the existing 2003 Campus Master Plan, which would reflect a very minor increase in campus-generated traffic above existing levels. As shown the trip cap would continue to be met, assuming current (2015) mode splits are maintained.

Table 3.15-30
VEHICLE TRIP CAP SUMMARY – NO ACTION

Location/Peak Period	Trip Cap (vph)	2028 No Action
UW Campus		
AM Peak Period Inbound (7:00-9:00)	*7,900*	*7,005*
PM Peak Period Outbound (3:00-6:00)	*8,500*	*7,005*
University District		
AM Peak Period Inbound (7:00-9:00)	*10,100*	*8,750*
PM Peak Period Outbound (3:00-6:00)	*10,500*	*8,750*

Source: The Transpo Group, 2016.

Parking Caps. New parking would be provided only to replace parking removed for buildings.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1, would include the development total of 6,000,000 gross square feet of gross floor area throughout the campus with a focus of this development in the West and South Campus sectors and more limited development in the Central and East Campus sectors. Approximately 3,000,000 square feet of development is proposed in West Campus and 1,350,000 square feet are proposed in South Campus. The remaining development would be located in Central and East Campus, approximately 900,000 gsf and 750,000 gsf.

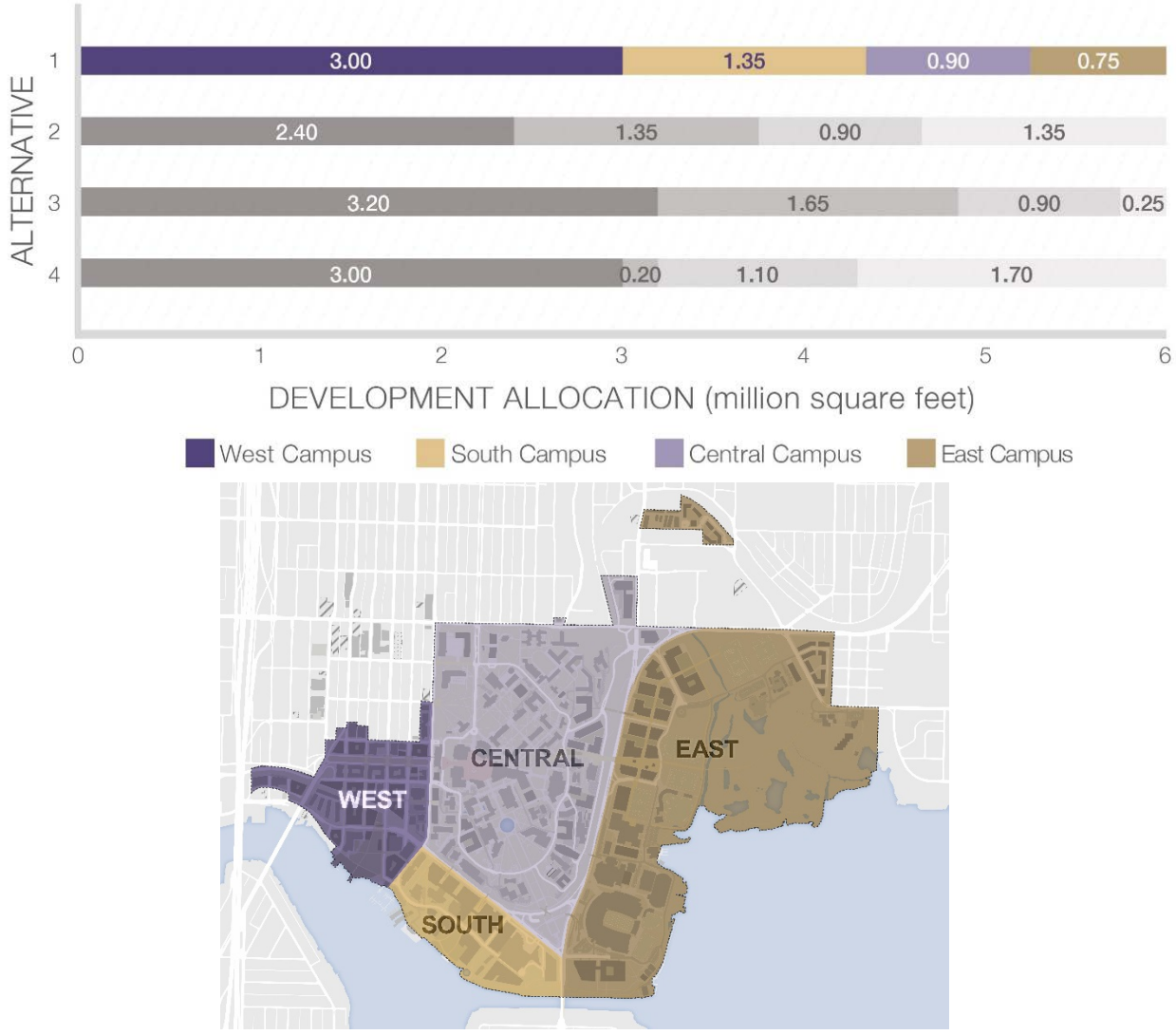


Figure 3.15-22 Alternative 1 Development Allocation

As noted in **Table 3.15-10** Alternative 1 will result in an increase of roughly 15,676 people over the current student, faculty, and staff campus population. Assuming the conservative

current mode split of 20% drive alone trips, the modes by population are shown in **Table 3.15-11** and **Table 3.15-13**.

Generally, all of the Action Alternatives have the same trip generation and mode split; however, they are applied at different sectors depending on where development is proposed to occur.

Pedestrian System Operations

Location of development in relation to multi-family housing and University of Washington residence halls are indicators of how well the alternative will be able to continue to have a strong pedestrian mode of travel. **Table 3.15-14** indicates that all of the Alternative 1 development is within 1/2-miles of multi-family housing and University of Washington residence halls. This Alternative would provide a number of quality enhancements to pedestrian travel within the MIO where development occurs. This alternative includes reserving land for a potential new open space area in West Campus with a number of new pedestrian facilities in and surrounding this area. The CMP identifies a new ADA accessible east-west connection between the potential Wes Campus open space to Central Campus, improving accessibility and providing an alternative route to the currently heavily used NE 40th Street/Grant Lane route. Pedestrian demand in and around West Campus would increase with added campus uses.

The CMP also identifies a number of new pedestrian connections in South Campus, better connecting Portage Bay with Central Campus by replacing the Medical Center. Compared to the No Action Alternative, this Alternative would greatly improve pedestrian circulation. The potential new land bridge to East Campus also would improve access to this area, especially for ADA access.

Bicycle System Operations

The quality of bicycle travel associated with this alternative generally improves in areas with development. This primarily includes new or improved dedicated bicycle facilities in West Campus and South Campus, or in the case of East Campus, improved access to the Burke-Gilman Trail. South Campus could see the largest improvement in internal circulation and improved access to Portage Bay.

In general, bicycle travel demand will increase throughout these areas as well as on regional bicycle facilities to/from them, however capacity constraints are not anticipated. Bicycle travel on Central Campus would grow but by a relatively small amount compared to existing travel demand, and limited improvements in dedicated bicycle facilities in Central Campus would be expected.

With expansion of the Burke-Gilman Trail and separation of pedestrian and bicycle facilities, this alternative will not impact trail operations.

Transit System Operations

Planned improvements to the transit system adjacent to the campus include a new light rail station (U District) and implementation of RapidRide on the adjacent corridors. As shown in **Table 3.15-16**, all of the Alternative 1 development is located within 1/2-mile of proposed RapidRide Corridors, while 95% is located within 1/2-mile of Light rail stations.

Vehicle System Operations

As shown in **Figure 3.15-19,** Alternative 1 has slightly fewer intersections operating well with a LOS A-C and more operating poorly at LOS D, E, and F. As shown, all of the Action Alternatives result in an increase of intersections operating poorly (LOS E and F) as compared to No Action. This is particularly true of all-way or two-way stop controlled intersections. As shown in **Table 3.15-20**, Alternative 1 has three corridors that operate with a worse level of service than No Action. Notably, Pacific Avenue eastbound in the PM peak hour would worsen from LOS C in the No Action case to F with Alternative 1. As compared to other Action Alternatives, Alternative 1 has a slightly better corridor speed and level of service for the 11th Avenue northbound corridor. Like the other Action alternatives, Alternative 1 operates well within the screenline capacity noted in **Table 3.15-22**.

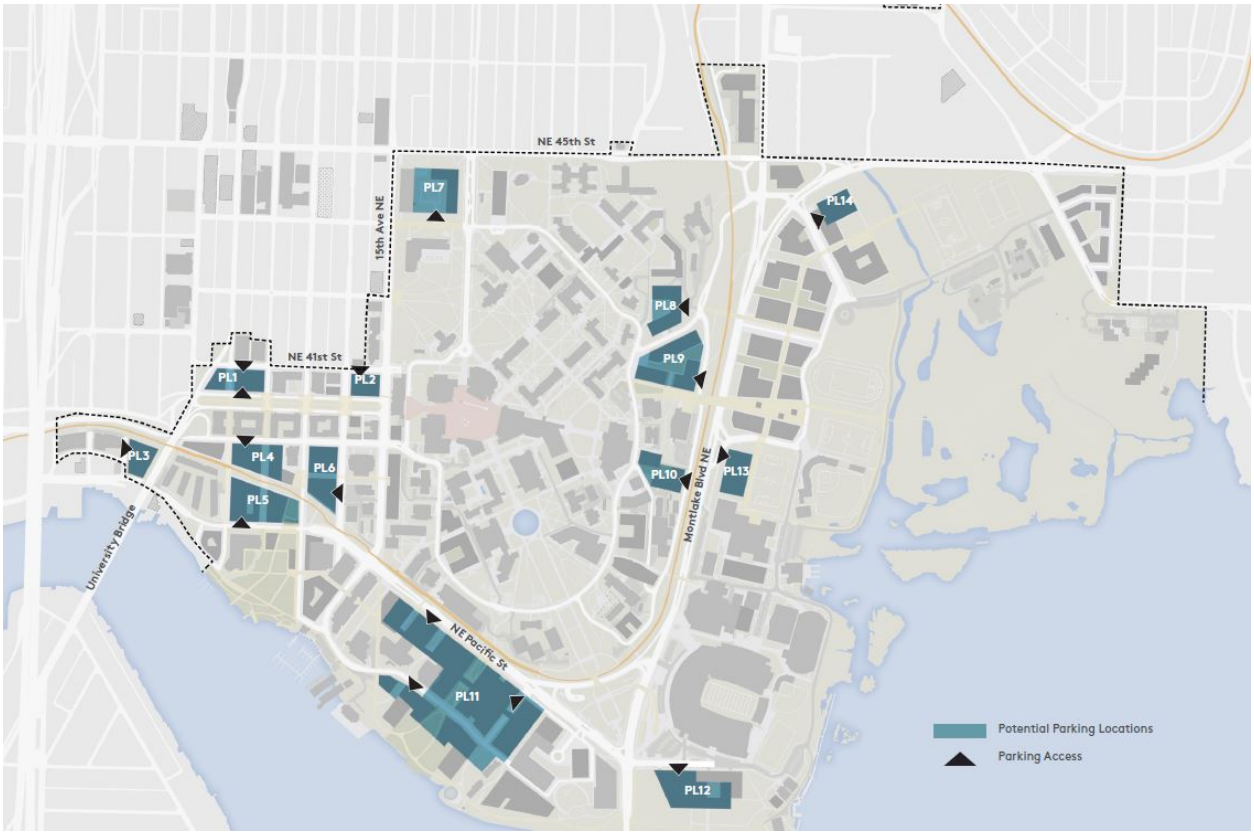
Parking

Supply

The identification of parking impacts is determined by evaluating the assumed parking supply in the development would be increased or decreased within each Sector to achieve an 85 percent utilization without exceeding the parking cap. Alternative 1 parking cap supply would be 10,250 spaces. An 85 to 90 percent utilization reflects a level where drivers are typically able to find parking without difficulty and circulation through the parking areas while searching for parking is minimized.

Additional parking would be constructed on one or more of the identified parking sites reflected in **Figure 3.15-23**. Any increases in parking supply would be phased such that the existing CUA parking cap would be maintained. Strategies to maintain the parking cap could include:

- Factoring in the parking demand and the implications on the parking cap when determining phasing of development
- Removing parking in sectors that are underutilized so that parking can be constructed in more desirable locations consistent with parking demand projections
- Shifting modes to reduce the overall parking needs for the campus to minimize the amount of new parking needed



Source: 2018 Seattle CMP

Figure 3.15-23 Potential Sites for Campus Parking

Demand

Alternative 1 would develop 6 million square-feet on-campus and vacate Boat Street. **Table 3.15-31** provides a summary of the resulting increase in parking demand by population with Alternative 1. The evaluation assumes that with the changes in campus parking supply potential on-street parking demand would occur within the campus.

Table 3.15-31
COMPARISON OF FUTURE NO ACTION AND ALTERNATIVE 1 PEAK PARKING DEMAND

	Vehicles Parked							
	Students[1]		Faculty[1]		Staff[1]		Total	
	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]
On-Campus	1,857	2,298	1,096	1,358	3,814	4,768	6,768	8,424

	Vehicles Parked							
	Students[1]		Faculty[1]		Staff[1]		Total	
	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]	No Action[2]	Alt 1[3,4]
Potential On-Street	134	136	49	50	94	96	277	282
Total	**1,991**	**2,435**	**1,146**	**1,408**	**3,908**	**4,863**	**7,045**	**8,706**

Source: Transpo Group, 2016.

1. Demand by population assumes a SOV at 20 percent for the campus.
2. No Action forecasts based on projected increase in population.
3. With the street vacation identified in Alternative 1, the reduction in on-street parking supply (approximately 60 spaces) results in on-street parking demand shifted on-campus.
4. Approximately 3% of the total parking demand is anticipated to be generated by the proposed partner development (500,000 square feet of development in West Campus).

As shown in the table, compared to the No Action, Alternative 1 would add a parking demand of approximately 1,660 vehicles assuming a 20 percent SOV for the campus. From the perspective of the campus as a whole, the Alternative 1 parking demand would continue to be accommodated within the existing parking supply and would not impact the CUA parking cap.

Similar to the No Action Alternative, the Alternative 1 on-campus parking demand and utilization was also reviewed by Sector to provide context on where parking demand would occur (see **Table 3.15-31).** Allocation of Alternative 1 parking demand by sector was based on projected development as documented in Appendix B of the TDR in the parking methodology. The evaluation assumes that on-street parking would be allocated to on-campus facilities given the increases and reallocation of parking supply to achieve an 85 percent utilization.

As shown in **Table 3.15-31**, reallocation of parking would result in a parking supply under the existing cap and an 85 percent utilization by Sector and for the campus as a whole. The additional parking and reallocation of parking supply would provide a better relationship between localized supply and demand and thus reduce the likelihood of parking beyond the University facilities (i.e., within the neighborhoods).

Secondary Parking Impacts

Parking outside the primary impact zone surrounding the campus would likely continue with Alternative 1 similar to the No Action Alternative. This would include vehicles parking within transit served areas with unrestricted parking and then using transit to travel to campus. As the campus grows, this could occur at higher levels compared to the No Action Alternative.

CUA vehicle trip caps are considered campus-wide and would not materially change between proposed alternatives.

Impacts During Construction

During construction of all Action Alternatives, potential construction impacts could include temporary closures of pathways, and streets, reallocation or removal of bike and auto parking, increased truck traffic or other temporary disruptions. While temporary in nature, potential mitigations for construction could include TMP strategies, outreach, and coordination to minimize impacts. Specific impacts and mitigations for development would be addressed as part of SEPA review.

Alternative 2 – Campus Development with Existing Height Limits

The following summarizes the evaluation of Alternative 2 with respect to the transportation related elements identified in the Affected Environment section of this report. The proposed University of Washington Development under Alternative 2 is anticipated to be primarily located in West, South and East Campus, with less development assumed for West Campus because the same level of development cannot be accommodated with existing height limits. The technical analysis of Alternative 2 focuses on the weekday PM peak period.

Alternative 2 would include the development total of 6,000,000 net new square feet of gross floor area of which approximately 2,400,000 gsf are located in West Campus, 1,350,000 gsf are located in South Campus, 900,000 gsf are located in Central Campus, and 1,350,000 are located East Campus, as shown in **Figure 3.15-24**.

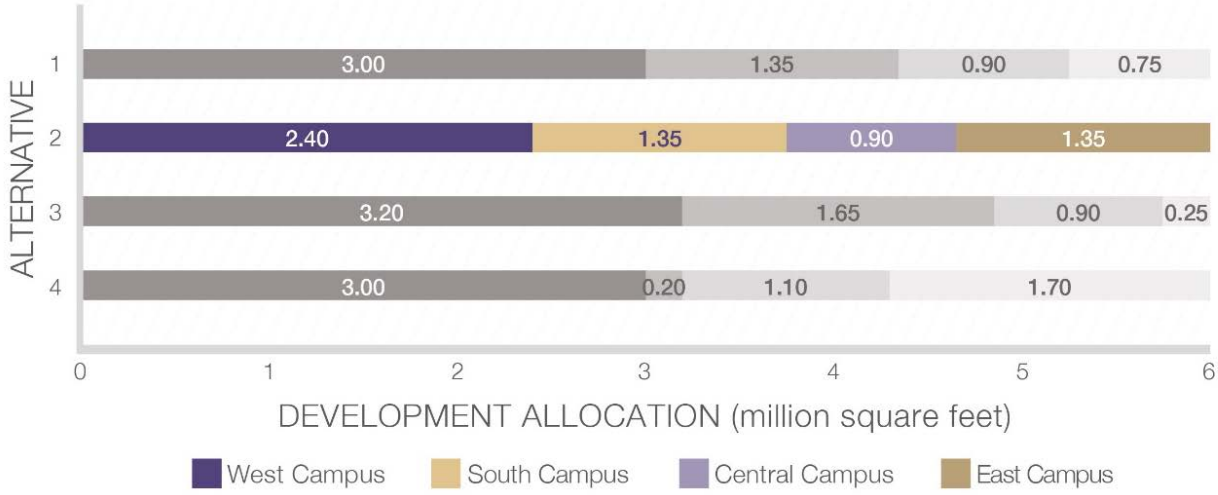


Figure 3.15-24 Alternative 2 Development Allocation

Similar to Alternative 1, Alternative 2 will result in an increase of roughly 15,676 people over the current student, faculty, and staff campus population. As noted, all of the Action Alternatives have the same trip generation and mode split; however, they are applied at different sectors depending on where development is proposed to occur.

Pedestrian System Operations

Location of development in relation to multi-family housing and University of Washington residence halls are indicators of how well the Alternative will be able to continue to have a strong pedestrian mode of travel. **Table 3.15-14** indicates that all of the Alternative 2 development is within 1/2-mile of multi-family housing and University of Washington residence halls.

This Alternative would provide a number of enhancements to pedestrian travel within the MIO where development occurs. Improvements in West Campus would primarily include improvements to sidewalks and a new ADA accessible pedestrian connection between West and Central Campus. Pedestrian demand in and around West Campus would increase with added campus uses.

The new pedestrian connections in South Campus, would improve access to Portage Bay; however, improved access and connectivity could be less than Alternative 1. The potential new land bridge to East Campus improves access to this area, especially for ADA access. South Campus would see increase in pedestrian travel, although not on the same scale as West or East Campus.

Bicycle System Operations

Change to bicycle travel associated with this alternative is similar to Alternative 1, however added bicycle travel demand would be lower in West Campus and greater in East Campus.

With expansion of the Burke-Gilman Trail and separation of pedestrian and bicycle facilities, this alternative will not impact trail operations.

Transit System Operations

Planned improvements to the transit system adjacent to the campus include a new light rail station (U District) and implementation of RapidRide on the adjacent corridors. As shown in **Table 3.15-16**, all of the Alternative 2 development is located within 1/2-mile of proposed RapidRide Corridors, while 81% is located within 1/2-mile of Light rail stations.

Vehicle System Operations

As shown in **Figure 3.15-19** and compared to No Action, Alternative 2 has slightly fewer intersections operating well, with a LOS A-C and more operating poorly at LOS D, E, and F. As shown, all of the Action Alternatives result in an increase of intersections operating poorly (LOS E and F) as compared to No Action. This is particularly true of all-way or two-way stop controlled intersections. As shown in **Table 3.15-20**, Alternative 2 has four corridors that operate with a worse level of service than No Action. Notably, Pacific Avenue eastbound in the PM peak hour would worsen from LOS C in the No Action case to F with Alternative 1. Notably, the NE Pacific Street corridor westbound would operate with a slightly better LOS and speed as compared to No Action and Alternative 1.

Like the other Action alternatives, Alternative 2 operates well within the screenline capacity noted in **Table 3.15-3**.

Parking

Supply

Similar to Alternative 1, it was assumed that parking supply would be increased or decreased within each Sector to achieve an 85 percent utilization without exceeding the parking cap for Alternative 2. Alternative 2 parking cap supply would be 10,250 spaces. The location of parking and strategies used to maintain the existing CUA parking cap would be consistent with those outlined for Alternative 1.

Demand

Overall parking demand for Alternative 2 would be the same as Alternative 1. Alternative 2 on-campus parking demand and utilization was reviewed by sector to provide context on where parking demand would occur (see **Table 3.15-32**). Allocation of Alternative 2 parking demand by sector was based on projected development as documented in Appendix B of the TDR. The evaluation assumes that on-street parking would be allocated to on-campus facilities given the increases and reallocation of parking supply to achieve an 85 percent utilization.

Table 3.15-32
ALTERNATIVE 2 PEAK PARKING DEMAND BY SECTOR

Sector	Future Cap Parking Supply	Parking Demand			% Utilization
		No Action[1]	Alternative 2		
			Growth[2]	Total	
West	1,910	1,428	436	1,623	85%
South	2,590	1,187	775	2,203	85%
Central	3,510	2,689	291	2,980	85%
East	2,240	1,464	436	1,900	85%
Total	**10,250**	**6,768**	**+1,938**	**8,706**	**85%**

Source: Transpo Group, 2016.

1. On-campus parking demand for No Action based on projected increase in population. This does not include on-street parking demand increases noted in the previous table since these would not be parking within the Sectors.
2. Growth in parking demand based on projected increase in population for Alternative 2. The analysis assumes with the street vacation and reallocation of parking supply in Alternative 2, on-street parking demand would shift to on-campus parking.

As the table above reflects, reallocation of parking would result in a parking supply under the existing cap and an 85 percent utilization by Sector and for the campus as a whole. The additional parking and reallocation of parking supply would provide a better relationship between localized supply and demand and thus reduce the likelihood of parking beyond the University facilities (i.e., within the neighborhoods).

Secondary Parking Impacts

Parking outside the primary impact zone surrounding the campus would likely continue with Alternative 2 similar to the No Action Alternative. This would include vehicles parking within transit served areas with unrestricted parking and then using transit to travel to campus. As the campus grows, this could occur at higher levels compared to the No Action Alternative.

CUA vehicle trip caps are considered campus-wide and would not materially change between proposed alternatives.

Alternative 3 – Campus Development with Increased West & South Campus Density

The following summarizes the evaluation of Alternative 3 with respect to the transportation related elements identified in the Affected Environment section of this report. The proposed University of Washington development under Alternative 3 is anticipated to be primarily located in West and South Campus. The technical analysis of Alternative 3 focuses on the weekday PM peak period.

Alternative 3 would include the development total of 6,000,000 square feet of gross floor area throughout the campus with a focus this development in the West and South Campus sectors and more limited development in the Central and East Campus sectors. Approximately 3,200,000 square feet of development is proposed in West Campus and 1,650,000 square feet are located in South Campus. The remaining development would be located in Central and East Campus, approximately 900,000 gsf and 250,000 gsf, respectively. A summary of the Alternative 3 development allocation is provided in **Figure 3.15-25**.

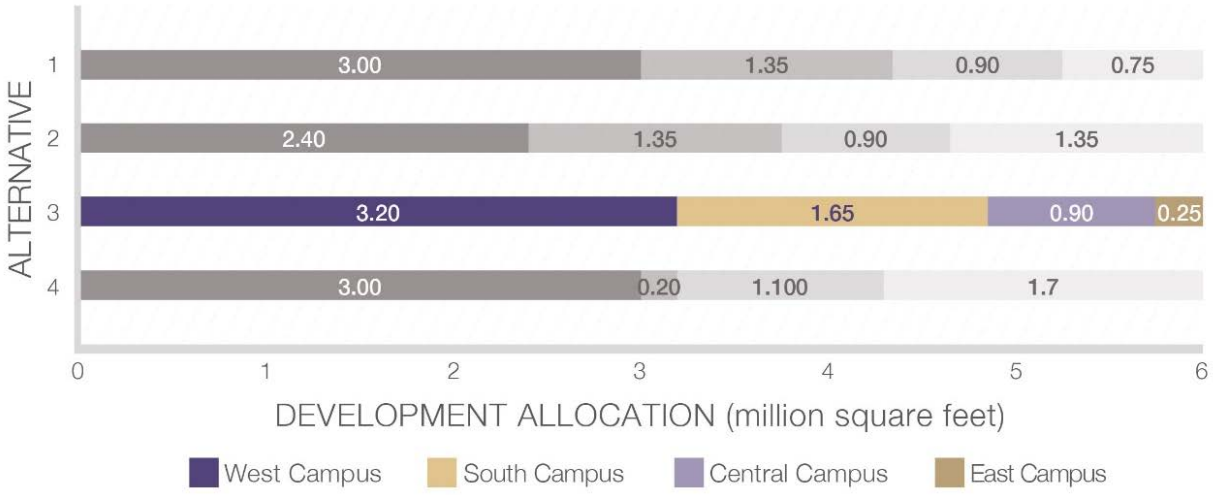


Figure 3.15-25 Alternative 3 Development Allocation

Similar to Alternative 1, Alternative 3 will result in an increase of roughly 15,676 people over the current student, faculty, and staff campus population. As noted, all of the Action Alternatives have the same trip generation and mode split; however, they are applied at different sectors depending on where development is proposed to occur.

Pedestrian System Operations

Location of development in relation to multi-family housing and University of Washington residence halls are indicators of how well the alternative will be able to continue to have a strong pedestrian mode of travel. **Table 3.15-14** indicates that almost all (99.4%) of the Alternative 3 development is within 1/2-miles of multi-family housing and almost all (99.8%) of the development is within 1/2-mile of the University of Washington residence halls.

The impacts of this Alternative are similar to those of Alternative 1. The primary difference is less development in East Campus, resulting in fewer connections and a less developed pedestrian network.

Bicycle System Operations

Burke-Gilman Trail Capacity

It is anticipated that this alternative would generally have the same impact on the pedestrian and bicycle demand on the Burke-Gilman Trail as Alternative 1, however due to the larger concentration of growth in West and South Campus, high travel demand would be anticipated in these areas along and crossing the Burke-Gilman Trail. It is anticipated that East Campus would see the least growth in demand. Planned expansion of the Burke-Gilman Trail separating pedestrian and bicycle uses will provide adequate capacity to meet CMP demands.

Quality of Bicycle Environment

This alternative would be expected to include the same general improvements to bicycle travel on campus as in Alternative 1, but with a greater concentration of added bicycle travel in the West and South Campus areas and less bicycle travel in East Campus.

The Burke-Gilman Trail is anticipated to experience increased demand in the West Campus and South Campus sectors. The focus on development in West Campus with Alternative 3 could result in trail facility improvements, similar to those in the Mercer Court area. Increased cross traffic and travel along the newly updated trail segment is anticipated in South Campus with Alternative 3 development. The Burke-Gilman Trail would provide better circulation from the southwest to the northeast areas of campus. Cross traffic and travel along the older segment of the trail would increase in East Campus, especially with the addition of the land bridge. Existing Pronto travel patterns indicate the East Campus bicycle travel may increase, as the Burke-Gilman Trail provides a flat and direct route from East Campus to the South Campus and West Campus sectors.

Transit System Operations

Planned improvements to the transit system adjacent to the campus include a new light rail station (U District) and implementation of RapidRide on the adjacent corridors. As shown in

Table 3.15-16, all of the Alternative 3 development is located within 1/2-mile of proposed RapidRide Corridors, while 96% is located within 1/2-mile of light rail stations.

Vehicle System Operations

As shown in **Figure 3.15-19** and compared to No Action Alternative 3 has slightly fewer intersections operating well, with a LOS A-C and more operating poorly at LOS D, E, and F. As shown, all of the Action Alternatives result in an increase of intersections operating poorly (LOS E and F) as compared to No Action. This is particularly true of all-way or two-way stop controlled intersections. As shown in **Table 3.15-20**, Alternative 3 has four corridors that operate with a worse level of service than No Action. Notably, Pacific Avenue eastbound in the PM peak hour would worsen from LOS C in the No Action case to F with Alternative . Notably, the NE Pacific Street corridor westbound would operate with a slightly better LOS and speed as compared to No Action and Alternative 3.

Like the other Action alternatives, Alternative 3 operates well within the screenline capacity noted in **Table 3.15-3**.

Parking

Supply

Similar to the other Action Alternatives, it was assumed that parking supply would be increased or decreased within each Sector to achieve an 85 percent utilization without exceeding the parking cap for Alternative 3. Alternative 3 parking cap supply would be 10,240 spaces. The location of parking and strategies used to maintain the existing CUA parking cap would be consistent with those outlined for Alternative 1.

Demand

Overall parking demand for Alternative 3 would be the same as the other Action Alternatives. Alternative 3 on-campus parking demand and utilization was reviewed by sector to provide context on where parking demand would occur (see **Table 3.15-33**). Allocation of Alternative 3 parking demand by sector was based on projected development as documented in Appendix B of the TDR. The evaluation assumes that on-street parking would be allocated to on-campus facilities given the increases and reallocation of parking supply to achieve an 85 percent utilization.

Table 3.15-33
ALTERNATIVE 3 PEAK PARKING DEMAND BY SECTOR

Sector	Future Cap Parking Supply	Parking Demand			% Utilization
		No Action[1]	Alternative 3		
			Growth[2]	Total	
West	2,020	1,428	533	1,720	110%
South	2,900	1,187	1,034	2,462	135%
East	1,820	1,464	81	1,545	31%
Central	3,500	2,689	290	2,979	89%
Total	**10,240**	**6,768**	**1,938**	**8,706**	**72%**

Source: Transpo Group, 2016.

1. On-campus parking demand for No Action based on projected increase in population. This does not include on-street parking demand increases noted in the previous table since these would not be parking within the Sectors.
2. Growth in parking demand based on projected increase in population for Alternative 3. The analysis assumes with the street vacation and reallocation of parking supply in Alternative 3, on-street parking demand would shift to on-campus parking.

As the table above reflects, reallocation of parking would result in a parking supply under the existing cap and an 85 percent utilization by Sector and for the campus as a whole. The additional parking and reallocation of parking supply would provide a better relationship between localized supply and demand and thus reduce the likelihood of parking beyond the University facilities (i.e., within the neighborhoods).

