

SDOT's Multimodal Intelligent Transportation Systems

September 2019 Seattle Department of Transportation



City of Seattle

Our vision, mission, and core values

Vision: Seattle is a thriving equitable community powered by dependable transportation

Mission: to deliver a transportation system that provides safe and affordable access to places and opportunities

Committed to **6 core values:**

- Equity
- Safety
- Mobility
- Sustainability
- Livability
- Excellence



Presentation overview

- Background
- UW MICMA
- Responses to Multimodal Needs
- Traffic Incident Management
- Summary



Intelligent Transportation Systems (ITS)

- ITS transforms a static road network into a dynamically responsive, data-driven system to balance multimodal needs.
- ITS allows us to get the most out of the transportation network – it is essential in Seattle’s current environment



ITS Program: What we do

Multimodal Traffic Operations

- Timing/operations of 1100 signals
 - Coordinated Operation
(Most N/S Arterials)
 - Traffic Responsive
(CBD, Elliott Ave, East Marginal Way)
 - Traffic Adaptive Operation
(Mercer)
 - Event/Construction Operations
(SODO, Seattle Center)
- Accessible Pedestrian Signals (APS)
- Rapid Rectangular Flashing Beacons (RRFBs) & School Flashers
- Bicycle Signals and Detection
- Transit/Rail Signal Priority



ITS Program: What we do

Traffic Incident Management

- Transportation Operations Center (TOC) 24X7, Helping to Manage:
 - 300 to 400 incidents/mo
 - 35 “major incidents” (>90 min)
 - 35 road construction projects
- Incident Management Actions:
 - Inter-agency data sharing
 - Dynamic Message Sign (DMS) messages
 - Tweets/website/Emails
 - CCTV incident detection/monitoring
 - Incident data collection

Real-time Information

- Travelers Map and DMS
 - Travel Times/Bridge openings/At-grade rail crossings
- Performance monitoring





