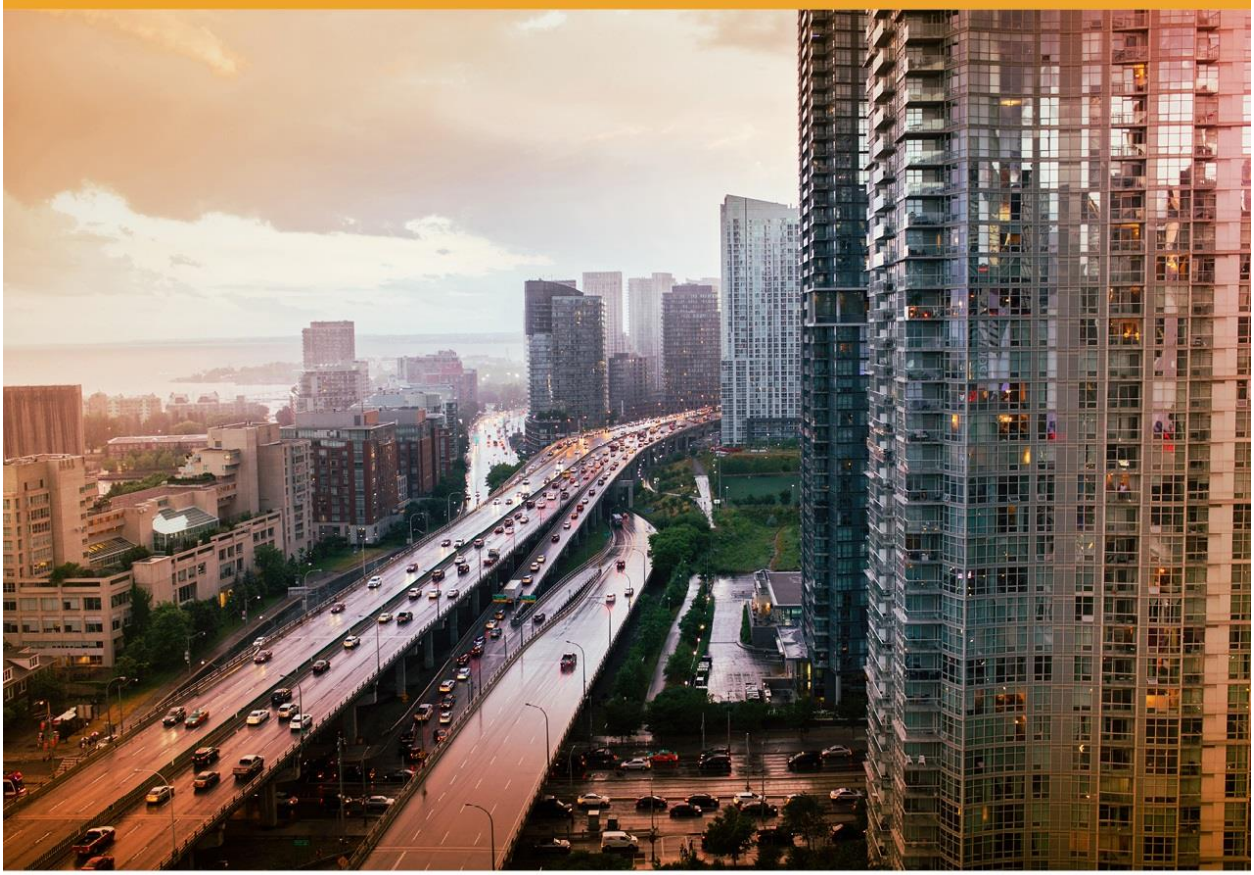


Noise Action Plan 2019

toronto.ca/health | Toronto Public Health

Background Note:

In June 2017, the Board of Health for the City of Toronto requested the Medical Officer of Health to develop a Noise Action Plan, in consultation with appropriate stakeholders, aimed at reducing exposure to ambient environmental noise over time.

Noise Action Plan

Introduction

Noise from sources such as road traffic and rail contribute to ambient environmental noise in the City. Cities around the world are exploring mitigation measures for environmental noise in recognition of the impacts that noise can have on health. Research from the World Health Organization and other bodies has identified a range of health impacts associated with various levels of environmental noise, such as hearing loss, sleep disturbance, annoyance, and some cardiovascular impacts. [1]

The City of Toronto is a vibrant city. While supporting a lively City, it is imperative to implement measures aimed at reducing environmental noise over time through a Noise Action Plan.

