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Gas Powered Leaf Blower Noise and Emissions Factsheet 11.12.2019
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Below is a compilation of facts and associated sources regarding the public hazards posed by Gas Powered Leaf Blowers.

1. Extreme Noise

High Decibel Noise - Portland has committed to minimize noise levels within the city to maintain quality of life. Title 18 of the Portland City Charter, Code and Policies - Noise Control states "It is the intent of the City Council to minimize the exposure of citizens to the potential negative physiological and psychological effects of excessive noise and protect, promote and preserve the public health, safety and welfare."[1]

Under Title 18, Leaf Blowers must operate under 65 dBA for year round use and under 70 dBA for use from Nov 1 - Feb 28. The Office of Neighborhood Involvement has published a list of available leaf blower models that comply with these standards. On the current list, there are only 2 gasoline engine backpack style blowers that comply with the year round standard. Since back pack style blowers are the standard choice for commercial lawn and garden services, it is therefore exceedingly likely that most commercial operations are not in compliance with Title 18 for at least half of the year.

A discussion with the staff at Noise Control, Office of Neighborhood Involvement revealed that complaints about noise from leaf blowers are one of the "top three sources of complaints" during the fall season. They also admit that this ordinance is nearly impossible to enforce due to the small staff of the Noise Control office and the fact that by the time a complaint is made and an officer arrives at the scene, the leaf blower is no longer being used.

Reviewing the noise ratings of the backpack leaf blowers available from typical suppliers, nearly all of the backpack style gas powered blowers operate at over 70dB and many are as high as 85 - 100 dB.[2] This would put most gasoline powered backpack style blowers out of compliance with the wintertime standards as well.

Low Frequeny Noise - The low frequency of gas powered leaf blower noise is also part of the problem that is not captured by the decibel ratings. A Study by the Harvard School of Public Health show that low frequency sound travels farther and penetrates walls and buildings more effectively than higher pitched sound[3]. The study concluded that a single gas powered leaf blower could

negatively impact up to 90 surrounding homes in typical urban densities versus 6 homes for a powerful electric blower. Electric engines operate at higher frequencies which is why they are significantly less "noisy" than gas powered blowers.

Hearing Loss and Hypertension - Most people consider the noise from gas powered leaf blowers to be annoying, but the noise they generate is also a health risk. Prolonged or repeated exposure to sound levels above 85dB which are common with backpack style leaf blowers can cause permanent hearing loss[4]. Multiple studies have found a correlation between exposure to ambient noise over 55dB and a higher incidence of arterial hypertension and cardiovascular diseases[5].

2. Health Risks

Dangerous Emisions - The concentrated emissions from lawn and garden equipment include high levels of benzene, butadiene, formaldehyde and fine particulates, all of which are known carcinogens or known respiratory, cardiovascular and neurological health risks and which lead to increased levels of mortality in children and the elderly.

The EPA has published a report titled "National Emissions from Lawn and Garden Equipment",[6] which states:

"Gasoline-powered lawn and garden equipment is a source of high levels of localized emissions that includes hazardous air pollutants, criteria pollutants, and carbon dioxide. Workers using commercial equipment are exposed when they are close to the emitting sources several hours each day, several days a week in seasons of use. Other members of the public, including children, may also be exposed to high levels of emissions from commercial landscape maintenance equipment."

"The very substantial contribution of VOC, in particular benzene and 1,3 butadiene, deserves attention especially because of their localized nature."

"Extensive evidence exists on the adverse health effects of exhaust emissions and other fine particulates which include cardiovascular disease, stroke, respiratory disease, cancer, neurological conditions, premature death, and effects on prenatal development."

"Communities and environmental, public health, and other government agencies should create policies and programs to protect the public from GLGE air pollutants and promote non-polluting alternatives".

The American Lung Association[7], the World Health Organization[8], and the American Heart Association[9] all report on the serious cardiovascular, neurological and respiratory health risks associated with the fine particulates and

other pollutants which are documented to be released in high concentrations by this EPA study. The American Cancer Society[10] states that exposure to benzene, which is common when working around gasoline and gasoline combustion, causes leukemia and other cancers of blood cells.

Environmental Justice - The health risks associated with lawn and garden equipment are highest for those who operate this equipment continuously. They are exposed to very high levels of pollutants for many hours each day. They are also exposed to very high noise levels that can induce permanent hearing loss if proper ear protection is not worn at all times. These operators are typically low wage workers. This puts additional, disproportionately high health risks upon this low income population who are some of the least able to avoid those risks.

3. Hazards to the Environment

Air Pollution - Gasoline powered leaf blowers typically use small two stroke engines which emit many more air pollutants than automobiles including Carbon Monoxide, Non-Methane Hydrocarbons and Oxides of Nitrogen. While manufacturers have made steady reductions in two stroke engine emissions, they are still one of the largest sources of air pollutants in this country.

A widely cited study conducted at the American Automobile Association's Automotive Research Center commissioned by Edmunds InsideLine.com[11] found that a typical two stroke leaf blower emits hundreds of times more hydrocarbons than the Ford Raptor Pickup truck that was used as a control.

"The hydrocarbon emissions from a half-hour of yard work with the two-stroke leaf blower are about the same as a 3,900-mile drive from Texas to Alaska in a Raptor."

Due to the increasing numbers of lawn and garden equipment powered by small gasoline engines, the California Air Resources Board projects that total smog forming pollution emissions from small engines will exceed those from passenger cars by 2020 in the state of California[12]. They recommend a major shift toward electric equipment in order to hit state emissions reduction targets.

"For the best-selling commercial leaf blower, one hour of operation emits smog-forming pollution comparable to driving a 2016 Toyota Camry about 1100 miles, or approximately the distance from Los Angeles to Denver."

Carbon Emissions - Gasoline powered leaf blowers combust fossil fuels and create carbon emissions just like automobiles. According to the US Department of Energy[13], 1.2 billion gallons of gasoline are consumed annually in the US for lawn and garden maintenance, and a significant portion of that is spilled while filling gas tanks. Roughly 25 pounds of CO2 are emitted per gallon of gasoline burned[14], which means nearly 15 Million Tons of CO2 are emitted per year for lawn maintenance.

Backpack style leaf blowers typically consume .43 gallons of fuel per hour of operation[15]. This translates to 11lbs of CO2 per hour of use. Because they are small engines that do not comply with automobile emissions standards, they also emit large quantities of fine particulates and black carbon due to incomplete combustion of the fuel. According to the Center for Climate and Energy Solutions, these particulates have additional global warming effects beyond the CO2 released during combustion[16].

"Black Carbon has recently emerged as a major contributor to global climate change, possibly second only to CO2 as the main driver of change."

Solid and Toxic Waste - Beyond the fumes and emissions, gas powered blowers also produce thousands of pounds of solid toxic waste and plastics waste yearly in the form of contaminated air and fuel filters, spark plugs, gaskets and plastic two cycle oil containers that are sent to landfills[16]. Filling gas tanks and mixing two cycle oil often results in spilling toxic liquids, and residual oil from used containers can find their way into water systems and harm local ecosystems. Common fluids used for engine maintenance - carbeurator cleaners and engine degreasers are highly toxic fluids with high VOC content that require care in use and special disposal procedures[17].

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