City of Hamilton
BOARD OF HEALTH
AGENDA

Meeting #:	22-001
Date:	January 10, 2022
Time:	9:30 a.m.
Location:	Due to the COVID-19 and the Closure of City Hall (CC) All electronic meetings can be viewed at: City's Website: https://www.hamilton.ca/council-committee/council-committee-meetings/meetings-and-agendas City's YouTube Channel: https://www.youtube.com/user/InsideCityofHamilton or Cable 14

Loren Kolar, Legislative Coordinator (905) 546-2424 ext. 2604

---

1. CEREMONIAL ACTIVITIES

2. APPROVAL OF AGENDA

   (Added Items, if applicable, will be noted with *)

3. DECLARATIONS OF INTEREST

4. APPROVAL OF MINUTES OF PREVIOUS MEETING

   4.1. December 6, 2021

5. COMMUNICATIONS

6. DELEGATION REQUESTS

7. CONSENT ITEMS

8. STAFF PRESENTATIONS

8.1. Clean Air Hamilton Annual Progress Report (BOH22001) (City Wide)

8.2. Overview of COVID-19 Activity in the City of Hamilton 11 Mar 2020 to Present (to be distributed)

9. PUBLIC HEARINGS / DELEGATIONS

10. DISCUSSION ITEMS

10.1. Interim Plan to Improve Staff Recruitment and Retention (BOH22002) (City Wide)

11. MOTIONS

12. NOTICES OF MOTION

13. GENERAL INFORMATION / OTHER BUSINESS

14. PRIVATE AND CONFIDENTIAL

15. ADJOURNMENT

BOARD OF HEALTH
MINUTES 21-012

9:30 a.m.
Monday, December 6, 2021
Due to COVID-19 and the closure of City Hall, this meeting was held virtually

Present:	Mayor F. Eisenberger Councillors M. Wilson (Vice-Chair), N. Nann, J. Farr, S. Merulla, R. Powers, T. Jackson, J.P. Danko, E. Pauls, B. Clark, M. Pearson, B. Johnson, L. Ferguson, A. VanderBeek and J. Partridge
Absent with Regrets:	Councillor T. Whitehead – Personal

THE FOLLOWING ITEMS WERE REFERRED TO COUNCIL FOR CONSIDERATION:

1. Public Health Inspections of Consumption and Treatment Services Sites (BOH21013) (City Wide) (Item 7.1)

(Johnson/Merulla)
That Report BOH21013 respecting Public Health Inspections of Consumption and Treatment Services Sites, be received.

Result: Motion CARRIED by a vote of 15 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
YES	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

FOR INFORMATION:

(a) CEREMONIAL ACTIVITIES (Item 1)

There were no ceremonial activities.

(b) CHANGES TO THE AGENDA (Item 2)

The Committee Clerk advised the Board that there were no changes to the agenda.

(Jackson/Pearson)
That the agenda for the December 6, 2021 Board of Health be approved, as presented.

Result: Motion CARRIED by a vote of 14 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
ABSENT	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

(c) DECLARATIONS OF INTEREST (Item 3)

None

(d) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) November 15, 2021 (Item 4.1)

(Farr/Johnson)
That the Minutes of November 15, 2021, be approved, as presented.

Result: Motion CARRIED by a vote of 14 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
ABSENT	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

(e) COMMUNICATIONS (Item 5)

(i) Correspondence from the Hon. C. Elliot, Minister of Health, respecting to New Base Funding to Address the Waitlist and Times for Child and Youth Mental Health Services (Item 5.1)

(Partridge/Pauls)
That the Correspondence from the Hon. C. Elliot, Minister of Health, respecting to New Base Funding to Address the Waitlist and Times for Child and Youth Mental Health Services, be received.

Result: Motion CARRIED by a vote of 15 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
YES	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek

ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

(f) DELEGATION REQUESTS (Item 6)

(i) Kayla Hagerty, respecting the Impact of the COVID-19 Pandemic on Opioid Epidemic in Canada (for a future meeting) (Item 6.1)

(Powers/Clark)
That the Delegation Request from Kayla Hagerty, respecting the Impact of the COVID-19 Pandemic on Opioid Epidemic in Canada be approved, for a future meeting.

Result: Motion CARRIED by a vote of 15 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
YES	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

(g) STAFF PRESENTATIONS (Item 8)

(i) Overview of COVID-19 Activity in the City of Hamilton 11 Mar 2020 to Present (Item 8.2)

Dr. E. Richardson, Medical Officer of Health; Michelle Baird, Director, Healthy and Safe Communities and Melissa Biksa, Manager, Healthy and Safe Communities, addressed the Board with an Overview of COVID-19 Activity in the City of Hamilton 11 Mar 2020 to present, with the aid of a PowerPoint presentation.

(Clark/VanderBeek)
That the Presentation respecting an Overview of COVID-19 Activity in the City of Hamilton 11 Mar 2020 to present, be received.

Result: Motion CARRIED by a vote of 14 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
YES	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
ABSENT	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
YES	-	Ward 15	Councillor Judy Partridge

(g) ADJOURNMENT (Item 15)

(Nann/Pearson)
That, there being no further business, the Board of Health be adjourned at 10:55 a.m.

Result: Motion CARRIED by a vote of 14 to 0, as follows:

YES	-	Mayor Fred Eisenberger	
YES	-	Ward 1	Councillor Maureen Wilson
YES	-	Ward 2	Councillor Jason Farr
YES	-	Ward 3	Councillor Nrinder Nann
YES	-	Ward 4	Councillor Sam Merulla
YES	-	Ward 5	Councillor Russ Powers
YES	-	Ward 6	Councillor Tom Jackson
YES	-	Ward 7	Councillor Esther Pauls
YES	-	Ward 8	Councillor J. P. Danko
YES	-	Ward 9	Councillor Brad Clark
YES	-	Ward 10	Councillor Maria Pearson
YES	-	Ward 11	Councillor Brenda Johnson
YES	-	Ward 12	Councillor Lloyd Ferguson
YES	-	Ward 13	Councillor Arlene VanderBeek
ABSENT	-	Ward 14	Councillor Terry Whitehead
ABSENT	-	Ward 15	Councillor Judy Partridge

Respectfully submitted,

Mayor F. Eisenberger,
Chair, Board of Health

Loren Kolar
Legislative Coordinator
Office of the City Clerk

INFORMATION REPORT

TO:	Mayor and Members Board of Health
COMMITTEE DATE:	January 10, 2022
SUBJECT/REPORT NO:	Clean Air Hamilton Annual Progress Report (BOH22001) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Trevor Imhoff (905) 546-2424 Ext. 1308 Jahanvi Desai (905) 546-2424 Ext. 3673
SUBMITTED BY: **SIGNATURE:**	Kevin McDonald Director, Public Health Services - Healthy Environments Division Healthy and Safe Communities Department

COUNCIL DIRECTION

Clean Air Hamilton reports annually to Board of Health (BOH) on the trends in local air quality and the actions undertaken by members of Clean Air Hamilton to address local air quality in Hamilton.

The “Clean Air Hamilton 2020 Air Quality Progress Report”, attached as Appendix “A” to Report BOH22001 provides further details.

INFORMATION

Clean Air Hamilton (CAH) is a community initiative to improve air quality in the City of Hamilton. It has a diverse membership with representation from environmental organizations, industry, businesses, academia, citizens and different levels of government including federal, provincial and municipal.

Initiated in 1998, CAH works to improve air quality throughout the City of Hamilton with an objective to meet all ambient air quality criteria. Public Health Services’ staff in the Healthy Environments Division supports the work of CAH and other work related to air quality and climate change across the corporation and the community.

The CAH committee aims to accomplish its objectives through sound science-based decision-making, using the most up-to-date information and tools available. CAH's work focusses on education and outreach, advocacy, air quality monitoring, and to continue to update the Hamilton Airshed Modelling System (HAMS). This will help identify major sources, and distribution, of air pollution in order to prioritize action for maximum air quality improvement and exposure reduction. CAH continues to follow the previously developed five strategic themes related to air quality improvement:

- Governance & Structure;
- Air Zone Management;
- Transportation;
- Air Monitoring; and,
- Dust and Particulate Matter (PM) Mitigation.

Throughout 2020, CAH continued to work on actions identified in the Air Quality Task Force's (AQTF) 2018 workshop which identified three main areas of focus including:

- Education;
- Air Quality Monitoring; and,
- Hamilton Airshed Modelling System.

These actions were assigned responsibility and helped create a three-year workplan for completion. By the end of 2020, CAH has completed seven of the fourteen actions within the 2019-2022 work plan. These actions included:

- Completion of a Communication and Education Awareness Strategy for Clean Air Hamilton to implement;
- Completed one of three Upwind Downwind (UWDW) virtual lunch and learns (in replacement of large in-person UWDW conference);
- Fresh Air for Kids 2020/2021 program work completed by Green Venture and Corr Research Inc. More details on page 3 of this report;
- Friendly Streets Initiative 2019 program completed by Environment Hamilton (see 2019 CAH progress report for more details).
- Trees Please program completed by Environment Hamilton. More details on page 3 of this report;
- Ministry of Environment, Conservation and Parks (MECP) deployment of 4 operational T640 devices to monitor PM levels and air quality; and,
- Hamilton's Airshed Model Urban and Rural Sub-Regional Analysis.

