TORONTO

REPORT FOR ACTION

Reducing Health Risks from Traffic-Related Air Pollution (TRAP) in Toronto

Date: October 16, 2017
To: Board of Health and Parks and Environment Committee
From: Medical Officer of Health and Deputy City Manager, Internal Corporate Services
Wards: All

SUMMARY

Toronto's air quality is improving. Policies and programs implemented by federal, provincial and municipal governments have led to decreases in pollutant emissions, ambient air pollution levels, and related health impacts. However, Toronto Public Health estimates that air pollution still contributes to 1,300 premature deaths and 3,550 hospitalizations in Toronto each year.

Motor vehicle traffic is the largest source of air pollution emitted in Toronto. Exposures to traffic-related air pollution (TRAP) are highest near highways and busy roads. The health literature indicates that health risk from TRAP is higher within 500 metres of highways with an average daily traffic volume of 100,000 vehicles or more, and within 100 metres of arterial roads with an average daily traffic volume of 15,000 vehicles or more. Studies show that people living close to roads are more likely to experience adverse health outcomes including breathing problems, heart disease, cancer, and premature death. People who are more vulnerable to these impacts include children, the elderly, and people with certain pre-existing medical conditions.

Emissions of TRAP in Toronto can be reduced with sustained focus on initiatives that promote active transportation and transit, reduce congestion, and encourage use of electric vehicles. Recent updates to the Official Plan, the Walking Strategy, the Toronto Complete Streets Guidelines, the 10-year Cycling Network Plan, and TransformTO, Toronto's renewed climate action plan, are among the City initiatives that will reduce exposure to TRAP.

There are additional opportunities to reduce health risks from TRAP. Operational changes in buildings and a combination of strategies including site planning, building design, and physical barriers can be used during construction or when retrofitting older buildings. Bringing these best practices to the attention of those who design and manage buildings, particularly buildings occupied by vulnerable populations such as schools, child care centres and long-term care facilities, can encourage their adoption.

Funding and other financing mechanisms can encourage building retrofits to mitigate exposure to TRAP, especially for vulnerable populations.

A special provincial air quality management approach for large urban areas can help provide a framework for focused interventions. Regular air quality monitoring along busy highways, and an assessment of the costs associated with TRAP, can help better define the challenge and assess the effectiveness of interventions. Strengthening partnerships with organizations around the Greater Toronto and Hamilton Area and across Canada who are addressing TRAP will help identify and implement best practices and contribute to reducing exposure to TRAP in Toronto.

RECOMMENDATIONS

The Medical Officer of Health and the Deputy City Manager, Internal Corporate Services recommend that:

1. City Council direct the Director, Environment and Energy Division, in collaboration with the Medical Officer of Health, to:

    a. work with staff from City Planning; Toronto Building; Children's Services; Long-Term Care Homes & Services; Facilities Management; Transportation Services; Engineering & Construction Services; Parks, Forestry & Recreation; the Toronto Public Library; and other appropriate City divisions and agencies, to develop feasible best practices on how to reduce exposure to traffic-related air pollution, and facilitate their implementation at City facilities;

    b. develop guidance to assist appropriate City agencies, corporations, and divisions in establishing traffic-related air pollution mitigation measures at City-owned sites located within 500 metres of roads with annual average traffic volumes of 100,000 vehicles or more per day, and within 100 metres of roads with annual average traffic volumes of 15,000 vehicles or more per day; and

    c. develop best practices guidelines for new and existing buildings, in consultation with industry professionals, and raise awareness of these practices among school board staff, child care centre operators, long-term care facility operators, and residents, as well as builders, developers, designers, architects, engineers and other professionals;