Secondary Parking Impacts

Parking outside the primary impact zone surrounding the campus would likely continue with Alternative similar to the No Action Alternative. This would include vehicles parking within transit served areas with unrestricted parking and then using transit to travel to campus. As the campus grows, this could occur at higher levels compared to the No Action Alternative.

CUA vehicle trip caps are considered campus-wide and would not materially change between proposed alternatives.

Alternative 4 – Campus Development with Increased West and East Campus Density

The following summarizes the evaluation of Alternative 4 with respect to the transportation related elements identified in the Affected Environment section of this report. The proposed University of Washington Development under Alternative 4 is anticipated to be primarily located in West and East Campus. The technical analysis of Alternative 4 focuses on the weekday PM peak period.

Alternative 4 would include the development total of 6,000,000 net new square feet of gross floor area of which approximately 3,000,000 square feet are located in West Campus and 1,700,000 square feet are located in East Campus. The remaining development would be located in South and Central Campus, approximately 200,000 gsf and 1,100,000 gsf, respectively as shown in **Figure 3.15-26.**

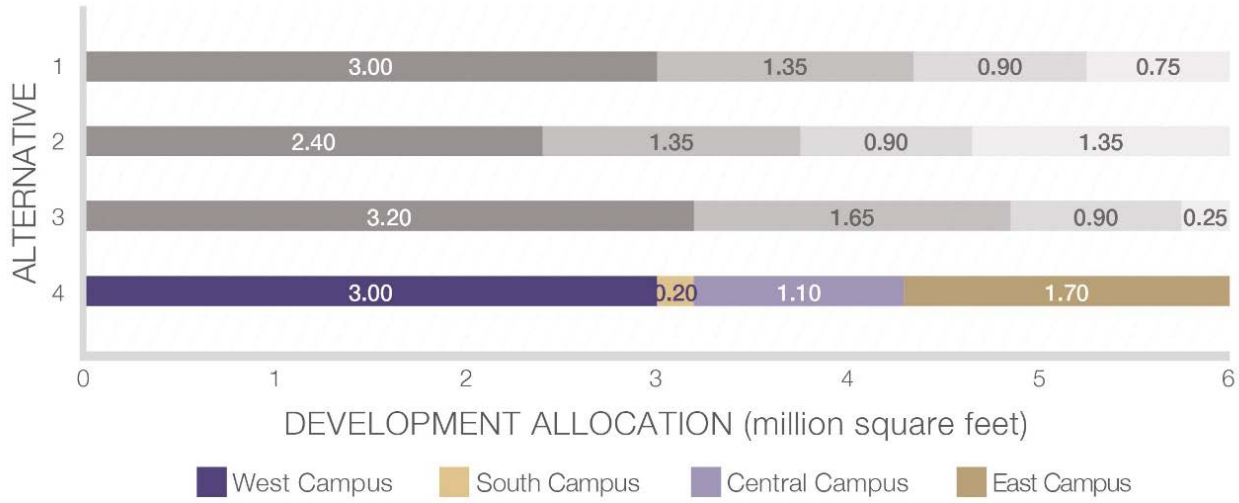


Figure 3.15-26 Alternative 4 Development Allocation

Similar to Alternative 1, Alternative 4 will result in an increase of roughly 15,676 people over the current student, faculty, and staff campus population. As noted, all of the Action Alternatives have the same trip generation and mode split; however, they are applied at different sectors depending on where development is proposed to occur.

Pedestrian System Operations

Location of development in relation to multi-family housing and University of Washington residence halls are indicators of how well the alternative will be able to continue to have a strong pedestrian mode of travel. **Table 3.15-14** indicates that all of the Alternative 4 development is within ½ miles of multi-family housing and University of Washington residence halls.

This alternative would provide a number of enhancements to pedestrian travel within the MIO where development occurs. Improvements in West Campus would mirror those of Alternative 1 with new pedestrian facilities in the waterfront green space and accessible connections to Central Campus. As identified in the CMP, East Campus would have improved pedestrian facilities including a land bridge. South Campus would see little change in the pedestrian environment, maintaining the currently disconnected and impermeable Medical Center.

Bicycle System Operations

Burke-Gilman Trail Capacity

This Alternative would concentrate growth in East and South Campus resulting in the largest growth in pedestrian and bike demand in East Campus among the Alternatives. This Alternative would likely create the largest change in pedestrian and bicycle travel patterns along the Burke-Gilman trail because it would diversify uses on East Campus away from surface parking. This Alternative would also increase cross traffic at the new potential East Campus Land Bridge the greatest of all Alternatives and would likely increase travel along the eastern segment of the Burke-Gilman Trail between Rainier Vista and Pend Oreille Road. Planned expansion of the Burke-Gilman Trail separating pedestrian and bicycle uses will provide adequate capacity to meet CMP demands.

Quality of Bicycle Environment

The quality of bicycle facilities and demand anticipated with this alternative would be similar to Alternative 1 in West Campus. In South Campus limited changes in facilities and demand would be expected. Compared to other alternatives, growth in bicycle travel demand within East Campus, would likely be largest under this Alternative. Due to the scale of development in East Campus, proximity to the Burke-Gilman Trail, flat terrain, existing bicycle travel patterns and longer walking distance to transit, this Alternative could result in the largest growth in bicycle travel.

Transit System Operations

Planned improvements to the transit system adjacent to the campus include a new light rail station (U District) and implementation of RapidRide on the adjacent corridors. As shown in **Table 3.15-16**, all of the Alternative 4 development is located within 1/2-mile of proposed RapidRide Corridors, while 78% is located within 1/2-mile of Light rail stations.

Vehicle System Operations

As shown in **Figure 3.15-19** and compared to No Action, Alternative 4 has slightly fewer intersections operating well, with a LOS A-C and more operating poorly at LOS D, E, and F. As shown, all of the Action Alternatives result in an increase of intersections operating poorly (LOS E and F) as compared to No Action. This is particularly true of all-way or two-

way stop controlled intersections. As shown in **Table 3.15-20**, Alternative 4 has four corridors that operate with a worse level of service than No Action. Notably, Pacific Avenue eastbound in the PM peak hour would worsen from LOS C in the No Action case to F with Alternative 1. Notably, the NE Pacific Street corridor westbound would operate with a slightly better LOS and speed as compared to No Action and Alternative 1.

Like the other Action alternatives, Alternative 4 operates well within the screenline capacity noted in **Table 3.15-3**.

Parking

Supply

Similar the other Action Alternatives, it was assumed that parking supply would be increased or decreased within each Sector to achieve an 85 percent utilization without exceeding the parking cap for Alternative 4. Alternative 4 parking cap supply would be 10,240 spaces. The location of parking and strategies used to maintain the existing CUA parking cap would be consistent with those outlined for Alternative 1.

Demand

Overall parking demand for Alternative 4 would be the same as the other Action Alternatives. Alternative 4 on-campus parking demand and utilization was reviewed by sector to provide context on where parking demand would occur (see **Table 3.15-34**). Allocation of Alternative 4 parking demand by sector was based on projected development as documented in Appendix B of the TDR. The evaluation assumes that on-street parking would be allocated to on-campus facilities given the increases and reallocation of parking supply to achieve an 85 percent utilization.

Table 3.15-34
ALTERNATIVE 4 PEAK PARKING DEMAND BY SECTOR

Sector	Future Cap Parking Supply	Parking Demand			% Utilization
		No Action[1]	Alternative 4		
			Growth[2]	Total	
West	1.470	1,428	65	1,252	85%
South	2,820	1,187	969	2,397	85%
Central	3,580	2,689	355	3,044	85%
East	2,370	1,464	549	2,013	85%

Sector	Future Cap Parking Supply	Parking Demand			% Utilization
		No Action[1]	Alternative 4		
			Growth[2]	Total	
Total	**10,240**	**6,768**	**1,938**	**8,706**	**85%**

Source: Transpo Group, 2016.

[1] On-campus parking demand for No Action based on projected increase in population. This does not include on-street parking demand increases noted in the previous table since these would not be parking within the Sectors.

[2] Growth in parking demand based on projected increase in population for Alternative 4. The analysis assumes with the street vacation and reallocation of parking supply in Alternative 4, on-street parking demand would shift to on-campus parking.

As the table above reflects, reallocation of parking would result in a parking supply under the existing cap and an 85 percent utilization by Sector and for the campus as a whole. The additional parking and reallocation of parking supply would provide a better relationship between localized supply and demand and thus reduce the likelihood of parking beyond the University facilities (i.e., within the neighborhoods).

Secondary Parking Impacts

Parking outside the primary impact zone surrounding the campus would likely continue with Alternative 4 similar to the No Action Alternative. This would include vehicles parking within transit served areas with unrestricted parking and then using transit to travel to campus. As the campus grows, this could occur at higher levels compared to the No Action Alternative.

CUA vehicle trip caps are considered campus-wide and would not materially change between proposed alternatives.

Alternative 5 – No Street, Alley or Aerial Vacations

The following summarizes the evaluation of Alternative 5 with respect to the transportation-related elements identified in the Affected Environment section of this report. The technical analysis of Alternative 5 focuses on the weekday PM peak period.

The only difference between Alternative 5 compared to Alternatives 1-4 is the assumption of no street, alley or aerial vacations. Trip generation for Alternative 5 is the same as Alternatives 1-4. For comparison purposes Alternative 5.1 includes development as proposed under Alternative 1 but with no vacations; similar logic holds for Alternatives identified as 5.2, 5.3 and 5.4.

Pedestrian System Operations

The proportion of development within a 1/2-mile of multi-family housing and University of Washington Residence Halls does not change with the assumption of no street, alley or

aerial vacations. Pedestrian improvements under this alternative would primarily be the same in each alternative, excluding the pedestrian land bridge to East Campus and vacation of Boat Street for construction of an expanded and continuous Portage Bay Park in West Campus. It is assumed that under Alternative 5 the existing, non-ADA compliant pedestrian bridge will remain. This means that relative to other alternatives, Alternative 5 would have the weakest pedestrian environment in East Campus and in West Campus.

Bicycle System Operations

Burke-Gilman Trail Capacity

The Burke-Gilman Trail is anticipated to experience increased demand in all sectors depending on the concentration of growth throughout the MIO. Alternatives 5.1-5.4 could result in trail facility improvements, similar to those in the Mercer Court when projects are built adjacent to the Burke-Gilman Trail. Increased cross traffic and travel along trail segment is anticipated in West and South Campus particularly under Alternatives 5.1, 5.2 and 5.3. Growth in travel along and across the trail would generally be concentrated in West and East campus for and 5.4. Without a new land bridge to East Campus bicycle demand will likely be lower along the trail. Planned expansion of the Burke-Gilman Trail separating pedestrian and bicycle uses will provide adequate capacity to meet CMP demands.

Quality of Bicycle Environment

Investments and demand for bicycle travel associated with this Alternative would be similar to other Alternatives with the exception of the land bridge to East Campus. The current bridge, which would be maintained, is not ADA or bicycle accessible, would not facilitate improved bicycle access to the Burke-Gilman trail and other destinations from East Campus.

Transit System Operations

This alternative will have similar impacts to transit as Alternatives 1-4. The lack of alley, street and aerial vacations is not expected to have an impact on transit.

Vehicle System Operations

This alternative will have similar impacts to vehicle operations as Alternatives 1-4, with the exception of intersection traffic operations described in **Table 3.15-19.**

Indirect/Cumulative Impacts

The cumulative impacts of these CMP alternatives with background growth and proposed U District Upzoning results in an overall increase in trips throughout the University District. This section describes the cumulative impacts of the CMP Action Alternatives and the proposed U District Upzoning. Similar to the operational analysis completed for No Action,

Alternatives 1-4, and Alternatives 5.1-5.4, a cumulative analysis was completed which utilized the volumes associated with the U District Upzone EIS. The difference between the volumes associated with the City of Seattle Comprehensive plan and the U District Up Zone are associated with proposed height and density changes in the U District primarily around the future U District Link Light rail Station. Consistent with the U District Upzone EIS an arterial level of service analysis was completed for No Action, Alternative 1-4, and Alternatives 5.1-5.4. Notably Alternatives 5.1-5.4 are similar in volume and distribution to Alternatives 1-4 respectively, but do not include street vacations. The same arterials analyzed for the traffic operations section were analyzed for the cumulative analysis. Generally, with addition of project related traffic, travel speeds are anticipated to decrease and corridor travel times would increase. More detailed information regarding the cumulative analysis and results can be found in **Appendix F**, the Transportation Discipline Report.

3.15.3 Mitigation Measures

Overview

The 2028 CMP development would accommodate up to 6 million net new gross square feet of new development. As part of this development, improvements such as new and wider sidewalks and bikeways, bicycle lockers, and loading areas are anticipated, as well as replacing parking. The following table summarizes improvements by campus sector and travel mode.

Table 3.15-35
PEDESTRIAN, BICYCLE, AND VEHICLULAR IMPROVEMENTS SUMMARY

West Campus	South Campus	East Campus
Pedestrian		
• Mid-block connections south of Gould Hall • Walkways adjacent to West Campus Green • Improvements along NE Campus Parkway • Mid-block connector east from West Campus Green	• Connection between Central Campus & waterfront along East Campus Lawn • Connection along Continuous Waterfront Trail	• Potential East Campus Land Bridge • Improved pedestrian network

West Campus	South Campus	East Campus
Bicycle		
• Connection between West Campus Park and Burke-Gilman Trail • Improved bicycle parking facilities	• Improved bicycle parking facilities	• Improved bicycle parking facilities • Improved bicycle network and Burke Gilman Trail access
Vehicular		
• Removal of University of Washington NE Cowlitz Road • Extensions of 11th and 12th Avenues	• Removal of University of Washington NE San Juan Road • New University of Washington roadway connections between NE Columbia/NE Pacific • Enhanced access for Marine Sciences from NE Columbia Road	

Source: The Transpo Group, 2016.

Transportation Management Plan

The University of Washington has successfully maintained traffic levels that fall well below the agreed upon traffic and parking caps, which hold University traffic and parking impacts at and below 1990 levels. The UW has accomplished this by successfully reducing percentage of student, faculty, and staff commuters choosing single occupant vehicles (SOVs) as their commute mode, despite growing campus population by over one-third since 1990. The implementation of the TMP within which the U-PASS program exists, has been the means through which all primary and supporting strategies have been implemented.

The University has actually reduced the proportion of drive alone traffic and resulting traffic generation (and parking) over the past 25 years, and remains well below City-University Agreement Cap goals.

The stated goal of the proposed CMP is to continue to limit UW peak period, peak direction vehicle trips by commuter students, faculty, and staff at or below 1990 levels. As a result, actual impacts associated with the proposed growth, even assuming no further improvement (reduction) in SOV travel would be less than described in the preceding analyses.

The UW will continue to mitigate transportation impacts through the implementation of the TMP and assure that 1990 levels of impact are not exceeded, despite ongoing growth. Specific strategies will continue to be refined annually, subsequent to the annual transportation survey and publication of the CMP Annual Monitoring Reports.

Transportation Management Plan and Program or TMP: A transportation management program provides strategies for limiting traffic impacts and promoting active communities by managing vehicle trips and parking, as well as accommodating transit and non-motorized travel modes.

Potential TMP strategies included in the Plan presently include, but are not limited to, maintenance or enhancements to programs related to:

- U-PASS
- Transit
- Parking Management
- Shared Use Transportation
- Pedestrian and Bicycle Travel
- Telecommuting

The recently-opened Link light rail station at Husky Stadium will result in substantial changes in the way commuters access the campus. Additionally, anticipated extensions of Link light rail to Northgate in 2021 and to Lynnwood, Redmond, and Federal Way in 2023 will improve the opportunities and access to transit for University students, faculty, staff and visitors. Prior to the publication of the Final EIS for this master plan, the 2016 data reflecting this opening will be collected and summarized for inclusion in the annual CMP report and FEIS.

Intersection Operations

Mitigation measures were reviewed at the signalized intersections that are anticipated to operate at LOS E or F and experience a 5 second or greater increase in delay. Additionally, one unsignalized intersection was reviewed for potential mitigations measures. Mitigation was reviewed at the following intersections:

15. 7th Avenue NE (I-5 NB)/NE 45th Street (Signalized)
29. Montlake Boulevard NE/Mary Gates Memorial Drive NE (Signalized)
67. 15th Avenue NE/NE Pacific Street (Signalized)
69. 15th Avenue NE/NE Boat Street (All Way Stop)

For the currently signal controlled intersections, mitigation was reviewed in the form of modifications to the signal timing such as phasing, offsets, and cycle length due to limitations in right-of-way at the intersections. While modifications to the signal timing could decrease the delay at the signalized intersections it won't decrease the delay to at or

near No Action conditions. For the 15th Avenue NE/NE Boat Street intersection, installation of traffic signals at the intersection would improve the intersection operations to LOS A under Alternative 1 conditions. Installation of traffic signals should be monitored and only implemented if warranted.

3.15.4 Significant Unavoidable Adverse Impacts

Implementation of the University of Washington 2018 Campus Master Plan would result in increases to all travel modes – pedestrian, bicycle, transit, vehicle, and freight. Local agency partners like the City of Seattle, King County Metro and Sound Transit all have plans to expand transportation facilities and services in and surrounding the campus. These include expanding the Burke-Gilman Trail, completing pedestrian and bicycle networks and expanding frequency, capacity and travel time of transit. Additionally, the University will be working to enhance connectivity and circulation with each development. Finally, the University, as specified in their City-University Agreement, continues to annually monitor parking and trips. The University also conducts annual surveys of mode splits. With access to Light rail at the University of Washington Station that opened in March 2016, the University is already seeing a significant (roughly 13%) increase in transit ridership. With the opening in 2021 of another new light rail station serving the University District, access to expanded RapidRide and new regional trail connections across Montlake students, faculty, staff and visitors will have more reliable transportation choices as alternatives to driving alone. With planned construction of multi-family housing nearby, drive alone trips may continue to decline as students, faculty and staff have choices for living near campus. With implementation of the identified mitigation measures, no significant unavoidable adverse impacts are anticipated.

3.16 CONSTRUCTION IMPACTS

This section of the Draft EIS describes and evaluates the potential impacts associated with the assumed construction under the EIS Alternatives. Construction-related impacts associated with air quality, greenhouse gases, noise, and vibration are analyzed in this section. This section consolidates discussion on conditions associated with construction and some construction conditions discussion in this section reflects discussion presented in Sections 3.2 **Air Quality** and 3.5 **Environmental Health**. A discussion on transportation conditions (vehicle circulation. Pedestrian circulation and parking) during construction and operations is included in Section 3.15 **Transportation**.

3.16.1 Affected Environment

Existing Campus

The University of Washington Seattle campus reflects a variety of uses, including buildings, roads, paved and unpaved walkways, parking areas, landscaping, natural open space, and bulkhead and natural shoreline. Within the campus boundaries, the University of Washington has approximately 307 permanent and temporary buildings[1] that total an estimated 17 million gross square feet (gsf). These buildings vary in size from approximately 300 gsf to 500,000 gsf. They also vary in age from 121 years (Denny Hall and the Observatory) to the present. The buildings on campus generally contain instructional, research, medical, manufacturing, athletic, housing and/or office use.

Direct vehicular access to the University of Washington campus is provided by a local roadway network accessed from I-5 and SR-520, including: NE 45th Street, Montlake Boulevard NE, NE Pacific Street, and 15th Avenue NE. Primary roadways internal to the University of Washington campus include Stevens Way in Central Campus, Columbia Road in South Campus, Brooklyn Avenue/University Avenue/Campus Parkway in West Campus, and Walla Walla Road in East Campus.

For descriptive and planning purposes, the campus has been divided into four (4) campus areas which are described further below.

West Campus

The West Campus sector is generally bounded by NE 41st Street to the north, 15th Avenue NE to the east, NE Pacific Street to the south, and the University Bridge and Roosevelt Way NE to the west. This sector of campus has the strongest connection with the adjacent

[1] The University of Washington also operates approximately 10 buildings outside of the campus boundaries.

University District neighborhood and, as such, existing campus uses reflect that relationship with the adjacent area.

Existing campus uses primarily include instructional and administrative uses, as well as several recently constructed student housing buildings (Elm Hall, Poplar Hall, Alder Hall, Lander Hall, etc.). Instructional and administrative uses are generally located south of NE Pacific Street and along 15th Avenue NE and University Way NE. Student housing uses are generally located west of University Way NE and north of NE Pacific Street.

South Campus

The South Campus sector is bounded by NE Pacific Street to the north, Montlake Boulevard to the east, Portage Bay to the south, and 15th Avenue NE to the west. This sector is generally characterized by existing development associated with the University of Washington Medical Center and the Magnuson Health Sciences Center; instructional uses, including William H. Foege Hall, Hitchcock Hall and the Ocean Sciences Building are also located near 15th Avenue NE. To the south of Columbia Road, the sector also includes administrative and research uses, as well as shoreline open space and piers associated with Oceanography and Marine Sciences uses.

Central Campus

The Central Campus sector represents the original core and surrounding central perimeter of the University of Washington campus, and is generally bounded by NE 45th Street to the north, Montlake Boulevard to the east, NE Pacific Street to the south, and 15th Avenue NE to the west. The sector is comprised of numerous campus core buildings, including instructional/research (i.e., Denny Hall, Architecture Hall, Bagley Hall, Parrington Hall, etc.), administrative (i.e., Gerberding Hall, the UW Club, student housing (i.e., McMahon Hall, Hansee Hall, etc.), and student support uses (i.e., Suzzallo Library, Odegaard Library, the HUB, etc.). It is also characterized by several important open spaces, including the Liberal Arts Quadrangle, Denny Yard, Memorial Way, Rainier Vista, the HUB Yard, Parrington Lawn, and the Central Plaza (Red Square).

East Campus

The East Campus sector is bounded by NE 45th Street to the north, Union Bay to the east, the Lake Washington Ship Canal to the south, and Montlake Boulevard to the west. The existing character of the East Campus is primarily defined by athletic facilities/recreational uses, surface parking and open space/natural areas. Development is primarily located in the south portion of the sector, along Montlake Boulevard, and includes Husky Stadium, Alaska Airlines Arena at Hec Edmundson Pavilion, the Intermural Activities Building, the golf driving range, and several sports fields; the existing E1 parking area also comprises a large portion

of the sector along Montlake Boulevard. Instructional/research uses are located along the eastern boundary of the sector, as well as student housing (Laurel Village) and the Union Bay Natural Area.

Surrounding Area

The area surrounding the campus contains a variety of single-family and multifamily residential, commercial, educational, service and semi-industrial uses. The University of Washington is a dominant land use in the area (see **Figure 3.6-1** in **Section 3.6 Land Use** for map of existing surrounding land uses).

The land use pattern of the area surrounding the University of Washington campus is reflective of both natural and built features. The primary natural features in the area are Union Bay, Portage Bay and the Lake Washington Ship Canal that form the southern and eastern boundaries of the campus. These waterways also separate the University of Washington campus, the University District and the Laurelhurst neighborhood from the neighborhoods to the south (Mountlake, Broadmoor and Capitol Hill neighborhoods). The neighborhoods to the north of the Ship Canal and Portage Bay (University of Washington, University District, and Laurelhurst) are connected to the neighborhoods to the south by the Montlake Bridge and University Bridge.

3.16.2 Impacts

This section of the Draft EIS identifies potential impacts associated with air quality, greenhouse gas emissions, noise, vibration and vegetation that could occur with construction under the EIS Alternatives.

No Action Alternative

Under the No Action Alternative, construction-related impacts would primarily be related to building development that would be constructed under the current *2003 Seattle CMP*. The No Action Alternative assumes approximately 211,000 gsf of building development with approximately 53,000 cubic yards of excavation. Temporary construction activities could also include demolition, vegetation removal, equipment operation, truck trips, and street/sidewalk closures. The potential for construction related impacts on the University of Washington campus would be substantially less than under Alternatives 1 through 5.

Alternative 1 – CMP Proposed Allocation with Requested Height Increases

Alternative 1 reflects the preferred allocation of building development under the *2018 Seattle Campus Master Plan* and includes development of 6.0 million gsf of net new building space throughout the campus with a focus of development in the West and South Campus sectors and more limited development in the Central and East Campus sectors. The *2018 Seattle Campus Master Plan* identifies 85 potential development sites on the campus. However, since future funding levels and program needs are fluid the individual sites to be developed have not been determined. Hence, development could occur on any of the sites, but not all of the sites would be developed. Development under Alternative 1 is assumed to be as follows:

- West Campus: 3.0[2] million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.75 million gsf

Construction Activities

Construction activities associated with assumed development under Alternative 1 would occur throughout the campus and would include: the demolition of existing buildings, pavement and landscaping; excavation and grading; and, construction of approximately 6.0 million gsf of building space. It is anticipated that construction activities would occur throughout the 10-year planning horizon.

The primary construction access to the campus would be via the surrounding roadway system. It is possible that some construction activities could occur in the evening hours in order to reduce the duration of the overall construction period. This is also due to the fact that the City of Seattle requires certain construction activities to be carried out at night to reduce impacts to pedestrians and vehicles during the day.

Demolition activities would include the demolition and removal of existing buildings on the campus. Depending on the potential development sites developed to achieve the 6.0 million gsf of net new building space, up to approximately 2,250,000 gsf of building space could be demolished under Alternative 1. Demolition of any buildings would be conducted in accordance with applicable local, state and federal regulations. Equipment utilized to demolish buildings could include truck-mounted demolition machines, excavators, and loaders.

[2] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

In addition to buildings, existing pavement could be demolished and transported from the campus to a permitted regional recycling facility. Existing landscaping would also be removed from the campus to accommodate construction; new landscaping would be provided for many of the individual development sites.

Grading (cut, fill and site regrading) assumed under Alternative 1 would total approximately 1,500,000 cubic yards. A portion of the excavated material (approximately 20 percent) could be reused on campus as backfill (on individual sites). It is anticipated that the remaining approximately 80 percent would be transported to undetermined approved off-campus disposal sites. In addition, fill material for site preparation and landscaping could be imported to the campus during development of the potential development sites.

Construction staging area and construction parking plan would be provided for each development project and would be coordinated between the general contractor/construction manager (GCCM) and the University of Washington prior to development on a site. Construction vehicle traffic routes would also be coordinated between the GCCM and the University of Washington, as well as approved by the City of Seattle as part of the permit process, and would be intended to minimize disturbance to the extent feasible, while also protecting pedestrian and vehicle safety in the area.

Based on future project funding, it is possible that some construction projects could occur concurrently and in proximity to each other. Temporary construction activity associated with any development projects will occur in compliance with applicable University of Washington, City of Seattle, and other relevant regulations. Significant cumulative construction-related impacts are not anticipated because each project would have its own separate construction schedule and haul routes that are specific for each project site. Additionally, each project will prepare a Construction Management Plan (CMP) to control and mitigate potential issues during the construction process.

Air Quality

The development of 6.0 million gsf of building space on the University of Washington Seattle campus would result in localized short-term increases in particulates (dust) and equipment emissions (carbon monoxide) in the vicinity of construction sites. Key construction activities causing potential impacts include: removal of existing pavement and/or buildings, excavation, grading, stockpiling of soils, soil compaction, and operation of diesel-powered trucks and equipment (i.e., generators and compressors) on the individual potential development sites.

Demolition of existing structures would require the removal and disposal of building materials, some of which could contain asbestos. If this proves to be the case, demolition

contractors would be required to comply with EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing materials.

Construction would require the use of heavy trucks, excavators, graders, cranes, pile drivers, and a range of smaller equipment such as generators, pumps, and compressors. Emissions from existing transportation sources (primarily vehicular traffic) around the development areas would very likely outweigh any emissions resulting from construction equipment. Pollution control agencies are nonetheless now urging that emissions from diesel equipment be minimized to the extent practicable to reduce potential health risks.

Although some construction could cause odors, particularly during paving operations that involve the using tar and asphalt, any odors related to construction would be short-term and localized (and in some areas located within a busy traffic area where such odors would likely go unnoticed). Construction contractor(s) would be required to comply with PSCAA regulations that prohibit the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

With implementation of the controls required for the various aspects of construction activities and consistent use of best management practices (BMPs) to minimize emissions, construction activities under Alternative 1 would not be expected to significantly affect air quality.

Greenhouse Gas Emissions

As described in Section 3.2, **Air Quality**, it is estimated that assumed development under Alternative 1 would generate GHG emissions associated with construction activities (including demolition and production/extraction of construction materials), as well as energy consumption from construction and operation, and vehicle emissions from associated vehicle trips. **Table 3.2-2** of the **Air Quality** section shows the anticipated lifespan GHG emissions and estimated annual GHG emissions associated with development of the *2018 Seattle Campus Master Plan* under Alternative 1 (6,272,882 $MTCO_2e$ and 100,366 $MTCO_2e$, respectively). Construction-related GHG emissions would equate to approximately four percent of those estimated emissions.

Noise

Potential noise impacts associated with Alternative 1 would occur during the construction of individual development projects under the *2018 Seattle Campus Master Plan*. During construction, localized sound levels would temporarily increase in the vicinity of the individual sites and streets used by construction vehicles accessing the construction site.

The increase in sound levels would depend upon the type of equipment being used, the duration of such use, and the proximity of the equipment to the property line. Sound levels within 50 feet of construction equipment often exceed the levels typically recommended for residential and institutional land uses. **Table 3.5-3** (Section 3.5, **Environmental Health**) provides a summary of noise levels from various types of construction equipment.

Depending on the location of construction activity, construction noise could result in temporary annoyance and possible increased speech interference near the potential development sites. Such noise could impact teaching and research activities or disturb student housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas (residential and commercial uses) would also result in temporary construction noise impacts to those adjacent land uses.

Vibration

Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites and adjacent areas. Operation of heavy construction equipment during construction, such as drilling rigs, excavators and haul trucks, would create waves that radiate along the surface and downward into the earth; the waves dissipate with distance from the source. These surface waves can be felt as ground vibration and create the potential to affect sensitive research uses that employ highly sensitive equipment.

Construction activities on potential development sites that are located in proximity to sensitive research uses would generate vibration that could impact sensitive research uses and/or equipment (identified in Section 3.5.1, **Environmental Health**). Construction activities in the West, South and Central Campus sectors that would be located in the vicinity of existing sensitive research uses would have the potential to result in vibration impacts due to their proximity to these uses. Potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites.

The remaining development sites (i.e. those not proximate to sensitive uses) in the West, South, Central, and East Campus sectors would have a low potential to result in vibration impacts due to their distance from existing sensitive research uses. However, existing research equipment and/or activities could be relocated to other facilities or discontinued in their current location. It is also possible that new vibration-sensitive uses could be established in other buildings on campus over the life of the *2018 Seattle Campus Master Plan*. As such, future development projects should verify existing surrounding uses as part of the planning process to determine if new or relocated vibration-sensitive uses are in the site vicinity.

Vegetation

Construction activities associated with potential future development under Alternative 1 could result in temporary disturbance to lawns, trees, and shrubs, including both native and ornamental species. Under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* would be preserved and area reserved for new planned open space. Landscape areas could also be provided on individual development sites.