Further details on air quality activities related to CAH and its members can be found in Appendix "A" to Report BOH19039.

Clean Air Hamilton Programs 2020

A. Fresh Air for Kids (FAFK)

FAFK aims to educate students on air quality, map neighbourhood air quality using a mobile monitoring unit from the MECP. The program teaches students about the monitoring of local air quality using hand-held devices and creates and delivers an environmental anti-idling campaign. As a result of the COVID-19 pandemic, the FAFK program was adapted to the virtual learning environment, where four sessions were provided using different strategies:

1. Pre-recorded videos and PDF activity sheets;
2. Providing other sessions through pre-booked live video calls; and
3. Creating online versions of student/teacher surveys, and student pledges.

Throughout the 2020-2021 school year, seven schools participated, out of which three completed the full four modules of the program. Despite the pandemic, FAFK engaged 218 students throughout this project year.

B. Trees Please!

Trees Please is a citizen science project with all data collected being completed by teams of volunteers who have been trained on proper tree identification and inventorying. The project comprised two main parts:

1. Tree inventory development (measuring, identifying and noting any challenges on trees); and
2. Collecting air quality data, specifically particulate matter (PM) levels.

The tree inventory is completed using iTree Eco, a free software program from the USDA Forest Service that calculates tree benefits. For air quality data, the project uses Dylos air quality monitoring devices that measures PM levels.

The goal of this project is to engage residents on local issues around air quality and urban forest health, by helping community members to understand that trees can help improve air quality and provide many other benefits. In 2020, the project was able to meet program goals, despite the pandemic, including:

1. Inventorying 451 trees in the Parkside Neighbourhood;
2. Organizing air quality monitoring walkabouts and distributing flyers;
3. Increasing the native tree canopy through a Free Tree giveaway (31 trees in total). This is in addition to a larger community-wide giveaway of 600 native trees and shrubs; and
4. Organizing a community tree planting in the fall of 2020, planting 200 native trees with 15 volunteers.

Air Quality Improvement Projects 2021

City staff in the Healthy Environments Division have worked with Procurement staff to update CAH funding to align with Procurement Policy (By-law No. 20-205). This included creating a competitive Request for Proposal (RFP) document and process. In total the City of Hamilton received four bids. As with previous years, the applications were scored by three adjudicators specializing in air quality, community planning and project management. Two applications were successful through the 2021 funding application process including:

1. Green Venture and Corr Research Inc. Fresh Air for Kids ($11,700); and
2. University of Toronto's Air Quality Research Project in Hamilton – ($7,000).

The results of these programs will be reported in the Clean Air Hamilton 2021 Air Quality Progress Report and presented to the Board of Health in 2022.

Upwind Downwind Lunch & Learn

The COVID-19 pandemic meant that Clean Air Hamilton's signature event, the Upwind Downwind (UWDW) Conference 2020 and the Clean Air Fair were cancelled. Rather than abandoning the plans altogether, CAH shifted gears and moved to run a series of virtual Lunch & Learns featuring speakers and topics from UWDW. The first one was held in December 2020 on the topic of *Transboundary Air Quality*, featuring:

1. Zac Adelman, Executive Director, Lake Michigan Air Directors Consortium (LADCO) who presented on *Perspectives on Air Quality in the Great Lakes Region in 2020*; and
2. Paul Miller, Executive Director, Northeast States for Coordinated Air Use Management (NESCAUM), from Boston, MA who presented on *Trucks, Air Quality, and Climate*.

Through these Lunch & Learns, CAH is able to provide the community with ongoing education and awareness about local and international air quality issues.

Air Quality in Hamilton

The MECP monitors air quality using the network of air quality monitoring stations across Hamilton. This network consists of provincially-owned air quality monitoring stations, air monitors owned and operated by members of the Hamilton Air Monitoring Network (HAMN), as well as two air-pointer monitors owned and operated by the City of Hamilton.

Air quality data is submitted to CAH and Hamilton Public Health Services (PHS) annually, which is reported to Board of Health and the community. The air quality data submitted continues to show a significant reduction city-wide in many of the monitored air pollutants since 1996. Based on the 2020 air quality data submitted, the following

concentrations and trends were observed for the following criteria air contaminants:

Total Suspended Particulate (TSP)

- Total suspended particulate (TSP) includes all particulate material with a diameter less than approximately 45 micrometres (µm). A substantial portion of TSP is composed of road dust, soil particles and emissions from industrial activities and transportation sources;
- The two Industry Stations in Hamilton show a decreasing trend of TSP and all stations (two City & two Industry) are below the annual objectives.

Inhalable Particulate Matter (PM_{10})

- Inhalable particulate matter (PM_{10}) has a diameter of 10 µm or less. PM_{10} makes up 40-50% of TSP in Hamilton and is primarily derived from vehicle exhaust emissions, industrial stack and fugitive dusts (non-stack), and the finer fraction of re-entrained road dust;
- The two Industry and two City stations located in Hamilton show decreasing trends since 2018.

Respirable Particulate Matter ($PM_{2.5}$)

- $PM_{2.5}$ makes up about 60% of PM_{10} and in most cities is derived from residential and transportation sectors. In Hamilton, there would also be some industrial contributions. Another significant portion of $PM_{2.5}$ is regionally generated emissions that can travel hundreds of kilometres via wind from where they originated. These transboundary flows play a significant role in Ontario's air quality and according to the Hamilton Airshed Modelling System (HAMS), transboundary emissions in Hamilton for $PM_{2.5}$ amounted to approximately 91%;
- The Hamilton Mountain and Hamilton Downtown air quality stations show a decreasing trend of $PM_{2.5}$, whereas the Hamilton West station shows an increase between 2019 to 2020;
- MECP data shows that Hamilton Downtown continues to have the highest concentrations of $PM_{2.5}$ relative to other municipalities across Ontario that have air quality stations measuring $PM_{2.5}$.

Ozone (O_3)

- The number of hourly exceedances greater than 50 parts per billion (ppb) increased in 2020 in comparison to 2019 for the Hamilton Downtown, Hamilton Mountain, and Hamilton West monitoring stations, but is below 2018 levels;
- Hamilton's 30-year ozone trend is comparable to many other municipalities in Ontario. Recent 2020 concentrations show Hamilton having one of the lowest concentrations of O_3, compared to other jurisdictions.

Sulphur Dioxide (SO_2)

- Concentrations since 2016 have shown a slight increase for Industrial Site 1, with

the annual average being recorded above the provincial Annual Objective;
- Conversely, SO_2 monitored at the Hamilton Downtown station has been decreasing since 2018 and was below the annual objective in 2020;
- While SO_2 concentrations in downtown Hamilton are achieving the provincial Annual Objectives, the average concentrations are higher compared to other Ontario municipalities.

Note: In 2018 the Province of Ontario approved a decision (EBR# 013-0903) to reduce the SO_2 standards to:
- 1-hour average air standard to 100 micrograms per cubic meter ($\mu g/m^3$) based on respiratory morbidity associated with exposure; and
- Annual average air standard for SO_2 to 10 $\mu g/m^3$, based on vegetation damage with exposure to this substance.

This decision contains a phase-in period with the air standard and will take effect on July 1, 2023[1].

Nitrogen Dioxide (NO_2)
- Sectors producing the majority of NO_2 emissions are transportation and industry. The level of vehicle use across Hamilton has increased slightly during the past decade, however overall NO_2 levels have decreased most likely due to improved vehicle engine technologies;
- NO_2 concentrations have shown a significant decrease since 1999. In recent years, the Hamilton Downtown air monitoring station recorded a steep decrease for 2019 to 2020. There is an increasing trend observed at Industrial Site 1 since 2018;
- NO_2 concentrations in Hamilton are higher when compared to other Ontario municipalities.

Benzene
- Benzene is a carcinogenic (cancer-causing) volatile organic compound (VOC) that is emitted from some operations within the steel industry, specifically coke ovens and coke oven by-product plant operations. Gasoline can also be up to 5% benzene. Vapours containing benzene may be released during pumping at gasoline stations. Transboundary benzene levels amount to 70% according to HAMS;
- Concentrations of benzene for all monitoring stations (Industry 1, 2, 3, and Hamilton Downtown) remain above the Annual Objective.

Benzo[a]pyrene (BaP)
- BaP, also a carcinogen, is emitted when carbon-based fuels such as coke, oil,

[1] Environmental Registry (2018). Regulatory amendments related to air emissions of sulphur dioxide and other items. Retrieved from https://ero.ontario.ca/notice/013-0903

wood, coal and diesel fuel are burned. BaP-generating activities include coke oven operations within the steel industry, incomplete combustion producing smoke such as vehicle traffic, burning of refuse, cooking, tobacco smoking, and wood burning;

- BaP has an increasing trend at all three monitoring stations (Industry 1, Industry 2, and Industry 3) and concentrations are above the Annual Objective;
- It is important to note that source apportionment for BaP from HAMS shows that industrial sources amount to 47% for BaP emissions, while transboundary emissions contribute to 29% of BaP concentrations in the City of Hamilton.

