

To: City of Newport Beach Mayor and City Council

October 2009

From: Environmental Quality Affairs Citizens Advisory Committee (EQAC)

Subject: Potential Ordinance to Ban Leaf Blowers in Newport Beach

BACKGROUND

Gas-powered and electrically-operated leaf blowers, vacuums and mulchers are widely used and have been this subject of significant objections by residents who experience the noise, combustion products and fugitive dust produced by such equipment. The California Air Resources Board (Ref. 1) recognized the potential health impacts of using this equipment by the operators and others in the vicinity. They recommended use of safety equipment by the operators (e.g. filtered masks, earplugs, safety glasses), but suggested further study on the potential hazards beyond the operator. Other environmental groups including ZAP (Zero Air Pollution, Ref. 2) have encouraged more restrictions on such equipment because of the potentially harmful and nuisance effects to nearby non-operators due to noise, combustion- product air pollution and fugitive dust (containing PM10 and PM2.5 particulates, garden chemicals, fungi etc.), all of which are felt well beyond the immediate area of operation. The major findings from data collected over approximately 10 years indicates leaf blowers produce significant exhaust emissions, re-suspend dust and particulate matter and generate high noise levels – all contributing to environmental health hazards. (Ref.1).

AIR POLLUTION ISSUES

Casual observations of operations make it obvious that leaf blowers (gas or electric powered) are significant producers of local air pollution. EPA reports warn of dust clouds consisting of particulate matters, fecal matter, pesticides, fungi, chemicals, fertilizers, spores and street dirt (containing lead and organic and elemental carbon). Such clouds are evident everywhere leaf blowers are used. In addition, gas powered machines produce unusually high concentrations exhaust emission products (hydrocarbons, carbon monoxide and particulates). While industry groups claim that these emissions average less than 1% of emissions pollution in a typical long-term scenario, other studies show that local, short term exposures can be 10-100 times the long

term averages. The combination of these leaf blower exhaust emissions and the associated dust cloud contaminants represents a significant nuisance and potential health hazard to those in the vicinity of their operation.

As described by the California EPA Air Resource Board comparing emissions for a given amount of leaf blower operation to miles traveled by car:

“...for the average 1999 leaf blower and car data ... we calculate that hydrocarbon emissions from one-half hour of leaf blower operation equal about 7,700 miles of driving, at 30 miles per hour average speed. The carbon monoxide emission benchmark is significantly different. For carbon monoxide, one-half hour of leaf blower usage ... would be equivalent to about 440 miles of automobile travel at 30 miles per hour average speed.” (Ref. 1, p. 58)

**Table 9. Commercial Leaf Blower Emissions Compared to Light Duty Vehicle Emissions
3 hp average, 50% load factor, 1999 emissions data**

	Exhaust Emissions, g/hr	Exhaust Emissions, new light duty vehicle,* g/hr	Exhaust Emissions, older light duty vehicle,** g/hr
Hydrocarbons	199.26	0.39	201.9
Carbon Monoxide	423.53	15.97	1310
Particulate Matter	6.43	0.13	0.78
Fugitive Dust	48.6-1031	N/A	N/A

*New light duty vehicle represents vehicles one year old, 1999 or 2000 model year, driven for one hour at 30 mph.

**Older light duty vehicle represents vehicles 1975 model year and older, pre-catalytic vehicle, driven for one hour at 30 mph.

Table 9 above provides the California EPA data on leaf blower emissions (excerpted from Ref. 1, pg. 50). The emissions from leaf blowers are significant because they use small but dirty two-stroke engines that can be responsible for a surprising share of the health-harming air pollutants in local environments, which is why municipal controls on two-stroke engines of all varieties is common.

NOISE ISSUES

Leaf blowers from all manufacturers produce objectionable levels of local noise. This problem has been addressed by most manufacturers of newest models (see Table

below), but they all operate at noise levels that exceed Newport Beach and other city municipal code noise allowable levels as discussed below. Even though their use is intermittent, while in operation, these devices produce objectionable local noise levels.