Transportation

During construction of all Action Alternatives (Alternatives 1 – 5), potential construction impacts could include temporary closures of pathways, and streets, reallocation or removal of bike and auto parking, increased truck traffic or other temporary disruptions. While temporary in nature, potential mitigations for construction could include TMP strategies, outreach, and coordination to minimize impacts. Specific impacts and mitigations for development would be addressed as part of SEPA review for each individual project.

Below is a discussion of potential construction-related impacts under Alternative 1 by campus sector.

West Campus

Construction Activities

The 3.0 million gsf of net new development in the West Campus under Alternative 1 would result in approximately 750,000 cubic yards of excavation, which would relate to the construction associated with development of approximately 16 Potential Development Sites and approximately 5 acres of planned open spaces. Up to 800,000 gsf of existing building space could also be demolished under Alternative 1. Construction-related earth impacts include short-term localized traffic congestion, noise, dust, erosion and increased street maintenance requirements associated with the removal of dirt tracked onto campus streets. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in West Campus.

Air Quality and GHG Emissions

Existing uses sensitive to dust and equipment emissions generated during construction in this area could be affected in the short-term under Alternative 1, including student housing and academic uses in West Campus. Demolition activities at the West Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and

disposal of any asbestos-containing material and significant air quality impacts associated with demolition would not be anticipated. Assumed development under Alternative 1 is estimated to generate an additional 3,136,441 $MTCO_2e$ of lifespan and 50,183 $MTCO_2e$ of annual GHG emissions in the West Campus. Construction-related emissions would account for approximately four percent of the total GHG emissions in the West Campus.

Noise

Potential noise impacts associated with Alternative 1 development in the West Campus would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional, administration and/or student housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas could also result in temporary construction noise impacts to those adjacent land uses. Because the West Campus is one of the focus areas of development under Alternative 1 (3.0 million gsf of assumed development), more noise would be generated during construction and operation in this sector than in the Central and East Campus sectors.

Vibration

Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the West Campus and on adjacent areas. Construction activities on potential development sites that are located in proximity to sensitive research uses would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the West Campus sector that would be located in the vicinity of the existing sensitive research use would have the potential to result in vibration impacts due to their proximity to this use. Potential future development near sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites.

Because the West Campus is one of the focus areas of development under Alternative 1, more vibration would be generated during construction activities in this sector than in the Central and East Campus Sectors. Only one vibration-sensitive use has been identified in this sector at this time. However, additional vibration-sensitive uses could be developed in this area in the future.

Vegetation

Potential future development in the West Campus under Alternative 1 could result in temporary disturbance to lawns, trees, and shrubs, including both native and ornamental

species. Construction could result in temporary impacts such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

South Campus

Construction Activities

The 1.35 million gsf of net new development in the South Campus under Alternative 1 would be anticipated to result in up to approximately 337,500 cubic yards of excavation over the planning horizon related to the construction associated with building development and approximately 3 acres of planned open spaces. Up to approximately 1.1 million gsf of existing building space could also be demolished. Construction-related earth impacts include short-term localized traffic congestion, noise, dust, erosion and increased street maintenance requirements associated with the removal of dirt tracked onto campus streets. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in South Campus.

Air Quality and GHG Emissions

The South Campus is also one of the focus areas of Alternative 1 (1.35 million gsf of building area). Existing uses sensitive to dust and equipment emissions generated during construction in this area could be affected in the short-term, including medical and dental uses in the South Campus. Demolition activities would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material and significant air quality impacts associated with demolition would not be anticipated. Assumed development under Alternative 1 is also estimated to generate an additional 1,411,398 $MTCO_2e$ of lifespan and 22,582 $MTCO_2e$ of annual GHG emissions in the South Campus. Construction-related emissions would account for approximately four percent of the total GHG emissions.

Noise

Potential noise impacts associated development in the South Campus would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional and research uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas could also result in temporary construction noise impacts to those adjacent land uses. As one of the focus areas of development under Alternative 1 (3.0 million gsf of assumed development), more noise would be generated

during construction and operation in the South Campus sector than in the Central and East Campus sectors.

Vibration

Construction activities on potential development sites that are located in proximity to sensitive research uses (including, but not limited to, the 12 buildings identified in **Section 3.5.1 - Affected Environment**) would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the South Campus that would be located in the vicinity of existing sensitive research uses identified in Affected Environment would have the potential to result in vibration impacts due to their proximity to these uses. Potential future development near sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues and measures to limit vibration associated with development on those sites.

Vegetation

Potential future development in the South Campus under Alternative 1 could result in temporary disturbance to lawns, trees, and shrubs, including both native and ornamental species. Construction could result in temporary impacts such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

Central Campus

Construction Activities

Alternative 1 assumes that the Central Campus would contain 0.9 million gsf of net new development, with a resulting amount of up to 225,000 cubic yards of excavation over the planning horizon. Up to approximately 350,000 gsf of building space could also be demolished in the Central Campus. Construction-related earth impacts include short-term localized traffic congestion, noise, dust, erosion and increased street maintenance requirements associated with the removal of dirt tracked onto campus streets. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in Central Campus.

Air Quality and GHG Emissions

Dust and equipment emissions associated with construction under Alternative 1 in the Central Campus would have the potential to impact academic and student housing uses. However, given the lower amount of construction assumed for the Central Campus, the potential for air quality impacts would be less than in the West and South Campus sector.

Assumed development under Alternative 1 is estimated to generate an additional 940,932 $MTCO_2e$ of lifespan and 15,055 $MTCO_2e$ of annual GHG emissions in the Central Campus. Construction-related emissions would account for approximately four percent of the total GHG emissions.

Noise

Potential noise impacts associated with Alternative 1 development in the Central Campus would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. Such noise could impact instructional, support, administration, and housing uses that are in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas would also result in temporary construction noise impacts to those adjacent land uses. Because less development would occur in the Central Campus under Alternative 1 (0.9 million gsf of assumed development), less noise would be generated during construction and operation in this sector than in the West and South Campus sectors.

Vibration

Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the Central Campus and on adjacent areas. Construction activities on potential development sites that are located in proximity to sensitive research uses (including, but not limited to, the 15 buildings identified in Section 3.5.1 - Affected Environment) would generate vibration that could impact sensitive research uses and/or equipment. Construction activities in the Central Campus sector that would be located in the vicinity of the existing sensitive research uses identified in Affected Environment would have the potential to result in vibration impacts due to their proximity to existing sensitive research uses. Because less construction activities would occur in the Central Campus under Alternative 1, less vibration would be generated in this sector than in the West and South Campus sectors. Potential future development near these sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues and associated measures to limit vibration impacts to the sensitive uses.

Vegetation

Potential future development in the Central Campus under Alternative 1 could result in temporary disturbance to existing lawns, trees, and shrubs, including both native and ornamental species. Construction could require temporary impacts such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

East Campus

Construction Activities

Alternative 1 assumes that the East Campus would contain 0.75 million gsf of net new development, with a resulting amount of up to 187,500 cubic yards of excavation associated with building development and approximately 1 acre of planned open space over the planning horizon. Very little to no building demolition would be anticipated in the East Campus. Construction-related earth impacts include short-term localized traffic congestion, noise, dust, erosion and increased street maintenance requirements associated with the removal of dirt tracked onto campus streets. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Air Quality and GHG Emissions

Given the relatively limited amount of construction assumed for the East Campus under Alternative 1 (0.75 million gsf of building area) and relative lack of sensitive uses in the East Campus sector (i.e., limited academic and housing uses), the potential for air quality impacts during construction in the East Campus would be low. Alternative 1 is estimated to generate an additional 784,110 $MTCO_2e$ of lifespan and 12,546 $MTCO_2e$ of annual GHG emissions in the East Campus. GHG emissions from the East Campus would be the least of all the campus sectors, and construction-related GHG emissions would account for approximately four percent of the overall emissions.

Noise

Potential noise impacts associated with development in the East Campus would primarily occur during the construction of individual development projects. During construction, localized sound levels would temporarily increase in the vicinity of the site and streets used by construction vehicles accessing the construction site. However, at this time there are no noise-sensitive uses located in East Campus in the vicinity of potential development sites. Construction activities located adjacent to off-campus areas would also result in temporary construction noise impacts to those adjacent land uses (e.g., the Laurelhurst neighborhood). Because less development would occur in the East Campus under Alternative 1 (0.75 million gsf of assumed development), less noise would be generated during construction and operation in this sector than in the South and West Campus sectors.

Vibration

Construction activities associated with new development under Alternative 1 would generate vibration on potential development sites in the East Campus and on adjacent

areas. No vibration-sensitive uses have been identified in the East Campus at this time. However, vibration-sensitive uses could be developed in this area in the future. Because less construction activities would occur in the East Campus under Alternative 1, less vibration would be generated in this sector than in the South and West Campus sectors.

Vegetation

Because the majority of potential development sites are located within surface parking lot area, assumed development in the East Campus under Alternative 1 would have little potential to impact lawns, trees, and shrubs, including both native and ornamental species.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Alternative 1 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential temporary impacts on uses in the Primary and Secondary Impact Zones would largely be due to noise, dust, equipment emissions, vibration and localized traffic congestion.

With the focus of development in the West and South Campus sectors (73 percent of development under Alternative 1), more construction-related impacts would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 1. As a result, there would be less construction impacts that would affect adjacent land uses in the Primary Impact Zone adjacent to these sectors.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 1, development would result in minimal to no construction-related impacts in the Secondary Impact Zone.

Compliance with existing regulations and codes, including air quality and noise regulations, would minimize the potential for impacts on uses in the Primary and Secondary Impact Zones.

Alternative 2 – Campus Development with Existing Height Limits

Alternative 2 reflects accommodation of the requested 6.0 million gsf of building area with the existing CMP height limits. Without the Alternative 1 proposed height increases, the development capacity of the West Campus is limited and additional development sites

would be required to approach the 3.0 million gsf of net new development in the West Campus identified in the *2018 Seattle Campus Master Plan* and analyzed under Alternative 1. Given the developed nature of the West Campus, the opportunity for additional development sites in this sector is limited, and therefore, Alternative 2 assumes additional development sites in the area reserved for the West Campus Green under Alternative 1. The development capacity in the West campus without the requested height increases is only 2.4 million gsf of net new development. The approximately 0.6 million gsf of the net new development not accommodated by the West Campus development capacity is shifted to the East Campus under Alternative 2. The assumed building development by campus sector under Alternative 2 is as follows:

- West Campus: 2.4[3] million gsf
- South Campus: 1.35 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 1.35 million gsf

West Campus

Construction Activities

It is anticipated that construction activity in the West Campus would be somewhat less under Alternative 2 than under Alternative 1. Alternative 2 would result in less excavation in the West Campus (600,000 cubic yards compared to 750,000 cubic yards under Alternative 1). Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in West Campus.

Air Quality and GHG Emissions

Assumed development of 2.4 million gsf of net new building space in West Campus under Alternative 2 is slightly less than under Alternative 1 and resultant air quality conditions during construction would be slightly less as well. To accommodate 2.4 million gsf of net new development in the West Campus sector without the proposed allowable building height increases, 3 additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2 without the proposed allowable building height increases, the potential for air quality impacts associated with demolition and site preparation would be slightly greater than Alternative 1.

[3] Net increase over existing gsf (i.e. net increase does not include new development replacing an equivalent amount of demolished space).

Alternative 2 would generate slightly less GHG emissions in the West Campus than Alternative 1 because of the amount of development assumed to occur in this area. However, the West Campus would generate more GHG emissions than any of the other campus sectors under Alternative 2.

Noise

To accommodate 2.4 million gsf of net new development in the West Campus without the proposed allowable building height increases, three additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2, the potential for noise impacts associated with demolition and site preparation would be similar to or greater than under Alternative 1.

Vibration

Assumed development in West Campus under Alternative 2 is slightly less than under Alternative 1. However, to accommodate new development in the West Campus without the proposed allowable building height increases, three additional potential development sites would be required with more limited open space improvements than assumed under Alternative 1. Given that more potential development sites would be developed under Alternative 2, the potential for vibration impacts associated with demolition and site preparation would be somewhat greater than under Alternative 1.

Vegetation

Similar to Alternative 1, potential future development in the West Campus under Alternative 2 could result in temporary disturbance to vegetation such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting. Disturbance to existing vegetation would be greater under Alternative 2 since more potential development sites would be developed.

South Campus

Construction Activities

Given the same amount of grading activities, the potential construction activities and earth-related impacts (dust, noise, etc.) are anticipated to be similar under Alternative 2 in the South Campus as described for Alternative 1.

Air Quality and GHG Emissions

Air quality and GHG emissions under Alternative 2 would be the same as under Alternative 1, because assumed development would be the same (1.35 million gsf).

Noise

Given that assumed building development in South Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of noise and associated potential impacts in the South Campus as described for Alternative 1.

Vibration

Given that assumed building development in South Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of vibration and associated potential impacts in the South Campus as described for Alternative 1.

Vegetation

Given that assumed building development in South Campus is the same as under Alternative 1, Alternative 2 would generate similar disturbance to vegetation in the South Campus as described for Alternative 1.

Central Campus

Construction Activities

Given that the assumed building development and grading activities would be the same, the potential construction activities and earth-related impacts (dust, noise, etc.) are anticipated to be similar under Alternative 2 in the Central Campus as described for Alternative 1.

Air Quality and GHG Emissions

Air quality and GHG emissions under Alternative 2 would be the same as under Alternative 1, because assumed development would be the same (1.35 million gsf)

Noise

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of noise and associated potential impacts in the South Campus as described for Alternative 1.

Vibration

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 2 would generate similar amounts of vibration and associated potential impacts in the South Campus as described for Alternative 1.

Vegetation

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 2 would generate similar disturbance to vegetation in the South Campus as described for Alternative 1.

East Campus

Construction Activities

Alternative 2 assumes that the East Campus would contain 1.35 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 337,500 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). As a result, the potential for construction earth-related impacts (dust, noise, etc.) are anticipated to be greater under Alternative 2 than under Alternative 1 in the East Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Air Quality and GHG Emissions

Development of approximately 1.35 million gsf of building area in East Campus under Alternative 2 would represent more development than under Alternative 1, and would result in greater potential for localized increases in dust and equipment measures. However, given the relatively low number of sensitive uses (housing, academic, research) in the East Campus sector, the potential for air quality impacts during construction in the East Campus is low. Assumed development under Alternative 2 is estimated to generate an additional 1,411,398 $MTCO_2e$ of lifespan and 22,582 $MTCO_2e$ of annual GHG emissions in the East Campus. Given that assumed building development in East Campus is greater than under Alternative 1, Alternative 2 is estimated to generate more GHG emissions in the East Campus than Alternative 1.

Noise

Similar to under Alternative 1, under Alternative 2, potential noise impacts would be primarily associated with construction of new development, operation of building systems

and increased traffic levels in the East Campus. Given that more building development is assumed in East Campus than under Alternative 1 (1.35 million gsf compared to 0.75 million gsf under Alternative 1), Alternative 2 would generate more noise and associated potential impacts in this sector.

Vibration

Similar to under Alternative 1, under Alternative 2, potential vibration impacts would be primarily associated with construction of new development in the East Campus. These activities could impact vibration-sensitive uses. However, no vibration-sensitive uses have been identified in the East Campus at this time. Additional vibration-sensitive uses could be developed in this area in the future, which could be impacted by Alternative 2 development. Given that more building development is assumed in East Campus than under Alternative 1, Alternative 2 would generate more vibration and associated potential impacts in this sector.

Vegetation

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus would be preserved under Alternative 2, and the overall amount of area available for vegetated open space on the University of Washington campus would increase.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Like Alternative 1, Alternative 2 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential impacts on uses in the Primary and Secondary Impact Zones would largely be due to noise, dust, equipment emissions, vibration and localized traffic congestion.

With the focus of development in the West, South and East Campus sectors (85 percent of development under Alternative 2), more construction activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus), a portion of the Montlake neighborhood (across the Ship Canal from South Campus) and the Laurelhurst neighborhood and University Village (adjacent to the East Campus).

Less development is assumed to occur in the Central Campus sector under Alternative 2. As a result, there would be less potential for construction activities that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 2, development would result in minimal to no construction-related impacts in the Secondary Impact Zone.

Compliance with existing regulations and codes, including air quality and noise regulations, would minimize the potential for impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 3 – Campus Development Reflecting Increased West and South Campus Density

Alternative 3 represents campus development with more density in the West and South Campus sectors than assumed under Alternative 1. This density under Alternative 3 would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6.0 million gsf of net new development for the campus during the planning horizon. Alternative 3 reflects the *2018 Seattle Campus Master Plan* preferred allocation of building development presented in Alternative 1 with allowed sector increase in the West and South Campus Sectors, as follows:

- West Campus: 3.2 million gsf
- South Campus: 1.65 million gsf
- Central Campus: 0.9 million gsf
- East Campus: 0.25 million gsf

West Campus

Construction Activities

Alternative 3 assumes that the West Campus would contain 3.2 million gsf of net new development (compared to 3.0 million gsf of net new development under Alternative 1), with a resulting amount of up to 800,000 yards of excavation over the planning horizon (compared to 750,000 under Alternative 1). The potential construction earth-related impacts (dust, noise, etc.) are anticipated to be somewhat greater under Alternative 2 than under Alternative 1 in the West Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in the West Campus sector.

Air Quality and GHG Emissions

Given that one of the focus areas of Alternative 3 development and associated construction is the West Campus sector, existing uses sensitive to dust and equipment emissions in this area (primarily student housing and academic uses) could be affected in the short-term. Assumed development of 3.2 million gsf of net new building space under Alternative 3 is slightly more than under Alternative 1 and resultant air quality conditions during construction would be slightly more as well.

As shown in **Table 3.2-4** (Section 3.2, **Air Quality**), assumed development under Alternative 3 is estimated to generate an additional 3,345,537 $MTCO_2e$ of lifespan and 53,529 $MTCO_2e$ of annual GHG emissions in the West Campus. Alternative 3 is estimated to generate slightly more GHG emissions in the West Campus than Alternative 1 because slightly more development is assumed to occur in this area. The West Campus would generate more GHG emissions than any of the other campus sectors under Alternative 3.

Noise

Similar to under Alternative 1, potential construction-related noise impacts would occur in the West Campus under Alternative 3. Given that assumed building development in West Campus under Alternative 3 is greater than under Alternative 1 (3.2 million gsf of assumed development compared to 3.0 million gsf under Alternative 1), Alternative 3 would generate more noise and associated potential impacts in the West Campus than described for Alternative 1.

Vibration

Similar to under Alternative 1, potential vibration impacts under Alternative 3 would be primarily associated with construction of new development in the West Campus. Only one vibration sensitive building has been identified in the West Campus at this time (Henderson Hall). Additional vibration-sensitive uses could be developed in this area in the future, which could be impacted by Alternative 3 development. Given that assumed building development in West Campus is more than under Alternative 1, Alternative 3 would generate somewhat more vibration and associated potential impacts in the West Campus than described for Alternative 1.

Vegetation

Similar to Alternative 1, potential future development in the West Campus under Alternative 3 could result in temporary disturbance to vegetation such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

South Campus

Construction Activities

Alternative 3 assumes that the South Campus would contain 1.65 million gsf of net new development (compared to 1.35 million gsf of net new development under Alternative 1), with a resulting amount of up to 412,500 yards of excavation over the planning horizon (compared to 337,500 under Alternative 1). The potential construction earth-related impacts (dust, noise, etc.) are anticipated to be greater under Alternative 3 than under Alternative 1 in the South Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in South Campus.

Air Quality and GHG Emissions

Assumed South Campus development under Alternative 3 would be slightly more than under Alternative 1 (1.65 million gsf compared to 1.35 million gsf under Alternative 1). A substantial amount of demolition of existing buildings could occur. As under Alternative 1, demolition activities at the South Campus would require adherence to applicable EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing material. As shown in **Table 3.2-4**, assumed development under Alternative 3 is estimated to generate an additional 1,725,043 $MTCO_2e$ of lifespan and 27,601 $MTCO_2e$ of annual GHG emissions in the South Campus. Alternative 3 is estimated to generate slightly more GHG emissions in the South Campus than Alternative 1 because of the amount of development assumed to occur in this area.

Noise

Similar to under Alternative 1, potential construction-related noise impacts would occur in the South Campus under Alternative 3. Given that assumed building development in South Campus under Alternative 3 is greater than under Alternative 1, it is anticipated that Alternative 3 would generate more construction noise and associated potential impacts in the South Campus.

Vibration

Given that assumed building development in South Campus is slightly greater than under Alternative 1, Alternative 3 would generate slightly more vibration and associated potential impacts in the South Campus than described for Alternative 1. As under Alternative 1, potential future development under Alternative 3 that occurs near sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine

potential vibration-related issues and measures to limit vibration associated with construction.

Vegetation

Similar to Alternative 1, potential future development in the South Campus under Alternative 3 could result in temporary disturbance to vegetation such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

Central Campus

Construction Activities

Given that the assumed building development and grading activities would be the same, the potential construction activities and earth-related impacts (dust, noise, etc.) are anticipated to be similar under Alternative 3 in the Central Campus as described for Alternative 1.

Air Quality and GHG Emissions

Air quality and GHG emissions under Alternative 3 would be the same as under Alternative 1, because assumed development would be the same (1.35 million gsf)

Noise

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 3 would generate similar amounts of noise and associated potential impacts in the South Campus as described for Alternative 1.

Vibration

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 3 would generate similar amounts of vibration and associated potential impacts in the South Campus as described for Alternative 1.

Vegetation

Given that assumed building development in Central Campus is the same as under Alternative 1, Alternative 3 would generate similar impacts to vegetation in the South Campus as described for Alternative 1.

East Campus

Construction Activities

Alternative 3 assumes that the East Campus would contain 0.25 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 62,500 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). The potential for construction earth-related impacts (dust, noise, etc.) is anticipated to be lower in the East Campus under Alternative 3 than under Alternative 1.

Air Quality and GHG Emissions

Development of approximately 0.25 million gsf of building area in East Campus would result in the potential for localized increases in dust and equipment measures. However, given the relatively low number of sensitive uses (housing, academic, research) and much less development in the East Campus sector than in the other sectors under Alternative 3, the potential for air quality impacts during construction in the East Campus is low. Given that assumed building development in East Campus is less than under Alternative 1, Alternative 3 is estimated to generate much less GHG emissions in the East Campus than Alternative 1. The East Campus would generate much less GHG emissions than any of the other campus sectors under Alternative 3.

Noise

Given that assumed building development in East Campus is considerably less than under Alternative 1 (0.25 million gsf compared to 0.75 million gsf under Alternative 1), Alternative 3 would generate much less noise and associated potential impacts in the East Campus than described for Alternative 1.

Vibration

Given that assumed building development in East Campus is considerably less than under Alternative 1, Alternative 3 would generate much less vibration and associated potential impacts in the East Campus than described for Alternative 1.

Vegetation

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus would be preserved under Alternative 3, and considering that new landscape open space opportunities would be provided in

currently impervious area, the overall amount of area available for vegetated open space on the University of Washington campus would increase.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Similar to Alternative 1, Alternative 3 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential impacts on uses in the Primary and Secondary Impact Zones would largely be due to noise, dust, equipment emissions, vibration and localized traffic congestion.

With the focus of development in the West and South Campus sectors (81 percent of development under Alternative 3), more construction activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located adjacent to these sectors, including the University District (adjacent the West Campus) and a portion of the Montlake neighborhood (across the Ship Canal from South Campus).

Less development is assumed to occur in the Central and East Campus sectors under Alternative 3. As a result, there would be less potential for construction activities that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 3, development would result in minimal to no construction-related impacts in the Secondary Impact Zone.

Compliance with existing regulations and codes, including air quality and noise regulations, would minimize the potential for impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 4 – Campus Development Reflecting Increased West and East Campus Density

Under Alternative 4, approximately 6.0 million gsf of building area would be developed on the University of Washington Seattle campus. The focus of development would be in the West and East Campus sectors, with an increase in development in the Central and East Campus sectors compared to Alternative 1. This increased density would be consistent with provisions identified in the *2018 Seattle Campus Master Plan* allowing increased density in campus sectors while maintaining the overall 6 million gsf of net new development for the campus during the planning horizon.

- West Campus: 3.0 million gsf
- South Campus: 0.2 million gsf
- Central Campus: 1.1 million gsf

- East Campus: 1.7 million gsf

West Campus

Construction Activities

As under Alternative 1, Alternative 4 assumes that the West Campus would contain 3.0 million gsf of net new development, with a resulting amount of up to 750,000 cubic yards of excavation over the planning horizon. The potential construction earth-related impacts (dust, noise, etc.) are anticipated to be the same under Alternative 4 as that assumed under Alternative 1 in the West Campus.

Air Quality and GHG Emissions

Assumed development of 3.0 million gsf of net new building space under Alternative 4 is the same as under Alternative 1 and resultant air quality conditions and GHG emissions during construction would be the same as well.

Noise

Given that assumed development in West Campus is the same as under Alternative 1, Alternative 4 would generate similar levels of noise and associated potential impacts in the West Campus as described for Alternative 1.

Vibration

Given that assumed development in West Campus is the same as under Alternative 1, Alternative 4 would generate similar levels of vibration and associated potential impacts in the West Campus as described for Alternative 1.

Vegetation

Given that assumed development in West Campus is the same as under Alternative 1, Alternative 4 would generate similar disturbance to vegetation in the West Campus as described for Alternative 1.

South Campus

Construction Activities

Since the assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate a lower amount of construction activities than described for Alternative 1. Compliance with existing regulations and codes, including

review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in South Campus.

Air Quality and GHG Emissions

Since the assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much less construction and GHG emissions in the South Campus than described for Alternative 1.

Noise

Given that assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much less noise and associated potential impacts in the South Campus than described for Alternative 1.

Vibration

Given that assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much less vibration and associated potential impacts in the South Campus than described for Alternative 1.

Vegetation

Given that assumed building development in South Campus is considerably less than under Alternative 1, Alternative 4 would generate much lower disturbance to vegetation in the South Campus than described for Alternative 1.

Central Campus

Construction Activities

Alternative 4 assumes that the Central Campus would contain 1.1 million gsf of net new development (compared with 0.9 million gsf under Alternative 1), with a resulting amount of up to 275,000 cubic yards of excavation over the planning horizon. The potential construction earth-related impacts (dust, noise, etc.) under Alternative 4 are anticipated to be greater than under Alternative 1 in the Central Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts.

Air Quality and GHG Emissions

Slightly more net new development is assumed for the Central Campus under Alternative 4 than under Alternative 1 (1.1 million gsf under Alternative 4 compared to 0.9 million gsf

under Alternative 1). As a result, the air quality emissions would be slightly more than under Alternative 4 than under Alternative 1. Assumed development under Alternative 4 is estimated to generate an additional 1,150,028 $MTCO_2e$ of lifespan and 18,400 $MTCO_2e$ of annual GHG emissions in the Central Campus. Alternative 4 is estimated to generate slightly more GHG emissions in the Central Campus than Alternative 1 because of the amount of development assumed to occur in this area.

Noise

Since the assumed building development in Central Campus is slightly more than under Alternative 1 (1.1 million gsf compared to 0.9 million gsf under Alternative 1), Alternative 4 would generate slightly greater noise and associated potential impacts in the South Campus than described for Alternative 1.

Vibration

Given that assumed building development in the Central Campus is slightly more than under Alternative 1, Alternative 4 would generate slightly greater vibration and associated potential impacts in this sector than described for Alternative 1.

Vegetation

Similar to Alternative 1, potential future development in the Central Campus under Alternative 4 could result in temporary disturbance to vegetation such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

East Campus

Construction Activities

Alternative 4 assumes that the East Campus would contain 1.7 million gsf of net new development (compared to 0.75 million gsf of net new development under Alternative 1), with a resulting amount of up to 425,000 cubic yards of excavation over the planning horizon (compared to 187,000 under Alternative 1). The potential construction earth-related impacts (dust, noise, etc.) are anticipated to be greater under Alternative 4 than under Alternative 1 in the East Campus. Compliance with existing regulations and codes, including review and approval of truck haul routes and compliance with stormwater and noise regulations would minimize potential impacts in East Campus.

Air Quality and GHG Emissions

Development of approximately 1.7 million gsf of building area in East Campus would be more development than under Alternative 1 (0.75 million gsf assumed under Alternative 1),

and would result in greater potential for localized increases in dust and equipment measures. However, given the relatively low number of sensitive uses (housing, academic, research) in the East Campus sector, the potential for air quality impacts during construction in the East Campus would be low. Assumed development under Alternative 4 is estimated to generate an additional 1,777,317 $MTCO_2e$ of lifespan and 28,437 $MTCO_2e$ of annual GHG emissions in the East Campus (beyond the 1,528,492 $MTCO_2e$ lifespan and 24,456 annual GHG emissions in this sector under existing conditions). Alternative 4 is estimated to generate more GHG emissions in the East Campus than Alternative 1 because of the amount of development assumed to occur in this area.

Noise

Given that considerably greater building development is assumed in East Campus than under Alternative 1 (1.75 million gsf as compared to 0.75 million gsf under Alternative 1), Alternative 4 would generate more noise and associated potential impacts in this sector than described for Alternative 1.

Vibration

Since considerably greater building development is assumed in East Campus than under Alternative 1, Alternative 4 would generate much more vibration and associated potential impacts in the East Campus than described for Alternative 1.

Vegetation

As under Alternative 1, the existing significant landscape open spaces identified in the *2018 Seattle Campus Master Plan* in the East Campus would be preserved under Alternative 4, and considering that new landscaped open space opportunities would be provided in currently impervious area, the overall amount of area available for vegetated open space on the University of Washington campus would increase. Significant impacts to plant communities under Alternative 4 would not be anticipated.

Summary of Impacts in Primary and Secondary Impact Zone Areas

Similar to Alternative 1, Alternative 4 would contribute to the overall amount of development in the University of Washington Seattle campus area. During construction, potential impacts on uses in the Primary and Secondary Impact Zones would largely be due to noise, dust, equipment emissions, vibration and localized traffic congestion.

With the focus of development in the West, Central and East Campus sectors (97 percent of development under Alternative 3), more construction activities would occur in proximity to residential, commercial and other uses in the portions of the **Primary Impact Zone** located

adjacent to these sectors, including the University District (adjacent the West Campus), a portion of the residential neighborhood to the north of NE 45th Street (adjacent to the Central Campus), and University Village and the Laurelhurst neighborhood (adjacent to the East Campus.

Less development is assumed to occur in the South Campus sector under Alternative 4. As a result, there would be less potential for construction activities that would impact adjacent land uses in the Primary Impact Zone.

Given the distance of land uses in the **Secondary Impact Zone** from development assumed under Alternative 4, development would result in minimal to no construction-related impacts in the Secondary Impact Zone.

Compliance with existing regulations and codes, including air quality and noise regulations, would minimize the potential for impacts on land uses in the Primary and Secondary Impact Zones.