This document describes a Noise Action Plan for the City of Toronto. Given that road traffic is a major source of environmental noise in the City, the Noise Action Plan focuses on noise from transportation sources. The plan identifies noise mitigation measures, such as traffic management, road surface improvements, structural noise attenuation, promotion of alternate forms of transportation, building design, neighbourhood approaches, and noise monitoring.

Background on Environmental Noise

Research has identified a range of health impacts associated with various levels of environmental noise, such as hearing loss, sleep disturbance, annoyance*, and some cardiovascular impacts.[1] Health research on environmental noise generally reports on average noise exposure for a specific period (day, night, or 24 hours), and is measured in A-weighted decibel levels (dBA).[2] Another common term to describe noise exposure is Leq*, which is the A-weighted sound level over a time period of interest. For example, Leq (16) refers to sound levels over 16 hours.[3]

In 2009, the World Health Organization (WHO) recommended noise levels of no

* Noise annoyance is defined as a feeling of displeasure, nuisance, disturbance, or irritation caused by a specific sound. In the World Health Organization 2018 Noise Guidelines, "annoyance" refers to long-term noise annoyance.

* Leq is the A-weighted sound level of a steady sound carrying the same total energy in the time period observed as the fluctuating sound.

more than 55 dBA outdoors (Leq16 hours) in daytime, and in evening/night, no more than 40 dBA (Leq night 8 hours).[4] Given that noise levels of 40 dBA at night are difficult to achieve in urban centres, the WHO recommended an interim nighttime target of 55 dBA.[4] In 2018, the WHO released the Environmental Noise Guidelines for the European Region, which recommends noise levels for different noise sources.[1]

Noise in the City of Toronto

In 2016, Toronto Public Health (TPH) completed a noise monitoring study[5] to identify levels of noise in the City. The study reported the following:

- Levels of noise in the City are similar to those of Montreal and Vancouver;
- Over 60 percent of residents experience traffic noise levels above 55 dBA during daytime hours;
- Nighttime noise levels are lower, with about 40 percent of the residential population experiencing average nighttime noise levels above 55 dBA; and,
- Residents in low income areas were more likely to experience nighttime noise levels over 55 dBA.

Noise Regulation in Toronto

Municipal Licensing and Standards (MLS) is responsible for enforcement of Chapter 591, Noise (Noise Bylaw), which provides standards for episodic noise associated with the day-to-day activities of residents and businesses. The Bylaw includes provisions for noise from sources such as construction, amplified sound (e.g., concerts), power devices, animal sounds, and motor vehicles (e.g., engines revving). In spring 2019, MLS introduced new amendments to the Noise Bylaw, which came into effect on October 1, 2019.

The Ontario Ministry of the Environment, Conservation and Parks is mandated to provide provincial Environmental Noise Guidelines for Stationary and Transportation Sources. For example, the Ministry recommends 55 dBA (Leq16) outdoor levels, 45 dBA (Leq16) indoor levels, and 40 dBA (Leq16) for sleeping areas for noise from road traffic sources.[3] The Ministry's role is to respond to noise complaints, conduct noise monitoring and assessment, and make recommendations to support compliance by organizations, businesses, and municipalities.

Noise Mitigation in Other Jurisdictions

Noise mitigation plans have been implemented in a number of settings, including Europe, the United Kingdom, Canada (Vancouver and Ottawa), and Australia. For example, the European Union (EU) Environmental Noise Directive (2002/49/EC) defines a common approach for member states to reduce effects of environmental noise exposure and requires members to conduct noise mapping and noise management action plans.[6]

Research suggests that noise mitigation strategies are most likely to be effective and sustained over time when implemented at the noise source (e.g., vehicle), and when they are tailored to the type of noise (e.g., road traffic).[1] Interventions to address noise are also more effective when implemented across several Divisions in a jurisdiction (e.g., planning, environment). Another key feature is that a number of jurisdictions conduct noise monitoring or noise mapping either during or following the implementation of noise mitigation initiatives.[6] For example, the Environmental Noise Directive from the European Commission states that noise mapping should be conducted in certain areas of interest to capture the data needed to provide a picture of the noise levels within a specific area.[6]

