

April 30, 2019

To: **Town Board New Castle, NY**

From: [Larry Will](#)



Having reviewed the [summary prepared by the New Castle Sustainability Advisory Board \(SAB\)](#), I find that there are several inexactitudes that you should be aware of, which are presented in support of their indictment of the gasoline powered leaf blower. I have information that clarifies, and in some cases, refutes certain questionable statements. I am a leaf blower expert with more than twenty-five years' experience working for a lawn care equipment manufacturer. The information I have included in this commentary is based partly on my own personal experience and partly on reputable sources of information to which I have provided Internet links.

I am a former Vice President of Engineering for a leading manufacturer of lawn care products. As a leaf blower expert in design, manufacture, application and use, I am in a unique position to supply up-to-date and accurate data and facts. I have been interviewed for many articles written by several leading news organizations including The Atlantic, New Yorker, Guardian, Miami Herald and on camera for CBS News Sunday Morning. I was also invited to make a presentation before the National Academy of Engineering in Washington DC, because I am the only nationally known expert totally familiar with the leaf blower issues of sound and environmental impact. I have helped more than [180 communities](#) sort fact from fiction, which typically resulted in a reasonable, effective and enforceable regulation.

As stated in the Advisory Board's opening paragraph, they are admittedly searching for only the negativities associated with gasoline powered leaf blowers, in order to justify an ordinance to ban them. I provided contrasting points of view to the Board back in August 2018, but none of my comments appeared in their report for I suspect that all of them were in conflict with their stated goal. The other issue you should have with the report is that they have filled it with quotations based on opinion and derogatory innuendo. The sources have impressive titles, but these sources have no real understanding of the modern leaf blower design or its uses. I think it would be a mistake to not give at least the same attention to the other side of the issue as was given to the condemnation of the blower. What about those that use them? What about those that need them in their

work? What about all the changes and improvements that have been made to the blower? What about the facts?

Since the primary purpose of the proposed ban is to remove the gasoline powered leaf blower's impact on the environment, I want to point out that this action is illegal per [Section 209 of the Federal Clean Air Act, 1990](#). The control of hydrocarbon exhaust emission from Small Non-Road Spark Ignited Engines, which includes the leaf blower, is a subset of this Act and is bound by its limitations.

No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part. No State shall require certification, inspection, or any other approval relating to the control of emissions.

A copy of a letter from the Outdoor Power Equipment Institute (OPEI), Alexandria, Virginia, to Solana Beach, California, at the following website explains it more precisely: [OPEI letter to Solana Beach](#)

Regardless, let me explain why hydrocarbon emission from a leaf blower should be of no concern to New Castle. The comment that 30% of the fuel passes straight through the engine unburned, is no longer the case. Hydrocarbon exhaust emission from these small engines has been reduce by 85 to 90%, depending on engine size and overall design. The EPA mandated this requirement as of January 1, 2005, that's 14 years ago. Furthermore, the amount of lubricating oil added to the fuel has been reduced from a 16 to 1, gasoline to oil ratio, to 50 to 1. Add to that the fact that the lubricating oil has been upgraded to a synthetic blend, exhaust pollution is now well within the limits of what is considered acceptable for the environment by the Federal EPA.
<https://www.leafblownoise.com/emission%20graph.htm>

Those that use EPA limits to justify that leaf blowers are much worse for the environment than are automobiles are just plain wrong. Automobiles cannot be compared directly to leaf blowers using published emission limits without first converting to like units.

The EPA measures emissions by "hydrocarbons per mile" for the automobile, and "hydrocarbons per horsepower-hour" for small off-road engines. Comparisons must be calculated after converting hydrocarbon emissions to "Total Kilograms per week", for example. To put this in perspective, think in terms of households.
<https://www.epa.gov/vehicle-and-fuel-emissions-testing/vehicle-testing-regulations>
<https://www.ecfr.gov/cgi-bin/text-idx?SID=fc799a21d4ca6f413913715af7c09e88&mc=true&node=pt40.36.1054&rqn=div5>