Alternative 5 – No Street, Alley or Aerial Vacations

Under Alternative 5, the same amount of building square footage would be developed as assumed under Alternatives 1 through 4, although none of the assumed street or aerial vacations would occur. Thus, neither the proposed vacations of NE Boat Street or NE Northlake Place in West Campus, nor the aerial vacation to accommodate the land bridge over Montlake Boulevard NE in East Campus, would occur. Because a substantial amount of construction activities are not anticipated to be associated with street or aerial vacations, it is assumed that construction impacts under Alternative 5 would be similar to those identified under Alternatives 1 through 4.

Potential Indirect/Cumulative Impacts

Development under Alternatives 1 through 5 would contribute to the amount of overall construction in the area and, in combination with future new development in the area, would contribute to indirect construction-related impacts including short-term, localized construction activities, dust, emissions, noise, vibration and vegetation removal. To the extent that increased campus population and development increase the pressure for supporting development in the area (primarily in the University District), campus growth could contribute to construction-related impacts in the area. Any development outside of the MIO boundary would comply with City of Seattle code requirements.

The No Action Alternative could result in more pressure for new construction in the surrounding area (primarily in the University District) to meet a portion of the building development necessary to accommodate increased campus population, thus, potentially

transferring a portion of the construction-related impacts from the University of Washington campus to surrounding areas.

Potential changes in the zoning and development capacity of the University District could result in increased development and construction in the vicinity of the University of Washington campus. Although the level, timing and specific location(s) of future development in the University District is not defined, it is possible that some level of concurrent development, and associated construction activities, would occur over a concurrent timeframe and in proximity to development under the *2018 Seattle Campus Master Plan,* especially given the proposed focus of development in the West Campus under Alternative 1 through 5. There would be the potential for indirect cumulative construction-related impacts (i.e., construction activities, dust, emissions, noise, vibration, etc.) associated with concurrent construction activities on the University of Washington campus and in the University District.

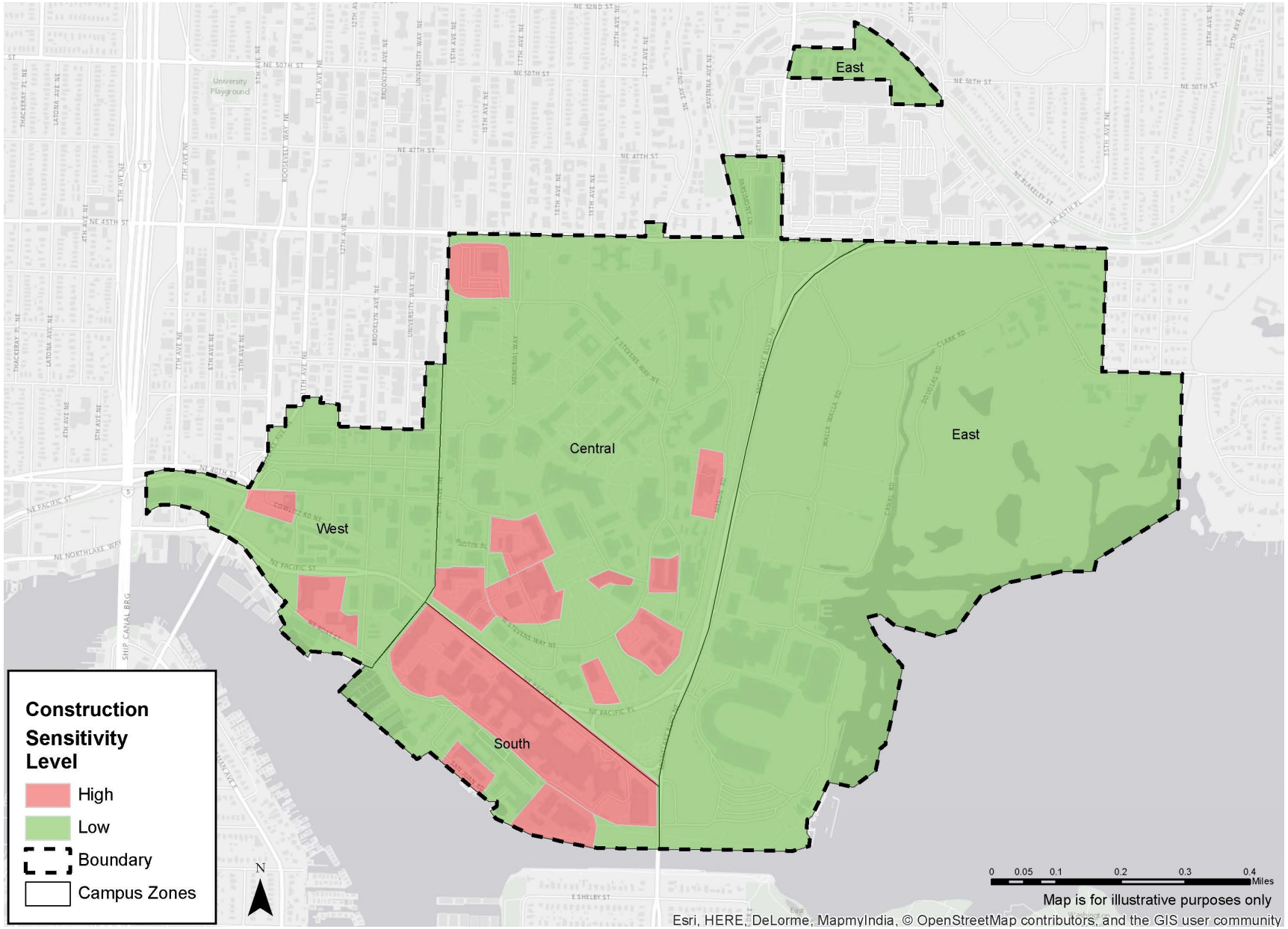
All construction activities in the area, both on the University of the Washington campus and in the campus vicinity, would be required to follow applicable regulations, and significant impacts would not be anticipated.

Potential to Encounter On-Campus Sensitive Conditions

As indicated in Chapter 2 of this Draft EIS, the State Environmental Policy Act (SEPA) requires decision-makers to consider the environmental consequences of proposed actions, and to consider ways to minimize adverse environmental impacts.

The approval of the *2018 Seattle Campus Master Plan* is classified under SEPA as a non-project (also referred to as programmatic) action. A non-project action is defined as an action that is broader than a single site-specific project, and involves decisions on policies, plans, or programs. An EIS for a non-project proposal does not require site-specific analysis; instead, the EIS addresses conditions at a more general level (see WAC 197-11-442 for details). As the SEPA Lead Agency, the University of Washington would be responsible for ensuring SEPA compliance for potential future development projects and would complete a SEPA threshold analysis/determination for individual projects.

Based on the programmatic analysis in this Draft EIS, the potential for a future site-specific project (i.e., specific proposals on potential development sites or other improvements identified in the *2018 Seattle Campus Master Plan*) to encounter sensitive environmental conditions is identified as “High”, “Medium” or “Low” (see **Figure 3.16-1**), and the need for additional studies or mitigation associated with specific areas on campus (if any) are



Source: EA Engineering, 2016.

EA Engineering, Science, and Technology, Inc.

Figure 3.16-1
Construction Sensitivity Map

defined. For example, areas of campus that contain existing vibration-sensitive uses are identified as having a "High" potential to generate construction-related vibration impacts, while areas of campus located at a distance from those vibration-sensitive uses are identified as having a "Low" potential to result in construction-related vibration impacts.

For areas of campus identified as having a **"Low"** or **"Medium"** potential to encounter sensitive conditions, it is anticipated that standard best practices and code compliance would be adequate. For areas of the campus identified as having a **"High"** potential to encounter sensitive conditions, site-specific study and/or additional mitigation measures may be appropriate as a part of SEPA compliance.

3.16.3 Mitigation Measures

The following measures would be available for development under the *2018 Seattle Campus Master Plan*. Mitigation measures that are identified below *in italics* are also included in their respective environmental element discussions as well (i.e., Section 3.1, **Earth**; Section 3.2, **Air Quality**; Section 3.3, **Wetlands, Plants and Animals**; Section 3.5, **Environmental Health;** and, Section 3.15, **Transportation**).

Measures Applicable to All Campus Areas (Low, Medium and High Potential)

Construction Activities

- *All earthwork and site preparation on the University of Washington Seattle Campus would be conducted in compliance with relevant grading criteria of the Seattle Municipal Code (Sections 22.170 and 22.802).*

- *The following Temporary Erosion and Sedimentation Control (TESC) measures would be implemented, as appropriate for the individual site, as part of code compliance to reduce the risk of construction-related erosion:*

    - *The ground surface in the construction area would be sloped and sealed to reduce water infiltration, to promote rapid runoff, and to prevent water ponding.*
    - *To prevent soil disturbance, the size or type of construction equipment may have to be limited.*
    - *No soil would be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, would be used to seal the ground surface.*

- *Work areas and soil stockpiles would be covered with plastic. Bales of straw and/or geotextile silt fences would be used as appropriate to control soil erosion.*
- *During periods of wet weather, excavation and fill placement would be observed on a full-time basis by a geotechnical engineer (or engineer's representative) experienced in wet weather earthwork to determine that unsuitable materials are removed and that suitable compaction and site drainage is achieved.*
- *Excavation slopes would be protected from infiltration and erosion by directing water away from excavations and covering slopes with impermeable membranes, such as plastic sheeting.*
- *Excavated materials, stockpiles, and equipment would be placed away from the top edge of excavations a distance equal to at least the depth of the excavation.*
- *To prevent an accumulation of dust and/or mud on campus during construction activities, the tires of construction equipment and trucks could be washed before they leave construction sites and streets could be swept as necessary.*

- *Site specific geotechnical recommendations would be provided as individual projects are proposed. Typical measures that could be implemented as part of code compliance, based on the specific conditions at the individual sites, include:*
  - *Excavations greater than four feet in height would be adequately sloped or braced to prevent localized sloughing and spalling.*
  - *Temporary shoring would be implemented during construction and would consist of a conventional soldier pile and lagging system.*
  - *All soil excavated from the site would be tested for contamination. All soil would be disposed of consistent with applicable University of Washington, State and local regulations.*
  - *Soldier piles and/or other slope stability techniques could be used as necessary in areas of unstable soils.*
  - *Structures could be designed with structural systems capable of supporting code-required floor loading and resisting lateral forces generated by earthquakes and wind.*

- *Whenever possible, construction could be scheduled to minimize overlapping of excavation periods for projects planned for construction in the same biennium.*

- *As individual projects are proposed, coordination with educational or research uses in the immediate vicinity that could be sensitive to vibration during construction would be conducted to determine appropriate measures to minimize the potential for disruption (see **Section 3.5 – Environmental Health**-for additional discussion and mitigation).*

Air Quality and GHG Emissions

- *During construction, applicable best management practices (BMPs) to control dust, vehicle and equipment emissions would be implemented. The University of Washington would coordinate with adjacent sensitive users to temporarily duct and protect air intakes to minimize the potential for the intake of fugitive dust and exhaust fumes.*

- Building construction and demolition would be conducted in compliance with Seattle Municipal Code Section 15.22.060B which provides criteria related to suppression of dust-generating activities.

- *Where appropriate, temporary asphalt roadways would be provided on Potential Development Sites to reduce the amount of dust and dirt that would be generated.*

- *As applicable, a Construction Management Plan would be prepared for each individual construction project to establish parking areas, construction staging areas, truck haul routes, and provisions for maintaining pedestrian and vehicle routes. These measures are intended to, among other things, minimize traffic delays and associated vehicle idling.*

- *As applicable, control measures in the Washington Associated General Contractors Guide to Handling Fugitive Dust form Construction Projects would be used, including:*

    - *Use only equipment and trucks that are maintained in optimal operational condition;*
    - *Require all off-road equipment to have emission reduction equipment (e.g., require participation in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel, by project sponsors and contractors);*
    - *Implement restrictions on construction truck and other vehicle idling (e.g., limit idling to a maximum of 5 minutes);*
    - *Spray exposed soil with water or other suppressant to reduce emissions of PM*

and deposition of particulate matter;

- *Cover all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM emissions and deposition during transport;*
- *Provide wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles in order to decrease deposition of particulate matter on area roadways; and*
- *Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.*

Noise

- *Construction activities would comply with the City of Seattle Noise Ordinance (SMC 25.08.425) which allows for temporary increases in the maximum permissible sound levels based on equipment type.*

- *The University of Washington also has additional conditions/considerations that project-specific campus contractors meet the following noise control criteria:*

    - *The sound pressure level of construction noise inside adjacent buildings and/or rooms cannot exceed 60 dBA (with windows closed) between the hours of 8 AM and 5 PM on week days. Barriers can be erected between construction activities and such interior areas, or equipment noise attenuators can be provided.*
    - *The use of electric equipment and machinery is preferred. If noise levels on any equipment or device cannot reasonably be reduced to criteria levels, either that equipment or device will not be allowed on the job or use times will have to be scheduled subject to approval.*
    - *The sound pressure level of each piece of equipment cannot be greater than 85 dBA at a distance of 50 feet. Rubber-tired equipment is to be used whenever possible instead of equipment with metal tracks. Mufflers for stationary engines are to be used in the hospital areas. Construction traffic should be routed through nearest campus exit.*
    - *Air compressors are to be equipped with silencing packages*
    - *Jack hammers and roto hammers may be used where no other alternative is available; core drilling and saw cutting equipment is preferred.*
    - *Specific scheduling of construction-related noise activities is required at the University of Washington Medical Center.*

Vibration

- *Potential future development projects under the 2018 Seattle Campus Master Plan should verify the existence of vibration-sensitive uses located in proximity to the development site and if necessary, work to provide mitigation in the project design.*

Transportation

- *Potential impacts associated with construction-related transportation disruptions would be mitigated by the implementation of the TMP, including outreach and project coordination.*

Additional Measure Applicable to Medium and High Campus Areas

Construction Activities

- *Construction activities conducted in portions of the campus identified as containing earth-related environmentally critical areas (primarily in the East Campus) identified by the City of Seattle Municipal Code (SMC) could comply with applicable development standards for: liquefaction-prone areas (SMC 25.09.100); peat settlement-prone areas (SMC 25.09.110); steep slope areas (SMC 25.09.180); and, abandoned landfills (SMC 25.09.220)*

Noise

- *Potential future development projects under the 2018 Seattle Campus Master Plan that are located in areas that are proximate to noise-sensitive uses would require project-specific coordination with adjacent noise-sensitive users to determine potential noise-related issues associated with development on those sites and could require additional noise analysis and mitigation measures (if necessary).*

Vibration

- *Potential future development projects under the 2018 Seattle Campus Master Plan that are located in areas that are proximate to vibration-sensitive uses would require project-specific coordination with adjacent vibration sensitive users to determine potential vibration-related issues associated with development on those sites and could require additional mitigation measures (if necessary).*

3.16.4 Significant Unavoidable Adverse Impacts

During construction activities, some temporary construction-related impacts would occur, including short-term, localized construction activities, dust, emissions, noise, vibration, traffic and vegetation removal. However, with the implementation of the mitigation measures identified above, no significant unavoidable adverse impacts would be anticipated.

CHAPTER 4

References

CHAPTER 4
REFERENCES

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APPENDIX A

Distribution List

Seattle Campus Master Plan Draft EIS Distribution list 10-5-2016

	Name
PUBLICATIONS	**Seattle Times**
	Daily Journal of Commerce
	The Daily
	UW Today
AGENCIES	SEPA Public Info Center City of Seattle Dept. of Construction & Inspections
	University Neighborhood Service Center
	SEPA Center Dept. of Natural Resources
	Dept. of Ecology SEPA Unit Environmental Review Section
	Harold Scoggins Fire Chief Seattle Fire Department
	Office of EPA Environmental Protection Agency
	Patty Hayes Director Seattle & King County-Public Health
	Environmental & Safety Division Seattle City Light
	James Irish Environmental Manager Sound Transit Link
	Lindsay King Dept. of Construction & Inspection
	Director Seattle Dept. of Transportation
	Seattle Police Department
	Seattle Dept. of Parks and Recreation

	Name
	SEPA Coordinator Seattle Public Utilites
	Russell Holter Project Complience Reviewer Dept. of Archeology & Historic Preservation
	Executive Director Puget Sound Clean Air Agency
	Isabel Tinoco Fisheries Director Muckelshoot Tribe
COMMUNITY ORGANIZATIONS	Eastlake Community Council
	Laurelhurst Community Club
	Montlake Communtiy Club
	Northeast District Council
	Ravenna Bryant Community Association c/o Ravenna-Eckstein Community Center
	Roosevelt Neighbors' Alliance
	View Ridge Community Club
	Wallingford Community Council
	President Wedgewood Community Council
	Matthew Fox c/o University District Community Council
	Alternate University District Community Council
	Roosevelt Neighborhood Association
	University Neighborhood Service Center
	The U District Partnership
	Greater University Chamber of Commerce

	Name
	President Portage Bay/Roanoke Park Community Council
LIBRARIES	Montlake Branch Seattle Public Library
	University Branch Seattle Public Library
	Documents Department - Central Library Seattle Public Library
	UW Health Sciences Library
	Shingeko Podgorny Reference Division UW Suzzallo Library
	Carla Rickerson NW Collection UW Suzzallo Library
CUCAC	Yvonne Sanchez Eastlake Community Council
	Doug Cambell University District Partnership
	Kay Kelly Laurelhurst Community Club
	Tamitha Blake Montlake Community Club
	John Gaines Portage Bay Roanoke Park Community Council
	Joan Kelday Ravenna Springs Community Group
	Brett Frosaker Ravenna-Bryant Community Association
	Eric Larson Roosevelt Neighbors Alliance
	Scott Cooper Roosevelt Neighborhood Association
	Barbara Quinn University Park Community Club

	Name
	Brian O'Sullivan Wallingford Community Council
	Kerry Kahl UW at Large Rep
	Ashley Emery UW Faculty Senate Rep
	Chris Leman Eastlake Community Council
	Louise Little University District Partnership
	Leslie Wright Laurelhurst Community Club
	Barbara Krieger Portage Bay Roanoke
	Pamela Clark Ravenna Springs Community Group
	Jorgen Bader Ravenna-Bryant Community Association
	Ruedi Risler University Park Community Club
	Jon Berkedal Wallingford Community Council
	Osman Salahuddin UW Student Rep
	Rick Mohler UW Faculty Senate Rep
	Maureen Sheehan City of Seattle, DON
	Karen Ko City of Seattle, DON
	Julie Blakeslee UW Environmental Planner
	Elizabeth McCoury University District Partnership
	Jeannie Hale Laurelhurst Community Club

	Name
	Bryan Haworth Montlake Community Club
	Inga Manskopf Ravenna-Bryant Community Group
	Matt Hoehnen Roosevelt Neighbor's Alliance
	Dirk Farrell Roosevelt Neighborhood Association
	Matt Fox University District Council
	Miranda Berner Wallingford Community Council
	Alternate

In addition to the distribution list above, a postcard notification by US Mail was sent to every address within the Primary and Secondary Impact Area as defined in this EIS.

APPENDIX B

GHG Emissions Worksheets

City of Seattle Department of Planning and Development
SEPA GHG Emissions Worksheet
Version 1.7 12/26/07

Introduction

The Washington State Environmental Policy Act (SEPA) requires environmental review of development proposals that may have a significant adverse impact on the environment. If a proposed development is subject to SEPA, the project proponent is required to complete the SEPA Checklist. The Checklist includes questions relating to the development's air emissions. The emissions that have traditionally been considered cover smoke, dust, and industrial and automobile emissions. With our understanding of the climate change impacts of GHG emissions, the City of Seattle requires the applicant to also estimate these emissions.

Emissions created by Development

GHG emissions associated with development come from multiple sources:

- The extraction, processing, transportation, construction and disposal of materials and landscape disturbance (Embodied Emissions)
- Energy demands created by the development after it is completed (Energy Emissions)
- Transportation demands created by the development after it is completed (Transportation Emissions)

GHG Emissions Worksheet

This GHG Emissions Worksheet has been developed to assist applicants in answering the SEPA Checklist question relating to GHG emissions. The worksheet was originally developed by King County, but the City of Seattle and King County are working together on future updates to maintain consistency of methodologies across jurisdictions.

The SEPA GHG Emissions worksheet estimates all GHG emissions that will be created over the life span of a project. This includes emissions associated with obtaining construction materials, fuel used during construction, energy consumed during a buildings operation, and transportation by building occupants.

Using the Worksheet

1. Descriptions of the different residential and commercial building types can be found on the second tabbed worksheet ("Definition of Building Types"). If a development proposal consists of multiple projects, e.g. both single family and multi-family residential structures or a commercial development that consists of more than on type of commercial activity, the appropriate information should be estimated for each type of building or activity.

2. For paving, estimate the total amount of paving (in thousands of square feet) of the project.

3. The Worksheet will calculate the amount of GHG emissions associated with the project and display the amount in the "Total Emissions" column on the worksheet. The applicant should use this information when completing the SEPA checklist.

4. The last three worksheets in the Excel file provide the background information that is used to calculate the total GHG emissions.

5. The methodology of creating the estimates is transparent; if there is reason to believe that a better estimate can be obtained by changing specific values, this can and should be done. Changes to the values should be documented with an explanation of why and the sources relied upon.

6. Print out the “Total Emissions” worksheet and attach it to the SEPA checklist. If the applicant has made changes to the calculations or the values, the documentation supporting those changes should also be attached to the SEPA checklist.

Existing University of Washington West Campus

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Single-Family Home.....	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home.....	0		41	475	709	**0**
Education		3,846.2	39	646	361	**4021126**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall).....		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement.....

Pavement.....		0.00				**0**

Total Project Emissions: **4021126**

Existing University of Washington South Campus

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Single-Family Home.....	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home.....	0		41	475	709	**0**
Education		4,178.5	39	646	361	**4368539**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall).....		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement.....

Pavement.....		0.00				**0**

Total Project Emissions: **4368539**

Existing University of Washington Central Campus

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Single-Family Home	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home	0		41	475	709	**0**
Education		7,153.5	39	646	361	**7478843**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall)		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement

Pavement		0.00				**0**

Total Project Emissions: **7478843**

Version 1.7 12/26/07

Existing University of Washington East Campus

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Single-Family Home.....	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home.....	0		41	475	709	**0**
Education		1,462.0	39	646	361	**1528492**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall).....		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement.....

Pavement.....		0.00				**0**

Total Project Emissions: **1528492**

Version 1.7 12/26/07

Definition of Building Types

Type (Residential) or Principal Activity (Commercial)	Description
Single-Family Home.....	Unless otherwise specified, this includes both attached and detached buildings
Multi-Family Unit in Large Building	Apartments in buildings with more than 5 units
Multi-Family Unit in Small Building	Apartments in building with 2-4 units
Mobile Home.....	
Education	Buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."
Food Sales	Buildings used for retail or wholesale of food.
Food Service	Buildings used for preparation and sale of food and beverages for consumption.
Health Care Inpatient	Buildings used as diagnostic and treatment facilities for inpatient care.
Health Care Outpatient	Buildings used as diagnostic and treatment facilities for outpatient care. Doctor's or dentist's office are included here if they use any type of diagnostic medical equipment (if they do not, they are categorized as an office building).
Lodging	Buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.
Retail (Other Than Mall).....	Buildings used for the sale and display of goods other than food.
Office	Buildings used for general office space, professional office, or administrative offices. Doctor's or dentist's office are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).
Public Assembly	Buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.
Public Order and Safety	Buildings used for the preservation of law and order or public safety.
Religious Worship	Buildings in which people gather for religious activities, (such as chapels, churches, mosques, synagogues, and temples).
Service	Buildings in which some type of service is provided, other than food service or retail sales of goods
Warehouse and Storage	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).
Other	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.
Vacant	Buildings in which more floorspace was vacant than was used for any single commercial activity at the time of interview. Therefore, a vacant building may have some occupied floorspace.

Sources: .....

Residential 2001 Residential Energy Consumption Survey
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

Commercial Commercial Buildings Energy Consumption Survey (CBECS),
Description of CBECS Building Types
http://www.eia.doe.gov/emeu/cbecs/pba99/bldgtypes.html

Embodied Emissions Worksheet

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# thousand sq feet/ unit or building	Life span related embodied GHG missions (MTCO2e/ unit)	Life span related embodied GHG missions (MTCO2e/ thousand square feet) - See calculations in table below
Single-Family Home	2.53	98	39
Multi-Family Unit in Large Building	0.85	33	39
Multi-Family Unit in Small Building	1.39	54	39
Mobile Home	1.06	41	39
Education	25.6	991	39
Food Sales	5.6	217	39
Food Service	5.6	217	39
Health Care Inpatient	241.4	9,346	39
Health Care Outpatient	10.4	403	39
Lodging	35.8	1,386	39
Retail (Other Than Mall)	9.7	376	39
Office	14.8	573	39
Public Assembly	14.2	550	39
Public Order and Safety	15.5	600	39
Religious Worship	10.1	391	39
Service	6.5	252	39
Warehouse and Storage	16.9	654	39
Other	21.9	848	39
Vacant	14.1	546	39

Section II: Pavement

All Types of Pavement			50

	Columns and Beams	Intermediate Floors	Exterior Walls	Windows	Interior Walls	Roofs		
Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building	5.3	7.8	19.1	51.2	5.7	21.3		
Average Materials in a 2,272-square foot single family home	0.0	2269.0	3206.0	285.0	6050.0	3103.0	Total Embodied Emissions (MTCO2e)	Total Embodied Emissions (MTCO2e/ thousand sq feet)
MTCO2e	0.0	8.0	27.8	6.6	15.6	30.0	88.0	38.7

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

Residential floorspace per unit
2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

Floorspace per building
EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building
Athena EcoCalculator
Athena Assembly Evaluation Tool v2.3- Vancouver Low Rise Building
Assembly Average GWP (kg) per square meter
http://www.athenasmi.ca/tools/ecoCalculator/index.html
Lbs per kg 2.20
Square feet per square meter 10.76

Average Materials in a 2,272-square foot single family home
Buildings Energy Data Book: 7.3 Typical/Average Household
Materials Used in the Construction of a 2,272-Square-Foot Single-Family Home, 2000
http://buildingsdatabook.eren.doe.gov/?id=view_book_table&TableID=2036&t=xls
See also: NAHB, 2004 Housing Facts, Figures and Trends, Feb. 2004, p. 7.

Average window size
Energy Information Administration/Housing Characteristics 1993
Appendix B, Quality of the Data. Pg. 5.
ftp://ftp.eia.doe.gov/pub/consumption/residential/rx93hcf.pdf

Pavement Emissions Factors
MTCO2e/thousand square feet of asphalt
or concrete pavement

50 (see below)

Embodied GHG Emissions……Worksheet Background Information

Buildings
Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass).

Estimating embodied GHG emissions is new field of analysis; the estimates are rapidly improving and becoming more inclusive of all elements of construction and development.

The estimate included in this worksheet is calculated using average values for the main construction materials that are used to create a typical family home. In 2004, the National Association of Home Builders calculated the average materials that are used in a typical 2,272 square foot single-family household. The quantity of materials used is then multiplied by the average GHG emissions associated with the life-cycle GHG emissions for each material.

This estimate is a rough and conservative estimate; the actual embodied emissions for a project are likely to be higher. For example, at this stage, due to a lack of comprehensive data, the estimate does not include important factors such as landscape disturbance or the emissions associated with the interior components of a building (such as furniture).

King County realizes that the calculations for embodied emissions in this worksheet are rough. For example, the emissions associated with building 1,000 square feet of a residential building will not be the same as 1,000 square feet of a commercial building. However, discussions with the construction community indicate that while there are significant differences between the different types of structures, this method of estimation is reasonable; it will be improved as more data become available.

Additionally, if more specific information about the project is known, King County recommends two online embodied emissions calculators that can be used to obtain a more tailored estimate for embodied emissions: www.buildcarbonneutral.org and www.athenasmi.ca/tools/ecoCalculator/.

Pavement
Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle. For specifics, see the worksheet.

Special Section: Estimating the Embodied Emissions for Pavement

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

The results of the studies are presented in different units and measures; considerable effort was undertaken to be able to compare the results of the studies in a reasonable way. For more details about the below methodology, contact matt.kuharic@kingcounty.gov.

The four studies, Meil (2001), Park (2003), Stripple (2001) and Treolar (2001) produced total GHG emissions of 4-34 MTCO2e per thousand square feet of finished paving (for similar asphalt and concrete based pavements). This estimate does not including downstream maintenance and repair of the highway. The average (for all concrete and asphalt pavements in the studies, assuming each study gets one data point) is ~17 MTCO2e/thousand square feet.

Three of the studies attempted to thoroughly account for the emissions associated with long term maintenance (40 years) of the roads. Stripple (2001), Park et al. (2003) and Treolar (2001) report 17, 81, and 68 MTCO2e/thousand square feet, respectively, after accounting for maintenance of the roads.

Based on the above discussion, King County makes the conservative estimate that 50 MTCO2e/thousand square feet of pavement (over the development's life cycle) will be used as the embodied emission factor for pavement until better estimates can be obtained. This is roughly equivalent to 3,500 MTCO2e per lane mile of road (assuming the lane is 13 feet wide).

It is important to note that these studies estimate the embodied emissions for roads. Paving that does not need to stand up to the rigors of heavy use (such as parking lots or driveways) would likely use less materials and hence have lower embodied emissions.

Sources:

Meil, J. A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential. 2006. Available: http://www.cement.ca/cement.nsf/eee9ec7bbd630126852566c40052107b/6ec79dc8ae03a782852572b90061b914/$FILE/ATTK0WE3/athena%20report%20Feb.%202%202007.pdf

Park, K, Hwang, Y., Seo, S., M.ASCE, and Seo, H. , "Quantitative Assessment of Environmental Impacts on Life Cycle of Highways," Journal of Construction Engineering and Management , Vol 129, January/February 2003, pp 25-31, (DOI: 10.1061/(ASCE)0733-9364(2003)129:1(25)).

Stripple, H. Life Cycle Assessment of Road. A Pilot Study for Inventory Analysis. Second Revised Edition. IVL Swedish Environmental Research Institute Ltd. 2001. Available: http://www.ivl.se/rapporter/pdf/B1210E.pdf

Treloar, G., Love, P.E.D., and Crawford, R.H. Hybrid Life-Cycle Inventory for Road Construction and Use. Journal of Construction Engineering and Management. P. 43-49. January/February 2004.