2. City Council direct the General Manager, Transportation Services, in collaboration with the Director, Environment and Energy Division, to:

    a. pursue, through the Toronto Congestion Management Plan (2016-2020), opportunities to reduce traffic-related air pollution;

    b. undertake an evaluation of the City's street sweeping service levels to identify any possible enhancements that could improve air quality along Toronto's roadways by:

i. adopting Ontario's interim 24-hour Ambient Air Quality Criterion (AAQC) for coarse particulate matter (PM10) of 50 micrograms per cubic metre of air (50 µg/m^3) and the 24-hour Canadian Ambient Air Quality Standard (CAAQS) for fine particulate matter (PM2.5) of 28 micrograms per cubic metre of air (28 µg/m^3) as air quality benchmarks for the maximum desirable concentration of particulate matter in air along Toronto streets;

ii. conducting an air quality monitoring study of ambient PM10 and PM2.5 concentrations along city streets to assess the impact of current street sweeping practices, and using the findings to inform street sweeping service levels;

iii. developing an air quality monitoring program for ambient PM10 and PM2.5 concentrations to assess whether the interim 24-hour Ambient Air Quality Criterion for PM10 and the 24-hour Canadian Ambient Air Quality Standard for PM2.5 are met near roadways; and

iv. giving first priority to meeting the air quality benchmarks at sensitive use properties, including child care centres, schools, and long-term care homes, within 500 metres of roads with annual average traffic volumes of 100,000 vehicles or more per day, and giving second priority to sensitive uses within 100 metres of roads with annual average traffic volumes of 15,000 vehicles or more per day, and identify a strategy for meeting the air quality benchmarks more broadly across the city giving priority to areas with elevated particulate matter concentrations and residential areas;

3. The Board of Health request Public Health Ontario to conduct air quality monitoring near buildings occupied by vulnerable populations, such as schools, child care centres and long-term care facilities in Toronto, to gather information about exposures to traffic-related air pollution (TRAP) in these settings, with a view to supporting building operators in understanding and mitigating exposure to TRAP;

4. City Council request the Ontario Minister of Environment and Climate Change to:

a. undertake mobile air quality monitoring and air modelling along provincial highways including those located in Toronto to assess the relationship between traffic counts and air quality in areas adjacent to these highways, to estimate health risks, and provide trends over time;

b. estimate the cost of social, environmental, and health impacts associated with traffic-related air pollution (TRAP), including health-care costs and years of life lost, and compare these with the costs of preventing emissions of, and exposure to, TRAP;

c. establish a special air management area focussed on land adjacent to Provincial highways in the Greater Toronto and Hamilton Area to facilitate development and implementation of provincial and municipal measures to reduce releases of, and exposure to, traffic-related air pollution along these highways;

5. City Council request the Ontario Minister of Finance to implement financing and funding mechanisms for building retrofits needed to reduce exposure to traffic-related air pollution, with a priority placed on supporting retrofits of buildings with sensitive uses (such as schools, child care centres and long-term care facilities) located near highways and roads with average daily traffic volumes of 100,000 vehicles or more;

6. City Council request the Ontario Minister of Transportation to review the feasibility of modifying street sweeping standards and practices on Provincial Highways to reduce levels of PM10 (particulate matter with an average diameter of 10 micrometres of less) in air along such highways;

7. City Council request the Federal Minister of Environment and Climate Change to:

a. harmonize Canadian environmental emissions standards for fuels, vehicles and engines with those applicable in the State of California;

b. identify a strategy to reduce emissions of air pollutants and greenhouse gases from older model heavy-duty diesel trucks; and

c. include in Canada's Clean Fuel Standard, limits to emissions of air pollutants, in addition to the proposed limits on greenhouse gases;

8. The Board of Health request the Medical Officer of Health to undertake an assessment of traffic-related air pollution using TPH's Child-Friendly Policy Assessment Tool, to identify any additional measures that could be implemented to reduce negative impacts on children's health; and

9. City Council forward this report and the attachment, *Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure* to the Ministry of Health and Long-Term Care, Public Health Ontario (PHO), Central Local Health Integration Network (LHIN), Central East LHIN, Central West LHIN, Mississauga Halton LHIN, Toronto Central LHIN, the Toronto District School Board (TDSB), the Toronto Catholic District School Board (TCDSB), le Conseil Scolaire Viamonde, le Conseil Scolaire Catholique MonAvenir, the Ontario Long Term Care Association (OLTCA), AdvantAge Ontario, the Home Child Care Association of Ontario, the Association of Day Care Operators of Ontario (ADCO), the Ontario Landlords Association, Toronto Landlords, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the Ontario Association of Architects (OAA), the Building Industry and Land Development Association (BILD), the Ontario Home Builders' Association, the Greater Toronto Area Clean Air Council (GTA-CAC), and the Pembina Institute.