**TYPICAL LEAF BLOWER CHARACTERISTICS
(2009 Models)**

<u>BRAND</u>	<u>TYPE/POWER</u>	<u>WT-LB</u>	<u>AIR VEL-MPH</u>	<u>SOUND LEVELdb(A)</u>
Toro 51599	Handheld/Electric	7.3	112-235	63-67
Black&Deckerbv4000	Handheld/Electric	8.1	230	65
Husqvarna 125B	Handheld/Gas Eng.	9.4	170	70
Stihl BG55	Handheld/Gas Eng.	9.0	140	69
Stihl BR380D	Backpack/Gas Eng.	20.5	181	73
Echo PB-265LC	Backpack/Gas Eng.	13.3	135	65

- NOTES:
1. Sound levels measured at 50-ft. per ANSI B175.2.
 2. NB Municipal Code 10.28.045 defines allowable noise levels of 55-60db(A).

HEALTH RISKS ASSOCIATED WITH LEAF BLOWER USE

The California Environmental Protection Agency Air Resources Board published a summary of existing research on the hazards and health risk factors associated with leaf blower operations (<http://www.arb.ca.gov/msprog/leafblow/leafblow.htm>). Two significant forms of hazards are summarized here: (1) hazards to leaf blower operators, and (2) hazards to the general public.

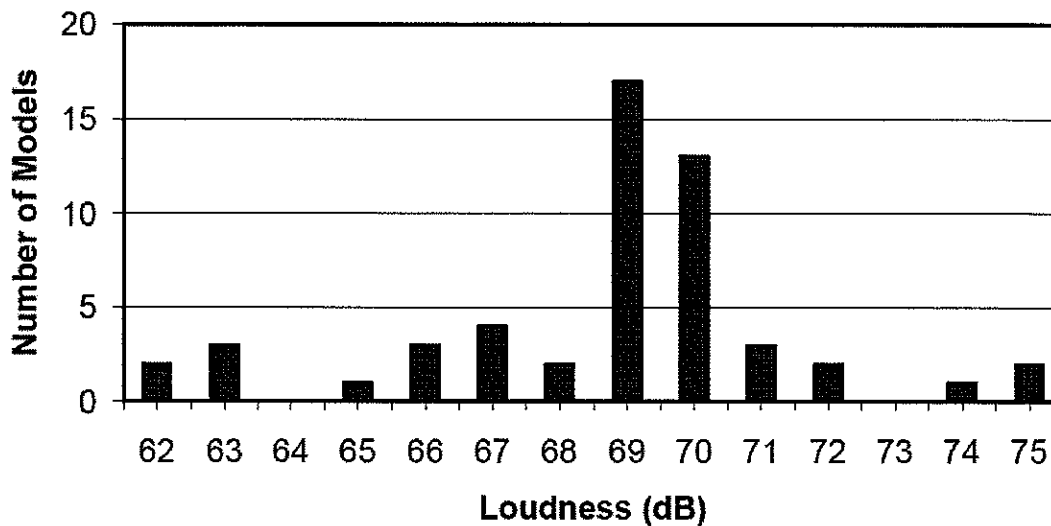
(1) The exposure scenario suggests that 10 minutes of leaf blower usage could expose the operator to a significant, potentially harmful dose of CO in cases where exposure involves no dispersion of pollutants out of the immediate area. In this case, the operator could be exposed to potentially harmful amounts of carbon monoxide. Actual operator usage apparently ranges from 15 minutes to a full work day. Research demonstrates that high short-term exposures to CO were found in people operating small gas-powered garden equipment (ref. 5). Thus, the real risks to long-term pollutants is substantial to the

operator. A second significant health risk to leaf blower operators is noise-induced hearing loss. Two factors contribute to an increased risk of hearing loss in typical career gardeners: the high sound pressure levels emitted by leaf blowers at the level of the operator's ear, and the infrequent use of hearing protection. Insufficient data makes it difficult to estimate the percentage of workers who will experience noise-induced hearing loss. Hearing loss is gradual, and may become obvious only years after the exposure has ceased. Thus, by using leaf blowers within the City, in all likelihood leaf blower operators may be exposed to potentially hazardous concentrations of carbon monoxide and particulate matter throughout their work day, and related noise exposure are likely high enough that operators are at increased risk of developing hearing loss.