Energy Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	Energy consumption per building per year (million Btu)	Carbon Coefficient for Buildings	MTCO2e per building per year	Floorspace per Building (thousand square feet)	MTCE per thousand square feet per year	MTCO2e per thousand square feet per year	Average Building Life Span	Lifespan Energy Related MTCO2e emissions per unit	Lifespan Energy Related MTCO2e emissions per thousand square feet
Single-Family Home	107.3	0.108	11.61	2.53	4.6	16.8	57.9	672	266
Multi-Family Unit in Large Building	41.0	0.108	4.44	0.85	5.2	19.2	80.5	357	422
Multi-Family Unit in Small Building	78.1	0.108	8.45	1.39	6.1	22.2	80.5	681	489
Mobile Home	75.9	0.108	8.21	1.06	7.7	28.4	57.9	475	448
Education	2,125.0	0.124	264.2	25.6	10.3	37.8	62.5	16,526	646
Food Sales	1,110.0	0.124	138.0	5.6	24.6	90.4	62.5	8,632	1,541
Food Service	1,436.0	0.124	178.5	5.6	31.9	116.9	62.5	11,168	1,994
Health Care Inpatient	60,152.0	0.124	7,479.1	241.4	31.0	113.6	62.5	467,794	1,938
Health Care Outpatient	985.0	0.124	122.5	10.4	11.8	43.2	62.5	7,660	737
Lodging	3,578.0	0.124	444.9	35.8	12.4	45.6	62.5	27,826	777
Retail (Other Than Mall)	720.0	0.124	89.5	9.7	9.2	33.8	62.5	5,599	577
Office	1,376.0	0.124	171.1	14.8	11.6	42.4	62.5	10,701	723
Public Assembly	1,338.0	0.124	166.4	14.2	11.7	43.0	62.5	10,405	733
Public Order and Safety	1,791.0	0.124	222.7	15.5	14.4	52.7	62.5	13,928	899
Religious Worship	440.0	0.124	54.7	10.1	5.4	19.9	62.5	3,422	339
Service	501.0	0.124	62.3	6.5	9.6	35.1	62.5	3,896	599
Warehouse and Storage	764.0	0.124	95.0	16.9	5.6	20.6	62.5	5,942	352
Other	3,600.0	0.124	447.6	21.9	20.4	74.9	62.5	27,997	1,278
Vacant	294.0	0.124	36.6	14.1	2.6	9.5	62.5	2,286	162

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

Energy consumption for residential buildings
2007 Buildings Energy Data Book: 6.1 Quad Definitions and Comparisons (National Average, 2001)
Table 6.1.4: Average Annual Carbon Dioxide Emissions for Various Functions
http://buildingsdatabook.eren.doe.gov/
Data also at: http://www.eia.doe.gov/emeu/recs/recs2001_ce/ce1-4c_housingunits2001.html

Energy consumption for commercial buildings and Floorspace per building
EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

Note: Data in plum color is found in both of the above sources (buildings energy data book and commercial buildings energy consumption survey).

Carbon Coefficient for Buildings
Buildings Energy Data Book (National average, 2005)
Table 3.1.7. 2005 Carbon Dioxide Emission Coefficients for Buildings (MMTCE per Quadrillion Btu)
http://buildingsdatabook.eere.energy.gov/?id=view_book_table&TableID=2057
Note: Carbon coefficient in the Energy Data book is in MTCE per Quadrillion Btu.
To convert to MTCO2e per million Btu, this factor was divided by 1000 and multiplied by 44/12.

Residential floorspace per unit
2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

average lief span of buildings,
estimated by replacement time method

	Single Family Homes	Multi-Family Units in Large and Small Buildings	All Residential Buildings	
New Housing Construction, 2001	1,273,000	329,000	1,602,000	
Existing Housing Stock, 2001	73,700,000	26,500,000	100,200,000	
Replacement time:	57.9	80.5	62.5	(national average, 2001)

Note: Single family homes calculation is used for mobile homes as a best estimate life span.
Note: At this time, KC staff could find no reliable data for the average life span of commercial buildings.
Therefore, the average life span of residential buildings is being used until a better approximation can be ascertained.

Sources:

New Housing Construction, 2001
Quarterly Starts and Completions by Purpose and Design - US and Regions (Excel)
http://www.census.gov/const/quarterly_starts_completions_cust.xls
See also: http://www.census.gov/const/www/newresconstindex.html

Existing Housing Stock, 2001
Residential Energy Consumption Survey (RECS) 2001
Tables HC1:Housing Unit Characteristics, Million U.S. Households 2001
Table HC1-4a. Housing Unit Characteristics by Type of Housing Unit, Million U.S. Households, 2001
Million U.S. Households, 2001
http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf

Transportation Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	# people/ unit or building	# thousand sq feet/ unit or building	# people or employees/ thousand square feet	vehicle related GHG emissions (metric tonnes CO2e per person per year)	MTCO2e/ year/ unit	MTCO2e/ year/ thousand square feet	Average Building Life Span	Life span transportation related GHG emissions (MTCO2e/ per unit)	Life span transportation related GHG emissions (MTCO2e/ thousand sq feet)
Single-Family Home	2.8	2.53	1.1	4.9	13.7	5.4	57.9	792	313
Multi-Family Unit in Large Building	1.9	0.85	2.3	4.9	9.5	11.2	80.5	766	904
Multi-Family Unit in Small Building	1.9	1.39	1.4	4.9	9.5	6.8	80.5	766	550
Mobile Home	2.5	1.06	2.3	4.9	12.2	11.5	57.9	709	668
Education	30.0	25.6	1.2	4.9	147.8	5.8	62.5	9247	361
Food Sales	5.1	5.6	0.9	4.9	25.2	4.5	62.5	1579	282
Food Service	10.2	5.6	1.8	4.9	50.2	9.0	62.5	3141	561
Health Care Inpatient	455.5	241.4	1.9	4.9	2246.4	9.3	62.5	140506	582
Health Care Outpatient	19.3	10.4	1.9	4.9	95.0	9.1	62.5	5941	571
Lodging	13.6	35.8	0.4	4.9	67.1	1.9	62.5	4194	117
Retail (Other Than Mall)	7.8	9.7	0.8	4.9	38.3	3.9	62.5	2394	247
Office	28.2	14.8	1.9	4.9	139.0	9.4	62.5	8696	588
Public Assembly	6.9	14.2	0.5	4.9	34.2	2.4	62.5	2137	150
Public Order and Safety	18.8	15.5	1.2	4.9	92.7	6.0	62.5	5796	374
Religious Worship	4.2	10.1	0.4	4.9	20.8	2.1	62.5	1298	129
Service	5.6	6.5	0.9	4.9	27.6	4.3	62.5	1729	266
Warehouse and Storage	9.9	16.9	0.6	4.9	49.0	2.9	62.5	3067	181
Other	18.3	21.9	0.8	4.9	90.0	4.1	62.5	5630	257
Vacant	2.1	14.1	0.2	4.9	10.5	0.7	62.5	657	47

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

people/ unit

Estimating Household Size for Use in Population Estimates (WA state, 2000 average)
Washington State Office of Financial Management
Kimpel, T. and Lowe, T. Research Brief No. 47. August 2007
http://www.ofm.wa.gov/researchbriefs/brief047.pdf
Note: This analysis combines Multi Unit Structures in both large and small units into one category;
the average is used in this case although there is likely a difference

Residential floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

employees/thousand square feet

Commercial Buildings Energy Consumption Survey commercial energy uses and costs (National Median, 2003)
Table B2 Totals and Medians of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set1/2003excel/b2.xls

Note: Data for # employees/thousand square feet is presented by CBECS as square feet/employee.
In this analysis employees/thousand square feet is calculated by taking the inverse of the CBECS number and multiplying by 1000.

vehicle related GHG emissions

Estimate calculated as follows (Washington state, 2006)_

56,531,930,000	2006 Annual WA State Vehicle Miles Traveled Data was daily VMT. Annual VMT was 365*daily VMT. http://www.wsdot.wa.gov/mapsdata/tdo/annualmileage.htm
6,395,798	2006 WA state population http://quickfacts.census.gov/qfd/states/53000.html
8839	vehicle miles per person per year
0.0506	gallon gasoline/mile This is the weighted national average fuel efficiency for all cars and 2 axle, 4 wheel light trucks in 2005. This includes pickup trucks, vans and SUVs. The 0.051 gallons/mile used here is the inverse of the more commonly known term “miles/per gallon” (which is 19.75 for these cars and light trucks). Transportation Energy Data Book. 26th Edition. 2006. Chapter 4: Light Vehicles and Characteristics. Calculations based on weighted average MPG efficiency of cars and light trucks. http://cta.ornl.gov/data/tedb26/Edition26_Chapter04.pdf Note: This report states that in 2005, 92.3% of all highway VMT were driven by the above described vehicles. http://cta.ornl.gov/data/tedb26/Spreadsheets/Table3_04.xls
24.3	lbs CO2e/gallon gasoline The CO2 emissions estimates for gasoline and diesel include the extraction, transport, and refinement of petroleum as well as their combustion. Life-Cycle CO2 Emissions for Various New Vehicles. RENew Northfield. Available: http://renewnorthfield.org/wpcontent/uploads/2006/04/CO2%20emissions.pdf Note: This is a conservative estimate of emissions by fuel consumption because diesel fuel,
2205	with a emissions factor of 26.55 lbs CO2e/gallon was not estimated.
4.93	lbs/metric tonne
	vehicle related GHG emissions (metric tonnes CO2e per person per year)

average lief span of buildings, estimated by replacement time method — See Energy Emissions Worksheet for Calculations

Commercial floorspace per unit — EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

City of Seattle Department of Planning and Development
SEPA GHG Emissions Worksheet
Version 1.7 12/26/07

Introduction

The Washington State Environmental Policy Act (SEPA) requires environmental review of development proposals that may have a significant adverse impact on the environment. If a proposed development is subject to SEPA, the project proponent is required to complete the SEPA Checklist. The Checklist includes questions relating to the development's air emissions. The emissions that have traditionally been considered cover smoke, dust, and industrial and automobile emissions. With our understanding of the climate change impacts of GHG emissions, the City of Seattle requires the applicant to also estimate these emissions.

Emissions created by Development

GHG emissions associated with development come from multiple sources:

- The extraction, processing, transportation, construction and disposal of materials and landscape disturbance (Embodied Emissions)
- Energy demands created by the development after it is completed (Energy Emissions)
- Transportation demands created by the development after it is completed (Transportation Emissions)

GHG Emissions Worksheet

This GHG Emissions Worksheet has been developed to assist applicants in answering the SEPA Checklist question relating to GHG emissions. The worksheet was originally developed by King County, but the City of Seattle and King County are working together on future updates to maintain consistency of methodologies across jurisdictions.

The SEPA GHG Emissions worksheet estimates all GHG emissions that will be created over the life span of a project. This includes emissions associated with obtaining construction materials, fuel used during construction, energy consumed during a buildings operation, and transportation by building occupants.

Using the Worksheet

1. Descriptions of the different residential and commercial building types can be found on the second tabbed worksheet ("Definition of Building Types"). If a development proposal consists of multiple projects, e.g. both single family and multi-family residential structures or a commercial development that consists of more than on type of commercial activity, the appropriate information should be estimated for each type of building or activity.

2. For paving, estimate the total amount of paving (in thousands of square feet) of the project.

3. The Worksheet will calculate the amount of GHG emissions associated with the project and display the amount in the "Total Emissions" column on the worksheet. The applicant should use this information when completing the SEPA checklist.

4. The last three worksheets in the Excel file provide the background information that is used to calculate the total GHG emissions.

5. The methodology of creating the estimates is transparent; if there is reason to believe that a better estimate can be obtained by changing specific values, this can and should be done. Changes to the values should be documented with an explanation of why and the sources relied upon.

6. Print out the “Total Emissions” worksheet and attach it to the SEPA checklist. If the applicant has made changes to the calculations or the values, the documentation supporting those changes should also be attached to the SEPA checklist.

University of Washington 2018 Campus Master Plan Update - Alternatives 1 - 5

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			**Lifespan Emissions (MTCO2e)**
			Embodied	Energy	Transportation	
Single-Family Home	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home	0		41	475	709	**0**
Education		6,000.0	39	646	361	**6272882**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall)		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement

Pavement		0.00				**0**

Total Project Emissions: **6272882**

Definition of Building Types

Type (Residential) or Principal Activity (Commercial)	Description
Single-Family Home	Unless otherwise specified, this includes both attached and detached buildings
Multi-Family Unit in Large Building	Apartments in buildings with more than 5 units
Multi-Family Unit in Small Building	Apartments in building with 2-4 units
Mobile Home	
Education	Buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."
Food Sales	Buildings used for retail or wholesale of food.
Food Service	Buildings used for preparation and sale of food and beverages for consumption.
Health Care Inpatient	Buildings used as diagnostic and treatment facilities for inpatient care.
Health Care Outpatient	Buildings used as diagnostic and treatment facilities for outpatient care. Doctor's or dentist's office are included here if they use any type of diagnostic medical equipment (if they do not, they are categorized as an office building).
Lodging	Buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.
Retail (Other Than Mall)	Buildings used for the sale and display of goods other than food.
Office	Buildings used for general office space, professional office, or administrative offices. Doctor's or dentist's office are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).
Public Assembly	Buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.
Public Order and Safety	Buildings used for the preservation of law and order or public safety.
Religious Worship	Buildings in which people gather for religious activities, (such as chapels, churches, mosques, synagogues, and temples).
Service	Buildings in which some type of service is provided, other than food service or retail sales of goods
Warehouse and Storage	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).
Other	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.
Vacant	Buildings in which more floorspace was vacant than was used for any single commercial activity at the time of interview. Therefore, a vacant building may have some occupied floorspace.

Sources: .....

Residential 2001 Residential Energy Consumption Survey
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

Commercial Commercial Buildings Energy Consumption Survey (CBECS),
Description of CBECS Building Types
http://www.eia.doe.gov/emeu/cbecs/pba99/bldgtypes.html

Embodied Emissions Worksheet

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# thousand sq feet/ unit or building	Life span related embodied GHG missions (MTCO2e/ unit)	Life span related embodied GHG missions (MTCO2e/ thousand square feet) - See calculations in table below
Single-Family Home	2.53	98	39
Multi-Family Unit in Large Building	0.85	33	39
Multi-Family Unit in Small Building	1.39	54	39
Mobile Home	1.06	41	39
Education	25.6	991	39
Food Sales	5.6	217	39
Food Service	5.6	217	39
Health Care Inpatient	241.4	9,346	39
Health Care Outpatient	10.4	403	39
Lodging	35.8	1,386	39
Retail (Other Than Mall)	9.7	376	39
Office	14.8	573	39
Public Assembly	14.2	550	39
Public Order and Safety	15.5	600	39
Religious Worship	10.1	391	39
Service	6.5	252	39
Warehouse and Storage	16.9	654	39
Other	21.9	848	39
Vacant	14.1	546	39

Section II: Pavement

All Types of Pavement			50

	Columns and Beams	Intermediate Floors	Exterior Walls	Windows	Interior Walls	Roofs		
Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building	5.3	7.8	19.1	51.2	5.7	21.3		
Average Materials in a 2,272-square foot single family home	0.0	2269.0	3206.0	285.0	6050.0	3103.0	Total Embodied Emissions (MTCO2e)	Total Embodied Emissions (MTCO2e/ thousand sq feet)
MTCO2e	0.0	8.0	27.8	6.6	15.6	30.0	88.0	38.7

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

Residential floorspace per unit
2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

Floorspace per building
EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building
Athena EcoCalculator
Athena Assembly Evaluation Tool v2.3- Vancouver Low Rise Building
Assembly Average GWP (kg) per square meter
http://www.athenasmi.ca/tools/ecoCalculator/index.html
Lbs per kg 2.20
Square feet per square meter 10.76

Average Materials in a 2,272-square foot single family home
Buildings Energy Data Book: 7.3 Typical/Average Household
Materials Used in the Construction of a 2,272-Square-Foot Single-Family Home, 2000
http://buildingsdatabook.eren.doe.gov/?id=view_book_table&TableID=2036&t=xls
See also: NAHB, 2004 Housing Facts, Figures and Trends, Feb. 2004, p. 7.

Average window size
Energy Information Administration/Housing Characteristics 1993
Appendix B, Quality of the Data. Pg. 5.
ftp://ftp.eia.doe.gov/pub/consumption/residential/rx93hcf.pdf

Pavement Emissions Factors
MTCO2e/thousand square feet of asphalt
or concrete pavement 50 (see below)

Embodied GHG Emissions……Worksheet Background Information

Buildings
Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass).

Estimating embodied GHG emissions is new field of analysis; the estimates are rapidly improving and becoming more inclusive of all elements of construction and development.

The estimate included in this worksheet is calculated using average values for the main construction materials that are used to create a typical family home. In 2004, the National Association of Home Builders calculated the average materials that are used in a typical 2,272 square foot single-family household. The quantity of materials used is then multiplied by the average GHG emissions associated with the life-cycle GHG emissions for each material.

This estimate is a rough and conservative estimate; the actual embodied emissions for a project are likely to be higher. For example, at this stage, due to a lack of comprehensive data, the estimate does not include important factors such as landscape disturbance or the emissions associated with the interior components of a building (such as furniture).

King County realizes that the calculations for embodied emissions in this worksheet are rough. For example, the emissions associated with building 1,000 square feet of a residential building will not be the same as 1,000 square feet of a commercial building. However, discussions with the construction community indicate that while there are significant differences between the different types of structures, this method of estimation is reasonable; it will be improved as more data become available.

Additionally, if more specific information about the project is known, King County recommends two online embodied emissions calculators that can be used to obtain a more tailored estimate for embodied emissions: www.buildcarbonneutral.org and www.athenasmi.ca/tools/ecoCalculator/.

Pavement
Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle. For specifics, see the worksheet.

Special Section: Estimating the Embodied Emissions for Pavement

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

The results of the studies are presented in different units and measures; considerable effort was undertaken to be able to compare the results of the studies in a reasonable way. For more details about the below methodology, contact matt.kuharic@kingcounty.gov.

The four studies, Meil (2001), Park (2003), Stripple (2001) and Treolar (2001) produced total GHG emissions of 4-34 MTCO2e per thousand square feet of finished paving (for similar asphalt and concrete based pavements). This estimate does not including downstream maintenance and repair of the highway. The average (for all concrete and asphalt pavements in the studies, assuming each study gets one data point) is ~17 MTCO2e/thousand square feet.

Three of the studies attempted to thoroughly account for the emissions associated with long term maintenance (40 years) of the roads. Stripple (2001), Park et al. (2003) and Treolar (2001) report 17, 81, and 68 MTCO2e/thousand square feet, respectively, after accounting for maintenance of the roads.

Based on the above discussion, King County makes the conservative estimate that 50 MTCO2e/thousand square feet of pavement (over the development's life cycle) will be used as the embodied emission factor for pavement until better estimates can be obtained. This is roughly equivalent to 3,500 MTCO2e per lane mile of road (assuming the lane is 13 feet wide).

It is important to note that these studies estimate the embodied emissions for roads. Paving that does not need to stand up to the rigors of heavy use (such as parking lots or driveways) would likely use less materials and hence have lower embodied emissions.

Sources:

Meil, J. A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential. 2006. Available: http://www.cement.ca/cement.nsf/eee9ec7bbd630126852566c40052107b/6ec79dc8ae03a782852572b90061b914/$FILE/ATTK0WE3/athena%20report%20Feb.%202%202007.pdf

Park, K, Hwang, Y., Seo, S., M.ASCE, and Seo, H. , "Quantitative Assessment of Environmental Impacts on Life Cycle of Highways," Journal of Construction Engineering and Management , Vol 129, January/February 2003, pp 25-31, (DOI: 10.1061/(ASCE)0733-9364(2003)129:1(25)).

Stripple, H. Life Cycle Assessment of Road. A Pilot Study for Inventory Analysis. Second Revised Edition. IVL Swedish Environmental Research Institute Ltd. 2001. Available: http://www.ivl.se/rapporter/pdf/B1210E.pdf

Treloar, G., Love, P.E.D., and Crawford, R.H. Hybrid Life-Cycle Inventory for Road Construction and Use. Journal of Construction Engineering and Management. P. 43-49. January/February 2004.

Energy Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	Energy consumption per building per year (million Btu)	Carbon Coefficient for Buildings	MTCO2e per building per year	Floorspace per Building (thousand square feet)	MTCE per thousand square feet per year	MTCO2e per thousand square feet per year	Average Building Life Span	Lifespan Energy Related MTCO2e emissions per unit	Lifespan Energy Related MTCO2e emissions per thousand square feet
Single-Family Home	107.3	0.108	11.61	2.53	4.6	16.8	57.9	672	266
Multi-Family Unit in Large Building	41.0	0.108	4.44	0.85	5.2	19.2	80.5	357	422
Multi-Family Unit in Small Building	78.1	0.108	8.45	1.39	6.1	22.2	80.5	681	489
Mobile Home	75.9	0.108	8.21	1.06	7.7	28.4	57.9	475	448
Education	2,125.0	0.124	264.2	25.6	10.3	37.8	62.5	16,526	646
Food Sales	1,110.0	0.124	138.0	5.6	24.6	90.4	62.5	8,632	1,541
Food Service	1,436.0	0.124	178.5	5.6	31.9	116.9	62.5	11,168	1,994
Health Care Inpatient	60,152.0	0.124	7,479.1	241.4	31.0	113.6	62.5	467,794	1,938
Health Care Outpatient	985.0	0.124	122.5	10.4	11.8	43.2	62.5	7,660	737
Lodging	3,578.0	0.124	444.9	35.8	12.4	45.6	62.5	27,826	777
Retail (Other Than Mall)	720.0	0.124	89.5	9.7	9.2	33.8	62.5	5,599	577
Office	1,376.0	0.124	171.1	14.8	11.6	42.4	62.5	10,701	723
Public Assembly	1,338.0	0.124	166.4	14.2	11.7	43.0	62.5	10,405	733
Public Order and Safety	1,791.0	0.124	222.7	15.5	14.4	52.7	62.5	13,928	899
Religious Worship	440.0	0.124	54.7	10.1	5.4	19.9	62.5	3,422	339
Service	501.0	0.124	62.3	6.5	9.6	35.1	62.5	3,896	599
Warehouse and Storage	764.0	0.124	95.0	16.9	5.6	20.6	62.5	5,942	352
Other	3,600.0	0.124	447.6	21.9	20.4	74.9	62.5	27,997	1,278
Vacant	294.0	0.124	36.6	14.1	2.6	9.5	62.5	2,286	162

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

Energy consumption for residential buildings
- 2007 Buildings Energy Data Book: 6.1 Quad Definitions and Comparisons (National Average, 2001)
- Table 6.1.4: Average Annual Carbon Dioxide Emissions for Various Functions
- http://buildingsdatabook.eren.doe.gov/
- Data also at: http://www.eia.doe.gov/emeu/recs/recs2001_ce/ce1-4c_housingunits2001.html

Energy consumption for commercial buildings and Floorspace per building
- EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
- Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
- http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

Note: Data in plum color is found in both of the above sources (buildings energy data book and commercial buildings energy consumption survey).

Carbon Coefficient for Buildings
- Buildings Energy Data Book (National average, 2005)
- Table 3.1.7. 2005 Carbon Dioxide Emission Coefficients for Buildings (MMTCE per Quadrillion Btu)
- http://buildingsdatabook.eere.energy.gov/?id=view_book_table&TableID=2057
- Note: Carbon coefficient in the Energy Data book is in MTCE per Quadrillion Btu.
- To convert to MTCO2e per million Btu, this factor was divided by 1000 and multiplied by 44/12.

Residential floorspace per unit
- 2001 Residential Energy Consumption Survey (National Average, 2001)
- Square footage measurements and comparisons
- http://www.eia.doe.gov/emeu/recs/sqft-measure.html

average lief span of buildings,
estimated by replacement time method

	Single Family Homes	Multi-Family Units in Large and Small Buildings	All Residential Buildings	
New Housing Construction, 2001	1,273,000	329,000	1,602,000	
Existing Housing Stock, 2001	73,700,000	26,500,000	100,200,000	
Replacement time:	57.9	80.5	62.5	(national average, 2001)

Note: Single family homes calculation is used for mobile homes as a best estimate life span.
Note: At this time, KC staff could find no reliable data for the average life span of commercial buildings.
Therefore, the average life span of residential buildings is being used until a better approximation can be ascertained.

Sources:

New Housing Construction, 2001
Quarterly Starts and Completions by Purpose and Design - US and Regions (Excel)
http://www.census.gov/const/quarterly_starts_completions_cust.xls
See also: http://www.census.gov/const/www/newresconstindex.html

Existing Housing Stock, 2001
Residential Energy Consumption Survey (RECS) 2001
Tables HC1:Housing Unit Characteristics, Million U.S. Households 2001
Table HC1-4a. Housing Unit Characteristics by Type of Housing Unit, Million U.S. Households, 2001
Million U.S. Households, 2001
http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf

Transportation Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	# people/ unit or building	# thousand sq feet/ unit or building	# people or employees/ thousand square feet	vehicle related GHG emissions (metric tonnes CO2e per person per year)	MTCO2e/ year/ unit	MTCO2e/ year/ thousand square feet	Average Building Life Span	Life span transportation related GHG emissions (MTCO2e/ per unit)	Life span transportation related GHG emissions (MTCO2e/ thousand sq feet)
Single-Family Home	2.8	2.53	1.1	4.9	13.7	5.4	57.9	792	313
Multi-Family Unit in Large Building	1.9	0.85	2.3	4.9	9.5	11.2	80.5	766	904
Multi-Family Unit in Small Building	1.9	1.39	1.4	4.9	9.5	6.8	80.5	766	550
Mobile Home	2.5	1.06	2.3	4.9	12.2	11.5	57.9	709	668
Education	30.0	25.6	1.2	4.9	147.8	5.8	62.5	9247	361
Food Sales	5.1	5.6	0.9	4.9	25.2	4.5	62.5	1579	282
Food Service	10.2	5.6	1.8	4.9	50.2	9.0	62.5	3141	561
Health Care Inpatient	455.5	241.4	1.9	4.9	2246.4	9.3	62.5	140506	582
Health Care Outpatient	19.3	10.4	1.9	4.9	95.0	9.1	62.5	5941	571
Lodging	13.6	35.8	0.4	4.9	67.1	1.9	62.5	4194	117
Retail (Other Than Mall)	7.8	9.7	0.8	4.9	38.3	3.9	62.5	2394	247
Office	28.2	14.8	1.9	4.9	139.0	9.4	62.5	8696	588
Public Assembly	6.9	14.2	0.5	4.9	34.2	2.4	62.5	2137	150
Public Order and Safety	18.8	15.5	1.2	4.9	92.7	6.0	62.5	5796	374
Religious Worship	4.2	10.1	0.4	4.9	20.8	2.1	62.5	1298	129
Service	5.6	6.5	0.9	4.9	27.6	4.3	62.5	1729	266
Warehouse and Storage	9.9	16.9	0.6	4.9	49.0	2.9	62.5	3067	181
Other	18.3	21.9	0.8	4.9	90.0	4.1	62.5	5630	257
Vacant	2.1	14.1	0.2	4.9	10.5	0.7	62.5	657	47

Sources

All data in black text — King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

people/ unit

Estimating Household Size for Use in Population Estimates (WA state, 2000 average)
Washington State Office of Financial Management
Kimpel, T. and Lowe, T. Research Brief No. 47. August 2007
http://www.ofm.wa.gov/researchbriefs/brief047.pdf
Note: This analysis combines Multi Unit Structures in both large and small units into one category;
the average is used in this case although there is likely a difference

Residential floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
http://www.eia.doe.gov/emeu/recs/sqft-measure.html

employees/thousand square feet

Commercial Buildings Energy Consumption Survey commercial energy uses and costs (National Median, 2003)
Table B2 Totals and Medians of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set1/2003excel/b2.xls

Note: Data for # employees/thousand square feet is presented by CBECS as square feet/employee.
In this analysis employees/thousand square feet is calculated by taking the inverse of the CBECS number and multiplying by 1000.

vehicle related GHG emissions

Estimate calculated as follows (Washington state, 2006)_

56,531,930,000	2006 Annual WA State Vehicle Miles Traveled Data was daily VMT. Annual VMT was 365*daily VMT. http://www.wsdot.wa.gov/mapsdata/tdo/annualmileage.htm
6,395,798	2006 WA state population http://quickfacts.census.gov/qfd/states/53000.html
8839	vehicle miles per person per year
0.0506	gallon gasoline/mile This is the weighted national average fuel efficiency for all cars and 2 axle, 4 wheel light trucks in 2005. This includes pickup trucks, vans and SUVs. The 0.051 gallons/mile used here is the inverse of the more commonly known term “miles/per gallon” (which is 19.75 for these cars and light trucks). Transportation Energy Data Book. 26th Edition. 2006. Chapter 4: Light Vehicles and Characteristics. Calculations based on weighted average MPG efficiency of cars and light trucks. http://cta.ornl.gov/data/tedb26/Edition26_Chapter04.pdf Note: This report states that in 2005, 92.3% of all highway VMT were driven by the above described vehicles. http://cta.ornl.gov/data/tedb26/Spreadsheets/Table3_04.xls
24.3	lbs CO2e/gallon gasoline The CO2 emissions estimates for gasoline and diesel include the extraction, transport, and refinement of petroleum as well as their combustion. Life-Cycle CO2 Emissions for Various New Vehicles. RENew Northfield. Available: http://renewnorthfield.org/wpcontent/uploads/2006/04/CO2%20emissions.pdf Note: This is a conservative estimate of emissions by fuel consumption because diesel fuel,
2205	with a emissions factor of 26.55 lbs CO2e/gallon was not estimated.
4.93	lbs/metric tonne
	vehicle related GHG emissions (metric tonnes CO2e per person per year)

average lief span of buildings, estimated by replacement time method — See Energy Emissions Worksheet for Calculations

Commercial floorspace per unit — EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

APPENDIX C

Wetlands, Plants and Animals Report

DRAFT WETLAND PLANTS and ANIMALS STUDY

University of Washington Master Plan Update
Seattle, Washington

March 2016

RAEDEKE ASSOCIATES, INC.

Raedeke Associates, Inc.

Wetland & Aquatic Sciences
Wildlife Ecology
Landscape Architecture

Report To:	Mr.
Title:	DRAFT Wetland Study for the UW Master Plan Update Seattle, Washington
Project Number:	2015-059-001
Prepared By:	RAEDEKE ASSOCIATES, INC. 2111 N. Northgate Way, Ste. 219 Seattle, Washington 98133 (206) 525-8122
Date:	May 2016

Raedeke Associates, Inc.

Wetland & Aquatic Sciences
Wildlife Ecology
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	Kolten T. Kosters, M.S. Wetland Scientist

Submitted by:

_____
Signature

_____
Printed Name

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March 2016

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TABLE OF CONTENTS

Page

LIST OF FIGURES

Figure **Page**

LIST OF TABLES

Table **Page**

EXECUTIVE SUMMARY

This report documents the results of our investigation to identify and describe wetlands within the University of Washington Campus in Seattle, Washington. The results of our investigation will be used to evaluate proposed development on campus and guide the site selection process.

During our investigation, we identified 15 wetlands within or in the vicinity of the campus. The wetlands are all either depressional, lake-fringe, or riverine hydrogeomorphic classes. Wetlands evaluated range from Category II to Category IV and would be provided with 50-foot to 110-foot buffers (based on habitat function score) under the City of Seattle (2015) code.