It is important to note that there is significant amount of transboundary (air emission sources outside of Hamilton) contributions to local airshed pollution concentrations in Hamilton. For example, and as noted above, HAMS estimated that transboundary sources contribute approximately 90% of $PM_{2.5}$, 70% of Benzene, and 29% of BaP concentrations locally across Hamilton. However, local industrial, on-road and off-road transportation emissions continue to contribute to localized air pollution and downwind airsheds as well.

2020 Air Quality Alerts

Two different air quality alerts are issued during periods of poor air quality in Ontario. A *Special Air Quality Statement* is issued when the Air Quality Health Index (AQHI) is a high risk (>6) and is forecast to last for 1-2 hours. If the high-risk AQHI level is forecasted to persist for at least 3 hours or longer, then a *Smog and Air Health Advisory* will be issued by the Province of Ontario.

In 2020, Hamilton did not experience any *Special Air Quality Statements* or *Smog and Air Health Advisory* instances[2]. For more information on current and historical air quality concentrations in Hamilton and across Ontario see: http://www.airqualityontario.com/.

Clean Air Hamilton notes that air pollution concentrations can be different at a local neighbourhood level and some areas of Hamilton can and do experience higher air pollution concentrations than others across the City.

Future Actions

There has been substantial improvement in Hamilton's overall air quality since the 1970s; however, air pollution continues to contribute to adverse health impacts to Hamilton residents. Recent improvements and information related to air pollution distribution at the hyper-local level is also providing evidence that some neighbourhoods across Hamilton experience higher levels of air pollution compared to others. Continued

[2] Ministry of Environment, Conservation, and Parks (2021). SAQS & SAHA 2015 TO 2021. Retrieved from http://www.airqualityontario.com/aqhi/advisories_stats.php

actions are imperative to further improve air quality in the City of Hamilton. Collaboration from individuals, organizations, industries, the City of Hamilton and other levels of government are required to reach our goals.
In the future, Clean Air Hamilton plans to:

- Continue to support and undertake all the recommendations of the Air Quality Task Force (BOH13029) and BOH report (BOH18016) in the areas of air modelling and monitoring, planning education and outreach, green infrastructure and advocating for government policies that encourage and facilitate behavioural change to active and sustainable transportation and alternative forms of efficiency and renewable energy for buildings;
- Continue to support and encourage Hamiltonians to reduce their transportation emissions through the use of alternatives including: public transit, bicycles, walking, hybrid or electric vehicles, etc. and support policies such as complete streets and transportation demand management;
- Encourage the continued efforts of the MECP and industry to reduce air borne contaminants in the City of Hamilton and the Province of Ontario;
- Organize additional UWDW Lunch & Learn sessions to educate and engage the City of Hamilton community on a broad range of air quality topics; and
- Continue to expand air quality monitoring activities by undertaking projects with community organizations and academic institutions in the City of Hamilton to better understand air pollution concentrations at the neighbourhood level.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report BOH22001: Clean Air Hamilton Annual Progress Report 2020

Clean Air Hamilton

2020 Air Quality Progress Report

November 2021

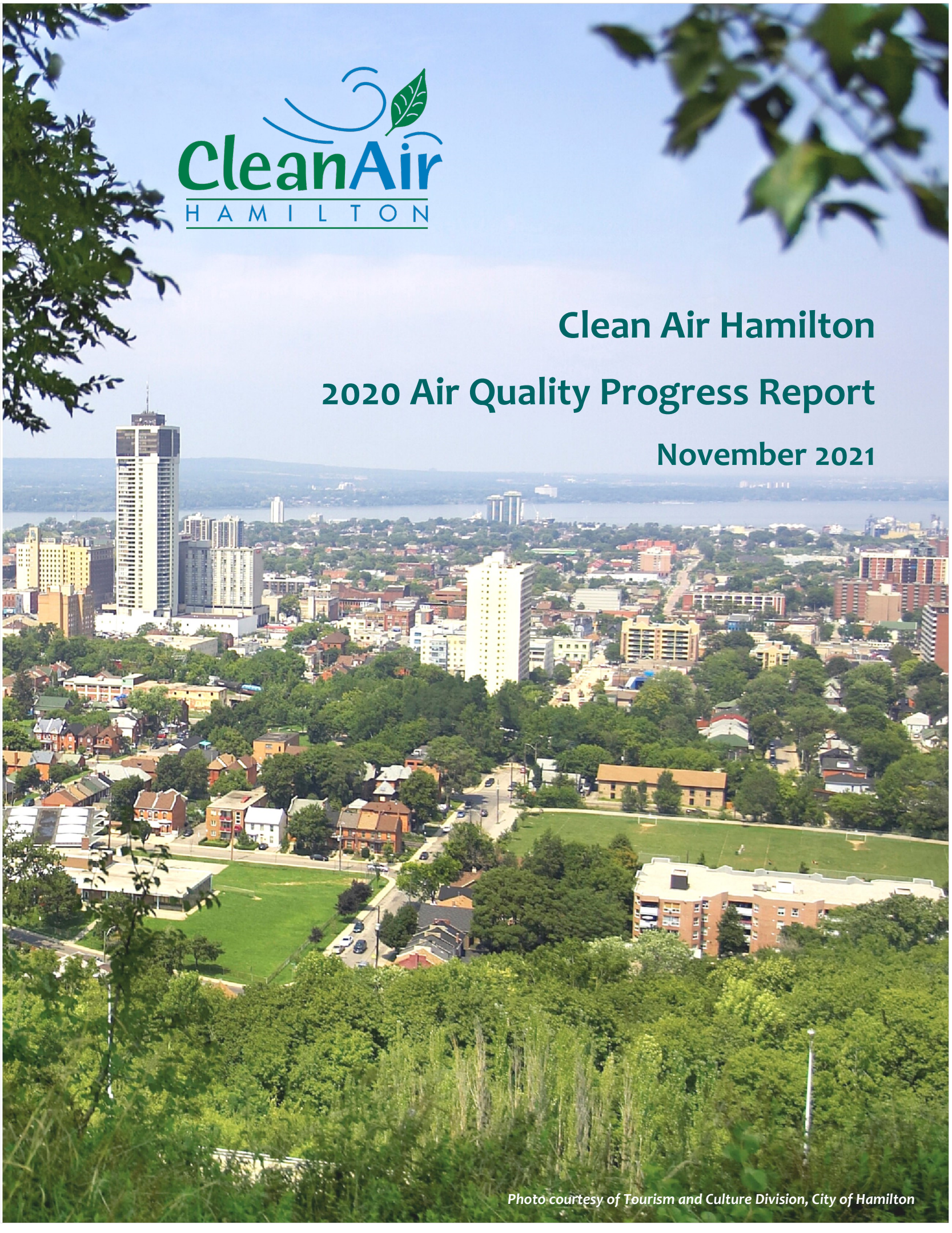


Photo courtesy of Tourism and Culture Division, City of Hamilton

Table of Contents

Top Row (L to R): Jahanvi Desai, Bruce Newbold (Chair), Andrew Sebestyen, Nico Strabac, Barry Duffey
Second Row (L to R): Stephen Burt, Denis Corr, Trevor Imhoff, Dan Dobrin, Geoffrey Knapper
Middle Row (L to R): George McKibbon, Heidi Levitzky, John Lundrigan, Julie Wedzinga, Kerry LeClair
Fourth Row (L to R): Lubna Hussain, Mainul Husain, Lynda Lukasik, Mark Smithson, Megan Sutton
Bottom Row (L to R): Tiffany Singh, Spencer Skidmore, Timothy Hung, Stephanie Gasko, Abigail Amponsah

For the full list of Clean Air Hamilton members, please go to https://cleanairhamilton.ca/members/

Message from the Chair

I am pleased to provide the Clean Air Hamilton Annual Report for 2020, which provides annual air quality data and our on-going work to improve air quality in Hamilton.

For previous years' activities and reports, please go to http://www.cleanairhamilton.ca.

With the COVID-19 pandemic impacting so much of our daily lives, to say that 2020 was a difficult year is an understatement. While we all practiced physical distancing, stayed at home in the early months of the pandemic, and shifted our meetings to a virtual format, our commitment to improving Hamilton's air quality remained.

Clean Air Hamilton's mandate includes involving and informing our citizens of all these issues and giving sound, science-based advice and recommendations. Reflecting this, we were well into planning for our bi-annual Upwind-Downwind conference and Clean Air Fair, both of which had been planned for June 2020. COVID-19, of course, meant that the events were cancelled.