(2) Considerable evidence also suggests both short- and long-term impacts of leaf blower operations on the general public. With respect to local pollutants: according to the California EPS, National Ambient Air Quality Standards have been set to protect public health and welfare and are intended to protect certain sensitive and probable risk groups of the general population. The sensitive and probable risk groups for CO include anemics, the elderly, pregnant women, fetuses, young infants and those suffering from certain blood, cardiovascular or respiratory diseases (Refs. 5, 6). At a minimum, it would be prudent to restrict the use of leaf blowers specifically in areas where these populations are present, including near schools, residential homes for elderly, hospital service areas, and where these groups are likely to be present.

For the general public, exposure to leaf blower noise also has deleterious effects, and the literature on health effects of noise is extensive. Exposure of adults to prolonged and excessive noise results in noise-induced hearing loss that shows a dose-response relationship between its incidence, the intensity of exposure, and duration of exposure. Noise-induced stimulation of the autonomic nervous system reportedly results in high blood pressure and cardiovascular disease (Ref. 7). In addition are psychological effects that reduce job performance and educational and work place productivity. The sound level distribution at which a leaf blower operates are illustrated in the following Figure (Ref. 1, pg. 40).

Loudness Levels of Leaf Blowers in dB(A) (measured at 50 ft)



The World Health Organization, as well as other informed organizations, cite 65 dB(A) as the criterion for psychologically disruptive sound (ref. 8) that impacts learning and productivity. It should be noted that the decibel scale shown is the dB(A) scale. For technical reasons, the dB(A) scale is most commonly used in practice, despite the fact that it greatly attenuates a spectrum's low frequency sound waves and thus underestimates the effects of low frequency noise on the human body and hearing. Almost half of the energy of the leaf blower sound spectrum occurs at frequencies below 1 kilohertz, which is the region of the spectrum where the dB(A) scale begins to progressively underestimate the effects of leaf blower noise. An alternative, but under-used measure, dB(C) more uniformly weights all frequencies of perceived sound, and would give a more accurate, more veridical, index of the damaging sound impacts of leaf blower noise.

Known cardiovascular effects, psychological stress and performance decreases have been demonstrated after long-term exposure to traffic noise (ranging in 65–70 dB(A)) – a range coincident with leaf blower noise. In general, NB Municipal Code 10.28.045 allows only 55-60 dB(A) Leq. Yet leaf blowers which can be used for hours every day, mostly exceed 65 dB(A) levels.

Based on these data, one can predict that long-term exposure to leaf blower noise will also have negative health impacts on local residents and presents risks for hearing impairment with continued increased exposure.

CURRENT SITUATION

Newport Beach and other densely populated areas are particularly susceptible to the secondary effects of the use of portable leaf blowers/mulchers. As a result, it is estimated (Ref. 3) that up to 100 California cities have imposed bans or restrictions on their use in their communities. These have taken the form of total and complete bans (as in Laguna Beach) or stringent restrictions (as in Palo Alto and Los Angeles). Other actions include ordinances requiring training and use of safety equipment by operators, relief for use in industrial/commercial areas versus residential areas and allowance for use of electric but not gas-powered equipment.

These municipal controls have led to objections by equipment suppliers and user groups and there have been unsuccessful attempts in Sacramento to prevent municipalities from imposing bans or restrictions.

In addition, user groups have raised concerns regarding potential economic impact of bans on the use of such equipment. To date, we have found no specific data (anecdotal or formal) to quantify this objection.

It has recently come to our attention that members of the Corona del Mar Residents Association have been seeking leaf blower controls. Current results of their surveys and polls can be found on their Association website, <http://www.cdmra.org>.

EXAMPLES

EQAC has performed a limited internet search to determine current status of some ordinances. Apparently because of the difficulty in quantifying the air pollution and fugitive dust components of the problem, all existing controls are focused on the health hazards or nuisance concerns of noise and are contained within the Municipal Codes related to residential noise control.