ITS Is Essential For Multimodal Balance

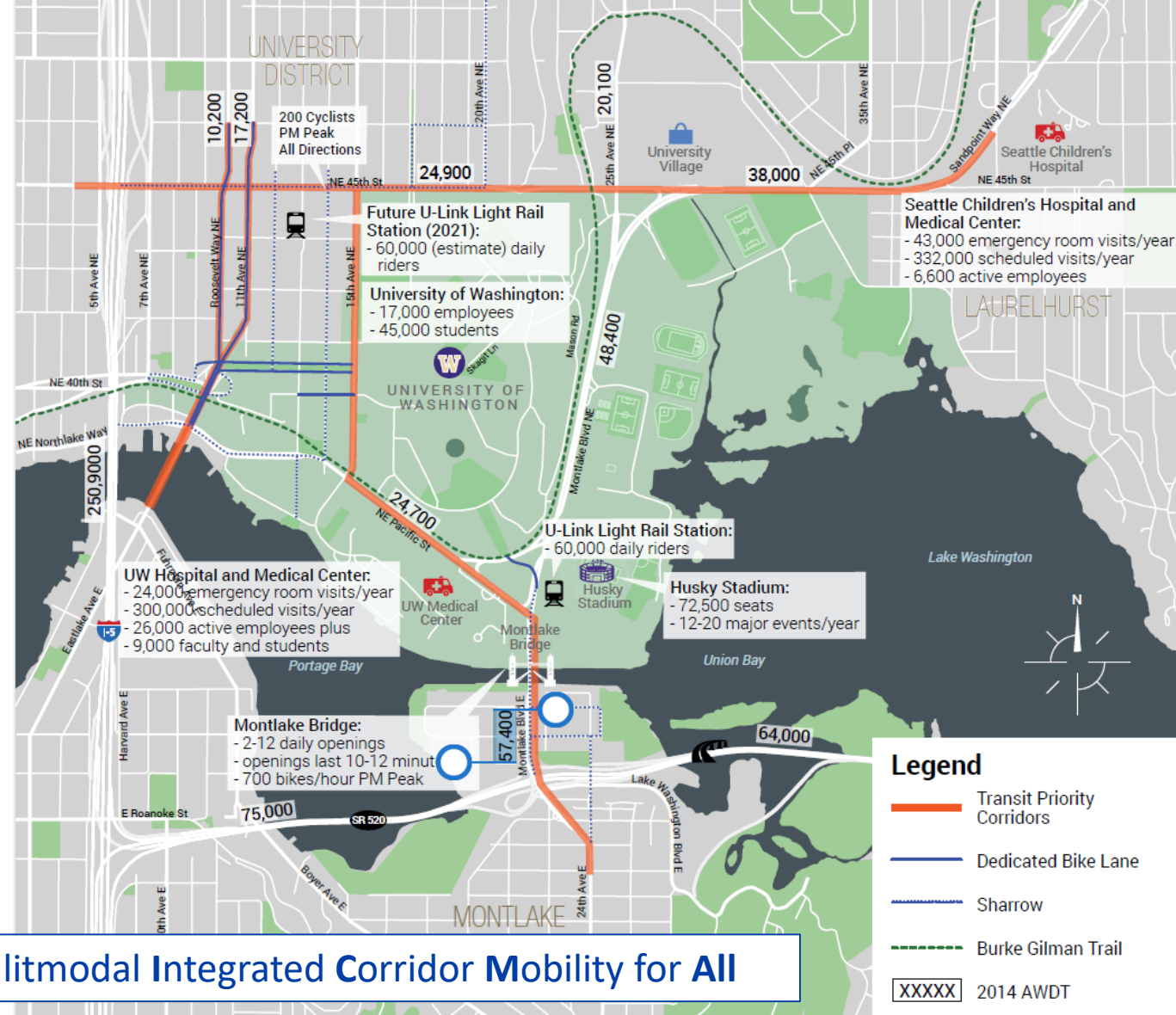
- For Transit
 - Manage vehicle movement to support transit operations
 - Transit signal priority
- For Pedestrians
 - Signal operations to support pedestrian movement and safe crossings.
- For Cyclists
 - Passive detection and signal timing for cyclists
- For Freight
 - Provide travel time information to freight destinations
 - Provide real-time bridge opening and rail crossing information (available to all)



The UW MICMA Project

Focused on multimodal mobility, the project addresses a core need to upgrade aging outdated traffic operations/ITS infrastructure

- Pedestrians
- Cyclists
- Emergency Vehicles
- Disabled Access
- Coordinating freeway and arterial operations



UW MICMA Multimodal Project Components

Safe Pedestrian Movement	Bicycle Mobility	Disabled Access	Emergency Vehicle Response
<p>Pedestrian Surge Management (Pilot)</p> <ul style="list-style-type: none"> • Passive pedestrian detection • System will count pedestrians and modify signal timing if needed to serve surges • No other systems in the US provide pedestrian demand-based signal timing 	<p>GiveMeGreen/SiBike Cell Phone Apps (Pilot)</p> <ul style="list-style-type: none"> • Cyclists with the app will place calls to the traffic signal, just as vehicles do 	<p>Accessible Pedestrian Signal Operations</p> <ul style="list-style-type: none"> • Audible and tactile push buttons • ADA ramps where improvements require <p>Mobility-As-A-Service</p> <ul style="list-style-type: none"> • Incorporate accessible walking paths into the City's data set 	<p>Green Wave (Pilot)</p> <ul style="list-style-type: none"> • Will clear traffic in advance of approaching emergency vehicles headed for emergency rooms • Relies on adaptive traffic signal control for response and recovery of traffic flow



Responding to Multimodal Needs - Transit

SDOT has operated passive Transit Signal Priority (TSP) for more than 25 years

- Queue jumps
- Signal green extension
- Transit-only signal phases

What's Next for Transit Operations

KCM and SDOT have agreed to jointly develop a new system for transit signal priority

