Clean Indoor Air Toronto

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Environment, Climate & Forestry Division
City of Toronto
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To the Environment, Climate & Forestry Division of the City of Toronto;

We are *Clean Indoor Air Toronto*, a group of concerned Toronto residents who are dedicated to improving indoor air quality in our shared public spaces. Many of us are parents of children attending TDSB schools; other members of our group have chronic health conditions that make them vulnerable to infection. We are joined with many other concerned Toronto residents and organizations in making the requests outlined below.

If the COVID-19 pandemic has taught us anything, it's that the air in our shared indoor spaces isn't as clean as we think. COVID-19 and many other serious infectious diseases like measles and polio, are primarily transmitted through the air. The risk is especially high in poorly ventilated spaces.

Since public health protections were lifted in 2022, airborne infectious diseases have continued to circulate at high levels in Toronto. We continue to observe the toll that constant illness is having on our communities, particularly amongst students and education staff, frontline workers, as well as the tremendous strain on Toronto's healthcare system.

Clean, safe-to-breathe, indoor air is an accessibility issue. Without indoor air quality regulations and information on the air quality in a given space, people who wish to protect themselves from airborne diseases cannot access a shared indoor space without risking exposure. This is a barrier of access to the city's services and facilities.

Access to clean indoor air is also an equity issue. Poor indoor air quality is associated with higher rates of disease and poor health; buildings with poor air quality are more likely to be found in lower income communities. The City of Toronto has an indoor air quality policy for its office-based employees[1], but this policy does not extend to all of Toronto's buildings, creating an inequitable access to clean air. The City of Toronto has the power to address this inequity and improve access to clean indoor air.

The Ontario *Building Code* relies on ventilation Standard 62.1, written by the American Society of Heating, Ventilating and Air Conditioning Engineers (ASHRAE).[2,3] However, this *Code* is rarely enforced after construction; compliance is assumed but only checked when someone complains. There are no laws or regulations that govern and enforce acceptable indoor air quality, and there is no defined standard for what constitutes clean, safe-to-breathe air. Many Toronto buildings do not comply with ASHRAE Standard 62.1, and that includes public schools.

To add to that, the events of the past 5 years have shown that the current ventilation standard is outdated.[4] It is not designed to handle the multiple challenges we now face:

- Air pollution from climate change-related events, e.g., wildfire smoke, aerosolized pollution and pathogens from flooding[5–7];
- Serious airborne infectious diseases[8,9];
- Harmful indoor air pollutants that were not contemplated when ASHRAE Standard 62.1 was written, including fine particulates (PM2.5), microplastics, and perfluorylalkyl and polyfluoroalkyl substances (PFAS).[10–13]

ASHRAE and other expert organizations, including the Harvard T.H. Chan School of Public Health, have issued new guidance to manage these challenges.[14,15] Yet, 5 years after the start of the pandemic, Toronto has made no moves to implement the latest guidance on indoor air quality management.

During the City's public consultation for Budget 2025, we requested that the City of Toronto invest in the following:

1. **A city-wide Indoor air quality (IAQ) policy and bylaw** that follow the latest recommendations from ASHRAE and the Ontario Society of Professional Engineers (OSPE) with regards to reducing airborne disease transmission and fine particulate (PM2.5) air pollution.[14,16,17] This policy must include a standard for clean, safe-to-breathe air and verification.
2. **A program to accelerate indoor air quality improvement in Toronto's buildings**, including incentives for HVAC upgrades/retrofits that meet the standards laid out in the City's IAQ policy in item (1).
3. **An IAQ monitoring system for indoor levels of carbon dioxide (CO_2) and PM2.5, for municipal buildings and public schools**, which includes a publicly available website for real-time reporting of collected data.[16,18]

The upfront cost of investing in policies and actions that provide access to clean indoor air is relatively low, compared to the outsize positive effect it will have on the health of our communities. ASHRAE published a cost/benefit analysis for implementing Standard 241 to control airborne diseases, and found that the economic benefit in terms of reducing infection and increasing productivity could be as high as 10 times the initial investment.[19] Based on ASHRAE's estimate of $4 billion (USD) for upgrading all indoor spaces in the U.S. to meet Standard 241, it would cost about $52 million (CAD) to upgrade the ventilation in all spaces in Toronto (based on US population, 335 million, and Toronto population, 3.026 million). This is a relatively small amount to invest that could translate quickly into an economic benefit of around $500 million in terms of increasing productivity, reducing time lost to sickness, and reducing the burden on the healthcare system. Upgrading a classroom to meet Standard 241 would cost about $18 per person – this would immediately translate into improved learning outcomes, fewer sick days, and significantly improved physical and mental health for students and staff.[20]

At the October 21, 2024 Board of Health meeting, Councillor Gord Perks advocated for robust recommendations on strategies to reduce cancers due to occupational and environmental exposures.[21] A significant proportion of such cancers are associated with inhaling air pollution commonly found indoors, including PM2.5 particulates, microplastics, and PFAS.[22] Other cancers may be due to a prior viral infection acquired by airborne transmission.[23,24] Investment in clean indoor air will have a significant impact in reducing the incidence of such cancers and benefit our long-term health.