In its place, Clean Air Hamilton proceeded with a series of noon-hour 'Lunch and Learns' that were meant to echo the planned conference sessions. The first Lunch and Learn was held in December of 2020 on the topic of Transboundary Air Pollution. The event featured contributions from partners in the US, along with a discussion of trucks and air quality. If you missed the presentation, the recording is available on the Clean Air Hamilton website. Additional Lunch and Learns are planned for 2021.

We continue to see improvements in Hamilton's air quality, but challenges remain. In particular, we are noting increases in sulfur dioxide (SO_2) in the industrial area, along with concerns over exposure to benzene and benzo[a]pyrene. Clean Air Hamilton will continue to work with our partners to understand these trends and work to address them, ensuring healthier air for all.

We thank the Healthy and Safe Communities department and the City Council for their ongoing support of Clean Air Hamilton and its special projects. Funding has allowed us to work closely with local partner groups including Environment Hamilton and Green Venture on projects that have raised awareness amongst local citizens about air quality issues, as well as allowed us to work towards improving local air quality.

Together, Clean Air Hamilton and its various partners are working to reduce emissions as well as our personal exposures and live healthier lives. Clean Air Hamilton's special projects and this report helps us to do that.

Bruce Newbold, Ph.D.
Chair, Clean Air Hamilton

Strategic Activities

Clean Air Hamilton is dedicated to improving air quality across the City of Hamilton. This will be accomplished through sound science-based decision making, using the most up-to-date information and tools available, such as the Hamilton Airshed Modelling System (HAMS). Clean Air Hamilton plans to focus on education and outreach, air quality monitoring, and to continue to update the HAMS and identify major sources of pollution to prioritize action for maximum air quality improvement and exposure reduction. Clean Air Hamilton has identified the following issues for research, communication and program activities in collaboration with our partners.

Governance & Structure:

To remain a multi-stakeholder group dedicated to improving air quality by increasing public perception and expanding Clean Air Hamilton membership while providing communication and promotion of realistic, science-based decision making and sustainable practices.

Air Zone Management:

Comply with the Ministry of the Environment, Conservation and Parks (MECP) and Canadian Ambient Air Quality Standards. This will be done through implementation of a systems level approach and future advocacy towards an industrial mandatory monitoring regulation.

Transportation:

To encourage and facilitate more use of public and active transportation through commentary on transportation related matters, supporting educational programs and localized monitoring leading to detailed information to encourage changes in behaviour.

Air Monitoring:

To improve air monitoring activities across the City of Hamilton by providing support for additional portable air monitors and fixed air monitors that provide real-time monitoring for contaminants of concern in Hamilton.

Dust & $PM_{2.5}$ Mitigation:

Lower concentrations of Particulate Matter ($PM_{2.5}$) across the City of Hamilton below Canadian Ambient Air Quality Standards by effectively utilizing the airshed model to create partnerships and pollution inventory specific to street sweeper and dust mitigation programs.

2020 Meetings	2021 Meetings
January 13, 2020	*January 11, 2021
February 10, 2020	*February 8, 2021
March 9, 2020	*March 8, 2021
n/a	*April 12, 2021
*May 11, 2020	*May 10, 2021
*June 8, 2020	*June 14, 2021
*July 13, 2020	*August 9, 2021
*September 14, 2020	*September 13, 2021
*October 19, 2020	*October 18, 2021
*November 9, 2020	*November 8, 2021
*December 14, 2020	*December 13, 2021

*signifies virtual meetings

Clean Air Hamilton Meetings

Clean Air Hamilton meetings are usually held on the second Monday of each month, virtually using Cisco Webex in light of the COVID-19 pandemic.

Photo courtesy of Tourism and Culture Division, City of Hamilton

Clean Air Hamilton (CAH) - 2020 Funded Projects

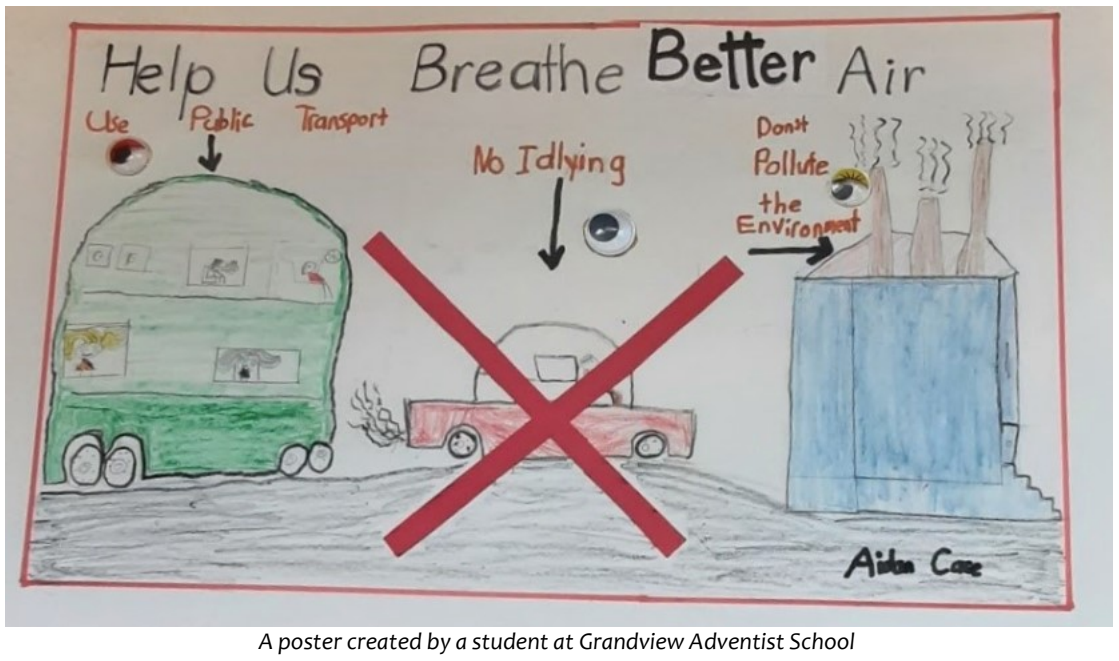
Clean Air Hamilton is an innovative, multi-stakeholder agent of change dedicated to improving air quality in our community. In 2020, Hamilton Public Health Services provided $24,868 to fund projects resulting in air quality improvement and awareness.

These projects have reached hundreds of citizens and contribute to improving Hamilton's air quality through monitoring, promotion and spreading awareness. Clean Air Hamilton is proud to support the 2020 funded projects.

Fresh Air for Kids

With support from Clean Air Hamilton and the Ontario Trillium Foundation, Green Venture and Corr Research brought the Fresh Air for Kids program (FAFK) to 18 new schools across Hamilton from Oct. 2018 to Apr. 2022.

Through a series of four modules, FAFK educated students on air quality, mapped neighbourhood air quality using a mobile monitoring unit from the Ministry of Environment, Conservation and Parks (MECP), taught students about the monitoring of local air quality using hand-held scientific devices, and created and delivered an environmental anti-idling campaign. Linking to the Ontario Elementary School Curriculum in Science and Technology, FAFK seeks to educate students in creative, meaningful, and hands-on ways, while inspiring the next generation's young scientists and environmental activists. Through the education and anti-idling campaign, kids and families change their behaviour in various ways, including idling their cars less and choosing more environmentally friendly modes of transportation.



A poster created by a student at Grandview Adventist School

Clean Air Hamilton 2020 Funded Projects Cont'd...

Fresh Air for Kids

In 2020, the FAFK program needed to adapt to the new virtual learning environment, as the staff were not able to visit schools. The team pivoted instead, to providing some sessions using different strategies:

- pre-recorded videos and PDF activity sheets;
- providing other sessions through pre-booked live video calls; and
- creating online versions of student surveys, teacher surveys, and student pledges.

Even though the neighbourhood walkabout with Dr. Denis Corr was suspended due to COVID-19, school neighbourhood air quality mapping was carried out with the MECP van.

The program was re-worked such that engagement and action could take place regardless of whether students were physically present at the school to run an anti-idling campaign.

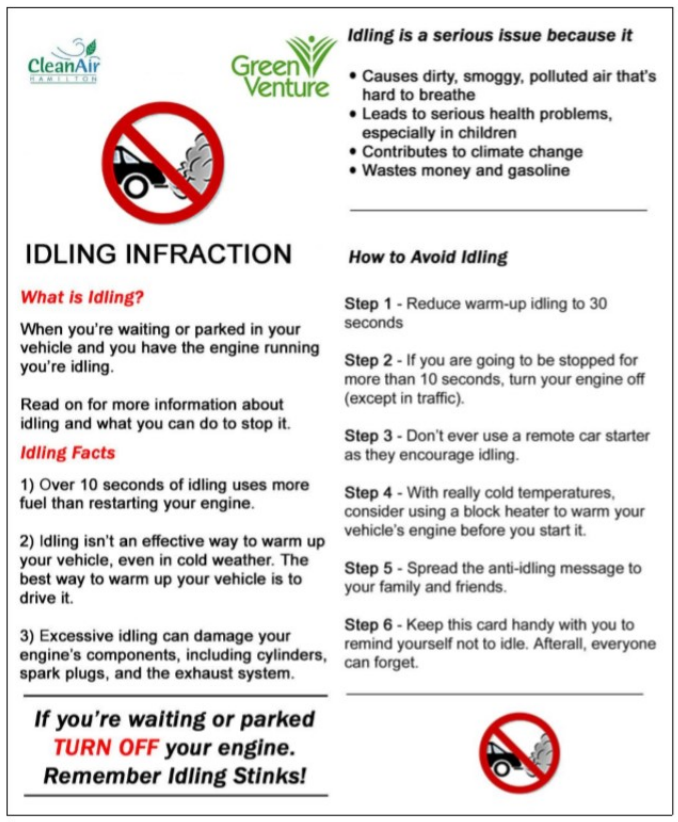
During the 2020 school year, seven schools participated in the FAFK program, out of which:

- Three completed all four modules of the program;
- One completed three modules of the program; and
- Three completed two modules of the program.