FINANCIAL IMPACT

There is no financial impact resulting from the adoption of the recommendations in this report beyond what has already been approved in the current year's budget and the proposed 2018 budget.

The Acting Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

On July 11, 2005 the Board of Health adopted the report on Air Emissions and Health Status Studies undertaken for the South Riverdale and the Beaches communities and recommended that a study be conducted to examine the cumulative air quality impact of emissions from all sources for these communities.
(https://www1.toronto.ca/city_of_toronto/environment_and_energy/key_priorities/files/pdf/abtp_board_of_health.pdf)

On April 10 and 11, 2012, City Council adopted reports from the Deputy City Manager and the Medical Officer of Health on local air quality in Wards 30 and 32 (South Riverdale, Leslieville and the Beaches), and the accompanying cumulative assessment of health impacts, and directed that a similar study of local air quality be conducted for Ward 5 and Ward 6 (Etobicoke-Lakeshore).
(http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.PE10.2
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2012.HL11.2)

On May 6, 2014, City Council considered reports from the Chief Corporate Officer and the Medical Officer of Health, on local air quality in Wards 5 and 6, and directed the Chief Corporate Officer to report to City Council on the results of additional local air quality studies including a discussion of initiatives of appropriate City Divisions, Agencies and Corporations to support local residents and businesses in improving their local air quality and natural environment.
(http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.PE26.2
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.HL30.8)

Also on May 6, 2014, City Council adopted the report *Path to Healthier Air: Toronto Air Pollution Burden of Illness Update* from the Medical Officer of Health, which highlighted traffic as an important source of air pollution in Toronto.
(http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.HL30.1)

COMMENTS

Traffic-related air pollution has been linked with harmful health effects

Policies and programs to reduce emissions, implemented by all orders of government over the past decade, have led to downward trends in pollutant emissions, ambient air pollution levels, and related health impacts. Despite these improvements, air pollution still poses a significant burden of illness in Toronto: Toronto Public Health (TPH) estimates that 1,300 premature deaths and 3,550 hospitalizations for heart and lung disease in Toronto can be attributed to air pollution each year.[1]

The largest source of air pollution emitted within Toronto is motor vehicle traffic. In 2012 and 2014, the Toronto Environment and Energy Division (EED) and TPH collaborated on neighbourhood-level local air quality studies that modelled and mapped concentrations of 30 air pollutants, based on information about emissions from a variety of sources. In 2015-2016, in collaboration with the Medical Officer of Health, EED expanded the local air quality modelling to address the city as a whole. This air quality modelling study and the associated cumulative health risk assessment confirm earlier findings that pollutants emitted by vehicles, and highway corridors, are associated with higher health risk.

Traffic-related air pollution (TRAP) is a mixture of substances emitted from cars, buses, and trucks, including particles (PM10 and PM2.5), nitrogen oxides such as nitric oxide (NO) and nitrogen dioxide (NO2), carbon monoxide, and volatile organic carbons. In 2014, TPH estimated that, each year, about 280 deaths and 1,100 hospitalizations arise from exposure to TRAP emitted within Toronto.[1] Estimated health risks were greatest for cardiovascular and respiratory health outcomes, followed by cancer. Some groups are especially at risk of adverse health impacts from exposure to air pollution, including TRAP. Children, older adults and people who live, work, play, or commute near major roadways are at increased risk. In addition, exposure to TRAP is inequitably distributed – people who live closer to busy roadways are not only exposed to higher pollution, they are already more likely to experience ill health because they are more likely to have lower income and education and be unemployed.[2] More information can be found in the report, *Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure*, (Attachment 2).