When it comes to hydrocarbon emissions, here is an interesting comparison: The most common use for a leaf blower is to remove debris from a sidewalk and driveway after

mowing the lawn and trimming the hedges. People generally work in their yards once a week and they use handheld equipment for about 1/2 hour. Of that, about 10 minutes is spent blowing grass clippings from the drive way and clearing the deck of nature's debris. The same household most likely has a car which is driven to work five days a week, burning about 18 gallons of gasoline if driving stop and go in the city. A leaf blower will burn maybe 10 ounces. A gallon, by the way, is 128 ounces. A week's worth of automobile driving for a typical homeowner is 30 times worse for the environment. An SUV is 45 times worse than a leaf blower. You can easily calculate what happens if two people in the household drive to work separately. To compare automobiles to all handheld lawn care equipment, not just leaf blowers, click the following link:

<https://www.leafblownoise.com/carchart%20comparison.htm>

On page 6 of the report, Edmonds.com was referenced. It is cited because it makes an impressive statement regarding a comparison between the leaf blower and a Ford Raptor truck. It falsely states that leaf blowers are worse than a Ford F-150 pickup truck when it comes to emission. This argument is so ridiculous that people think that a reputable organization like Edmonds wouldn't say something this unrealistic if it were not true. The more often this edmonds.com article is cited, the more credible it seems, which is a typical political approach to convincing the uninformed of an untruth. I don't consider Edmonds credible because they will not even respond to my request to discuss their finding. I believe they are afraid they will be exposed as a purveyor of false information, which is what should happen. To learn why it's ridiculous, please review the following paper. <http://leafblownoise.com/edmonds%20test%20response2.pdf> .

One unregulated form of exhaust emission present as part of the combustion process is greenhouse gas or CO₂. I am always amazed when I hear someone try to blame this type of emission on leaf blowers. What we have here is a clear misunderstanding of what greenhouse gas is, and how it is formed.

<http://pubs.acs.org/cen/whatstuff/stuff/8308gasoline.html>

Gasoline is a hydrocarbon, which when completely burned turns into water vapor (H₂O) and Carbon Dioxide (CO₂). In concept, this equation is valid for all types of hydrocarbon combustibles such as coal, oil, wood, grass, leaves and all sorts of materials that are typically incinerated. Carbon dioxide generation is directly proportional to the amount of carbon-based fuel burned.

http://earthguide.ucsd.edu/eoc/special_topics/teach/sp_climate_change/p_burning_gasoline.html

Using the same auto vs. blower comparison explained above, the average automobile is 230 times worse than a leaf blower when it comes to the emission of greenhouse gasses. None of the emission controls imposed on the car engine will reduce the amount of CO₂ generated. Fuel metering computers and catalytic converters, of the type found on automobiles, minimize the emission of unburned hydrocarbons by turning it into CO₂ and water vapor.

Aspen, Colorado wanted to know what was generating greenhouse gasses in their community. Where is the CO₂ coming from? They found that in 2004, 555,660 tons of CO₂ were emitted from the transportation sector in one year. That represents 66% of all the greenhouse emissions in Aspen. The other major contributor is the power generation sector. The data is outdated, but the proportions have changed little over the past 15 years. All lawn care equipment combined, was not even measurable because it was insignificant on this scale.

https://www.leafblownoise.com/Emissions%20Inv%202004_ExecSumm.pdf

Carbon monoxide, which was also mentioned, is the result of an incomplete burn, which is a byproduct of all internal combustion engines in trace amounts. It too is proportional to the amount of fuel burned.

Benzene has been reduced in the United States to less than one and a half percent of total volume of gasoline from the pump prior to burning and even less after combustion.

Of all the non-organic compounds characterized as being harmful to human health, most of them are emitted in trace amounts and are insignificant. They are dealt with by the catalyst in the leaf blower exhaust system. <https://www.epa.gov/gasoline-standards/gasoline-mobile-source-air-toxics>

Regarding the generation of dust, according to the EPA, the only particulate matter that is potentially harmful to someone's health is known as PM-10 and PM-2.5. These numbers represent the particle size, which is 10 microns and 2.5 microns respectively. A micron is a meter divided by one million. PM-10 is one-seventh the width of a human hair. It is similar in size to the dust you see in a ray of sun light, right within your own living room. For the most part, PM-10 is otherwise invisible. Leaf blowers deal with a much larger sized particle, one that falls back to the earth within a few feet of the nozzle.