1.0 INTRODUCTION

1.1 STATEMENT OF PURPOSE

This report documents the results of our investigation of the University of Washington campus in Seattle Washington. (Figure 1). The purpose of our investigation was to identify and describe any portions of the campus that could be classified as wetland according to the wetland delineation methods in effect at the time of this report.

This report presents the findings of our background information review and our 2016 site investigations of the project site. This report is intended to provide baseline technical information for the proposed campus development.

1.2 STUDY AREA

For purposes of this wetland study, field investigations for the UW Master Plan update were conducted in portions of Sections 15, 16, and 17, Township 25 North, Range 4 East W.M (Figure 2).

2.0 METHODS

2.1 DEFINITIONS AND METHODOLOGIES

Wetlands and streams are protected by federal law as well as by state and local regulations. Federal law (Section 404 of the Clean Water Act) prohibits the discharge of dredged or fill material into "Waters of the United States", including certain wetlands, without a permit from the U.S. Army Corps of Engineers (COE 2012). The COE makes the final determination as to whether an area meets the definition of a wetland and whether the wetland is under their jurisdiction.

The COE wetland definition was used to determine if any portions of the project area could be classified as wetland. A wetland is defined as an area "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Federal Register 1986:41251).

We based our investigation upon the guidelines of the U. S. Army Corps of Engineers (COE) Wetlands Delineation Manual (Environmental Laboratory 1987) and subsequent amendments and clarifications provided by the COE (1991a, 1991b, 1992, 1994), as updated for this area by the regional supplement to the COE wetland delineation manual for the Western Mountains, Valleys, and Coast Region (COE 2010). The COE wetlands manual is required by state law (WAC 173-22-035, as revised) for all local jurisdictions, including the City of Seattle.

Hydrophytic vegetation is defined as "macrophytic plant life growing in water, soil or substrate that is at least periodically deficient in oxygen as a result of excessive water content" (Environmental Laboratory 1987). The U.S. Army Corps of Engineers National Wetland Plant List wetland indicator status (WIS) ratings were used to make this determination (Lichvar and Kartesz 2009). The WIS ratings "reflect the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in wetland versus non-wetland across the entire distribution of the species" (Reed 1988:8). Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL), respectively. In general, hydrophytic vegetation is present when the majority of the dominant species are rated OBL, FACW, and FAC.

A hydric soil is defined as "a soil that is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register 1995: 35681). The morphological characteristics of the soils in the study area were examined to determine whether any could be classified as hydric.

According to the 1987 methodology, wetland hydrology could be present if the soils were saturated (sufficient to produce anaerobic conditions) within the majority of the rooting zone (usually the upper 12 inches) for at least 5% of the growing season, which in this area is usually at least 2 weeks (COE 1991a). It should be noted, however, that areas having saturation to the surface between 5% and 12% of the growing season may or may not be wetland (COE 1991b). Depending on soil type and drainage characteristics, saturation to the surface would occur if water tables were shallower than about 12 inches below the soil surface during this time period. Positive indicators of wetland hydrology include direct observation of inundation or soil saturation, as well as indirect evidence such as driftlines, watermarks, surface encrustations, and drainage patterns (Environmental Laboratory 1987). Hydrology was further investigated by noting drainage patterns and surface water connections between wetlands and streams within and adjacent to the project area.

2.2 BACKGROUND REVIEW

In preparation for our site investigation, we collected and analyzed background information available for the site prior to the on-site investigations. We collected maps and information from the U.S.D.A Natural Resources Conservation Service (2015) Web Soil Survey, the U.S. Fish and Wildlife Service (USFWS 2015) National Wetland Inventory (NWI) on-line mapper, Washington Department of Fish and Wildlife Priority Habitats and Species (PHS 2015) on-line mapper, and the City of Seattle (2015) Public GIS maps. We also reviewed current and historical aerial photographs (Google Earth 2015) to assist in the definition of existing plant communities, drainage patters, and land use.

2.3 FIELD SAMPLING PROCEDURES AND DATA ANALYSIS

Raedeke Associates, Inc. visited the site on February and March, 2016 to identify wetlands within the site and to investigate the vicinity of the site for the presence of wetlands.

During our field investigation, we inventoried, classified, and described representative areas of plant communities, soil profiles, and hydrologic conditions in both uplands and wetlands. We searched specifically for areas with positive indicators of hydrophytic vegetation, hydric soil, and wetland hydrology.

Vegetation, soils, and hydrology were examined in representative portions of the investigated area according to the procedures described in the COE Wetlands Delineation Manual (Environmental Laboratory 1987), as updated by the Regional Supplement (COE 2010). Plant communities were inventoried, classified, and described during our field investigation. We estimated the percent coverage of each species. Plant identifications were made according to standard taxonomic procedures described in Hitchcock and

Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant List (Lichvar and Kartesz 2009). Wetland classification follows the USFWS wetland classification system (Cowardin et al. 1992). We determined the presence of a hydrophytic vegetation community using the procedure described in the Regional Supplement (COE 2010), which requires the use of the dominance test, unless positive indicators of hydric soils and wetland hydrology are also present, in which case the prevalence index or the use of other indicators of a hydrophytic vegetation community as described in the Regional Supplement (COE 2010) may also be required.

We excavated pits to at least 18 inches below the soil surface, where possible, in order to describe the soil and hydrologic conditions throughout the study area. We sampled soil at locations that corresponded with vegetation sampling areas and potential wetland areas. Soil colors were determined using the Munsell Soil Color Chart (Munsell Color 2009). We used the indicators described in the Regional Supplement (COE 2010) to determine the presence of hydric soils and wetland hydrology.

3.0 EXISTING CONDITIONS

3.1 GENERAL PROPERTY DESCRIPTION

We visited the University of Washington in February and March 2016 to collect information on the existing conditions of the site. Elevations through the project area vary from approximately 20 feet along Lake Washington to 200 feet above sea level in the northwest portion of the campus.

The majority of the investigated area is developed. The undeveloped portions of the area are primarily in the eastern portion of the campus and along the shore of Lake Washington.

3.2 WETLAND DESCRIPTIONS

Raedeke Associates, Inc. identified a total of fifteen wetlands within the investigated area (Table 1). The wetlands are found mostly in the Union Bay Natural Area, the Center for Urban Horticulture, and along the shore of Lake Washington in the eastern portion of campus. We identified two wetlands along the west side of the Burke Gilman Trail in the north-central portion of the investigated area. We rated each of the wetlands using the WDOE 2004 wetland rating system for western Washington. Data forms characterizing each of the identified wetlands and upland investigated during our site visits are found in Appendix A.

Union Bay Natural Area

Nine wetlands were identified in the Union Bay Natural Area. These wetlands range from small isolated pockets or pools to the wetlands fringing Lake Washington. University Slough is a riverine wetland identified along the western boundary of the Union bay Natural Area. For the most part these wetlands have low vegetative diversity and have a hydrologic regime controlled by runoff from surrounding uplands during storm events.

These wetlands range from Category IV for the small isolated depressions in the central portion of the Union Bay Natural Area to Category II for the University Slough.

City of Seattle (2015) code requires a 50-foot-wide buffer on Category IV wetlands and a 110-foot-wide buffer for Category II wetlands with moderated habitat value.

Center for Urban Horticulture

Raedeke Associates, Inc. identified one wetland on the Center for Urban Horticulture site. The wetland on the Center for Urban Horticulture is known as Yesler Swamp. This

wetland is a diverse area featuring forested wetland, scrub-shrub wetland, emergent wetland, aquatic bed wetland, as well as open water associated with Lake Washington.

This large wetland area is several acres in area and was determined to be a Category II wetland with 54 points, 24 habitat points.

City of Seattle (2015) code provides for 110-foot-wide buffers on Category II wetlands with moderate habitat scores.

Shoreline of Lake Washington

The shoreline of Lake Washington supports three wetlands not associated with the wetlands described above. These wetlands are located west of the University Slough and east of the various athletic facilities in the eastern portion of campus. One of the wetlands appears to be a compensatory mitigation wetland that was created to provide replacement wetland area for impacts associated with construction of the University of Washington boat house. The other wetland is a depressional feature located between the baseball stadium and the existing gravel road along University Slough. The third wetland is located along the shoreline of Lake Washington, south of the boat house and east of Hec Edmundson pavilion.

These wetland were determined to be Category III wetlands

City of Seattle (2015) code requires that a 60-foot-wide buffer be provided to Category III wetlands that provide relatively low habitat function.

Burke Gilman Trail

There are two wetlands along the west side of the Burke Gilman Trail in the north central portion of the campus. These wetlands were identified during site investigations in 2013 and 2014 and reconfirmed in 2016.

Wetland 1 is located within a ditch abutting the west side of the Burke-Gilman Trail. The wetland extends for approximately 450 feet from the 45th Street viaduct northward to a 24-inch concrete pipe that conveys water from the ditch to the east beneath the trail and the University of Washington motor pool adjacent to the east side of the trail. The total area of the wetland is 2,980 square feet.

Wetland 2 is located just south the NE 45th Street viaduct within a shallow swale that extends up the slope from the west side of the Burke-Gilman Trail into a narrow ravine that runs parallel to the viaduct. A seasonal stream flows from the ravine into the wetland and meanders eastward through the wetland to the ditch on the west side of the Burke-Gilman Trail. Although dry at the time of our initial site investigation, the ditch flows

northward during periods of heavy rainfall to Wetland 1. The total wetland area is 2,087 square feet

Wetland 1 meets Category III wetland criteria. The wetland scored a total of 41 points with 11 points for habitat functions.

Wetland 2 meets Category III wetland criteria. The wetland scored a total of 48 points with a habitat functions score of 10 points.

City of Seattle (2015) code requires that a 60-foot-wide buffer be provided to Category III wetlands that provide relatively low habitat function.

Per requirements of City of Seattle (2015) code, we rated each wetland using the Washington Department of Ecology's (WDOE) Wetland Rating System for Western Washington (Hruby 2004). See Appendix B for completed wetland rating forms. Wetlands ranged from 25 to 53 points and meet criteria to be regulated as either Category IV (less than 30 points), Category III (30 to 50 points), or Category II (50 points to 69 points) under the City of Seattle (2015) code (Table 1, Appendix B). Each of the wetlands was rated as providing low level of habitat function (less than 20 habitat points) or a moderate level of habitat function (between 20 and 28 habitat points).

3.2.1 Plant Communities

The majority of the wetlands identified consist of only one or two vegetation cover types, most commonly palustrine, scrub-shrub, broad-leaved deciduous (PSS1) and palustrine, forested, broad-leaved deciduous (PFO1). The most diverse wetland on site, in terms of number of vegetation cover types and plant species, is the Yesler Swamp area on the Center for Urban Horticulture portion of the property. This wetland include several cover types, including forested cover, aquatic bed, and a portion of Lake Washington. Plant species diversity is moderate within each of the wetlands, and they are dominated by native plant species. Plant species that dominate many of the wetlands in the study area occur commonly in wetlands in the Puget Sound region. Patchiness within the vegetative layers of each of the wetlands is generally low to moderate.

Given their small size (most are under 0.5 acres each), the fairly simple vegetation structure and composition, the value of many of the wetland plant communities on-site is relatively low. The plant communities within Yesler Swamp and the University Slough are considered to be of moderate to high value. Yesler Swamp is considered to be the highest value wetland community on site.

3.2.3 Fish and Wildlife Habitat

Many species of wildlife (e.g., waterfowl and freshwater and saltwater fish) require certain types of wetland habitat to breed, nest, rear young, and acquire nutrient stores for winter and during migration (Bellrose 1976, Paulus 1982, Ohmart and Anderson 1986). Wetlands that provide important wildlife and fisheries habitat may have some or all of the following characteristics: (1) proximity or adjacency to watercourses such as streams or rivers; (2) large size; (3) diverse types and species of vegetation; (4) habitat for federal or state unique, sensitive, threatened or endangered plant or animal species; and (5) several vegetation layers or strata (e.g., herbs, shrubs, and trees).

Most of the identified wetlands are relatively small and isolated, and contain only one cover type composed of relatively common wetland species, most of which are deciduous (or die back during the winter). Deciduous plants have been rated of modest value as food producers for wildlife (Martin et al. 1961). Much leafy material may be available in spring and summer months. Some food in the form of berries or fruits is produced in the on-site wetlands. More is likely produced in the form of flowers or seeds. As mentioned above, plant species diversity is relatively low to moderate, as is structural diversity, with one vegetative layer containing most of the cover in most of the smaller wetlands. Most of the wetlands (with Yesler Swamp a notable exception) do not contain trees, some of the ponds in the Union Bay Natural Area contain relatively little vegetation aside from that growing along the edges. Given these factors, together with the relative lack (or limited amounts) of habitat features such as large downed logs, snags, cavities, and natural brush piles, the overall habitat value of the smaller on-site wetlands would be considered relatively low. Yesler Swamp which is relatively large and contains several cover types, is probably of the highest value for wildlife habitat.

We have conducted systematic surveys of the study area habitats (both wetland and non-wetland) for occurrence of wildlife, and have confirmed the presence of a variety of species. A number of species of birds, mammals, reptiles, and amphibians may be expected to use the site and vicinity. As discussed above, the small, isolated wetlands on site are generally expected to provide habitat for relatively few species, while the larger, more diverse wetlands can potentially harbor more species (and individuals).

Special Habitat Features

Many wetlands provide special habitat features that are important to a wide variety of wildlife species. These features may include edges, snags (standing dead or partially dead trees), and dead-and-down material. Edges are areas where different plant communities or successional stages meet. These areas tend to be rich in wildlife as wildlife have access to more than one environmental and vegetation type (Thomas and Verner 1986). Snags are dead or partly dead trees at least four inches in diameter at breast height (dbh) and six feet tall. They are used by many species for nesting, feeding, roosting, as perches while hunting, and for a more stable microclimate during summer and winter. Snags can

determine the presence and abundance of cavity-nesting birds (Ohmart and Anderson 1986); they may provide essential habitat for a large number of bird species (Scott et al. 1977) and many species of bats (Cross 1986). Dead-and-down material includes the dead portions of shrubs and trees lying on the ground and leaf litter. Downed logs provide many features, including (1) perch sites, (2) food, (3) nest cavities, and (4) cover. The presence of rotting logs and dense ground cover is essential to some amphibians and small mammals (Aubry et al. 1988, Aubry and Hall 1991, Bury et al. 1991, Jones 1986, West 1991).

The on-site wetlands contained relatively few snags, and most of these were small to medium diameter red alder. The relatively paucity of snags in the wetlands (and elsewhere on site) is a result of the urban nature of the site as a whole. The wetlands contained variable amounts of downed logs, but most contained only modest amounts.

The most diverse wetland on site (Yesler Swamp) provides considerable edge habitat between forest and non-forest cover. The remaining wetlands on site have limited edge habitat.

4.0 REGULATORY CONSIDERATIONS

Wetlands and streams are protected by Section 404 of the Federal Clean Water Act and other state and local policies and ordinances including the City of Seattle (2015) code. Regulatory considerations pertinent to wetlands identified within the study area are discussed below; however, this discussion should not be considered comprehensive. Additional information may be obtained from agencies with jurisdictional responsibility for, or interest in, the site. A brief review of federal and state regulations and City of Seattle policy, relative to wetlands, is presented below.

4.1 FEDERAL CLEAN WATER ACT (U.S. ARMY CORPS OF ENGINEERS)

Federal law (Section 404 of the Clean Water Act) discourages the discharge of dredged or fill material into the nation's waters, including most wetlands and streams, without a permit from the U.S. Army Corps of Engineers (COE). We note that certain wetlands, including many that are hydrologically isolated from "Waters of the U.S.," may not be regulated by the COE. The COE makes the final determination as to whether an area meets the definition of "Waters of the U.S." as defined by the federal government (Federal Register 1986:41251), and thus, if it is under their jurisdiction.

We should caution that the placement of fill within wetlands or other "Waters of the U.S." without authorization from the COE is not advised, as the COE makes the final determination regarding whether any permits would be required for any proposed alteration (COE 2012). Therefore, we recommend requesting a jurisdictional determination from the COE prior to any construction activities, if any modification of wetlands is proposed. A jurisdictional determination would also provide evaluation and confirmation of our wetland delineation by the COE.

4.2 STATE OF WASHINGTON

Under Section 401 of the Clean Water Act, an activity involving a discharge in waters of the U.S. and authorized by the COE must also receive certification that the federally permitted activity complies with the federal Clean Water Act, state water quality laws, and any other appropriate state laws (such as the Water Resources Act and Hydraulic Code). In Washington State, the certifying agency is usually the Washington Department of Ecology (WDOE). In addition, if the COE-authorized permit is for actions within the 15 coastal counties, including King County, then the WDOE must confirm or deny that the proposed action complies with the Washington Coastal Zone Management Program.

The WDOE also regulates activities within isolated wetlands under the state Water Pollution Control Act (90.48 RCW) in instances where a wetland is determined to be non-jurisdictional by the COE. The standards of review for issuance of a permit by the

WDOE for activities within non-COE-jurisdictional wetlands are the same as those for Section 401 certifications.

4.3 CITY OF SEATTLE

City of Seattle (2015) code regulates wetlands and streams as critical areas. Alterations of wetlands or streams and their buffers are generally prohibited, except as allowed under certain conditions. All direct wetland impacts must be mitigated through wetland creation, restoration, or enhancement. City of Seattle (2015) has the final authority to determine ratings, buffers, and allowed uses of wetlands, their buffers, and other sensitive areas that are under their jurisdiction.

None of the wetlands identified in the University of Washington study area have been designated as Natural Heritage sites by Washington DNR (2013), and to our knowledge, none have been identified as wetlands of local significance by the City of Seattle. Wetlands on site were rated by our staff as Category II, III, or IV wetlands.

5.0 IMPACTS

This section of the report compares the probable impacts to wetlands from the each of the 4 alternative development scenarios.

The proposed alternatives involve urbanization. The process of urbanization can affect the existing wetlands in three ways: (1) direct changes in the habitats available; (2) increase in human use and disturbance associated with development; and (3) changes in the hydrologic characteristics of the site.

5.1 ALTERNATIVE 1

5.1.1 Description

Alternative 1 focus new development in the western portion of the campus. Developemnt would occur in the north-central portion of the site near the wetlands along the Burke Gilman Trail.

5.1.2 Summary of Impacts

Direct Impacts

Alternative 1 appears to avoid all direct physical alteration to all identified wetlands by retaining them in place. Thus, under the Alternative 1 development plan, direct impacts to wetlands will be avoided.

Hydrologic Impacts

The clearing of vegetation, grading, and construction of impervious surfaces, underground utilities, and stormwater collection and detention facilities associated with the proposed development would substantially modify the surface hydrologic conditions of the site. These changes, if unmitigated, would likely cause changes in the hydrologic conditions within the on-site wetlands, including greater annual variation in water levels of the wetlands, as well as greater and more frequent water level fluctuations in response to individual storm events (Azous and Horner 1997, 2000). Changes in the hydrologic conditions resulting from development can adversely affect plant species (Cooke and Azous 1993, Taylor 1993) and animal species richness, and diversity (Richter and Azous 1995).

With appropriate stormwater controls, water level fluctuations were not expected to increase substantially, so these changes are not expected to cause substantial adverse impacts to vegetation or wildlife habitat of the wetlands.

Wetlands 1 and 2 (located along the Burke Gilman Trail) are expected to be the wetlands most affected by development as they are closest to proposed new development. However, with appropriate stormwater controls, water level fluctuations will likely be

minimal. Consequently, we expected no significant adverse hydrologic impacts to these wetlands from development of Alternative 1.

Erosion/Sedimentation and Water Quality Impacts

The Alternative 1 plan should include implementation of erosion and sedimentation control measures during and after construction to limit the potential for erosion and sedimentation impacts to on-site wetlands. The wetland buffers (with minimums ranging from 50-110 feet in width) on the property, many of which have well-established would aid in preventing introduction of substantial sediments from adjacent construction to wetlands. Some increases in sediment deposition would be expected in the on-site wetlands, particularly during construction; however, these would be limited through implementation of Best Management Practices during construction.

Habitat Impacts

Alternative 1 would retain the on-site wetlands and their required buffers (which range from 50 to 110 feet wide). The larger wetlands, such as Yesler Swamp and University Slough, would be contained within larger buffers. Most of the smaller, isolated wetlands and their buffers would be retained within the Union Bay Natural Area. Linkage of these areas would help provide some limited avenues of movement for wildlife among them and between the site and off-site habitats.

Construction activities and implementation of the proposed development would result in both short-term disturbance to wildlife inhabiting the wetlands and long-term disturbance from increased human activity and clearing and conversion of adjoining areas to campus-related uses. In addition, increased fragmentation of native habitat would increase the risk of spread of invasive plant species, which could also adversely affect the habitat value of remaining native open space areas. Some smaller, isolated wetlands, which currently are of limited habitat value, would remain as isolated "islands" of native habitat, as such indirect effects on these small wetlands would not be considered a significant impact to the overall wetland resources on site.

5.2 ALTERNATIVE 2

Alternative 2 provides for development in the eastern portion of campus, nearer to many of the identified wetlands.

5.2.1 Direct Alteration

Alternative 2 appears to avoid all direct physical alteration to all identified wetlands by retaining them in place. Development will occur to the north, east, and west of identified wetlands, however, under the Alternative 2 development plan, direct impacts to wetlands will be avoided.

5.2.2 Hydrologic Impacts

Hydrologic impacts of Alternative 2 would be similar to those described for Alternative 1. Clearing, grading, and construction of impervious surfaces has the potential to change hydrologic conditions in the wetlands.

With appropriate stormwater controls, water level fluctuations were not expected to increase substantially, so these changes are not expected to cause substantial adverse impacts to vegetation or wildlife habitat of the wetlands.

The University Slough and Wetlands 1 and 2 along the Burke Gilman Trail are the wetlands closest to the prosed development under Alternative 2. However, with appropriate stormwater controls, water level fluctuations will likely be minimal. Consequently, we expected no significant adverse hydrologic impacts to these wetlands from development of Alternative 2.

5.2.3 Erosion/Sedimentation and Water Quality Impacts

Potential impacts of Alternative 2 are expected to similar to Alternative 1. Some increases in sediment deposition would be expected in the on-site wetlands, particularly during construction; however, these would be limited through implementation of Best Management Practices during construction.

5.2.4 Habitat Impacts

Alternative 2 would develop more area in closer proximity to identified wetlands, however, the required buffers for the wetland would be retained. Construction activities and implementation of the proposed development would result in both short-term disturbance to wildlife inhabiting the wetlands and long-term disturbance from increased human activity and clearing and conversion of adjoining areas to campus-related uses. In addition, increased fragmentation of native habitat would increase the risk of spread of invasive plant species, which could also adversely affect the habitat value of remaining native open space areas. Some smaller, isolated wetlands, which currently are of limited habitat value, would remain as isolated “islands” of native habitat, as such indirect effects on these small wetlands would not be considered a significant impact to the overall wetland resources on site.

5.3 ALTERNATIVE 3

Alternative 3 develops the campus in the vicinity of wetlands in the same manner as Alternative 1.

5.3.1 Direct Alteration

No direct impacts to wetlands would occur under Alternative 3.

5.3.2 Hydrologic Impacts

Hydrologic impacts are the same as discussed under Alternative 1.

5.3.3 Erosion/Sedimentation and Water Quality Impacts

Erosion/Sedimentation and water quality impacts are the same as those discussed under Alternative 1.

5.3.4 Habitat Impacts

Habitat impacts are the same as those discussed under Alternative 1.

5.4 ALTERNATIVE 4

Alternative 4 is the no action alternative. Impacts to wetlands would be the same as those addressed in the original campus master plan.

5.4.1 Direct Alteration

No direct impacts to wetlands are anticipated under Alternative 4.

5.4.2 Hydrologic Impacts

No new hydrologic impacts are anticipated under Alternative 4.

5.4.3 Erosion/Sedimentation and Water Quality Impacts

No new impacts are anticipated under Alternative 4.

5.4.4 Habitat Impacts

No new impacts are anticipated under Alternative 4.

6.0 SUMMARY OF MITIGATION

Prior to development, any areas within the vicinity of wetlands should be delineated to determine the precise location of the wetland and the extent of their buffers. Standard best management practices would be employed prior to, during, and after construction activities to limit the amount of sediment generated and the amount that can reach site receiving waters (particularly wetlands). These would serve to limit the potential for substantial adverse impacts to the water quality of the wetlands related to sediment deposition.

A Master Drainage Plan should be developed for the project in order to avoid or minimize probable hydrologic impacts to the site, including impacts to wetlands.

The drainage system should be designed to maintain water levels and water level fluctuations in existing wetlands to near existing levels. Design and performance of stormwater detention facilities would be refined further during detailed design phases by means of HSPF or WWHM3 modeling to minimize the potential for adverse hydrologic impacts to on-site wetlands. Modeling would be used to confirm whether specific hydrologic performance criteria can be met.

The wetland buffer areas should be maintained in order to avoid indirect impacts to the wetlands.

Interpretive or educational materials would be developed or made available in order to foster an understanding and appreciation of the wetlands on the property (e.g., Yesler Swamp and University Slough) by campus users and visitors. Such an appreciation can help to limit unnecessary disturbance or destruction of native vegetation or wildlife. Materials could include signs or materials available from public agencies or local conservation groups.

7.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant unavoidable adverse impacts to wetlands are anticipated to result from the proposed alternatives. Direct alteration of wetlands would be avoided. Development of the site, including clearing of native vegetation and construction of impervious surfaces, will change site recharge patterns and create greater surface runoff, which would result in some unavoidable changes to the hydrologic conditions in the wetlands. With mitigation measures employed through a Master Drainage Plan, the primary hydrologic impacts to the wetlands can generally be limited to insignificant levels, as long as hydrologic changes are kept within acceptable limits as determined through hydrologic modeling. Some additional sediment deposition and associated water quality impacts from the proposed development areas are unavoidable, but can be kept to minimal levels through the use of stormwater detention/wetpond facilities and other erosion/sediment control measures.

Indirect impacts to wetland vegetation and wildlife resulting from increased human activity and associated disturbance on site are unavoidable. These affects would likely be most pronounced for the smaller, isolated wetlands, particularly those located away from other retained native open space (e.g., Burke Gilman wetlands), and their value as wildlife habitat, which is currently fairly limited because of their very small size and seasonality, would likely become further compromised over time. With respect to the affected isolated wetlands, these impacts may be viewed as significant. However, in the context of the major wetlands and their habitat value on site, these unavoidable impacts are not considered significant.

8.0 LIMITATIONS

We have prepared this report for the exclusive use of and their consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from.

The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries for regulatory purposes is the responsibility of the various agencies that regulate development activities in wetlands. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

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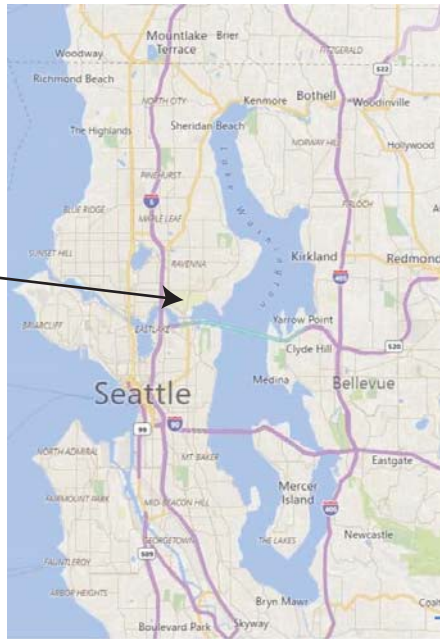
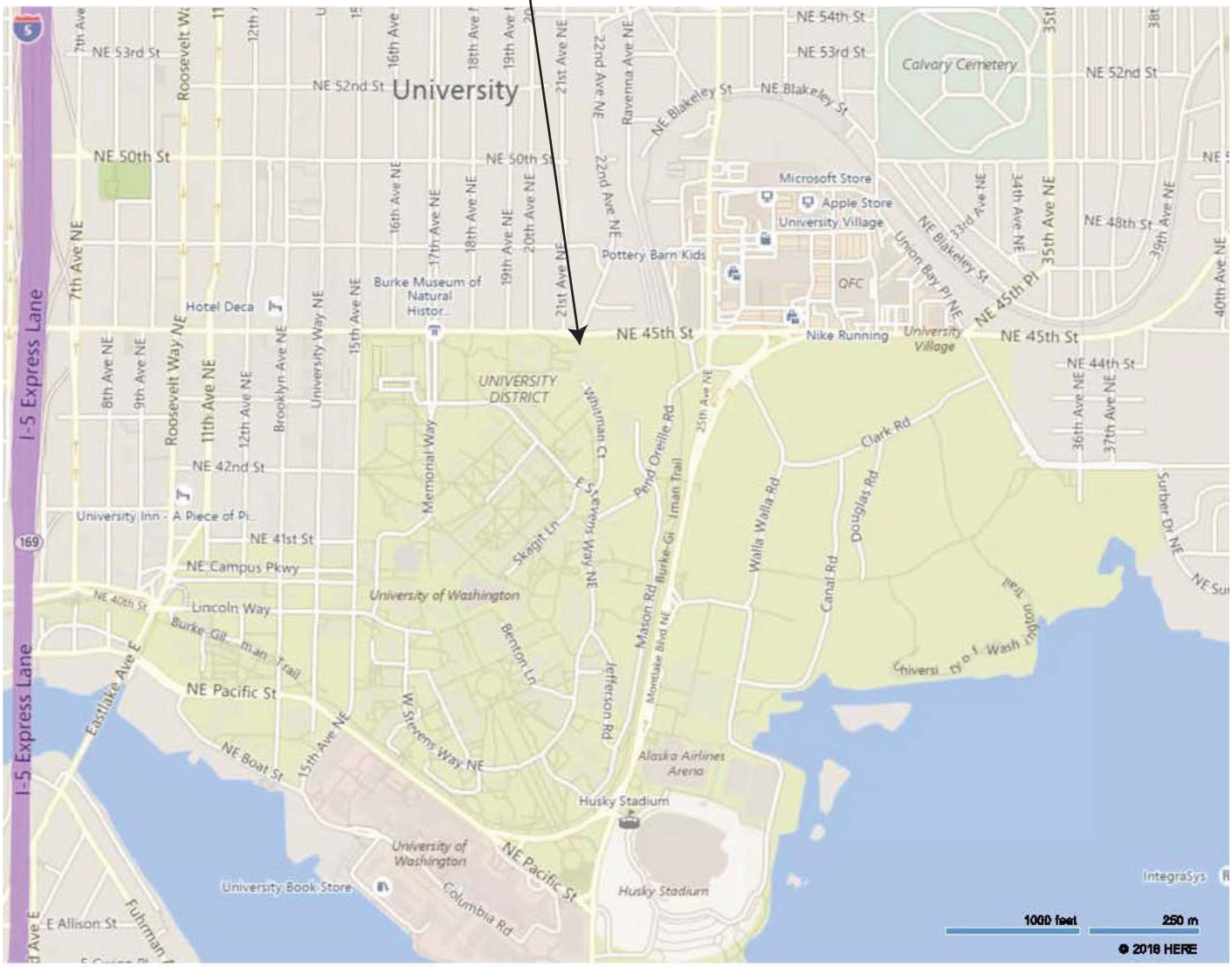
FIGURES

UNIVERSITY OF WASHINGTON





Source: Bing Maps

FIGURE 1
REGIONAL & VICINITY MAP
UNIVERSITY OF WASHINGTON
SEATTLE, WA

Raedeke Associates, Inc.
2111 N. Northgate Way, Ste. 219
Seattle, WA 98133

2016-059

Source of Image: Bing Maps

NTS

FIGURE 2
EXISTING CONDITIONS

UNIVERSITY OF WASHINGTON
MASTER PLAN UPDATE
SEATTLE, WA

Raedeke Associates, Inc.
2111 N. Northgate Way, Ste. 219
Seattle, WA 98133

2016-059

Table 1. Summary of Wetlands Identified on or near the UW property.