Exposure to TRAP is highest near highways and busy roadways

For any given roadway, a key indicator of the presence of TRAP is traffic volume. Organizations such as the Health Effects Institute and Public Health Ontario identify that health risk from TRAP is higher within 500 metres of highways with an average daily traffic volume of 100,000 vehicles or more, within 150 metres of highways with daily traffic volumes of 50,000 vehicles or more, and within 100 metres of arterial roads with an average daily traffic volume of 15,000 vehicles or more. Additional factors that affect TRAP concentrations near roads include traffic speed, the proportion of older and heavy-duty vehicles in the traffic mix, and weather-related factors such as wind direction and precipitation.

Numerous Toronto highways and roadways carry high traffic volumes. Highway 401 within Toronto includes the busiest section of highway in North America, with an annual average daily traffic (AADT) volume of over 331,000 vehicles across Toronto and with some portions having as many as 410,000 vehicles. The average daily volume of traffic on Toronto's 116 major arterials is over 25,000 vehicles, with many arterials experiencing maximum daily traffic volumes of over 50,000 vehicles. Attachment 1 identifies expected zones of TRAP exposure along highways and busy arterial roads in Toronto.

Based on the city-wide air quality modelling, traffic is a significant source of air pollution in Toronto, and concentrations are especially high near highways and busy roads. Modelling indicates that some TRAPs, benzene and PM10, are present at levels that

exceed health benchmarks at times in Toronto. Higher levels of air pollution near highways and busy roads highlight the need to consider ways to reduce and mitigate exposures in these areas.

Some populations are more vulnerable to the adverse impacts of air pollution. Settings where large numbers of vulnerable people can be found include child care centres, schools, and long term care homes. In Toronto, 50 percent of all child care centres, 43 percent of schools, and 63 percent of long term care homes are located within at least one of the TRAP exposure zones. Eleven child care centres and 20 schools are located close to multiple highways. In addition, about 35 percent of Toronto's residential areas are located within a TRAP zone.

Current evidence indicates that exposure to air pollution at any level is associated with an increase in health risk. This suggests that priority should be placed on reducing exposures near highways and busy roads. It is important to note that the results of the air quality modelling do not indicate that these pollutants are present in Toronto’s air at levels above occupational health and safety guidelines.

Current City initiatives are leading towards a low-emission future

TransformTO, the City's climate action plan, outlines a long-term approach to reducing greenhouse gas emissions in Toronto by 80 percent by 2050, while also improving health, prosperity and equity. It establishes long-term, low-carbon goals for transportation in Toronto that will also reduce TRAP. Achieving these goals requires sustained investment in transit and active transportation infrastructure, and efforts to electrify and switch to low-carbon fuels for all types of vehicles.

To promote walking, cycling, and transit as the best ways to get around, Toronto has introduced the Walking Strategy, the Toronto Complete Streets Guidelines, and the 10-year Cycling Network Plan and made improvements to transit. The City will build on the efforts already underway to enable Toronto to move to a future where levels of TRAP are nearly eliminated.

There is a need to address TRAP sources and exposure now

A review of the literature and initial consultations with City and external partners indicate that there are a variety of options that can help reduce exposure to TRAP in the near-term. Interventions to reduce TRAP can be focussed on (i) reducing emissions at the source; and (ii) modifying the natural, built, and operational environments in ways that reduce the amount of TRAP reaching people. Some of these intervention measures are highlighted in Attachment 2 and summarized below.

There are many ways to reduce emissions of TRAP at its source

Harmonize Canadian emission standards with California's
Emission control regulations and fuel standards are set by the federal government through the *Canadian Environmental Protection Act, 1999.* Currently, emissions from vehicles are addressed in the 2004 *On-Road Vehicle and Engine Emission Regulations,* which are closely aligned with corresponding federal emission standards of the United

States. As a result of a history of concerns related to air pollution, the state of California is allowed to promulgate more stringent vehicle emissions standards, and other states can choose to follow either the U.S. federal or California standards. The Canadian standards should align with California standards to allow reductions in TRAP emissions in Canada to occur sooner.