The City of Hamilton **Anti-Idling By-law No. 07-160** can be found on the City's Bylaw website at:

https://www.hamilton.ca/government-information/by-laws-and-enforcement/city-hamilton-by-laws

School Name	# of students participating
Bernie Custis Secondary School	15
Colin MacDonald Community School	9
Dundana Elementary School	24
Grandview Adventist School	12
Highview Public School	89
HWDSB Remote Class	30
Lawfield Elementary School	39
Total	**218**



Trees Please

Trees Please is a citizen science project led by Environment Hamilton and the Hamilton Naturalists' Club since 2016.

This initiative collects data with a team of volunteers trained to use specialized equipment and to follow specific data collection protocols. The project includes tree inventorying (measuring, identifying and noting any changes in tree health) and collecting air quality data, specifically Particulate Matter (PM) levels.

The goal of this project is to engage residents on local issues around air quality and urban forest health by helping them understand that trees can help improve air quality, among their many other benefits.

When air quality data is layered with tree health maps, strategic tree planting areas can be determined based on those areas with high particulate pollution as well as poor tree cover. The project team then works with residents towards planting native trees in these vulnerable areas through Trees Please free tree giveaways and by partnering with the City's Forestry and Horticulture Division in a community tree planting.

In 2020, the project was able to meet goals despite the pandemic. COVID-19 protocols included:

- Following the most up-to-date Ontario government and Hamilton Public Health guidelines;
- Ensuring contact tracing by requiring all volunteers to register for each session / event;
- Hosting every in-person event outdoors;
- Requiring staff and volunteers to wear masks;
- Limiting each session to less than 10 people in total and then dividing the group into smaller groups; and
- Sanitizing all equipment before and after each session.

Air and Tree walk in the Homeside neighbourhood

This is an Ash tree and participants are looking for the distinctive "D" shaped holes made by the Emerald Ash Borer

Clean Air Hamilton 2020 Funded Projects Cont'd...

Trees Please

With thanks to support from Clean Air Hamilton, Trees Please was able to successfully achieve the following:

1. Inventoried 451 existing trees in the Homeside Neighbourhood (Kenilworth Avenue North to Strathearne Avenue and Queenston Road to the rail lines).
This included measuring, identifying and noting any challenges the trees face (ex. too close to a structure).

2. Organized air quality monitoring walkabouts and distributed flyers.

3. Increased the native tree canopy through a Free Tree Giveaway (31 trees in total). This is an addition to a larger community-wide giveaway of 600 native trees and shrubs.

4. Organized a community tree planting in the fall of 2020, planting 200 native trees with 15 volunteers.

Community Tree Planting Day, Fall 2020

Training Session with volunteers, 2020

Upwind Downwind Conference 2020: Clean Air Hamilton's Signature Event that Wasn't

Plans for the 2020 version of Clean Air Hamilton's Upwind-Downwind conference, Our Health and Air Quality: Past, Present and Future, along with the Clean Air Fair were quickly taking shape through early 2020. Held every other year with participants drawn from government, non-governmental organizations, the local community, industry and academics from both Canada and the United States, the 2020 version was to be held June 8 and 9.

The Clean Air Fair, which was to be held on the evening of June 8, was to include a public lecture on Electric Vehicles by Cara Clairman from Plug 'n Drive followed by a panel discussion and would have showcased a variety of student projects with environmental focuses. The Upwind Downwind conference, scheduled for June 9, included panel sessions that engaged our international neighbors on the topics of trans-border air quality and addressed topics such as air quality and health effects, transportation and air quality, and how industry was working towards meeting its air quality goals.

The COVID-19 pandemic meant that both events were cancelled. Rather than abandoning our plans altogether, Clean Air Hamilton shifted gears and moved to run a series of virtual Lunch and Learns, with the first one held in late 2020 on the topic of *Transboundary Air Quality*. Please see the next section for key takeaways from our debut event!

Additional talks have been planned for 2021, including a discussion on *Air Pollution Sensors in Hamilton and How Can They Help?* by Dr. Matthew Adams and updates from Dr. Janya Kelly on the *Hamilton Airshed Modelling System; Sub-Region Analysis.* Through these Lunch and Learns, we plan to continue to keep the community informed about air quality issues in Hamilton.

In late 2021, we will turn our attention towards planning the 2022 version of the Upwind Downwind Conference, with the hope that we can once again return to an in-person event.

Upwind Downwind Lunch & Learn Seminars Kick-Off

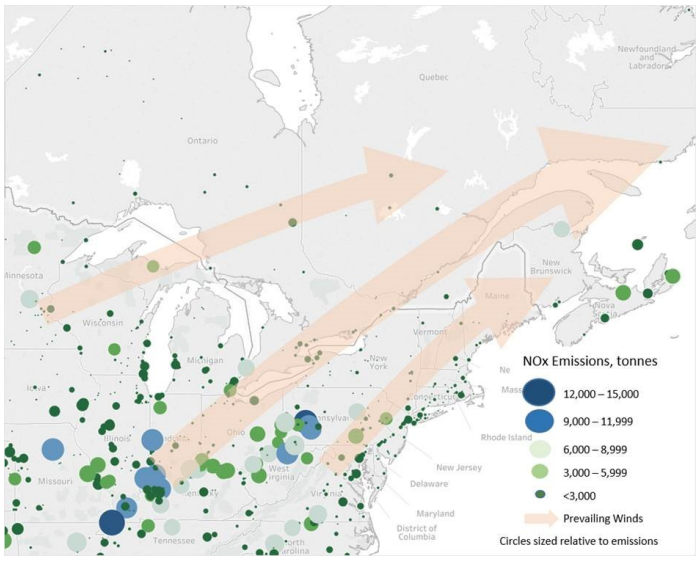
On December 1, 2020, Clean Air Hamilton hosted their first of three Upwind Downwind lunch and learn seminars in lieu of the Upwind Downwind Conference (which was originally scheduled for June 9, 2020). The event's theme was befittingly 'Transboundary Air Quality', exploring air pollution trends and sources on both sides of the border.

Distinct weather patterns drive prevailing winds to carry pollutants from neighbouring U.S. industrial and urbanized cities, elevating air pollution levels in Ontario's lower great lakes region. The result is a shared challenge for both Canada and the U.S.

Featured guest speakers included Zac Adelman, Executive Director, Lake Michigan Air Directors Consortium (LADCO); Paul Miller, Executive Director, Northeast States for Coordinated Air Use Management (NESCAUM), from Boston, MA; with moderator, Brian Jantzi of Clean Air Hamilton.

LADCO is an air quality research and planning organization that focuses on understanding and improving air quality in the Great Lakes region.

One of the key highlights included perspectives on the continuing pressing problems with air quality, which are namely regional haze and ozone. Most air quality indicators such as nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) are now at historical lows but ozone continues to be an issue. In order to get ozone in check, precursors such as Nitrogen Dioxide (NO_2) and volatile organic compounds (VOCs) need further reductions.



2016 NO_x Emissions from Electricity Generators Located in Eastern U.S. and Canada with Prevailing Winds During Smog Season. Source: Ontario.ca

LADCO also noted a reduction in nitrogen dioxide (NOx) in urban areas due to the pandemic and States making remarkable progress on addressing regional haze, where the goal is to attain natural visibility by 2065. Recommended transboundary collaborations include improving lakeshore ozone simulation, identifying NOx and VOC emissions control strategies, holistic approach for pollutant planning, and integrating climate impacts and co-benefits in planning.

UWDW Lunch & Learn Seminars Kick-Off Cont'd…

NESCAUM is a nonprofit association of air quality agencies in the northeastern United States which address a wide spectrum of air quality, climate, and energy issues such as mercury contamination, diesel exhaust, climate change adaptation and mitigation, energy efficiency, cleaner cars and fuels, environmental justice, and new and more effective regulatory policies, to name just a few.

In particular regions of the U.S., on-road diesel trucks are the second largest source of NOx emissions, next to on-road gasoline light duty vehicles. Similar to the prevailing winds, trucks also travel across borders and in doing so bring pollution with them.

