Towards banning gas powered leaf blowers in Seattle

Text of Presentation by Quiet Clean Seattle

Regarding Resolution 32064

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Introduction

The mission of Quiet Clean Seattle is to find an acceptable way to reduce or eliminate leaf blower impacts. In this talk I plan to thoroughly scare you about the detrimental effects of leaf blowers. Scare you so much that you'll be convinced to enthusiastically vote "yes" on CM Pedersen's resolution. Frankly, I'd prefer to see leaf blowers banned for almost all uses. But today I'll focus on the resolution at hand.

Are we numb to the hazards created by leaf blowers? I've heard people say they are part of the cost of living in a modern society. Well, up through the 80s the "cost" of eating in a restaurant was to inhale second hand cigarette smoke. It took a lot of civic and government action to change that.

Some people say they are disgusted with leaf blowers but what would happen to the landscape workers' jobs without them? First off, no one is proposing to eliminate or restrict yard service companies. Even if we were to completely ban leaf blowers, the demand for lawn mowing, trimming, pruning, and edging would continue. The difference might be slightly less scoured earth and tarmac, since rakes and brooms leave some dust behind.

What about the workers themselves? If we really want to protect the workers, shouldn't we be making their jobs safer? Breathing the exhaust from 2 stroke engines is significantly harmful to their health. Some of the most harmful particles are so small that they directly flow through an N95 mask and immediately into the bloodstream. These workers subject themselves, perhaps without complaint, because they need to work. They could be working much more safely with electric equipment.

Noise and Mental Health

Some people seem to be able to focus and tune-out distractions. My wife is one of them and doesn't really notice leaf blowers so much. On the other hand, when a leaf blower is blaring somewhere nearby, I tend to reread the same sentence about five times. I just can't concentrate. Beyond distraction, there are more serious effects of excessive noise.

While I haven't found any scientific studies directly measuring correlation between leaf blower noise and ability to concentrate, there are plenty of studies about noise in general. Here are some noteworthy results:

- Excessive noise causes cognitive impairment and oxidative stress in the brain. This contributes to depression and neurodegenerative disorders, according to the National Institute of Healthe (NIH). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6901841/

- Some individuals enjoy the ambiance of a noisy office. Others have an extreme aversion, known as misophonia disorder, where certain sounds can trigger extreme anxiety, rage, or panic, as reported on BBC: https://www.bbc.com/worklife/article/20191115-office-noise-acceptable-levels-personality-type

- For someone with ADHD, tapping a pencil or a cough can feel like torture, from testimony in the ADDitude magazine. How do leaf blowers affect their concentration? See: https://www.additudemag.com/adhd-noise-distractions/

- During the pandemic, a SWNS (South West News Service) survey asked 2003 US respondents about noise. 25% have become more sensitive to loud music, 43% to loud conversations. 52% said loud noises give them headaches. https://swnsdigital.com/us/2022/02/over-half-of-americans-have-become-more-sensitive-to-noise-since-the-beginning-of-the-pandemic/

- Scientists from Northwestern University found that creative people can't cope with noise. They have a reduced ability to filter extraneous external sensory information. I think this applies to a large sector of people. Maybe you are one of them! https://spinalresearch.com.au/creative-geniuses-cant-concentrate-background-noise/ (Study Link)

- NIOSH (National Institute for Occupational Safety and Health) says ambient noise affects health by increasing general stress levels and aggravating high blood pressure, coronary disease, peptic ulcers, migraine headaches, and other stress related conditions. Further, continued exposure does not lead to habituation; in fact the effects worsen. https://www.scientificamerican.com/article/ask-the-brains-background-noise/

- In 2011, scientists studying people living near seven major European airports found that a 10dB increase in aircraft noise related to a 28% increase in usage of anxiety medication. Another study showed that people living in areas of higher traffic noise than quiet areas were 25% more likely to have symptoms of depression.

- How much is too much noise? Toronto Public Health claims health impacts occur at levels between 42 and 60 dBA outdoor, and the WHO (World Health Organization) set guidelines of 55 dBA daytime and 40 dBA evening exposures. Currently Seattle's limit in residential areas is 70 dBA, which is way too high, but even that is rarely enforced. And that says nothing about what the operators are exposed to.

It's an obvious conclusion that leaf blowers are breaking some people's concentration and may be triggering rage in a percentage of people. Does it make sense to continue to ignore these effects, which are chipping away at Seattle's livability? What other effects are caused by gas leaf blowers?