Limit emissions of air pollutants in the Clean Fuel Standard
Environment and Climate Change Canada is currently developing a Clean Fuel Standard. While commendable for its focus on reducing greenhouse gas emissions, the proposal does not currently consider other air pollutants such as particulate matter and nitrogen oxides. Given that the concept of “clean fuels” normally implies minimizing air pollution impacts broadly, effort to reduce greenhouse gas emissions should also incorporate consideration of air pollutants including common air contaminants and air toxics. Limiting emissions of air pollutants from the burning of transportation fuels is especially important in urban areas with high traffic densities.

Adopt strategies to reduce emissions from diesel trucks
The introduction of hybrid and electric light-duty vehicles (personal vehicles) is occurring relatively quickly and will reduce TRAP. Conversion of heavy-duty vehicles to reduce their reliance on fossil fuels is expected to be much slower. Heavy-duty diesel trucks are associated with much higher emissions than light-duty vehicles. While updated standards set more stringent emission limits from heavy-duty vehicles, diesel engines last for many years, and the new standards apply only to new model years.

The Provincial Drive Clean heavy-duty testing program and the Federal SmartWay program are in place to target older diesel vehicles. It would be beneficial for the Federal government to explore additional opportunities to reduce TRAP from heavy-duty diesel vehicles, such as requiring retrofits that reduce emissions or instituting incentives for vehicle replacement.

Evaluate the City's street sweeping program
While most vehicle emissions come from tailpipes, a significant portion of harmful particles is generated as a result of wear of asphalt, tires, brake discs and brake pads. Currently, after an initial spring clean-up, Toronto sweeps arterial roads twice a month, while lower volume roads are swept less frequently. To reduce the presence of particles Transportation Services uses street sweepers that are able to reduce the amount of ambient PM10 and PM2.5 in the air above swept road surfaces by 27% or more. There is currently limited information about how long the improvements to ambient air quality are maintained after sweeping, how this relates to traffic volumes on various roads, and how frequently street sweeping should be conducted in order to maintain healthier air quality conditions on arterial roads.

A mobile air monitoring study to assess the relationships between street sweeping and air quality over time would support a City evaluation of the current service levels and the need for revised service levels that ensure air quality benchmarks are being met. In addition the City could consider giving priority to sweeping the streets in high-traffic areas of Toronto where fine particulate pollution levels are the highest and where there are especially vulnerable people in adjacent buildings.

Implement congestion management strategies
Traffic congestion contributes to TRAP, as it causes vehicles to spend more time on the road, and because stop-and-go driving results in greater pollutant emissions than driving at more constant speeds. In November 2015, City Council endorsed the updated Congestion Management Plan (CMP) 2016-2020. The plan includes measures to improve management of traffic congestion on Toronto's streets and expressways, including development of action plans for "hot-spots", implementing transit priority, upgrading the City's "smart" traffic signal system, developing a comprehensive curbside management strategy, expanding the existing Smart Commute program, and developing a road safety plan.

The value of the CMP could be enhanced by explicitly considering both the link to traffic pollution and the health implications of actions that are taken. Implementation of congestion management strategies and other key programs, such as the 10-year Cycling Plan, Complete Streets, and Vision Zero will continue to improve the safety and attractiveness of walking, cycling and taking transit. Road safety measures that reduce motorized vehicle conflicts for vulnerable road users or that calm the speed of motorized traffic may also help reduce stop-and-go driving and result in safer and more consistent speeds.

Reduce automobile dependency
An urban region with convenient, affordable, safe and pleasant transportation alternatives enables people to reduce their dependency on cars. Similarly, compact, mixed-use neighbourhoods provide the goods and services that people need and the ability to access them without driving a car. Toronto Public Health's 2012 report, *Road to Health*, highlighted the many health and other benefits of walking, cycling, and other forms of active transportation, and the need for better active transportation infrastructure.