In 2018, New York City saw the highest ozone levels since 2006 which was disconcerting because progress was thought to have been made. During the pandemic, they saw reductions in vehicle and truck traffic initially, but truck traffic only slightly dips and then reaches a little higher level pre-Covid. The challenge is that despite a 25% drop in vehicle traffic, ozone levels were still above the standards. This means if 25% of vehicles on the road were electric, standards would still be exceeded.

In the U.S., diesel engine NOx emissions only meet the standards when they are on a highway travelling greater than >50 mph, which is why better truck traffic data is needed.

NESCAUM's project includes working with a local truck fleet base to put on data loggers to collect emissions data, and Environment and Climate Change Canada is assisting with the analytical analysis to realize year-round truck performance.

There is a multi-state zero emission vehicle initiative that has been launched which focuses on trucks. The heavy-duty vehicle side is a fast-growing sector and more programs and policies that individual states could adopt to facilitate a more rapid introduction of zero emission trucks are needed.

In July 2020 NESCAUM developed a Memorandum of Understanding (MOU) to move forward. It has been signed by 15 states, roughly representing 50% of U.S. Economy and 40% of goods moved, and where 100% of fleets will be zero emission by 2050. Learn more here: https://www.nescaum.org/documents/multistate-truck-zev-governors-mou-20200714.pdf

MULTI-STATE MEDIUM- AND HEAVY-DUTY ZERO EMISSION VEHICLE

MEMORANDUM OF UNDERSTANDING

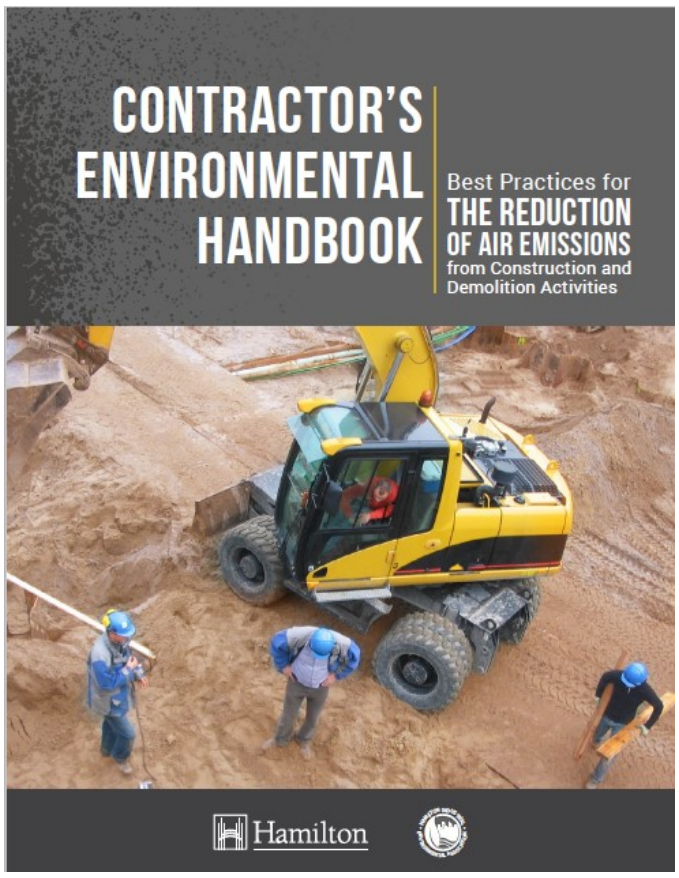
To view a recording of this webinar, please visit: https://cleanairhamilton.ca/upwind-downwind-lunch-n-learns/

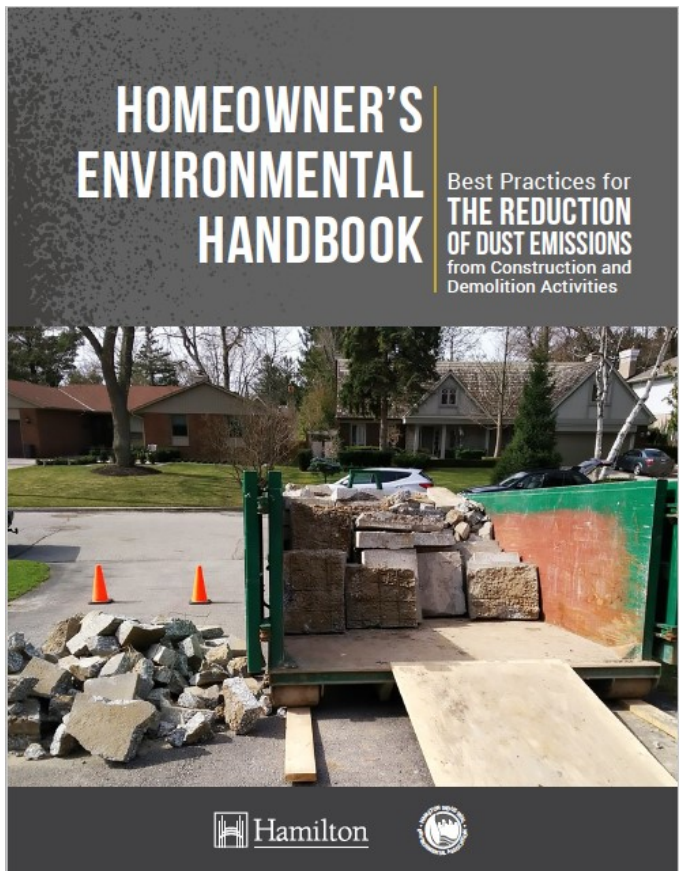
Dust Group & Handbooks, Demolition Guidelines

Airborne Particulate Matter emissions in the City of Hamilton are a concern both for all stakeholders. The Dust and Particulate Matter Working Group, a sub-committee of Clean Air Hamilton, has undertaken a number of initiatives over the last few years to attempt to address these issues.

The latest, a pair of handbooks on managing dust and particulate matter emissions for construction and demolition projects, is nearing completion. The first handbook is directed towards contractors and is a comprehensive document describing many technical mitigation measures commonly applied on construction and demolition sites. The second is a smaller document meant for homeowners engaged in Do-It-Yourself construction or demolition projects, and contains user-friendly directions on how to control emissions for the health of the homeowners and their neighbours.

The documents have been approved and designed, and will be posted soon to the Clean Air Hamilton website (https://cleanairhamilton.ca/dust-abatement/), with links distributed by the City's Buildings staff as part of the Building Permit Process. Other distribution avenues for print versions are also under discussion.





Hamilton's Ambient Air Quality Trends 2020

The City of Hamilton is a port city in Ontario. It is located 58 kilometres southwest of Toronto in the Greater Toronto and Hamilton Area (GTHA). As one of Canada's leading industrial and transportation hubs, Hamilton's industrial sector, including the iron and steel industry, accounts for major local and national Gross Domestic Product (GDP) and job creation.

The following section provides the ambient Air Quality Trends for the City of Hamilton for the year 2020. Through the completion of Hamilton's Airshed Modelling System (HAMS)[1], we are able to understand that a significant amount of transboundary (air emission sources outside of Hamilton) emissions contribute to local airshed pollution concentrations. For example, HAMS models that approximately 90% of PM2.5 concentrations come from transboundary sources. Local industrial, on-road and off-road transportation emissions continue to contribute to localized air pollution and downwind airsheds as well.

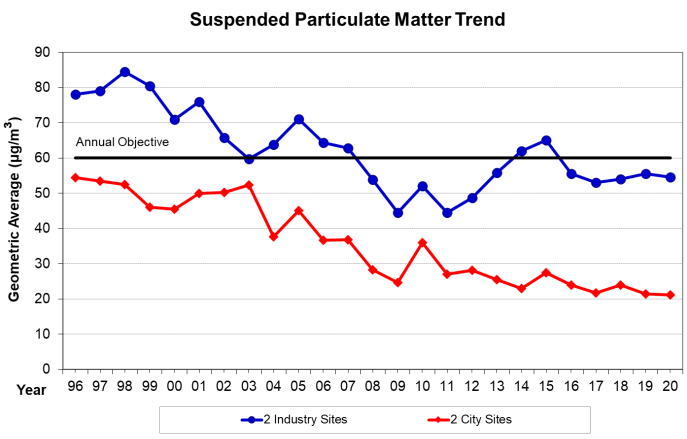
It is important that Hamilton continues to reduce local sources of emissions (including industrial, transportation, and off-road sources), not only to improve local air quality, but also to be a good neighbour to reduce downwind transboundary emissions to other municipalities.

Clean Air Hamilton would like to sincerely thank the Ministry of Conservation, Environment, and Parks (Hamilton Regional Office) for their support in providing air quality trends data.

Particulate Material: Total Suspended Particulate (TSP)

Total suspended particulate (TSP) includes all particulate material with diameters less than about 45 micrometers (µm*). A substantial portion of TSP is composed of road dust, soil particles and emissions from industrial activities and transportation sources.

TSP averages have reduced at municipal and industrial sites since 1996. The 2020 emissions at industrial sites are below the annual objective (AO). The AO is the desired concentration established by the MECP as documented in the Ontario Ambient Air Quality Criteria (AAQC).