Other Health Effects

While it's clear that a large engine produces far more CO2 than a small engine, CO2 is generally not harmful to health. And while a modern vehicle engine has a catalytic converter and various other pollution control mechanisms, it's easy for people to forget about all the particulate matter that comes out of a small engine. As I explained earlier, most of this particulate is at the molecular scale and passes freely through N95 masks, immediately entering the bloodstream. That means, when you're around a gas powered leaf blower, you are inhaling dangerous particles and there's really not much you can do about it.

- A PNAS (Proceedings of the National Academy of Sciences) publication shows that increased PM2.5 correlates to increased inhaler use for people with asthma. The publication estimates that just a 1 microgram/m3 *decrease* would be a health savings of $350 million annually. https://www.pnas.org/doi/10.1073/pnas.1805647115

- A similar study in PubMed of NIH (National Institutes of Health) shows that asthma increases with increases in PM2.5. https://pubmed.ncbi.nlm.nih.gov/27385358/

- The "Air Quality News" website explains that PM2.5 overdrives the immune system, worsening asthma. The body uses normal inflammation to remove toxins, but over inflammation causes other problems, such as Asthma. https://airqualitynews.com/2019/07/30/pm2-5-sends-immune-system-into-overdrive-worsening-asthma/

- Here's another study by the ACS (American Chemical Society): they found that increases in daily exposure to PM2.5 were significantly associated with increased small, large, and total airway resistance and decreased lung function. What does that say about operator safety? https://pubs.acs.org/doi/10.1021/acs.est.0c06114

- The EPA also reports that ozone is well known to correlate with the development of asthma. Children exposed to even low levels of ozone (one of the gases leaf blowers exhaust) caused a decrease in lung function as well as pulmonary effects. Furthermore, coarser particulates (PM10), which include roadway particles from brakes and tires plus various metals, also increased the onset of asthma and emergency room treatments. https://www.epa.gov/sciencematters/links-between-air-pollution-and-childhood-asthma

The exhaust of 2 stroke engines causes more than decreased lung function and asthma. What other damage do these gases and particles do?

- The WHO says that PM2.5 causes cardiovascular disease, respiratory disease, and cancers resulting in 4.2 million premature deaths worldwide per year. 58% of those deaths are heart disease and stroke, 18% respiratory infections and chronic obstructive pulmonary disease, 6% lung cancer. https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health

- The WHO goes on to explain that the major components of PM2.5 from 2 stroke engines are sulfate, nitrates, ammonia, sodium chloride, black carbon, mineral dust, and water. It's a complex mixture of these particles suspended in the air. Because the particles are so small, they pass through the lung tissue directly into the blood system.

- In Canada, the Forest Practices Branch of BC Ministry of Forests writes that 2 stroke engines produce a lot of harmful particles, such as benzene, formaldehyde, naphthalene, benzopyrene, carbon monoxide, nitric oxide, and more. All of these directly impair health and also cause nervous system disorders, such as lower competence. https://www.for.gov.bc.ca/hfp/publications/00012/3-dost-powersawemissions.pdf

- And, like I said, N95 masks won't help. The Massachusetts Nurses Association explains that

  N95 respirators are 95% efficient in stopping particles down to about 0.1 microns. But gas molecules (NO, CO, hydrocarbon molecules) are on the nano scale and pass freely through the fibers in an N95 mask. https://www.massnurses.org/health-and-safety/articles/chemical-exposures/p/openItem/1318

Summary

I don't know how much PM2.5 is in the air due to leaf blowers. I'd love to see a study that compares the levels before, during, and after leaf blower usage. How much higher is the PM2.5 level and how long does it hang in the air? Certainly it's hazardous to the operators. Let's also find out how much of it gets into peoples' houses, especially in summer with windows open.

I've focused on gas leaf blowers, which have nasty exhaust plus make excessive noise. I hope our campaign against these blowers is successful. But in the long run, I hope we can go further. Electric blowers still make a lot of noise. And they still kick up dangerous PM2.5 from dry ground and hard surfaces. And there are a myriad of other small machines powered by 2 cycle engines. Once we get rid of gas blowers, let's continue addressing the remaining problems.

Reducing the awful noise from gas leaf blowers is reason enough to adopt CM Pedersen's resolution. But, as you can see, gas blowers are far worse than just making excessive noise. And that's scary!

I believe Seattle residents will strongly support this resolution. CM Pedersen's recent survey shows that about 83% of respondents support banning gas blowers. The Quiet Clean Seattle's membership is growing. The support is apparent. Please make our city better, cleaner, and quieter by adopting Resolution 32094.