- The new system will exchange real-time data from KCM's bus location/dispatch computer system to SDOT's signal operations computer systems – work to begin in 2020
- Will enable additional and enhanced transit-focused operations





Responding to Multimodal Needs - Pedestrians

SDOT has listened and responded to pedestrian concerns over adaptive control on Mercer, and pedestrian operations across the city

- Changed operations to be more supportive of pedestrian needs
 - Rest in WALK on Mercer with WALK/FDW time to match vehicle timing - east of Warren Ave N Button push needed to cross Mercer
 - WALK comes up concurrent with vehicle phase for all pedestrian crossings (no button push needed for any crossing) - at Queen Anne Ave N and 1st Ave N

What's Next for Pedestrian Operations

1. Passive pedestrian detection will be piloted as part of the UW MICMA project in 2020
 - The pilot will include changing pedestrian signal timing in response to high-volume pedestrian “surges”, such as from the UW Sound Transit station – minimizing the flow of pedestrians that are stopped at the signal
2. SDOT is developing a policy on pedestrian operations at traffic signals that incorporates pedestrian volume and safety into pedestrian signal operations choice
3. SDOT is monitoring emerging technology for passive pedestrian detection, that is just now being field tested in CA and AZ





Responding to Multimodal Needs - Cyclists

Cyclist passive detection has been in place at selected locations in the City for more than 10 years

- Video
- Loop detectors

Cyclist passive detection is incorporated into existing SDOT work plan

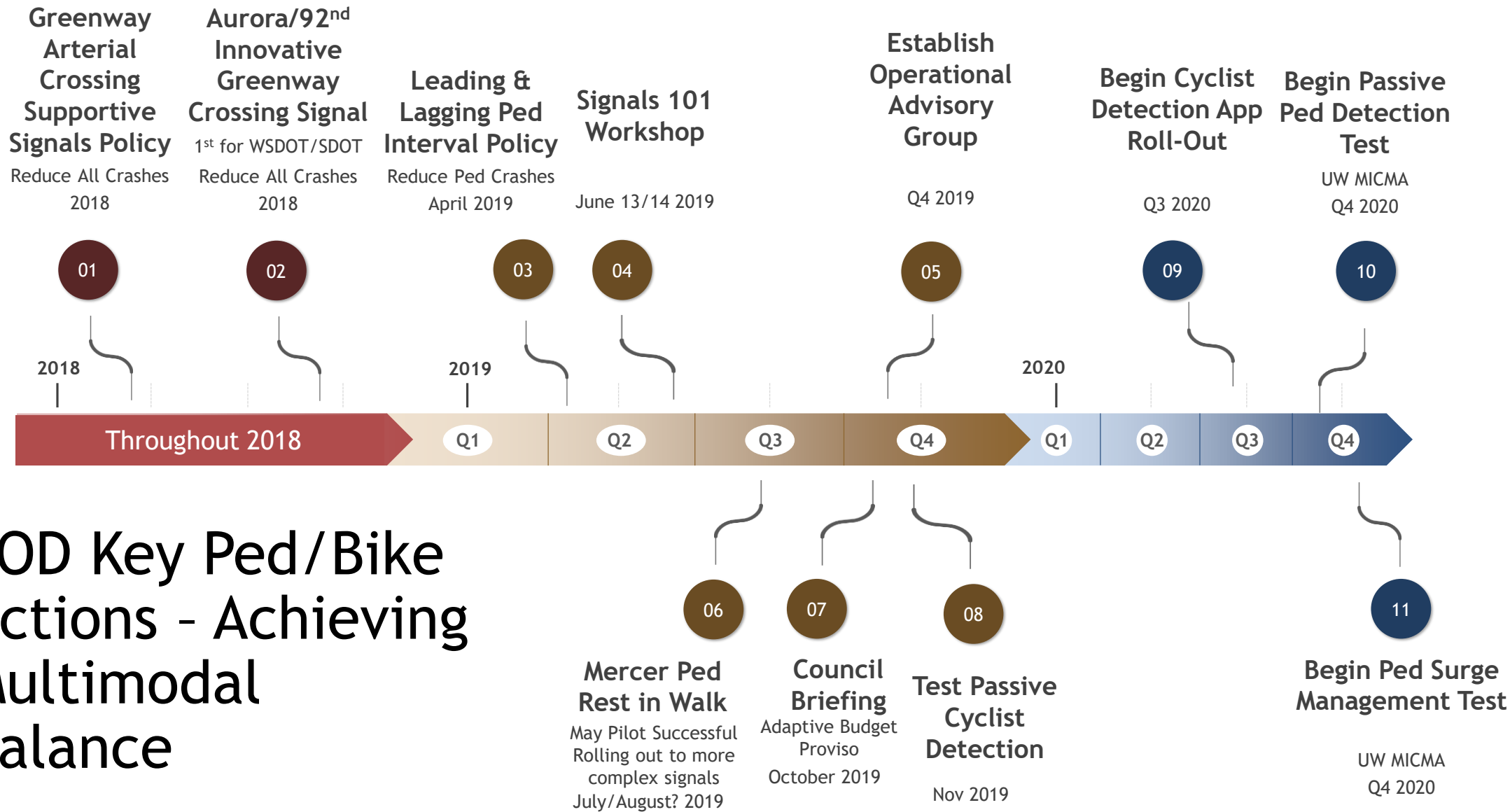
Protected bike lane facilities include signal timing focused on cyclists