PM-10 particles originate from a variety of mobile and stationary sources (diesel trucks, woodstoves, power plants, etc.). Their chemical and physical compositions vary widely. Particulate matter can be directly emitted or can be formed in the atmosphere when gaseous pollutants such as SO₂ and NO_x react to form fine particles. Gasoline-powered leaf blower engines do not produce these chemicals.

As for leaf blowers raising this particle into the air, PM-10 is already in the air. Because it is so small and lightweight, the wind keeps these particles suspended. The brown haze you see over a city is comprised of these particles. Eventually moisture will bring these particles to the ground, but when that happens, it attaches itself to larger particles and can no longer be put back in suspension as a PM-10 particle.

You can learn more about PM-10 at the following sites:

<https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>

<https://www.epa.gov/sites/production/files/2014-05/documents/huff-particle.pdf>

Studies have been conducted that verify that leaf blowers are not hazardous to your health. The following three organizations have spent up to a year studying this allegation:

- 1) The Greenwich Department of Health has addressed this issue for the City Council. They concluded that there is no substantial evidence documenting scientific and medically-grounded data tied to health risks caused by gasoline-powered leaf blowers. No changes in the Town's existing Noise Ordinance, with respect to gasoline-powered leaf blowers, are warranted at this time for health reasons;
[Greenwich Board of Health Statement](#)
- 2) The San Joaquin Valley Air Pollution Control District commissioned Dennis Fitz of the University of California at Riverside to study the potential for leaf blowers to generate dust. His results show that the amount they generate is insignificant. Comparing data compiled in the San Joaquin Valley, daily driving of automobiles generates 100 times more dust than leaf blowers. He also proved that brooms in fact do generate more dust than a leaf blower.

Daily amounts of dust entrained in the air within San Joaquin Valley per a Modesto Bee Article:

(Tons per day)

Agriculture 91.33

Paved roads 62.66

Construction 14.09

Leaf Blower 0.52

[University of California, Riverside Report, Leaf Blower Dust](#)
[Fresno Bee Dust Article](#)

- 3) Dr. Nancy Steele of the California Air Resources Board conducted a yearlong study of leaf blowers for the California legislature. [Report to California Legislature on Leaf Blowers](#). She and her staff concluded that there is no scientific evidence that leaf blowers are any more detrimental to the environment than the alternatives. Under certain conditions, brooms are likely to lift more dust than leaf blowers. They can dislodge caked dirt and generate dust that leaf blowers would normally leave behind.

The secondary purpose of the leaf blower indictment is to claim that they have noise related negative health effects. This statement is simply not true, because there is no documented evidence that leaf blowers are in any way the cause of hearing loss. The impact of sound on the ear is a function of exposure time and overall magnitude. OSHA has set a guideline for permissible noise exposure limits. Ninety dB(A) allows for a full eight hours of continuous use without hearing protection.

The argument that leaf blowers generate low frequencies, which have a tendency to travel farther than high frequencies, is a moot argument because leaf blowers do not generate low frequencies. Have you ever heard a leaf blower that sounds like the bass sounds from a boom box or car parked next to you with oversized woofers in the trunk? This type of sound requires energy that is not available from a one to three horsepower leaf blower engine (20 to 60HZ). Leaf blowers run greater than 6000 rpm driving an air impeller with ten blades. Six thousand pulses from the combustion chamber is 100 HZ and 60,000 fan blade pulses is 1000 HZ, which is a mid-range frequency. While designing the quiet leaf blower, both these sound sources have been attenuated to where neither is of a significant magnitude at distance.

A lot has been done by the industry to the design of leaf blowers, which may not be obvious or well known to the average person. Manufacturers of leaf blowers, in response to complaints from the field, have spent millions of dollars to provide a solution to the leaf blower noise problem. New Castle should take advantage of that improvement and require that blowers be limited to 65 dB(A), measured at 50 feet per the ANSI Standard B175.2, the quietest design available.