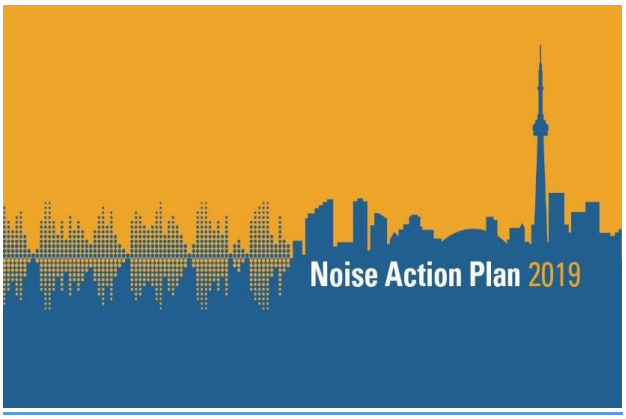
Table 1
Example Noise Mitigation Measures in Other Jurisdictions[6,7]

Noise Mitigation Category	Example Noise Mitigation Measures
Traffic Management Measures	Traffic Flow Design and Calming
Road Surface Modifications	Roads in State of Good Repair
Structural Noise Attenuation	Noise Walls
Alternate Forms of Transportation	Cycling, Electric Vehicles, Walking
Building Design	Design and Placement of Sleeping Area
Noise Monitoring and Mapping	Noise Monitoring Studies

Noise Action Plan for Toronto

The purpose of the Noise Action Plan is to identify measures that can mitigate environmental noise over time. Given that road traffic is a major source of environmental noise in the City, and recognizing that many sources of episodic noise are managed through the Noise Bylaw (Chapter 591, Noise), many of the proposed interventions focus on mitigating road traffic noise.

Proposed interventions include traffic management, road surface improvements, structural noise attenuation, promotion of alternate forms of transportation, building design, neighbourhood approaches, and noise monitoring and assessment.



The Noise Action Plan identifies new initiatives and builds on noise mitigation activities already underway. Multiple City Divisions are involved including Transportation Services, City Planning, Municipal Licensing and Standards, Environment and Energy, Social Development, Finance and Administration, Economic Development and Culture, Fleet Services, and Toronto Building.

Traffic Management

Traffic management measures provide an opportunity to mitigate road traffic noise. For example, the design of roads, congestion management strategies, and traffic control measures can contribute to reducing environmental noise in the City.

There are opportunities to introduce additional strategies to mitigate noise from transportation sources in Toronto. For example, Transportation Services is currently developing a Freight and Goods Movement Strategy that aims to ensure the efficient and effective movement of goods throughout the City. Incorporating effective noise mitigation measures as part of this strategy will contribute to managing environmental noise from heavy trucks. Similarly, the Congestion Management Plan offers opportunities to reduce noise by implementing measures that facilitate a smooth flow of traffic, as the stopping and starting of vehicles can contribute to environmental noise. In addition,

Transportation Services has developed the next phase of the Vision Zero Road Safety Plan (Vision Zero 2.0). The implementation of further measures to reduce vehicle speed at various locations across the City contributes to safety, as well as mitigates environmental noise. [8]

As a part of ongoing work, City Planning has added mitigation policies to the Official Plan, which specifically reference noise mitigation requirements.

Road Surface Improvements

There are a number of measures that can be used to mitigate noise produced from vehicles on asphalt surfaces. For example, the interaction of vehicle tires and road surfaces that are not in a state of good repair can contribute to elevated noise levels. Transportation Services will consider noise as one of the factors in prioritizing road projects as part of their State of Good Repair Capital Program.

Structural Noise Attenuation

Structural noise attenuation measures, including the construction of sound barriers and noise abatement walls are a common measure to mitigate road traffic noise and railway noise in other jurisdictions and in the City.[7]

For example, Transportation Services currently conducts noise assessments along City-owned expressways and may construct barriers to mitigate noise from road traffic for residents.

Transportation Services will review the issue of noise attenuation and recommend options and associated costs.