Wetland	Size (acres)[1]	Cowardin Vegetation Class[2]	Rating Category[3]	Buffer (ft)
Yesler Swamp	>5	PAB3, PEM1, PSS1, PFO1 LLEM	II	110
Shoveler's Pond	0.5	PEM1, PSS1	III	60
Central Pond	0.5	PEM1, PSS1	III	60
South Pond	0.25	PEM1, PSS1	III	60
Wetland A	1	PFO1, PEM1, PSS1	II	100
Wetland B	0.5	PSS1, PFO1	II	100
Wetland C	0.25	PSS1, PFO1	III	60
Wetland D	0.01	PSS1	IV	50
Wetland E	0.01	PSS1	IV	50
University Slough	>2	R3UBX, PFO1, PSS1	II	110
Boat House	0.5	PSS1	III	60
Baseball Field	0.25	PSS1, PEM1	III	60
Soccer Stadium	0.01	PSS1	III	60
Wetland 1	0.01	PSS1	III	60
Wetland 2	0.01	PSS1	III	60

1 Acreages of Wetlands is estimated from aerial photo interpretation.

2 Based on Cowardin et. al. (1992).

PAB3	Palustrine, aquatic bed, rooted vascular
PEM1	Palustrine, emergent, persistent
PSS1	Palustrine, scrub-shrub, broad-leaved deciduous
PFO1	Palustrine, forested, broad-leaved deciduous
R3UBX	Riverine, lower perennial unconsolidated bottom, excavated
LLEM	Lacustrine, littoral, emergent wetland

3 Wetland ratings based on WDOE 2004 Wetland Rating System

APPENDIX D

Archaeological Predictive Model Report

DRAFT—Archaeological Predictive Model for the University of Washington, City of Seattle, King County, Washington

Submitted to:
EA Engineering, Science, and Technology, Inc.

Submitted by:
Historical Research Associates, Inc.
Alexander Stevenson, MS
Gabe Frazier, MS

Seattle, Washington
March 2016

Historical Research Associates, Inc.

This predictive model and accompanying documentation was prepared by HRA Principal Investigator Alexander Stevenson, MS, and Gabe Frazier, MS, who meet the Secretary of the Interior's (SOI) professional qualifications standards for archaeology. This product is intended for the exclusive use of the Client and its representatives. It contains professional recommendations concerning the potential for identifying archaeological sites on the University of Washington Campus based on the results of HRA's investigation. It should not be considered to constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by an SOI qualified archaeologist and the appropriate reviewing or permitting agency.

Table of Contents

List of Figures

List of Tables

1. Introduction and Project Description

The University of Washington (UW) requested that Historical Research Associates, Inc., develop an archaeological predictive model to assist with planning and development on the existing UW campus. This predictive model and associated documentation will be part of an environmental impact statement being prepared for the UW.

This document includes background information used in creating the model as well as a description of how the model was created and how it can be effectively used for planning purposes. The model includes locations of previously documented archaeological sites, documented ethnographically important places, geologic data, as-built plans for the UW, and multiple environmental factors.

Background information presented in Section 2 is generally limited to a review of cultural resources and studies within the UW campus. The predictive model was created using data from within the UW campus boundaries as well as an expanded research area (Figure 1-1). This expanded research area was necessary because data within the campus did not provide sufficient information to create a reliable and well-grounded archaeological predictive model. When data is increased, reliability of a model increases; as such, the expanded research area has increased the reliability and accuracy of the predictive model for the UW campus.

1.1 Organization of Document

This document is organized to provide a high level overview of archaeological resources, archaeological potential on the UW campus, a review of the approach used for predictive archaeological modelling and finally provide recommendations regarding archaeological investigations within the UW campus for future development projects. Sections of this document include the following information:

Section 2 – Information presented here includes results of background research on previously recorded archaeological sites and previous cultural resource surveys conducted on and immediately adjacent to the UW Campus.

Section 3 – This section provides context necessary for understanding the precontact environmental setting of the UW.

Section 4 – Important and generalized cultural context is included in this section in order to develop a picture of how the UW landscape may have been used during the precontact and historic periods.

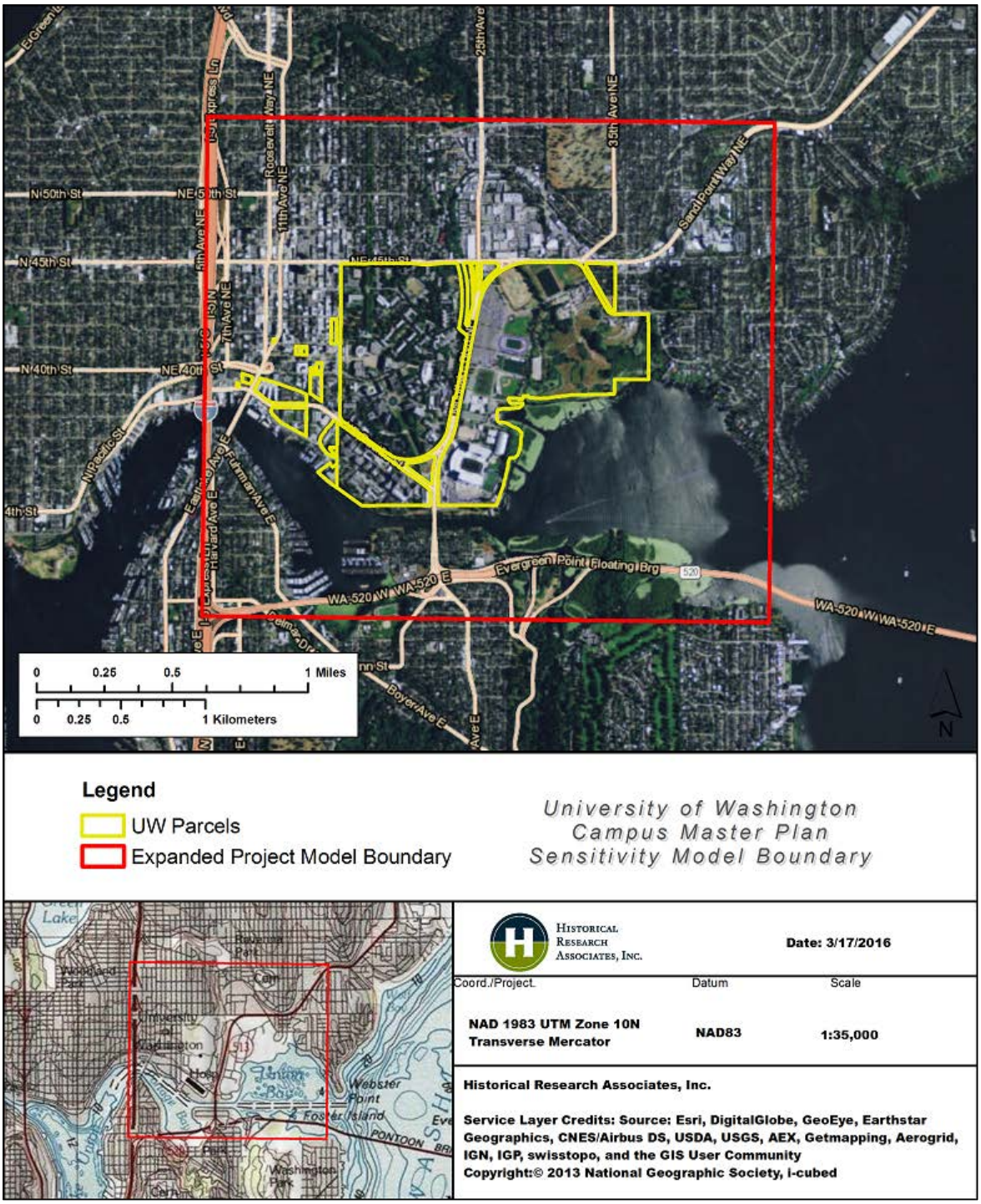


Figure 1-1. Boundary of UW campus and predictive model.

Section 5 – Our approach to predictive modelling is presented here to create a basis for understanding how the model was created, particularly what variables were used and how those variables were weighted to create sensitivity categories. This section also includes a brief consideration of the objectives and the limitations of archaeological predictive models.

Section 6 – A summary of the model, contexts, and background research is presented. This summary is accompanied by a set of recommendations for using this model as a planning tool.

Section 7 – This section includes a review of the results of the model and a brief discussion of the three levels of archaeological potential across the UW campus. Also, recommendations for future use of this model as a planning tool are presented in this section

2. Archival Research

This chapter provides a review of archival data including previous cultural resources surveys; documented archaeological sites, buildings, structures, and objects; and historic maps. Understanding previous cultural resource surveys and known cultural resources and historic properties in the vicinity of a project is important for understanding how intensively work has been conducted in the area.

2.1 Research Methods and Materials Reviewed

HRA archaeologists conducted an archival record search for records pertaining to resources locations within the UW campus. The review below includes cultural resources and cultural resource studies only within the existing UW campus. The archaeologists searched the Department of Archaeology and Historic Preservation's (DAHP's) online database (Washington Information System for Architectural and Archaeological Records Data [WISAARD]) for archaeological site records, cultural resource survey reports, historic property inventory (HPI) forms, historic register information, and cemetery records.

2.2 Archival Research Results

2.2.1 Previous Cultural Resources Studies

Twenty-two cultural resource studies including archaeological investigations have been conducted on the UW campus (Table 2-1)[1]. These studies have included both surface and subsurface survey.

In general, these studies have concluded that the areas of proposed development for each project include highly disturbed sediments and/or intact glacially deposited sediment that has had the original surface removed, thus there is little to no potential to contain intact archaeological deposits. Few intact archaeological sites have been identified by these cultural resource studies.

[1] Cultural resource studies not including archaeological investigations have been excluded from this review.

Table 2-1. Previous Cultural Resources Studies on UW Campus.

Reference	NADB#	Title	Archaeological Resources Identified
Courtois et al. 1998	1339816	*Sound Transit Central Link Light Rail Draft Environmental Impact Statement Historic and Archaeological Technical Report*	None
Courtois et al. 1999	1339836	*Central Link Light Rail Transit Project Final Environmental Impact Statement Technical Report*	None
Rooke 2002	1341144	*Letter to Jay Grenfell regarding Cingular Wireless Tower WA-539 (Cavilier Apartments)*	None
Courtois & Associates 2003	1350148	*Preliminary Report on University of Washington Main Campus Seattle-Significant Buildings and Features Completed Prior to 1953, in Select Campus Area*	None
Parametrix et al. 2010	1354602	*SR520, I-5 to Medina: Bridge Replacement and HOV Project, Cultural Resources Report for Section 6(f) Environmental Evaluation*	None
Blukis Onat et al. 2005	1680617	*Preliminary Ethnographic and Geoarchaeological Study of the SR520 Bridge Replacement and HOV Project*	None
Elder 2011	1682027	*Cultural Resources Investigations at the Bryant Building Section 6(f) Replacement Site*	Brick, mortar, concrete, glass, ceramic, and metal fragments, one wire nail, charcoal, and slag in fill deposits – no site record completed
Elder and Reed 2011	1682029	*Results of Archaeological Monitoring of Geotechnical Borings within the SR520 Limits of Construction*	None
Elder et al. 2011a	1680657	*Section 106 Technical Report (Volume I Archaeology and Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	None
Elder et al. 2011b	1681090	*Section 106 Technical Report (Volume I Archaeology) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	This is part of the larger report compiled in Elder et al. 2011a
ICF and Gray Lane 2011	1681089	*Section 106 Technical Report SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	This is part of the larger report compiled in Elder et al. 2011a – no archaeological resources

Table 2-1. Previous Cultural Resources Studies on UW Campus.

Reference	NADB#	Title	Archaeological Resources Identified
Walker Gray et al. 2011	1681091	*Section 106 Technical Report (Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	This is part of the larger report compiled in Elder et al. 2011a – no archaeological resources
Elder and Cascella 2013	1683661	*SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project Corridor Archaeological Landform Sensitivity Assessment*	None
Stevenson and Dellert 2013	1684507	*University of Washington Burke-Gilman Trail, Rainier Vista to 15th Avenue NE Segment, Cultural Resources Inventory Project, Seattle, King County, Washington*	None
Stevenson and Little 2014a	1685157	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, Brooklyn Avenue NE to 15th Avenue NE (Garden Reach) Segment, City of Seattle, King County, Washington*	None
Stevenson and Little 2014b	1685154	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, University Bridge to Brooklyn Avenue NE (Neighborhood Reach) Segment, City of Seattle, King County, Washington*	None
Stevenson and Little 2014c	1685155	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, Pasadena Place NE to University Bridge (Northlake Reach) Segment, City of Seattle, King County, Washington*	45KI1181
Stevenson and Little 2014d	1685156	*Cultural Resources Inventory for the University of Washington Burke-Gilman Trail, Rainier Vista to Northeast 47th Street (Forest Reach) Segment, City of Seattle, King County, Washington*	None
Schultze and Stevenson 2014	1687351	*Archaeological Inventory for the University of Washington Animal Research and Care Facility Construction Project, City of Seattle, King County Washington*	None
Stevenson et al. 2014b	none	*Cultural Resources Inventory for the University of Washington Life Sciences Building Project, City of Seattle, King County Washington*	None
Schultze 2015a	none	*Archaeological Background Record Search for the North Campus Housing Project on the University of Washington Campus, City of Seattle, King County, Washington*	None

Table 2-1. Previous Cultural Resources Studies on UW Campus.

Reference	NADB#	Title	Archaeological Resources Identified
Schultze 2015b	none	*Archaeological Background Record Search for the Science and Engineering Facilities on the University of Washington Campus, City of Seattle, King County, Washington*	None

2.2.2 Previously Recorded Archaeological Resources

A total of six archaeological resources have been identified on the UW campus (Table 2-2). Generally these sites have been from the historic period. The two precontact archaeological resources found on campus have both been recommended not eligible for listing in the National Register of Historic Places (NRHP), and one of them, 45KI1181, has been determined not eligible for listing in the NRHP. None of the historic-period archaeological resources have been formally evaluated for NRHP eligibility based on information available in WISAARD.

It should be noted that while the precontact sites have been recommended not eligible for listing in the NRHP, if projects are planned within the boundaries of the defined resource, there is no eligibility threshold, and disturbance of the resources will require preparation of a DAHP excavation permit.

Table 2-2. Previously Recorded Archaeological Isolates Within the UW Campus Boundaries.

Site Number	Site Type/Description	Eligibility for NRHP	Reference
45KI952	Historic Bottle Isolate, circa 1920s to early 1930s	Not Evaluated	Boggs 2009a
45KI955	Historic Public Works	Not Evaluated	Boggs 2009b
45KI957	Multicomponent-Prehistoric Lithic Material and Historic Debris	Not Evaluated	Louderback and Jolivette 2009
45KI1030	Historic Structures – stone staircase	Not Evaluated	Gilpin 2011
45KI1181	Precontact Isolate	Not Eligible	Stevenson and Little 2014b
45KI1201	Historic debris concentration; landfill	Not Evaluated	Lockwood 2014a

2.2.3 Cemeteries

No cemeteries are recorded on WISAARD within the UW campus. Site 45KI1154, located outside the UW campus boundary, consisted of human remains found in 1937 (DAHP 2016).

2.2.4 DAHP Predictive Model

The DAHP predictive model for archaeological sites is based on statewide information, using large-scale factors. Information on geology, soils, site types, landforms, and from General Land Office (GLO) maps was used to establish or predict probabilities for archaeological resources throughout the state. The DAHP model uses five categories of prediction: Low Risk, Moderately Low Risk, Moderate Risk, High Risk, and Very High Risk. The DAHP predictive model map indicated that the UW campus ranges from moderate to very high risk for encountering archaeological deposits. The DAHP model does not account for disturbance and does not include other important factors included in the model produced here by HRA.

3. Environmental Context

This chapter provides a brief overview of the local environment, including historic modification to the UW campus landscape and natural resources. Understanding the local environment including geology, climate, flora, and fauna is important for understanding how people used the landscape in the past.

3.1 Topography and Geology

The UW campus is located north of the Montlake Cut and east of the modern-day shoreline of Lake Union and west of the modern-day shore of Lake Washington. Elevation of the campus ranges from approximately 30 to 60 feet (ft) above mean sea level (amsl).

The campus is located within the Southern Puget Sound Basin, a portion of the Puget Trough Physiographic Province (Franklin and Dyrness 1973). The north–south trough of the Puget Lowland separates the Olympic Mountains to the west from the Cascade Range on the east. The lowland was carved out during the last major glaciation of western Washington which ended approximately 16,000 years before present (B.P.) (Alt and Hyndman 1995; Booth et al. 2004; Dethier et al. 1995; Easterbrook and Rahm 1970:49; Galster and Laprade 1991:249). As glaciers retreated, they left thick sediment deposits. This sediment forms the parent material of many soils throughout this part of King County including the UW campus (Snyder et al. 1973). Sediments at the surface across the campus are glacially deposited during but also include substantial amounts of historic fill especially in the eastern and southern portions of campus where the sports complexes are currently located (Booth et al. 2009). As glaciers retreated, the land on which they rested began to rebound, and would have become available for colonization by plant and animal communities as the climate began to ameliorate.

3.2 Climate and Vegetation

Between approximately 13,000 and 12,000 years ago, the region had developed a much cooler and drier climate, which supported an ecosystem characterized by lodgepole pine (*Pinus contorta*), sedges (*Cyperaceae* sp.), sage (*Artemisia*), and a variety of grasses and herbs. After 12,000 years ago, the climate warmed while continuing to dry, and Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and red alder (*Alnus rubra*) joined the developing parkland forest. By around 6,000 years ago, the climate of the region had cooled and moistened to levels comparable to today's maritime regime, producing the current western hemlock vegetation zone. Presently, uplands are moderately to heavily forested with Douglas fir, western hemlock, and western red cedar (*Thuja plicata*). Red alder and big-leaf maple (*Acer macrophyllum*) represent secondary species in forested

habitats and are dominant in disturbed areas (Barnosky 1984; Barnosky et al. 1987; Brubaker 1991; Whitlock 1992).

3.3 Fauna

During the late Pleistocene, western North America would have provided habitat for a number of animal taxa not found in the region after about 11,000 B.P. (Gilmour 2011). These animals would have done well in the developing forested parkland environment in the Puget Sound region, which would have provided food for both grazers and browsers and, in turn, food for large carnivores. Climatic changes undoubtedly reduced the habitat for these animals, which would eventually become extinct across the North American landscape.

Throughout the Holocene, and prior to extensive Euroamerican influence in the area, larger terrestrial mammals would have included elk (*Cervus elaphus*), deer (*Odocoileus* spp.), black bear (*Ursus americanus*), coyote (*Canis latrans*), and mountain lion (*Felis concolor*) (Johnson and Cassidy 1997). Smaller mammals that inhabited the area included snowshoe hare (*Lepus americanus*), raccoon (*Procyon lotor*), and beaver (*Castor canadensis*) (Kruckeberg 1991; Larrison 1967). Avifauna found in the Puget Sound region include raptors such the bald eagle (*Haliaeetus leucocephalus*) and waterfowl (*Aix* and *Anas* species). Freshwater fish including trout (*Salmo* sp.), suckers (*Castomidae* spp.) and minnows (*Gila* sp.) would have been readily available in in Lake Washington and Lake Union. Pacific salmon and trout (*Onchorhynchus* spp.), including land locked Kokanee (*O. nerka*), would have also been readily available in the region and from waterways near the UW campus (Berge and Higgins 2003; WDFW 2012). Freshwater mussels (*Unionidea*) are found in Lake Washington and Lake Union (Xerces 2010).

4. Cultural Context

This chapter provides a brief overview of nearly 14,000 years of human occupation in North America, focusing specifically on western Washington and the Puget Sound area where possible. Understanding the history of human occupation and land use in an area is crucial for understanding how archaeological data is important and what kinds of archaeological sites may be encountered during a project. The context presented below includes a high level review of precontact lifeways and a review of ethnographic lifeways. Ethnographic locations identified below include very important places just outside the UW campus in order to stress the importance of the landscape.

4.1 Precontact Background

The current understanding of Pacific Northwest precontact lifeways is derived from the archaeological record, which is constantly changing as our knowledge grows. How archaeologists see archaeological data is conditioned by a number of factors, including natural (e.g., rising sea levels) and cultural (e.g., excavation, curation) processes, which selectively modify what remains for modern investigators to be seen (Schiffer 2002). New discoveries can either change or reinforce prior notions of human lifeways, but the continually growing body of archaeological data helps give archaeologists a better understanding of the past (Trigger 2008).

In order to organize current knowledge of Pacific Northwest precontact lifeways, numerous investigators have proposed chronologies for the region's archaeological record (e.g., Ames and Maschner 1999; Kidd 1964; King 1949). Ames and Maschner's (1999) chronology is used here to structure discussion of precontact archaeology and inferred lifeways. Their chronological sequence is divided into three basic developmental periods: Paleoindian, Archaic, and Pacific. The archaeological evidence from these periods suggests a gradual shift from small nomadic groups relying on generalized hunting and gathering to larger sedentary groups with increased social complexity and specialized reliance on marine and riverine resources (Ames and Maschner 1999). In essence, the archaeological record in the region documents a shift from foraging to collecting strategies (*sensu* Binford 1980) and cultural change toward ethnographically observed lifeways.

4.1.1 Paleoindian (~12,500 B.C. to 10,500 B.C.)

Evidence for late Pleistocene occupation of western North America comes from a very small number of archaeological sites, including Paisley 5-miles Cave in Oregon (Gilbert et al. 2008) and sites on California's Channel Islands (Erlandson et al. 2011). Data from these sites have reinforced the idea that these first inhabitants of the region lived in small groups, were probably highly mobile, and followed the migration patterns of animals across the landscape. Mounting evidence (e.g.,

Dillehay et al. 2008) suggests that occupants of the "new world" exploited both marine and terrestrial environments, contrary to long held hypotheses (e.g., Martin 1967). Up to now, no archaeological sites dating to the late Pleistocene have been discovered in the Puget Sound region.

The earliest sites in the Pacific Northwest date to the early Holocene and are commonly associated with Clovis points, an iconic large spear point found across much of North America during this time (Meltzer and Dunnell 1987; Osborne 1956). These sites are said to represent the remains of mobile hunting activities and are scarce in the Pacific Northwest. Clovis points have been recovered from sites across the Puget Sound (Osborne 1956). Other early western Washington sites dating to this period include the Manis Mastodon Site (45CA218) near Sequim, and 45KI839 on Bear Creek in Redmond. The Manis Site dates from roughly 11,800 B.P., and consists of the remains of a mammoth found in a peat bog with a human-made bone point lodged in a rib fragment (Waters et al. 2011). Site 45KI839 dates from approximately 10,000 to 12,000 B.P., and consists of a highly diverse stone tool kit (Kopperl et al. 2010). This site has been interpreted as a short term occupation site and has yielded evidence of mammal, fish, and plant exploitation. The Manis and Bear Creek Sites have demonstrated that the earliest inhabitants of western Washington were not simply big game hunters who used large stone tools to kill game. These sites demonstrate the implementation of diverse toolkits and subsistence strategies, signaling an excellent working knowledge of the landscape and available resources.

4.1.2 Archaic (10,500 B.C. to 4400 B.C.)

Sites dating to the Archaic period, especially prior to 5000 B.P., are rare, at least in part because of natural processes such as sea-level rise, which have undoubtedly obscured sites that are currently underwater. The current view of this period is generally one of stasis, but this is likely at least partially conditioned by the rarity of sites dating to this period.

Lifeways during the Archaic period are thought to have changed little from the Paleoindian period. In essence, people are thought to have hunted game and lived in small highly mobile egalitarian groups, as foragers (*sensu* Binford 1980). Microblades and leaf shaped projectile points (i.e., Cascade points) have been used to argue for Archaic period occupation across Western (e.g., Chatters et al. 2011; Greengo and Houston 1965). Identifiable faunal remains are rare at Archaic period sites, making inferences about subsistence difficult, but mammal and fish remains have been reported from Archaic period sites in the Puget Sound region (Chatters et al. 2011; Elder, personal communication 2013; Stilson and Chatters 1981).

The most discussed sites dating to the Archaic period are often referred to as "Olcott" sites (Kidd 1964). These sites typically lack good absolute dates, are highly disturbed, are located near rivers, and contain expedient tools such as scrapers, flaked cobbles, and debitage in addition to large lanceolate and stemmed projectile points. Much discussion of these sites has taken place in the last 50 years (e.g., Chatters et al. 2011; Dancey 1969; Kidd 1964; Morgan 1999; Stilson and Chatters 1981). The sites were thought to represent short-term camps where hunting and game processing was the

primary focus of activity (Kidd 1964). Investigators like Dancey (1969), Morgan (1999), and others have refuted Kidd's (1964) initial interpretation, and Chatters et al. (2011) have recently suggested that "Olcott" sites represent the cultural remains of a group of people well adapted to unpredictability who used both plants and animals but were still highly mobile.

A number of Archaic period sites have been recorded in King County. Greengo and Houston (1965) excavated at the Marymoor site, located in Marymoor Park, during the 1950s. This site yielded a large array of Archaic period artifacts, including large projectile points, modified cobbles, and microblades. The earliest component of the West Point Sites (discussed below) also falls into the Archaic period. Additionally, projectile points that probably date to this period have been identified at Foster Island, just outside the UW campus boundaries (45KI1107 [Perkins 2010]).

4.1.3 Pacific (4400 B.C. to A.D. 1775)

Based on the archaeological record, the Pacific period is the most culturally dynamic precontact period in the Pacific Northwest (Chatters 1987; Larson and Lewarch 1995; Lewarch 2006). Over time, changing technologies and site locations suggest increased sedentism and specialization in the use of particular environments and resources (Ames and Maschner 1999). During this period, evidence of exploitation of the littoral environment increases, and shell middens become a prominent site type across Puget Sound. After about 5000 B.P., populations on or near the Puget Sound coast grew and became more complex in organization. Technological organization and subsistence practices became increasingly complex during the Pacific period as well. During this period, there is apparent increasing emphasis on the use of plants including berries and root-vegetables (e.g., Elder and Sparks 2010). Social stratification and inequality, a hallmark of Northwest coast cultures, is thought to be less pronounced in the Puget Sound than in other parts of the Pacific Northwest; however, objects like labrets, indicative of social stratification, appear early in the Pacific period in the Puget Sound at sites like West Point (45KI248) (Larson and Lewarch 1995). By shortly after 2500 B.P., a variety of bone, chipped stone, and groundstone artifacts represent coastal marine-oriented cultures and inland hunting/fishing/gathering cultures (Ames and Maschner 1999; Nelson 1976, 1990).

Shell midden sites dating to the past several thousand years have been recorded in and around the Puget Sound area. The most well studied shell middens are found around Seattle. The West Point Sites (45KI428 and 45KI429), located at Discovery Park in West Seattle, have been interpreted as long-term camping and food-processing activity areas (Larson and Lewarch 1995). Five distinct cultural components indicate use of the sites between 4200 and 200 B.P. These sites included a number of personal items, including beads, bracelets, and labrets, which may be related to developing social inequality in the region (Ames and Maschner 1999). The West Point Sites also yielded a highly diverse tool kit, including bone as well as ground and chipped stone implements used for capturing and processing prey (Larson and Lewarch 1995). The highly diverse faunal

assemblage includes sea mammals, fish, terrestrial mammals, birds, and shellfish, indicating exploitation of a number of available niches.

4.2 Ethnographic Background

The AI is located within the traditional territory of the Duwamish Indians, members of the Coast Salish cultural group that spoke Southern Lushootseed (Suttles 1990). The Duwamish traditionally lived in winter villages on the shores of Elliott Bay, Salmon Bay, Lake Washington, and Lake Union, as well as along the Black, Cedar, and Duwamish Rivers (Ruby and Brown 1992; Stevens 1854; United States Court of Claims 1927). Ethnographer T. T. Waterman (in Hilbert et al. 2001:15–16), who worked in the Puget Sound region during the 1920s, pointed out that the Duwamish, like other groups, identified themselves in relation to their local geography. For example, a group who lived in the vicinity of the AI around Lake Union identified themselves as the *Xa^{3}tcua'bc* (Waterman orthography), or "people of the small lake." While this distinction is taken into account ethnographically, these groups have historically been grouped into a larger entity (the Duwamish) based on shared culture and language.

Ethnographic and archaeological evidence suggests that the Salish Lushootseed-speaking Duwamish, whose name means "inside [the bay] people," practiced their life way of hunting, fishing, and gathering for centuries before contact with white settlers (Hilbert et al. 2001). Duwamish settlement and subsistence were inextricably linked throughout the year.

The Duwamish, like other Coast Salish groups, spent the majority of the winter inside large longhouses made from cedar planks that had "shed" roofs, which Waterman and Greiner (1921) note were common among tribes around the Sound. These houses could be massive, providing room for very large extended families and much of the food they would need for the cold months. The houses were often arranged into villages of two to five structures. The Duwamish occupied extended family villages and established a flexible system of intermarriage with the surrounding peoples, including the Sammamish and Snohomish (Ruby and Brown 1992). Winter was spent engaged in storytelling and ceremonial performances (Amoss 1978).

During spring, fall, and summer, people from the winter villages dispersed to hunt, fish, and gather plant foods for immediate consumption and winter storage (Buerge 1984; Haeberlin and Gunther 1930). Summer camps usually consisted of small, temporary reed or grass-mat structures occupied by a single family, although several families might join together to build a larger mat house (Haeberlin and Gunther 1930; Suttles 1990; Suttles and Lane 1990). Upland forested environment, not only attracted and supported deer and elk populations for hunting, but likely also provided a variety of plant resources such as berries, nuts, and root foods.

T. T. Waterman (Hilbert et al. 2001) identified several Duwamish ethnographic place names on or adjacent to the UW campus (Table 4-1). Locations included in Thrush (2007) and Buerge (1984) were overlapped with Waterman's recorded locations. Waterman described identifiable physical

locations along the lake shores and nearby landforms. The discussion below includes selected examples of the toponyms recorded by Waterman.