What's Next for Cyclist Operations

1. Two providers' cyclist detection phone apps will be piloted as part of the UW MICMA project in 2020
2. Testing of new video-based cyclist passive detection will begin in Winter 2019





TOD Key Ped/Bike Actions - Achieving Multimodal Balance

Responding to Multimodal Needs - Freight

Freight operator information provision:

- Provide freight-focused travel times and bridge opening information on Dynamic Message Signs on the road
- Traffic signals designed and operated to ensure freight clearance in balance with other modes



What's Next for Freight Operations

Our Port and freight community partners have advised us that actionable information is a priority

- Deploying rail crossing delay information system in 2020 (also available to the Fire Department dispatch, Police dispatch and all travelers)
 - Piloting rail crossing delay prediction in 2021 – support Fire and Police dispatch, and all travelers
- Working to share CCTV camera images with Port to manage truck queues (dependent on Port funding)

Traffic Incident Management (TIM)

What SDOT Does:

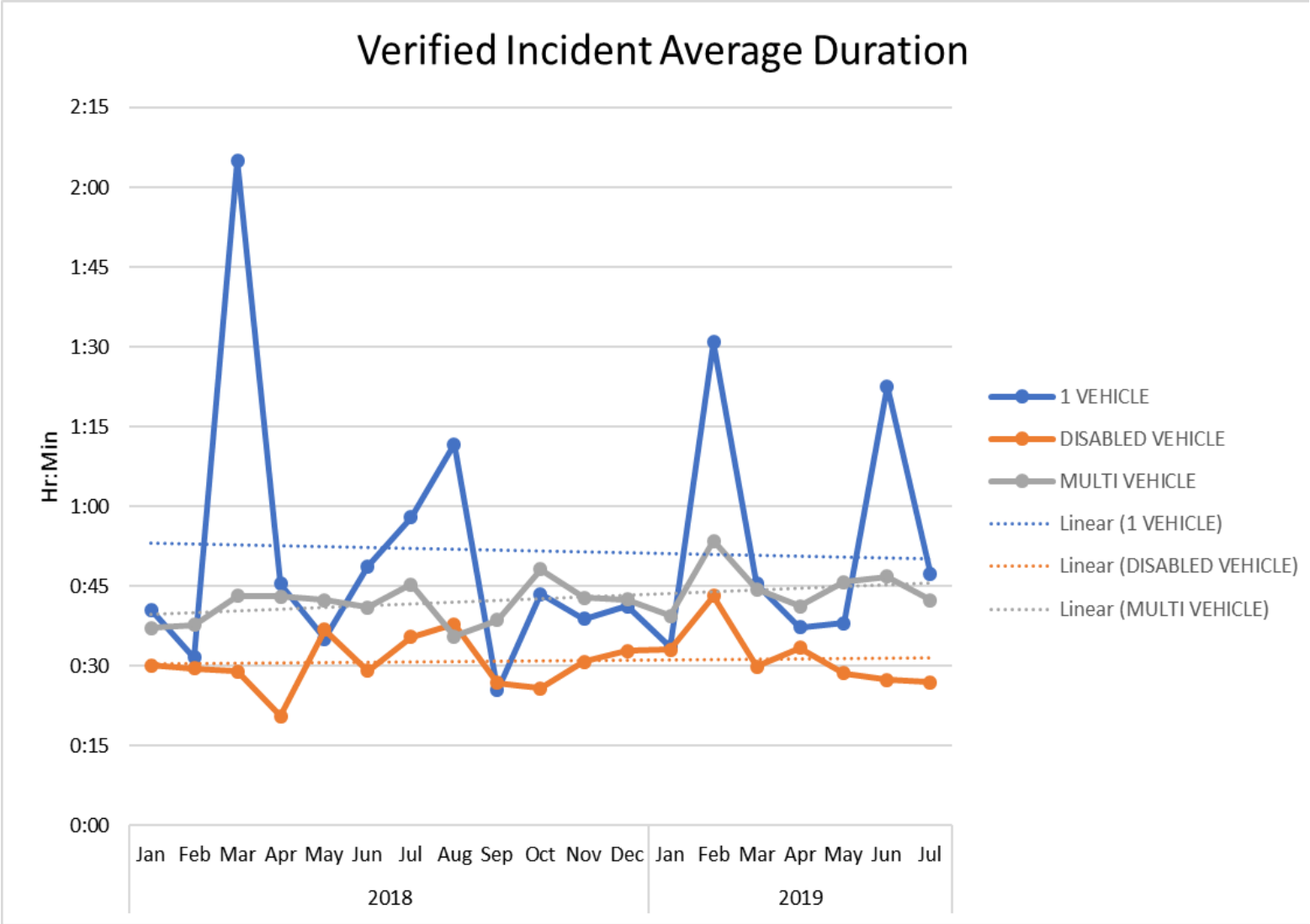
- Information provision/coordination with TIM partners
- Public information (DMS, tweets, emails, travelers web site)
- SDOT Response Team (SRT)