Los Angeles: Has had existing ordinance No. 171890 since 1998. Refer to Los Angeles Municipal Code Chapter XI (Noise Regulation, Article 2, Special Noise Sources), Section 112.04 (Distance Restrictions). The last change code for this was dated 6/10/2005. Equipment cannot operate within 500 feet of a residence if the equipment exceeds 65 db(A) at 50 feet from the equipment. We have obtained no input on compliance/enforcement issues.

Palo Alto: Has had an ordinance since 2005 amending Municipal Code Title 9 (Peace, Morals and Safety), Chapter 9.10 (Noise), Item 9.10.030 (Residential Property Noise Limits). It bans gas-powered and electrically-operated equipment with noise level more than 6db above local ambient, but allows electrically operated blowers powered by gas powered electrical generators which are compliant with local noise ordinances. Enforcement has been more complicated and expensive than desired according to an August 7, 2006 status report by the Palo Alto City Manager (Ref. 4).

Laguna Beach: Ordinance 1259 amended Municipal Code Title 7 (Health and Sanitation), Section 7.25.071, Item D to now read as follows:

“The use of electrical gas powered blowers, such as used by gardeners and other persons for cleaning lawns, yards, driveways, gutters and other property is prohibited at any time within the city limits”.

This is the most complete, least equivocal position we have seen. Compliance Officer, Joe Trujillo (949-497-0301) stated in a telephone interview that “in two years on the job I have had no more than 3 or 4 complaints. We have had negligible compliance problems and good community support. If we see a potential problem while on patrol, we hand out a copy of the ordinance and it is solved then and there.”

RECOMMENDATION

Research shows that ordinances to ban or control leaf blowers have been successfully implemented in residential areas in other communities in California. At least 100 municipalities in California have restricted or banned the use of leaf blowers within city limits in response to community health concerns and in the interest of adopting “greener” policies and practices. Compliance enforcement experience varies widely among communities, with the most successful compliance apparently occurring in the city with the most restrictive ordinance – Laguna Beach. EQAC recommends that the city of Newport Beach take steps needed to evaluate whether a similar residential leaf blower ban is feasible here. The following steps are recommended:

1. Direct staff to confirm above findings and expand the database with other communities as needed.

2. Conduct an outreach activity to quantify the perceived economic impacts (i.e. increased labor costs) on the affected residential property owners.
3. Conduct outreach to determine residential community reactions (positive and negative) to such an ordinance.
3. Based on above, decide whether to proceed with a complete ban, limited ban, imposition of more restrictive standards (noise and air pollution) or continue with the current ordinance (10.28.045).

REFERENCES

1. California Environmental Protection Agency Air Resources Board, "A Report to the California Legislature on the Potential Health and Environmental Impacts of Leaf Blowers." Feb. 2000.
(<http://www.arb.ca.gov/msprog/mailouts/msc0005/msc0005.pdf>)
2. Zero Air Pollution web site: zapla.org
3. Citizens for a Cleaner, Better Lincoln web site: ccblincoln.com (other cities and towns heading).
4. Palo Alto City Manager Interim Report to City Council, "Gas-Powered Leaf Blower Ban Enforcement – One Year Status Report", Aug. 7, 2006
5. Air Resource Board. Notice of public meeting to consider the approval of California's small off-road engine emission inventory. Mailout MSC#98-04, March 1998b.
6. Air Resources Board, Research Division. Cardiac response to carbon monoxide in the natural environment. Contract no. A3-138-33. 1992.
7. American Academy of Pediatrics Committee on Environmental Health. Noise: A Hazard for the Fetus and Newborn (RE9728). *Pediatrics*, 100(4), 1997; [online at: <http://www.aap.org/policy/re9728.html>, 07/08/99].
8. WHO *Guidelines for Community Noise – Guideline document* to the Department of the Protection of the Human Environment, Occupational and Environmental Health, World Health Organization, Geneva, Switzerland (Fax: +41 22-791 4123, e-mail: schwelad@who.int).