Table 4-1. Ethnographic Locations Within or Adjacent to the UW Campus (after Hilbert et al. 2001).

Location	**Lushootseed Orthography**	**Lushootseed Translation**	**Citation**
Lake Union, a small creek just east of the Latona Bridge	*waq̇waq̇ab*	Like a frog	Hilbert et al. (2001:79 location 62)
Lake Union, a promontory at the University Boat Club	*sqʷicqs*	Down river promontory	Hilbert et al. (2001:80 location 63)
Lake Washington, a small cove west of Laurel Point	*ʔadid(a)*	For gosh sakes; dear me; for goodness sakes	Hilbert et al. (2001:80 location 66)
Lake Washington, the southernmost of the two promontories forming Union Bay	*bəskʷiʔkʷil*	A place that has skate fish	Hilbert et al. (2001:104 location 136)
Lake Washington, portage from Lake Washington to Lake Union	*sxʷacəgʷiɬ*	To lift a canoe; to pull a canoe	Hilbert et al. (2001:105 location 139)
Lake Washington, Laurel Point; Webster Point	*sabalʔtxʷ*	Dry house	Hilbert et al. (2001:80 location 67)
Lake Washington, the marsh between Laurel Point and University of Washington	*sluʔwiɬ*	Perforation for a canoe	Hilbert et al. (2001:80 location 64)

Near the western extent of the UW campus is a location called ***waq̇waq̇ab***, translated as "like a frog." At this location, a small creek drains into Portage Bay. Along the Portage Bay shoreline, just east of ***waq̇waq̇ab***, Waterman's informants identified a small promontory (now the location of the UW Boat Club) as ***sqʷicqs***, "down river promontory."

The marsh between Laurel Point and UW, now filled in, and the location of parking lots for UW and Husky Stadium, was known as ***sluʔwiɬ***, translated as "perforation for a canoe." A village with at least five longhouses was located here, along with a fish weir. The small cove west of Laurel Point was referred to as ***ʔadid(a)***, or "dear me/for gosh sakes"(Hilbert et al. 2001:77–80; Thrush 2007:251).

An "Indian Trail" depicted on the 1865 GLO plat connects Lake Washington and Lake Union and passes through the northern portion of the AI (USGS 1865). This trail, along with one located slightly farther to the south, both likely canoe portage routes, is evidence of the heavily used transportation corridor stretching between Shilshole Bay and Lake Washington, bringing people from various neighboring tribes into and through the project area vicinity (Miller and Blukis Onat

2004:70; USGS 1865). Another portage trail, recorded by Waterman as *sx^{w}acəg^{w}iɬ*, was located in the vicinity of the modern day Montlake Cut.

Foster Island has been identified by numerous investigators through Native American testimony as an area of particular importance to Native American groups in the area (e.g., Blukis Onat et al. 2005). Foster Island holds special importance as the location of precontact and ethnographic period burials, a cemetery of sorts. Archaeological investigations on Foster Island for the Washington State Department of Transportation have recovered limited evidence of this use (e.g., Lockwood et al. 2014), but the area is considered a Traditional Cultural Property, is held in high regard, and is thought of as sacred landscape.

4.3 Historic Background

European visitation to the Puget Sound region began in 1792 when George Vancouver and his crew explored the region. Within the next 100 years, native populations would plummet due to repeated outbreaks of introduced diseases such as smallpox, influenza, and typhoid fever (Boyd 1990; Suttles and Lane 1990). Fort Nisqually, located approximately 40 miles (mi) southeast of the Duwamish River headwaters, was established as a trading post by the Hudson's Bay Company in 1833. The Treaty of Washington in 1852 conveyed the territory to the United States, and the Donation Land Claim Act drew settlers into land occupied by the Duwamish and their neighbors. In 1855, members of the Duwamish and neighboring Puget Sound tribes signed the Treaty of Point Elliott, which provided for the removal of tribal members to reservations, including the Port Madison Reservation (Suquamish/Fort Kitsap). Some Duwamish people continued to live in and around Seattle, maintaining friendly relations, working for, and trading with incoming settlers. Many others, meanwhile, relocated to the Port Madison Reservation, but due to undesirable conditions were compelled to leave. Many then attempted to return to their ancestral lands, and a few were able to claim or purchase land (Ruby and Brown 1992; Thrush 2007).

Tribal lands and fishing rights continued to be eroded through the late 1800s and 1900s, culminating, in the late 1900s, in a series of lawsuits and court cases that upheld certain treaty rights (Marino 1990; Ruby and Brown 1992). The Duwamish Tribe is not currently federally recognized, but continues to fight for this distinction.

For additional historic context, including development of the UW Campus for the Alaska Yukon Pacific Exposition please see (BOLA 2016).

5. Predictive Model Creation

This section provides a brief review of archaeological modelling in order to better understand how predictive models are created and can be used. There are limitations to the power of these models, and their effectiveness is oriented toward the objectives they are created for.

5.1 Predictive Modelling

Archaeologists often expect archaeological sites to be found on particular topographic landforms adjacent to specific resources and have developed sensitivity or predictive models that reflect these expectations. Typically, notions about potential site locations have been derived from previous archaeological data (e.g., Mehrer and Wescott 2005), from ethnographic literature (e.g., Krauss 1990; Zenk 1990), and from personal field experience. These models rely on the archaeologist's understanding of past human behavior to select environmental datasets, such as slope, distance to water, land cover, geology, and proximity to previously mapped sites or historic features. Once pertinent context has been established, it is then determined which variables are most predictive for the occurrence of archaeological sites. The variables within each dataset are then weighted toward the ones that the archaeologist perceives as having the most influence on past human settlement patterns, resource acquisition locations and strategies, etc.

Sensitivity analysis is achieved through the use of environmental variables that, when assessed in conjunction with one another, indicate the likelihood of potential site locations within the project area. The model inputs are raster layer variables in the form of GIS thematic layers, geomorphic and other derivative layer variables. The model outputs are combined to a final cumulative raster data layer, which translates into physical maps showing areas with high, medium, and low potential for the discovery of cultural resources within the proposed project area. This is calculated using a weighted-sum raster math calculation based on the project variable weight distribution.

Due to the small size of the geographic area covered by this project, a sensitivity model was constructed to identify spatially explicit data to assist in project planning. The draft sensitivity model for the project area was developed for an area extending beyond the UW campus owned parcels.

In developing the site location sensitivity model and survey approaches to be used for this project we employed Geographic Information System (GIS) techniques to identify and create digital variables covering the UW campus and an expanded research area (i.e., project model boundary) in order to help predict local archaeological sensitivity. Then, based on the weighted sum of these variables, our findings are projected across the campus and adjacent areas. An area slightly larger than UW campus footprint was chosen for the expanded model boundary in an effort to increase model accuracy.

5.2 Model Objectives

The objective of the site sensitivity modeling process is to plan and assist survey strategies by helping to identify potentially high sensitivity areas for cultural resources within a given area, in this case the UW campus. This is best achieved by implementing a model approach that is:

1) based on a sample of sensitivity variable information and site locational data using known site distributions contained in the WISAARD database;

2) designed to operate at the finest level of resolution available;

3) applicable to both historic-period and precontact cultural resources;

4) indicative: showing high, medium, and low potential for the presence of cultural resources;

5) able to account for under-reported areas as well as typically located sites; and

6) provides planning information for all areas of sensitivity of site occurrence.

This approach provides a testable model that can be modified based on new information (e.g., newly discovered archaeological sites). It also, accounts for real world conditions (e.g., previous disturbance) that may not be included in some, hypothetical models of precontact or historic-period landuse.

5.3 Model Assumptions and Limitations

A number of assumptions are standard in site location modeling (commonly referred to as predictive modeling). Following Banning (2002:138–141), these models generally assume that:

1) sites are easily identified in the field;

2) geographic spaces can be defined as adequately surveyed or unsurveyed;

3) surveyed spaces are representative of the overall site population; and

4) geospatial data is fine-grained enough to allow meaningful correspondence between environmental characteristics and site locations.

Few archaeological sites falling within the overall model area have been previously identified (see Section 2). Because of this, the standard predictive modeling approach of generating a model through the examination of the previously recorded site distribution and extending this to the rest of the project area must be modified. The approach taken here is to generate a model through a combination of deductive (previous theoretical models of the relationships of spatial variables and site locations) rather than inductive means (statistical comparisons of known sites within the model area).

6. Predictive Model Variables

This overview section lists and summarizes the variables and data sources used in the development of the sensitivity model. Independent variables are defined as those potentially affecting the likelihoods of site locations. In the case of this modeling effort, potential site resource location will be the dependent variable or response variable. The explanatory variable(s) (or independent variables) are those that will be used to model site distribution.

6.1 Site Location

DAHP maintains archaeological information for known site locations and site attribute data reflecting cultural resource locations, providing the dependent dataset used here. The model information is only defined by the project area (see Figure 1-1). This sample is 11 previously recorded archaeological sites, both historic-period and precontact, located in the expanded research area for the project model boundary.

6.2 Explanatory Variables

The data variables for the independent datasets are derived from digital elevation model datasets, environmental datasets in both vector and raster format, or digitized from georeferenced maps. This data is downloadable from a variety of agencies and sources (Table 6-1). ESRI software ArcGIS© 10.4 was used to geoprocess all datasets. Decisions as to which explanatory variable(s) to include in this analysis follows, including discussion on how variables are weighted. A total of 10 variables were selected and analyzed for the greater project modeling boundary. As noted, the entire model area of 2,470 acres was modeled to encompass all possible future project components for the campus master plan development. All variables were converted to raster GIS data, retaining a 3-meter resolution. In addition, all variables were weighted by associated weight value discussed in the following variables subsection. All variables were projected to UTM Zone 10, 1983 Datum and were imported to a project geodatabase during processing phases.

Table 6-1. Explanatory Variables, Weights and Data Sources used in this Model.

Variable (Class & Value)	**Weight**	**Data Source**	**Resolution**
Slope (Degrees)			
1. 0-3 2. 3-5 3. 5-10 4. >10	4 3 2 1	USGS DEM	NED 3 (1/9 arc-second approximately 3 meters)

Table 6-1. Explanatory Variables, Weights and Data Sources used in this Model.

Variable (Class & Value)	Weight	Data Source	Resolution
Distance to Water (Modern and Historic)			
1. 0-50 m	4	USGS NHD, 1856 GLO	1:24,000, Digitized at various scales
2. 50-100 m	3		
3. 100-150 m	2		
4. >150 m	1		
Geology			
1. Alluvium	4	Pacific Northwest Center for Geologic Mapping Studies at the Department of Earth and Space Sciences, University of Washington	Various scales
2. Lake Deposits	4		
3. Peat	4		
4. Wetland Deposits	4		
5. Olympia Beds	3		
6. Nonglacial Deposits	3		
7. Deposits of Pre-Olympia Age	3		
8. Advance Outwash Deposits	2		
9. Ice-Contact Deposits	2		
10. Pre-Fraser Glaciation Age	1		
11. Recessional Outwash Deposits	1		
12. Vashon Till	1		
13. Water	0		
Previously Recorded Archaeological Sites			
1. 0-50 m	4	WA DAHP, WISAARD	Digitized at various scales
2. 50-100 m	3		
3. 100-150 m	2		
4. >150 m	1		
Previously Archaeological Surveys			
1. Within previous survey area	-1	USGS NHD	Digitized at various scales
2. Outside previous survey area	0		
Historic Shoreline			
1. 0-50 m	3	US Coast and Geodetic Survey 1899 T-Sheet	Digitized at various scales
2. >50 m	0		
Historic Map Features			
1. 0-50 m	4	1856 GLO, 1936 Metsker, 1926 Kroll, 1912 Kroll, 1907 Anderson, 1895 T-Sheet, 1895 USGS. Hilbert et al. 2001	Digitized at various scales
2. 50-100 m	3		
3. 100-150 m	2		
4. >150 m	1		

Table 6-1. Explanatory Variables, Weights and Data Sources used in this Model.

Variable (Class & Value)	Weight	Data Source	Resolution
UW Building Footprints			
1. Aboveground Building 2. Underground Building 3. No Building	-3 -5 1	UW Engineering GIS Services	Unknown or Various
UW Landscaping Surfaces			
1. Wetland 2. Natural 3. Lawn 4. Bed 5. Recreation 6. Walkway 7. Road 8. Other 9. Parking	2 2 2 1 1 1 1 1 0 0	UW Engineering GIS Services	Unknown or Various
UW Paths or Sidewalk Surfaces			
1. Path Surface 2. No Path	-1 0	UW Engineering GIS Services	Unknown or Various

Given the small geographic area represented by the UW campus, an attempt was made to generalize the modeling approach through selection of wide-ranging variable datasets for the entire campus. A weighting scheme was developed based on the location of known sites and their correlation with each independent variable, when available, and past archaeological modeling experience. When mapped, overlap of variables assists in the identification of possible areas of resource concentrations, keeping in mind the limits of the modern datasets where the past is concerned. Nonetheless, based on known site location parameters, modern data can give us relative measures which can be extrapolated back in time. In this modeling effort, there are two types of independent variables: those expressing material availability (distance to water for both modern and historic watercourses, geology and historic shoreline location), and those expressing the "friction" or character of the land surface: slope, campus as-built mapping, distance to possible travel routes/trails, and distance between known sites and map features (historic maps features and previously recorded site locations, and surveys).

6.2.1 Slope

A USGS National Elevation Dataset (NED) 1/9 arc-second (approximately 3 meter) Digital Elevation Model (DEM) was produced for the entire model boundary area. Spatial Analyst, an extension to ArcGIS 10.4, classified the entire raster project surface by slope in degrees (90 =

vertical) into four slope classes (NED 2016; see Table 6-1). Approximately 73 percent of the previously recorded sites boundary centroids selected for this analysis fall within the 0–3 degree class, and this slope classification makes up 54 percent of the project area. The remaining slope classes were constructed between 3–5 degrees, 5–10 degrees, and slopes greater than 10 degrees. Of the remaining 27 percent of previously recorded sites, all fall within a slope range of less than 10 degrees. Slope weights were categorized for 0–3 degrees, 3–5 degrees, 5–10 degrees, and greater than 10 degrees from 4 to 1, respectively.

6.2.2 Distance to Water

Water is perhaps the most vital natural resource. In general, the presence of water is of paramount importance to the spatial patterning of past human dispersals and settlements and is commonly used to develop archaeological modeling. The USGS National Hydrology Dataset (NHD) in high resolution vector format for line and polygon data, comprising hydrological data for streams, rivers, creek and lakes/ponds was acquired and extrapolated to a series of buffers surrounding each hydrological feature (NHD 2016; see Table 6-1). A distance weighting strategy surround each hydrologic feature was applied, ranges include 0–50 meters (m), 50–100 m, 100–150 m, and greater than 150 m. These were again weighted 4 to 1 for all buffers. Patterns of precontact sites and site selection to distance of water vary, making it difficult to determine an exact *ideal* or even *suitable* distance from water for use in modeling probable site locations. For the purposes of this research and building the model, three out of five sites located on campus fall within 200 m of modeled hydrologic resources.

According to historic-period maps, many of the small tributaries and drainages possibly containing watercourses have changed location over the past 200 years. In order to model all possible locations for water, historic period maps were georeferenced and used to plot these approximate deviations. The same weighting strategy was applied to these features.

6.2.3 Geology

Certain landforms and surface geology have higher potential to yield buried archaeological deposits or contain areas where toolstone can be procured. In order to model these possible areas, a geology dataset was obtained from the USGS Pacific Northwest Geologic Mapping and Urban Hazards data portal (USGS 2006). Polygons for geology designations were grouped into 13 classes for the model area by deposit type/ name and weighted accordingly (see Table 6-1). Alluvium, Lake Deposits, Peat, and Wetland areas have higher potential for cultural deposits. The remaining formations were weighted less due to their decreased likelihood of containing cultural resources.

6.2.4 Previously Recorded Archaeological Sites

A total of 11 previously recorded archaeological sites were documented within the model boundary; 6 of these are located on or immediately adjacent to UW-owned parcels (see Section 2). These GIS

boundaries were digitized from WISAARD. A distance weighting strategy surrounding each site was applied to create a proper mapping buffer; ranges include 0–50 m, 50–100 m, 100–150 m, and greater than 150 m (see Table 6-1). These classes were again weighted 4 to 1, respectively.

6.2.5 Previous Archaeological Surveys

The southern portion of the model boundary outside of campus owned property has been extensively surveyed. These GIS boundaries were digitized from WISAARD. Within campus, portions along NE Campus Parkway, 15th Avenue NE, and the Burke-Gilman Trail have all been previously surveyed. To account for this previous work in the project area, previously surveyed areas were digitized and weighted negatively (-1) (see Table 6-1). Areas not previously surveyed were weighted neutral (0). The intention of this weighting strategy is to cancel out higher sensitivity areas within previously surveyed areas.

6.2.6 Historic Shoreline

The shoreline between Union Bay and Portage Bay has changed over the past 200 years during the development of the Montlake Cut, urban development, and UW expansion. Consequently, historic-period maps were consulted to evaluate the migration of the shoreline over time. Through past research, archaeologists have found higher potential for archaeological sites near these marine landforms. Geographically, these areas were used for both settlement and as areas where people acquired marine resources.

To capture these higher potential areas, the shoreline location from the Treasury Department U.S. Coast and Geodetic Survey T-Sheet Map for 1899 was digitized (USCGS 1899). A 50 m buffer was created around the 1899 shoreline and weighted +3 as a higher potential area (see Table 6-1). The project area outside the buffer was weighted 0.

6.2.7 Historic Map Features

In order to identify current high probability areas for potential known or mapped resources, background investigations by HRA mapped and digitally recorded GLO plat features, consulted USGS historic topographic quadrangles, ethnographic mapping, historic atlas and city maps for Seattle, and historic campus maps mentioned in the background section (Anderson 1890, 1907; Hilbert et al. 2001; Kroll 1912, 1926; Metsker 1936; USGS 1894 to 1908; USSG 1856).

Features such as trails, railways, ethnographic place names, and buildings were digitized from their georeferenced locations. The same weighting strategy was employed here as was used for the previously recorded sites. Multi-ring buffers were created at 50 m intervals and weighted accordingly (see Table 6-1).

6.2.8 Campus Buildings, Landscape Architecture, and Pedestrian Pathways

GIS data covering the UW campus building footprints, landscape architecture, and pedestrian paths was acquired from the campus engineering GIS department. Each layer was weighted for potential influence for disturbance potential or potential to yield buried archaeological deposits. Each layer includes categorical GIS subtypes for outlines at a detailed campus-wide scale (see Table 6-1). These three layers were integrated into the model and defined into three separate variable layers.

Building outlines were separated into aboveground and underground subtypes to define higher or low potential disturbance areas. Underground buildings were weighted -5, aboveground buildings -3, and no building as 1. Likewise, the landscape and pedestrian paths were categorically divided into potential sensitivity class. Those weights and categories are listed again in Table 6-1.

7. Predictive Model Results and Recommendations

All variable weights were spatially combined using a geoprocessing method called a weighted sum overlay. The weights of each environmental variable are added ($W_1+W_2+W_3+\ldots W_x$) across the various themes by summing each raster layer. Then a total weighted value is calculated for a specific location in the project area at a 3-m resolution. In this model, the higher the total weighted value for a specific location, the higher the potential is for the occurrence of an archaeological resource. When the weighted factor of each variable is clearly defined, the weights of individual variables can be discussed and the effects of changing weights can be tested and evaluated. Model information can also be update when new cultural resource or finer resolution datasets become available.

7.1 Model Assessment

The final cumulative model feature class layer includes weight totals from 0 to 26 and is classified into three categories (high, medium, and low). These value groups are determined based in Jenks natural breaks classification. Values of ≤ 10 are considered low potential areas, while totals of 10 to 15 are considered medium, and ≥ 15 is high sensitivity.

For the model area, categories quantities include approximately 12 percent of high potential area (304 acres), 32 percent medium (785 acres), and 56 percent low (1,379 acres) of modeled sensitivity land (Figure 7-1).

In general, the areas of high potential are those located in the area of the sports complexes on the eastern half of the campus. It is likely that the development of the sports complexes has dramatically modified the precontact and historic-period landscape in this area; however, Lockwood et al. (2014) recorded a large historic-period debris scatter in this area, and a number of important ethnographic places are located in this general area as well. As anticipated, areas of low potential are those that currently contain buildings and other facilities, or areas where substantial landscaping has taken place. Moderate potential areas require detailed consideration. For example, the vicinity of the UW Greenhouse has been shown, through a number of subsurface survey efforts (see discussion in Stevenson et al. 2014b), to have been highly modified.

7.2 Recommendations

Through creating this model, HRA identified some discrete areas of archaeological probability across the UW campus and immediately surrounding landscape. In order to effectively use this model for planning, HRA recommends the following:

1) All projects should adhere to cultural resource requirements included as part of their specific funding and/or permitting.

2) Consultation with Native American tribes should take place on projects conducted by the UW as the lead agency under the State Environmental Policy Act (SEPA) and/or Governor's Executive Order 05-05.

3) Consultation with Native American tribes should take place on all projects defined as federal undertakings where federal funding is involved.

4) If a project will take place is an area identified by this model as having low potential to contain archaeological deposits, the project should follow pertinent cultural resource regulations; and

    a) It is likely that only a project specific desktop analysis and inadvertent discovery plan will be needed.

5) If a project will take place in an area identified by this model as having medium potential to contain archaeological deposits, the project should follow pertinent cultural resources regulations; and

    a) It is likely that project specific desktop analysis accompanied by a project site visit by a Secretary of Interior Qualified archaeologist and an inadvertent discovery plan only may be needed. The project site visit should be geared toward assessing and documenting obvious signs of landscape modification (see discussion of Greenhouse in Section 7.1 above).

        i. An archaeological inventory may be needed if no obvious signs of landscape modification are observed.

6) If a project will take place in an area identified by this model as having high potential to contain archaeological deposits, the project should follow pertinent cultural resources and include archaeological inventory work consisting of both surface and subsurface survey.

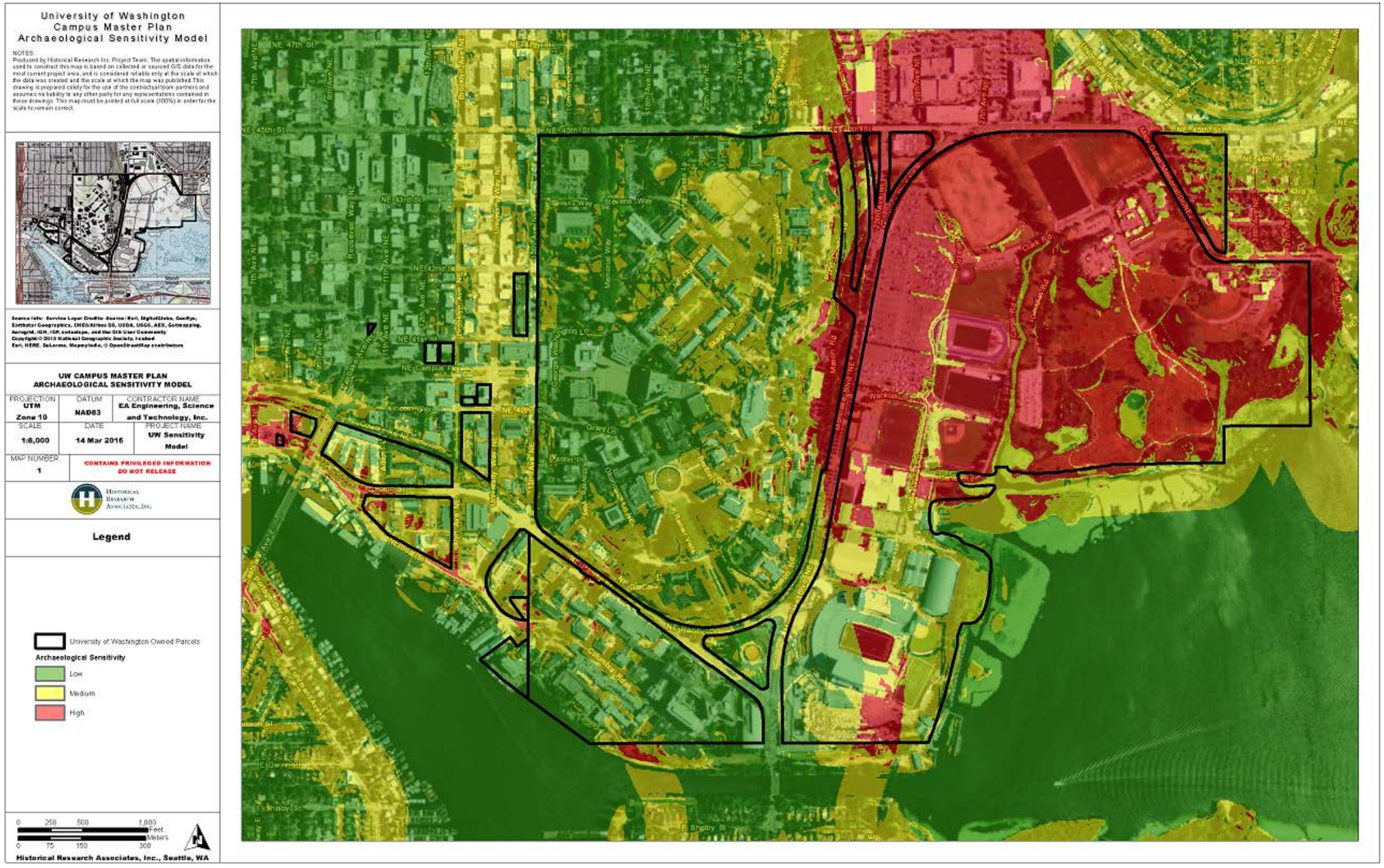


Figure 7-1. Overview of archaeological predictive model.

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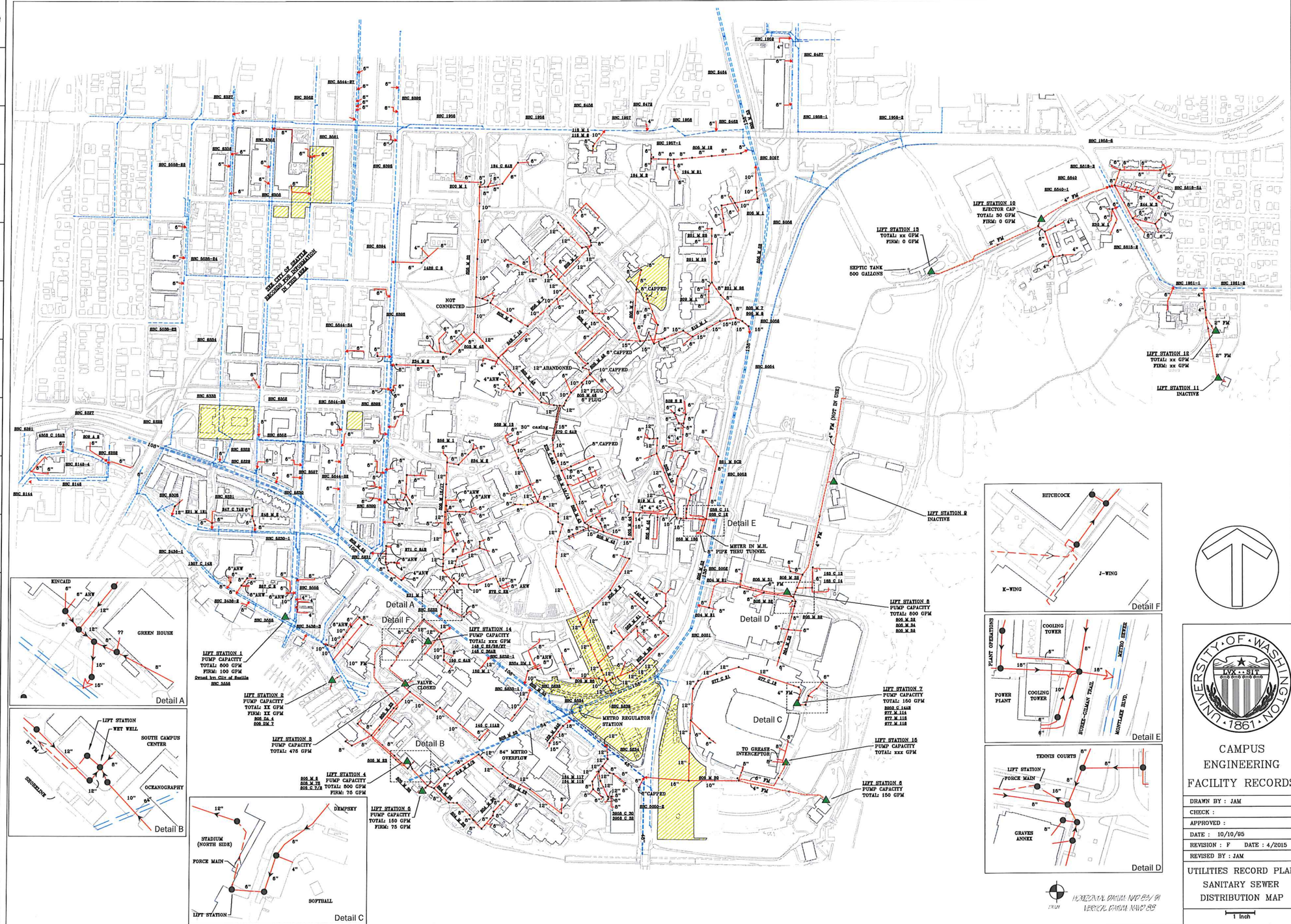
APPENDIX E

Existing Sanitary Sewer System Map



LEGEND

- 1480 C 8 — SOURCE RECORD DRAWING
- SMC 8081 — SEATTLE SEWER CARD
- CONNECTION WITH CITY/COUNTY MAIN
- LIFT STATION 6 PUMP CAPACITY TOTAL: 150 GPM FIRM: 75 GPM (TO BE VERIFIED) — LIFT STATION
- SEWER MANHOLE
- 6" — PIPE – COMBINED
- 6" — PIPE – SEWER
- 4" FM — FORCEMAIN
- STORM CONVEYANCE
- 108" — KING COUNTY METRO
- CITY OF SEATTLE
- CONSTRUCTION AREA

Email Any Drawing Feedback/Comments To: campmap@uw.edu

UNIVERSITY OF WASHINGTON · 1861 · LVX · SIT

CAMPUS ENGINEERING FACILITY RECORDS

DRAWN BY :	JAM
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APPROVED :	
DATE :	10/10/95
REVISION :	F DATE : 4/2015
REVISED BY :	JAM

UTILITIES RECORD PLAN
SANITARY SEWER
DISTRIBUTION MAP

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DRAWING NUMBER
805RU-01

APPENDIX F

Transportation Technical Report

Appendix F

Transportation Technical Report

The Transportation Technical Report is on-file at the University of Washington Capital Planning and Development Office (University Facilities Building. Box 352205. Seattle, WA, 98195).