The quiet leaf blower is only 89 dB(A) when measured at the operator's ear. Nevertheless, hearing protection is always recommended by the manufacturer for the operator as a precaution because it is not known how long the blower will be in use. <https://www.leafblownoise.com/Hearing%20Loss%20Limits.pdf>

To say that leaf blower noise can cause heart disease, hypertension, sleep disturbance, psychological, cognitive and learning issues, is irrational. This statement is incorrectly worded. Stress, not the leaf blower, causes heart disease, hypertension, sleep disturbance, psychological, cognitive and learning issues. I doubt anyone willingly using a leaf blower will be suffering from noise related stress. On the contrary, he will be happy that he is able to get the job done eight times faster than with a broom or rake. Not pleasing his boss or his customer is more likely to be a cause of any stress he may be experiencing. https://www.webmd.com/balance/stress-management/stress-symptoms-effects_of-stress-on-the-body#1. Click "View All"

Sound is a complex issue and has many things that will influence magnitude. The most influential is the distance from the source one encounters the sound. The farther one is from the sound source, the lower the volume is and thus the less likely one is to be disturbed. Short of that, only silence will be better and that is not a reasonable expectation. There is a complicated formula that describes the condition and you can read about it at the following sites:

https://www.leafblownoise.com/Measuring_Sound.pdf.
<https://www.leafblownoise.com/sound%20power.xlsx>

So as for the bystander, due to the duration of exposure and reduced magnitude at distance, it is unlikely that momentary exposure to blower sound will cause any harmful stress induced health issues. If a bystander is prone to sound generated stress repercussions at any volume level, the leaf blower will not be his biggest problem. We

all must live with sounds from cars, trucks, airplanes, work environments, and sounds from within your home. A vacuum cleaner comes to mind.

Suggestions:

Clearly there are people that have a dislike for leaf blowers. There has been a measurable number of cities that have regulations in place to control how they are used and what type of designs are allowed. The driving force behind this movement is the fact that some blowers are excessively noisy and if not used appropriately, can be a serious irritation to some. It has been shown that in most cases, city councils find it unrealistic to ban blowers for the sake of sound only. Even anti-leaf blower advocates acknowledge this fact. For one thing, there are many other products in service that generate noise and we just accept it and live with it.

One cannot ban all gasoline powered lawn care equipment because in this fast pace world we live in, it makes no sense to return to the tools from the early part of the last century; push lawn mowers, hedge shears, rakes and brooms. Because the sound from a leaf blower is unique to the bystander, it is the blower that is being attacked. With little reason to ban them based on sound, those adamant about the existence of a leaf blower have conjured up other issues that support their argument to ban them. Since quiet leaf blowers are available on the market as a solution to the noise issue, one might look at what was done in Arizona and consider doing something similar, tailored to fit the needs of New Castle.

https://www.azleg.gov/FormatDocument.asp?inDoc=/legtext/48leg/1r/summary/h.sb1552_06-27-07_astransmittedtogovernor.doc.htm&Session_ID=85

Here are my suggestions:

- Require that no leaf blower exceed a sound level of 65 dB(A) as measured per ANSI Standard B175.2, which is indicated on the sound label attached to the housing by the manufacturer.
<https://www.leafblownoise.com/Sound%20label%20mounted.jpg>
- Disallow the use of any leaf blower manufactured prior to January 1, 2005 in order to ensure the lowest possible exhaust emission. Manufacturing dates can be found on the emission label.
<https://www.leafblownoise.com/Mounted%20emission%20Label.jpg>
- Prohibit the operation of leaf blowers, except on surfaces that have been stabilized chemically, paved or landscaped with some form of ground cover to minimize dust.
- License any person operating a leaf blower for remuneration and require him to attend an approved training program on the proper use of a leaf blower.
- Develop printed materials for the purpose of educating and informing the private user on how to safely and properly use a leaf blower. Require retailers to include

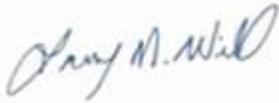
a copy with each leaf blower sold or rented. It can also be made available via your website and through your enforcement agencies. Example:

https://www.leafblownoise.com/Pointers_Operating_Leaf_Blower_flier.pdf

Please take time to review my website. You will find a wealth of information specifically dealing with the issue of leaf blower sound as well as many other claims made about the blower.

If you should need information that is not clearly addressed on my website, please contact me and I will do whatever I can to help, including further research on your behalf.

Best regards,



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To learn more about ECHO:
<http://www.echo-usa.com/About-ECHO/About-Us>