In the short term, efforts to address crowding and expand capacity on busy transit routes are needed to encourage people to choose transit. Expanding and increasing the safety of spaces used by pedestrians and cyclists will enable more people to choose active transportation for short trips. In the long term, building a low-carbon future as envisioned by Toronto's *TransformTO* initiative offers numerous opportunities to reduce automobile dependency and reduce TRAP.

Modifying the built environment can reduce people's exposure to TRAP

There are a variety of strategies that can modify the natural and built environment and be implemented in either existing or new buildings to reduce exposure to TRAP. Strategies include:

- separation distances, which set a minimum distance between high-traffic roadways and places where people live, work, and play;
- orientation of buildings, play areas, and air intakes away from known pollution sources;
- slightly positive internal air pressures in buildings;
- combinations of vegetative and physical barriers; and
- superior ventilation, filtration, and air-conditioning systems.

Plan neighbourhoods and new buildings to minimize exposure to TRAP
At the neighbourhood level, the presence of “street canyons” created by many tall buildings located adjacent to one another can limit natural airflow and dispersal of pollutants. A 2016 Urban Ventilation Study by EED identified features of urban design that encourage dispersion of pollutants, such as “V-shaped” cross-street profiles and wider spaces between buildings. The study also developed an approach to identify where changes to existing and future buildings can best alleviate air quality impacts. As well, pedestrian and cycling infrastructure can be added to the network of local streets to complement the major street network, enabling pedestrians and cyclists to use "quiet streets" away from certain sections of arterials.

The Official Plan currently addresses air quality through policy 3.4.1 a) i) requiring that city-building activities be environmentally friendly, protecting and improving health of the ecosystem by minimizing air, soil and water pollution. The review of the Built Form policies is currently underway, and will address how changes to built form could encourage dispersion of air pollutants. *Growing Up*, the draft Urban Design Guidelines for vertical communities, are currently being piloted, and provide another opportunity to address mitigation measures for air quality issues. In addition, the updated Toronto Green Standards are anticipated for the fall of 2018 and will address air quality in terms of revised performance measures for electric vehicles, bike parking and reductions to urban heat island. City Planning, TPH, and EED will continue to work together to ensure that mitigation measures are considered in both the green standards and the urban design policies within the Official Plan.

Require measures to improve indoor air quality in buildings
The Ontario Building Code (OBC) is a set of minimum provisions respecting the safety of buildings with reference to public health, fire protection and structural sufficiency. While the OBC contains provisions regarding ventilation, it does not directly address indoor air quality.

In response to the 2017 OBC consultation on proposed amendments to support the Province's Climate Change Action Plan, Toronto Building included comments from TPH. The submission included the matter of indoor air quality highlighting the need to reduce building occupants' exposure to TRAP.

Develop best practice guidelines to raise City staff's and professionals' awareness of measures to reduce TRAP exposure
Best practice guidelines on measures to reduce TRAP exposure in buildings would assist both City staff and professionals who are involved in development, planning, design, and construction in Toronto. The City could provide information about TRAP, its health risks, and measures to reduce those risks to school boards, day cares, long-term care facilities, architects, landscape architects and the public. Best practices guidelines could be developed with the assistance of an inter-divisional advisory group and in consultation with industry professionals. The City could raise awareness among designers, architects, engineers, and other professionals by working with universities,

colleges and professional associations to ensure that training for these professions considers methods to mitigate exposure to TRAP.

Address TRAP exposure in existing buildings through building operational changes, awareness, retrofits and financing
There are many existing buildings in Toronto located close to busy roads and highways. Operational changes to reduce indoor sources of pollutants, and timing of opening of windows and doors relative to peak traffic times, can improve indoor air quality. As well, portable indoor air filters may help remove pollutants. Some of the strategies that reduce TRAP exposure at new facilities can also be applied to existing facilities as retrofits. *TransformTO*, the City's climate action plan, includes an acceleration campaign on workforce development for high-performance buildings. As part of this campaign, training programs for professional engineers, builders and others could be enhanced to include strategies for addressing TRAP in new and existing buildings.

