

Excessive Vehicle Noise - Impact and Remedies

by: Marek Roland-Mieszkowski, M.Sc., Ph.D., tel. (902) 429-9622, www.digital-recordings.com
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Introduction

The noise level in our cities is rapidly increasing. This is due to heavier traffic and more powerful engines. On top of that there is a growing number of vehicles which are much louder and do not adhere to Canadian Noise Standards. This is due to the fact that their owners install or modify mufflers and install large sound systems creating so-called “boom cars” (typical sound is boom, boom) which can be heard from a kilometer away. I would like to express my expert opinion about this phenomenon and suggest remedies, which should be implemented.

A bit of science - “Modified Mufflers”

Most of the vehicles on the road use combustion engines. Fuel explodes in cylinders 1000 times/min (for 4-stroke, 2-cylinder engines at 1,000 rpm) creating sound with 16.7 Hz fundamental frequency and many harmonics. Without an engine block/enclosure and muffler these explosions will be very noisy (194 dB at close distance) and deadly. No wonder that vehicles with modified mufflers or straight pipes can produce sound levels which are deafening (up to 120 dB at 15.2 m distance) and are up to 40 dB louder than vehicles equipped with stock mufflers, which meet Canadian Standards (about 80 dB at 15.2 m distance - Transport Canada Regulations, Standard # 1106) To illustrate this: a modified vehicle which produces a 10 dB louder sound is as loud as 10 standard vehicles, 20 dB louder => 100 vehicles, 30 dB louder => 1000 vehicles, 40 dB louder => 10,000 vehicles. As can be seen from this example these vehicles can significantly increase the noise levels in the city.

A bit of science - “Boom Cars”

A similar situation is with the excessive sound systems in “boom cars”. Standard car stereo systems have amplifiers capable of 5 W -> 50 W/channel. This is sufficient power, since most car speakers can produce 80 dB -> 100 dB sound with just 0.1 W of input power. Boom cars can have sound systems which have amplifiers with 700 W -> 2000 W/channel. With the same efficiency speakers they can produce about 143 dB sound, which is 10,000 times more powerful (some competition boom cars achieved insane 182 dB SPL levels inside of reinforced cabin). One vehicle like this can produce as much noise as 10,000 vehicles with a “normal” sound system set at 0.1 W. Very often, in order to use such powerful sound systems, vehicles carry additional batteries (the alternator is too small to provide this much power) and speakers (often large and many) at the expense of the vehicle’s structural integrity, safety and driver’s visibility.

Why we should ban these types of vehicles from our cities ?

First these cars and motorbikes violate the Canadian Vehicles Standards. Second, they are a tremendous annoyance. It is not reasonable that a vehicle should produce so much noise that despite its distance it is louder in an apartment or office than the radio, TV and human voices and sounds. These vehicles can wake-up an entire neighborhood at night (estimate given in "Time" magazine was that a single motorbike with a modified mufflers can wake-up up to 200,000 people at night in Paris).

The noise produced by these vehicles not only lowers the quality of life and work of the majority of people but also can result in permanent hearing loss for vehicle operators and people nearby (this includes unborn children, since noise penetrates the womb). At high levels this noise can result even in tissue damage (body parts and organs resonate and tissues can fracture at some low frequencies) leading to serious health problems (it can even lead to a miscarriage). Walking on the street is a hazzard these days and is not at all enjoyable (which has no doubt an impact on tourism as well).

These vehicles are highly distracting in traffic and can cause accidents since they mask sounds and agitate drivers. Loud sounds can affect hearing, vision, reaction time and judgement of drivers and nearby people increasing dangers significantly for everyone involved. Very often operators of these vehicles have tinted windows and race rather than drive through the city. It is a phenomenon which increased after the release of the "Fast and Furious" movie series.

Proposed remedies

Excessive noise is a serious environmental problem impacting health and well-being of all living things. The police and politicians should be alerted and educated about this problem. Cities should establish simple and fast SLM (Sound Level Meter) - based measurement procedures for checking sound levels, which could be performed by some officers and inspectors.

There should be stiff fines for violators. Fine structure could be for example as follows:

- + 6 dB above norm (4 x noise level) => \$ 500 fine, inspect vehicle again in 2 days
- +12 dB above norm (16 x noise level) => \$1,000 fine, inspect vehicle again in 2 days
- +18 dB above norm (64 x noise level) => \$1,500 fine, vehicle towed away for repairs
- +24 dB above norm (256 x noise level) => \$2,000 fine, vehicle towed away for repairs
- +30 dB above norm (1000 x noise level) => \$2,500 fine, vehicle towed away for repairs
- +36 dB above norm (4000 x noise level) => \$3,000 fine, vehicle towed away for repairs
- +40 dB above norm (10,000 x noise level) => \$4,000 fine, vehicle towed away for repairs

Conclusions

Noise pollution caused by modified vehicles is a very fast growing problem They are the weapons of intimidation and acoustical terrorism in the hands of disrespectful and ignorant people. Proposed measures should be introduced quickly by the government in order to stop this dangerous trend and to protect the environment, as well as the well-being and health of people. Let's keep our cities and streets livable and quiet !