In 2018, City Planning conducted a City-wide rail study related to development along railway corridors and yards. The study is now complete and City Planning is making modifications to the City Planning Terms of Reference related to requirements for Noise Impact Studies to reflect the findings of the study.[9]

Promotion of Alternate Forms of Transportation

Noise mitigation measures in other jurisdictions include strategies to promote alternate forms of transportation. For example, promoting active transportation, such as walking and cycling, the use of electric vehicles, and the use of public transportation can reduce the number of cars with combustion engines on the City's roads, which can have an effect on both noise and air quality. Vehicles are the source of approximately one-third of

Toronto's Greenhouse Gas (GHG) emissions. The City plans to reduce GHG emissions by 2040, in part by switching passenger, freight and transit vehicles to electric and other low-carbon fuels. This will significantly reduce local air pollutants, as well as lead to a decrease in urban noise, both of which can affect the health of Toronto residents.[10]

In 2019, the Environment and Energy Division will be developing an Electric Mobility Strategy that will identify actions to ensure Toronto achieves its TransformTO goals on transportation; in particular that by 2050, 100 percent of vehicles in Toronto will use low or zero carbon energy and 75 percent of trips under 5km will be walked or cycled. The Strategy's goal is to maximize the co-benefits associated with the electrification of transportation, including the mitigation of road traffic noise. The Division will include noise mitigation as a part of the forthcoming strategy.

As a part of ongoing initiatives that promote alternate forms of transportation and support noise mitigation, the following City initiatives will continue to be underway:

- Transportation Services will continue to promote the use of electric vehicles through the ongoing implementation of the electric vehicle charging stations pilot.
- Fleet Services Division will continue to identify opportunities to green the City's fleet by procuring electric vehicles, as the City's budget allows.
- As a part of the City's forthcoming Mobility Strategy, the City will continue to identify new and innovative opportunities to promote active transportation, such as cycling and walking and further opportunities to promote public transit.

Building Design

The design of residential buildings, including the placement of sleeping areas and the type of windows used, has been promoted in other jurisdictions as a measure to reduce environmental noise in the home. In 2018, Toronto Building requested the Province of Ontario to consider amending the Ontario Building Code to add additional noise mitigation requirements. As an ongoing initiative, Toronto Building will continue to work with other municipalities to identify noise mitigation recommendations for the province related to the

Ontario Building Code that could be considered at a future date.

Neighbourhood Approaches

The noise monitoring study completed by Toronto Public Health in 2016 identified that dissemination areas in the lowest income quintile are almost 11 times more likely to have 50 percent of their residents exposed to night noise levels over 55 dBA than residents in the highest income quintile. Social Development, Finance & Administration (SDFA) is responsible for the ongoing implementation of the Toronto Strong Neighbourhoods Strategy (2020). In light of the findings of the noise monitoring study related to lower income groups, Toronto Public Health, in collaboration with SDFA will identify actions to engage residents and other partners on environmental noise in neighbourhoods through the Toronto Strong Neighbourhood Community Planning Tables.

The City is currently exploring opportunities to promote the nighttime economy, including activities in the evening such as eating and drinking, entertainment, and nightlife. The nighttime economy has many social and economic benefits, and contributes to the overall vibrancy of the city. Economic Development and Culture has developed the Toronto Nightlife Action Plan and could consider the Noise Action Plan as a component of this and other programs and policies.

Noise Monitoring and Assessment

Aligned with noise mitigation plans in other jurisdictions, it is recommended that on an ongoing basis, the City explore options to monitor noise from transportation sources under City jurisdiction (e.g., City roads). This will provide information in the future about noise levels in the City, and whether any changes have occurred. Transportation Services will explore the feasibility of conducting road traffic noise monitoring on an ongoing basis, including approximate costs. Options could include monitoring noise hot spots or monitoring based on noise complaints. Transportation Services will identify and request any budgetary increases required to support the cost of monitoring. In addition, Transportation Services will assess noise monitoring and mitigation opportunities as a part of ongoing projects (e.g., Light Rail Transit Study in the Finch corridor).

Expected Health Benefits of a Noise Action Plan As identified in other jurisdictions, reduction and

mitigation of environmental noise, particularly road traffic noise has been shown to promote health.[1] Noise mitigation measures, such as promoting electric vehicles and active transportation will also benefit population health through the reduction of greenhouse gas emissions and improvement of air quality. Opportunities to lower speed limits and manage congestion and traffic flow can enhance safety for all road users (e.g., pedestrians, cyclists, and drivers). Overall, it is anticipated that the City will benefit from the Noise Action Plan, particularly as City partners are committed to mitigating and managing environmental noise on an ongoing basis.

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