An awareness program that promotes the use of best practices for owners and operators of buildings in TRAP exposure zones could encourage the adoption of physical and operational measures to reduce exposure to TRAP in existing buildings. School boards, child care centres, long-term care homes, landlords, and residents are among audiences that would benefit from this kind of information.

An important barrier to implementing measures to reduce TRAP exposure in both new and existing buildings is cost. Financial support is needed to encourage the adoption of measures to mitigate TRAP exposure. Retrofitting in particular can be costly; for schools and long-term care homes, current funding models prevent giving priority to the allocation of funds for retrofits to facilities located in TRAP exposure zones. Existing funding models for capital projects and repairs could be reviewed to include consideration of exposure to TRAP when decisions are made about the allocation of funds for building improvements.

Opportunities to Strengthen Ontario's Air Quality Management Initiatives

In the Greater Toronto and Hamilton Area (GTHA) large volumes of traffic flow along regional highways and major arterial roadways, and road transportation is a primary source of locally generated air pollution. Given that more than 45% of Ontario's population lives in the Greater Toronto Area, it is important to address this source of pollution.

In 2012, the Canadian Council of Ministers of the Environment established the Air Quality Management System (AQMS) which is a collaborative framework for improving air quality across Canada. Under the AQMS, provinces and territories are required to establish air zones for reporting on and managing air quality. Under the AQMS, the Province has identified special management zones for areas where air quality is primarily influenced by cumulative industrial sources. In 2015, TPH requested that the Province also create an Air Quality Management Zone for the Greater Toronto Area to acknowledge that traffic sources are a significant contributor of air pollution in this area. There is a need for a mechanism that will identify the GTHA as a special area to help the adoption of measures tailored to preventing emissions of, and exposure to, air pollution from traffic-related sources where vehicle emissions predominate.

Improving our Understanding of the Problem

Currently, there are limited data on TRAP concentrations along the various segments of Toronto's roadways or highways, and data that link traffic volumes to pollutant levels. Mobile monitoring of TRAP conducted in conjunction with collection of traffic volumes and congestion occurrences by time and location would provide information about the variability of concentrations of TRAP in Toronto, enable validation of air quality models developed for the City, support improved health assessment related to TRAP, and provide information on trends in TRAP concentrations over time.

To better understand the impact of TRAP on health and the economy, a study that estimated the social, environmental, and health costs associated with TRAP, and a comparison of these with the costs of preventing emissions of, and exposure to, TRAP would support the implementation of effective interventions.

To ensure that policies fully consider the wellbeing of children, TPH has developed a Child Friendly Policy Assessment Tool. Undertaking a child-focussed assessment of TRAP would enable the City to identify any additional measures to reduce negative impacts on children's health.

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ATTACHMENTS

Attachment 1. Map of Expected Zones of TRAP Exposure in the City of Toronto

Attachment 2. Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure

References

1. Toronto Public Health (TPH). (2014b). Path to healthier air: Toronto air pollution burden of illness update. April 2014. http://www1.toronto.ca/City%20Of%20Toronto/Toronto%20Public%20Health/Healthy%20Public%20Policy/Report%20Library/PDF%20Reports%20Repository/2014%20Air%20Pollution%20Burden%20of%20Illness%20Tech%20RPT%20final.pdf

2. Canadian Institute for Health Information (CIHI). (2011). Urban physical environments and health inequalities. https://secure.cihi.ca/estore/productSeries.htm?pc=PCC552

Attachment 1: Map of Expected Zones of TRAP Exposure in the City of Toronto

(Data source: Based on road data and traffic volumes, Ministry of Transportation, 2013; City of Toronto Transportation Division, 2010.)