Incident Durations

Incident duration trends remain steady in 2019

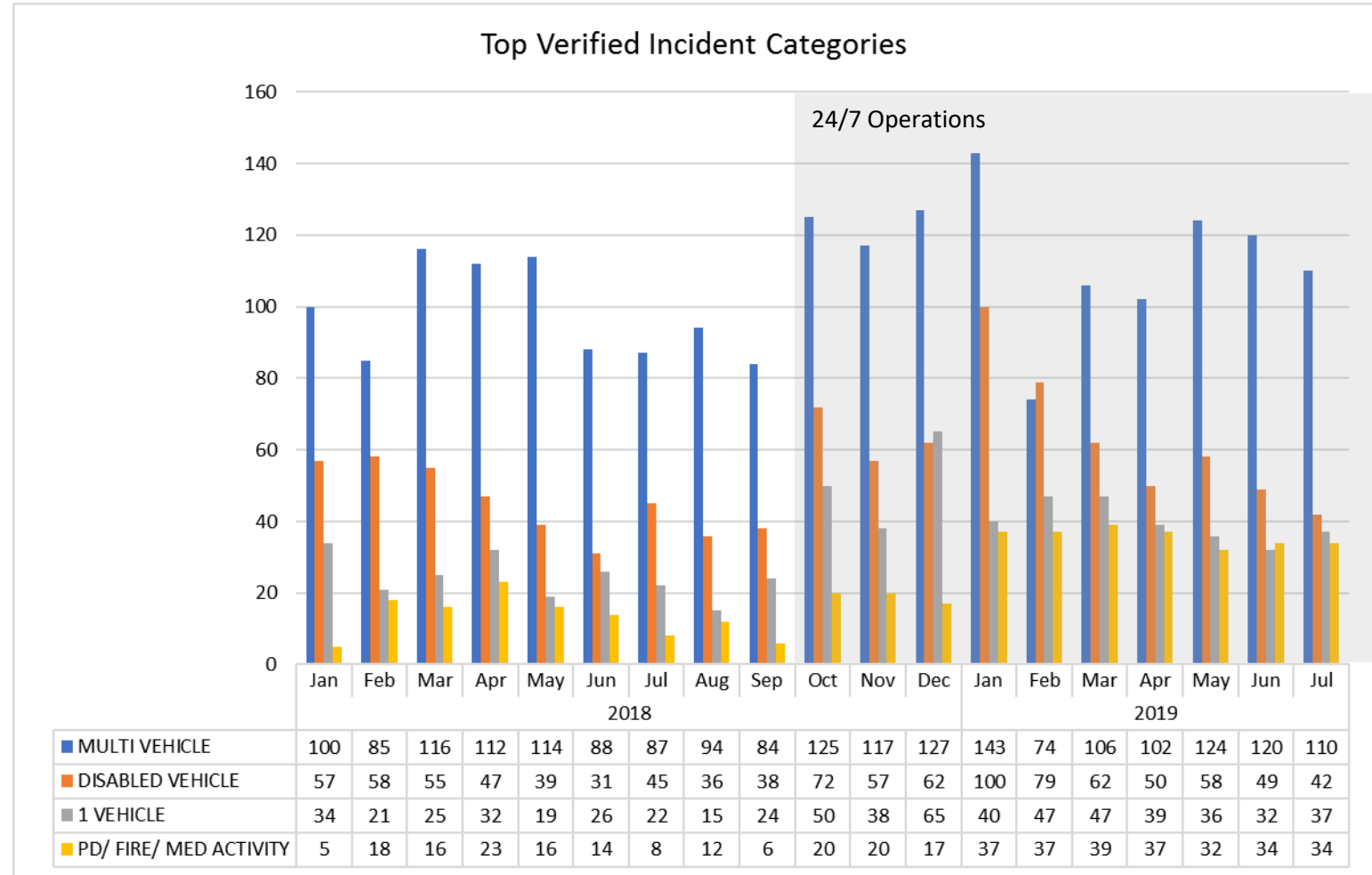
- Increase in traffic volumes
- TIM partners (SFD, SPD, SRT, SDOT, WSDOT) continue to improve TIM response procedures



Traffic Incident Management

Increased tracking to improve incident management:

- 24X7 operations
- More CCTV cameras
- More info provided to traveling public



Multimodal balance in Seattle requires:

Listening to, learning from, and responding to the needs of all modes

- SDOT will work to improve connections to modal stakeholder communities
- Continued connection to business, freight, pedestrian, cyclist and transit stakeholders via existing processes

Unique, leading-edge technologies and approaches

- Research, development, and technology pilots will be key in moving forward with the following **for 2019/2020**:
 - Passive vehicle/bike detection testing
 - Pedestrian responsive signals and passive pedestrian detection (UW MICMA)
 - Green Wave for SFD (UW MICMA)
 - Cyclist passive detection app (UW MICMA)
 - King County Metro/SDOT center-to-center Transit Signal Priority development

Questions?

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