* 1 cm = 10,000 µm

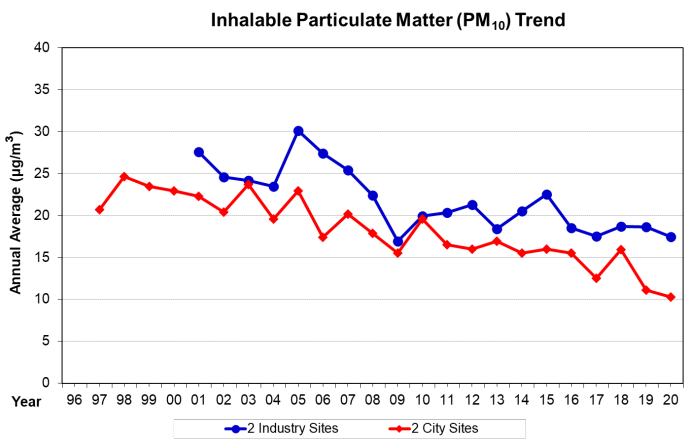
Included in the TSP category are inhalable particulates (PM10) and respirable particulates (PM2.5).

Particulate Material: Inhalable Particulate Matter (PM10)

Inhalable particulate matter (PM_{10}) has a diameter of 10 µm* or less. PM_{10} makes up 40-50% of TSP in Hamilton and has been linked to respiratory, cardiovascular and other health impacts in humans.[2]

PM10 is primarily derived from vehicle exhaust emissions, industrial stack and fugitive dusts (non -stack), and the finer fraction of re-entrained road dust.

PM10 at City and Industry sites has decreased over the past two decades. This is likely a combination of better performance of vehicle



* 1 cm = 10,000 µm

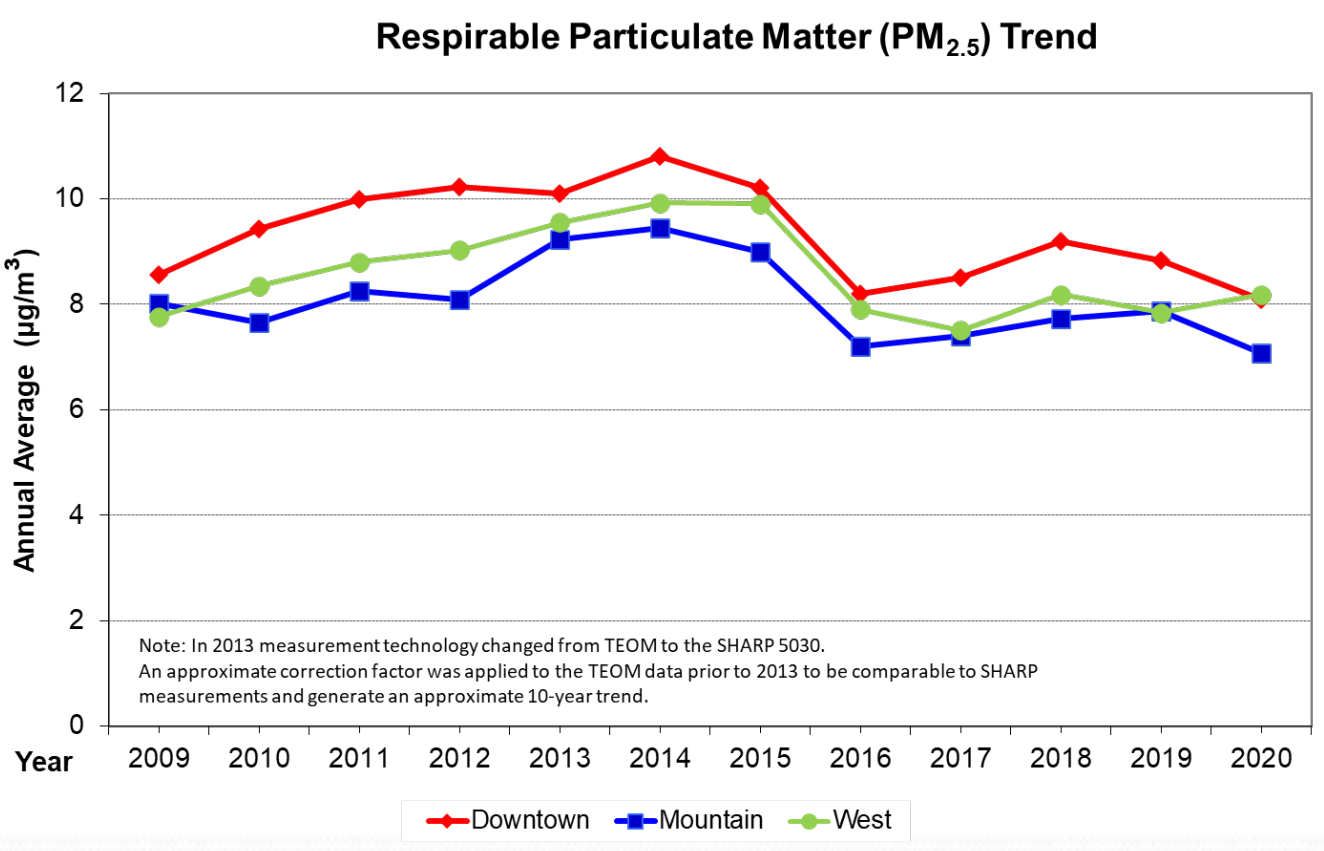
fleets, improved process emissions, increased management of dust track-out by industries, and the use of better street sweepers and street sweeping practices by the city. From the Hamilton Airshed Modeling System (HAMS)[1], transboundary PM10 levels are primarily from transportation related emissions, and they amount to over 90% of the total PM10 emissions.

Particulate Material: Respirable Particulate Matter (PM2.5)

The Ontario government started measuring PM2.5 across Ontario in 1999. PM2.5 makes up about 60% of PM10 and in most cities is derived from residential and transportation sectors. In Hamilton, there would also be some industrial contributions. Another significant portion of PM2.5 is regionally generated emissions that can travel hundreds of kilometers via wind from where they originated. These transboundary flows play a significant role in Ontario's air quality and according to HAMS[1], transboundary emissions in Hamilton for PM2.5 amounted to 91%.

Exposure to fine particulate matter has been associated with hospital admissions and several serious health effects, including premature death[3].

The apparent increase in 2013 is not reflective of a change in air quality but is a result of change in monitoring to a more sophisticated and sensitive PM2.5 monitoring technology. The trend for PM2.5 since 2016 appears to be relatively constant, with no significant increases or decreases. The Mountain, Downtown, and West remain below the Annual Canadian Ambient Air Quality Standard (CAAQS). CAAQS became more stringent in 2020 (decreasing from 10.0 µg/m^3 to 8.8 µg/m^3).



Ground Level Ozone (O3)

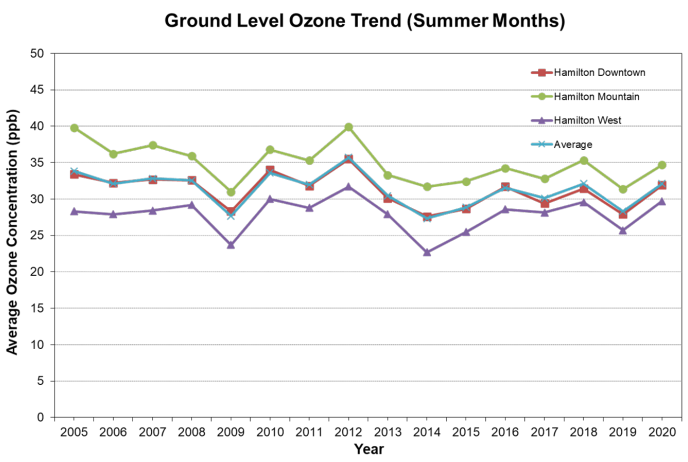
Ground-level ozone is a colourless, odourless gas not emitted directly into the atmosphere. It is a result of photochemical reactions between oxides of Nitrogen (NOx) and Volatile Organic Compounds (VOCs) in the presence of sunlight and is a major component of smog[2]. This is why O3 concentrations are higher during summer months, generally from May to September.