A clean indoor air policy which includes IAQ monitoring would align with the City of Toronto's goal of reducing emissions, and increasing our resilience to the effects of climate change and related air pollution. For under-ventilated spaces, the retrofits/upgrades to install heat exchangers would improve ventilation while having minimal energy impact. Inclusion of IAQ monitoring and controls in HVAC retrofits/upgrades would be highly beneficial, as it would allow for improved ventilation, while preventing over-ventilating and energy wastage. An incentive program for HVAC retrofits/upgrades that includes IAQ monitoring could be integrated with the City of Toronto's existing TransformTO program, and potentially also the Environmental Grants & Incentives program.[25,26]

The following three questions were posed in the Net Zero Retrofit Discussion Toolkit and our answers to each are provided below.

1. Rank in order the barriers the City needs to reduce in order to spur voluntary uptake of Net Zero Retrofits. Describe your rationale for this order and the importance of addressing these barriers.

(1) Cost is a primary concern. There is a perception that the cost of replacing fossil fuel-powered appliances, such as the furnace and water heater, present a very large upfront cost. Since the federal grant program ended, it is not apparent if another grant program that offers the same subsidy level has taken its place.

(2) Awareness and information are of equal concern as the cost. In our view, the lack of awareness of the need to updating our building air handling systems to protect occupant health is a major barrier. Many people are not aware of the impact of poor indoor air quality on their health, so they do not believe there is any need for spending money on upgrading/retrofitting the air handling system and replacing gas-powered appliances.

2. What are your thoughts on the programs and policies presented? How can they be improved (i.e. what barriers need to be addressed)? Will they be effective in accelerating retrofits across the city?

Improved indoor air quality (IAQ) need not come at the expense of the City's emissions goals. Rather, the addition of IAQ monitoring and controls along with improved ventilation can prevent the problem of over-ventilating that results in excessively dry air and unnecessary energy use. For under-ventilated spaces, the programs and policies we are proposing have significant health benefits, and retrofits that add heat exchangers can bring spaces up to code with minimal energy impact.

The programs and policies could be improved by:

(1) Placing greater emphasis on protecting the health of building occupants by providing clean, safe-to-breathe indoor air. This can be accomplished by incorporating the latest recommendations from ASHRAE and the Ontario Society of Professional Engineers (OSPE) with regards to reducing airborne disease transmission and fine particulate (PM2.5) air pollution, including implementation of ASHRAE Standard 241

(2) Inclusion of an IAQ monitoring system in a building's HVAC retrofit/upgrade, that allows for real-time reporting of indoor levels of carbon dioxide (CO_2) and PM2.5 in each ventilation zone within a building, wherein the collected data is immediately available to building occupants. Ventilation and air filtration rates can be adjusted as needed, based on the collected data. In addition, the collected data can be stored and monitored by the City of Toronto for regular assessment of air quality in buildings which have been retrofitted/upgraded.

(3) A public education program, that is particularly aimed at equity-deserving residents (e.g., those in low-income brackets, racialized groups, newcomers, and renters), to outline the many benefits of Net

Zero retrofits and upgrades, with increased emphasis on the benefits for occupant health, including protection from indoor air pollution, airborne infectious diseases, and improved productivity.

3. How can the City of Toronto make Net Zero Retrofits more inclusive and accessible for equity-deserving residents/small business owners (low-income, racialized, newcomers, renters)?

(1) As noted in question #1, cost is a primary concern, and presents a major financial barrier to equity-deserving residents, e.g., those in low-income brackets, racialized groups, newcomers, and renters. Although the City offers loan programs, they do not offer a means to immediately bring down the cost of a retrofit/upgrade. A policy that includes a subsidy, grant, and/or rebate for equity-deserving residents would be helpful.

(2) A public education campaign that is aimed directly at equity-deserving residents, that clearly describes all the benefits of clean, safe-to-breathe air, how indoor air quality may be improved with increased ventilation and filtration, and how the retrofits/upgrades can provide improved IAQ as well as helping to reduce emissions and overall energy consumption.

In addition, investing in a clean indoor air policy as part of the Net Zero strategy aligns with the City of Toronto's Budget priorities, including maintaining a State of Good Repair in municipal buildings, investing in climate action and resilience, and increasing accessibility.[27]

Other jurisdictions, like Boston, Colorado, and California, have begun the work of cleaning indoor air.[18,28,29] This is an opportunity for Toronto to lead the way for the rest of Canada.

We urge the Environment, Climate & Forestry Division to increase the emphasis on protecting the health of building occupants, by investing in policies and actions that will provide clean, safe-to-breathe indoor air. By doing so, the City of Toronto can reduce barriers and inequities that prevent Torontonians from achieving their fullest potential, and fulfilling their aspirations without the risk or burden of poor health, in addition to ensuring that all can access city services and facilities safely.

Yours Sincerely,

On behalf of Clean Indoor Air Toronto (CIAT)
[14 names redacted for privacy]

Safe Air Collective

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