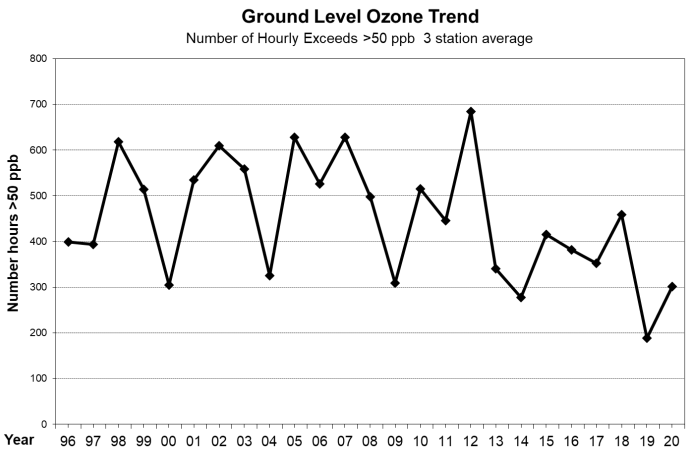
Major sources of O3 include (but are not limited to):

- coal-fired power plants
- vehicles
- urban activities

The trend in O3 shows that concentrations have been highly variable in the past 20+ years and showed a marked increase in 2020 for almost all seven cities (see page 21). O3 is a main contributor for Hamilton's Special Air Health Advisories (SAHA) and Special Air Quality Statements (SAQS), and unlike other pollutants, the majority of O3 comes from precursors emitted by sources upwind of Hamilton such as the Midwest Ohio Valley region. Sources from Hamilton contributing to O3 pollution will affect areas downwind of Hamilton which makes lowering O3 very important.

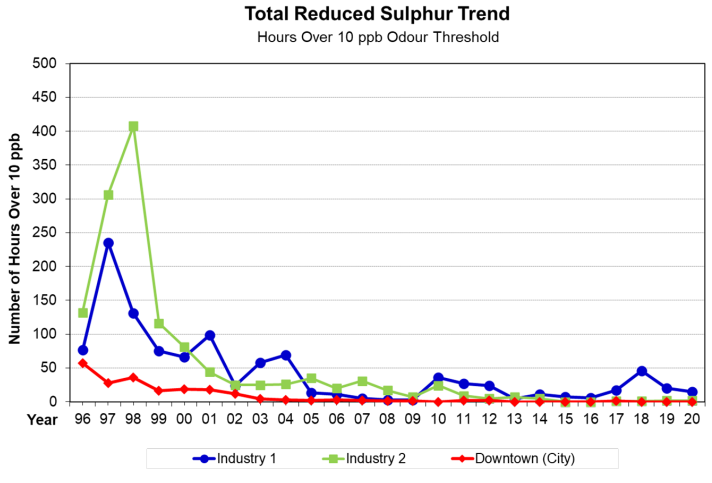
The number of hourly exceedances greater than 50 ppb increased in 2020 in comparison to 2019. The Government of Ontario has been dedicated to lowering O3 precursor emissions by eliminating all coal fired power plants in Ontario.





Total Reduced Sulphur (TRS)

Total Reduced Sulphur (TRS) is a measure of the volatile, sulphur-containing compounds that are the basis of many of the odour complaints related to steel mill operations. TRS compounds are not normally considered a health hazard. An odour threshold has been set at 10 parts per billion (ppb) TRS because at this level about one-half of any group of people can detect an odour similar to the smell of rotten eggs.

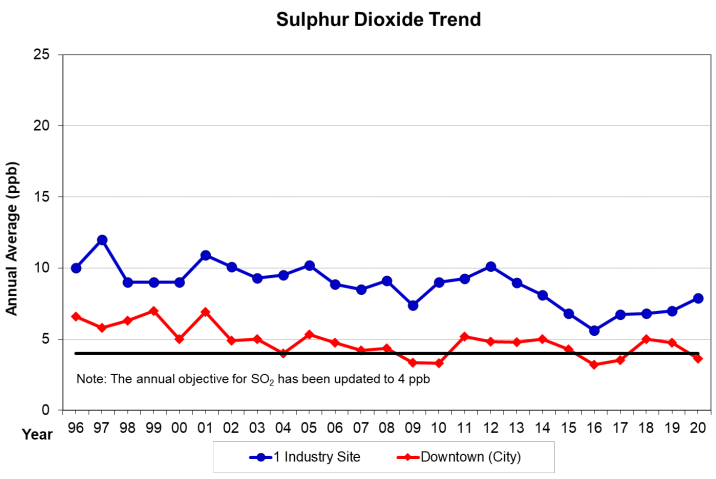


The number of hours per year in which measurements exceed 10 ppb have been reduced by over 90% since the mid-1990s. This is due to significant changes in the management and operation of the coke ovens, blast furnaces, and slag quenching operations associated with steel mill operations.

Sulphur Dioxide (SO2)

Sulphur Dioxide (SO_2), a by-product of industrial activity, is not only a respiratory irritant but is also converted in the atmosphere over several hours to sulphuric acid (H_2SO_4), which is then converted to sulphate particles. These particles are acidic in nature and tend to cause lung irritation[4].

Significant reductions in air levels of SO2 were made in the 1970s and 1980s. There has been a gradual decline in air levels of SO2 since 1998. However, concentrations since 2016 have shown a slight increase for Industrial Site 1.

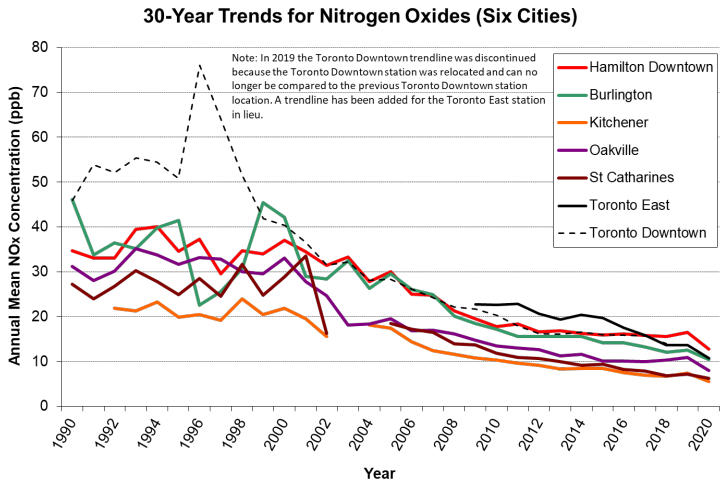


Transboundary emissions represent about 69% of the annual contribution to SO2 levels within Hamilton of which 97% are from industrial sources[1].

Nitrogen Oxides (NOx)

Nitrogen Oxides (NOx) are the collective term and combined total of Nitrogen Monoxide (NO) and Nitrogen Dioxide (NO_2). NO and NO_2 are routinely measured and their sum reported as NOx to reflect the presence of both species in urban areas.

This chart displays the steadily decreasing trend of NOx in six cities in Ontario, including Hamilton. Since the 1990s downtown Toronto has seen reductions in NOx levels of approximately 60%. Hamilton's NOx levels have decreased by approximately 46% since 1990.

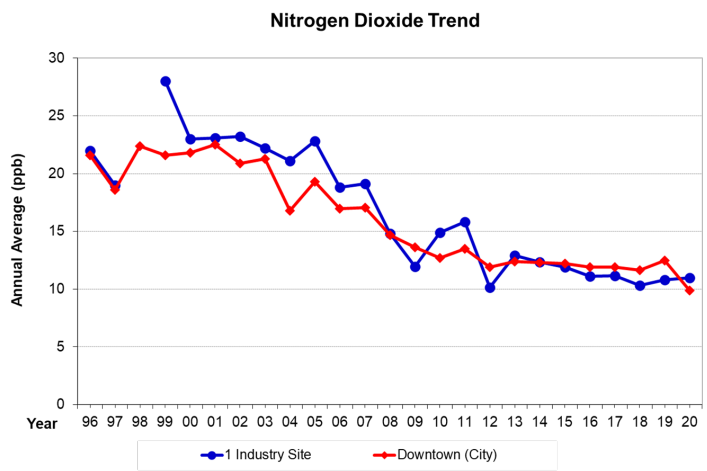


Overall, the decrease in NOx levels is a reflection of improvements in emission performance of the vehicle fleets in Ontario over the past decade as well as industrial process improvements.

Nitrogen Dioxide (NO_2)

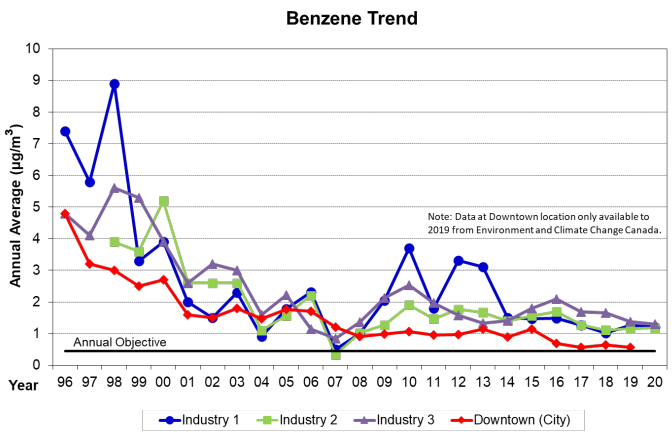
NO_2 is formed in the atmosphere from NO which is produced during combustion of fuels (i.e. gasoline, diesel, coal, wood, oil and natural gas). The leading sectors producing these emissions are transportation and industry. The level of vehicle use across Hamilton has increased slightly during the past decade, however overall NO_2 levels have decreased most likely due to improved engine technologies.

Based on HAMS[1], local emissions are highest for on-road transport at 34% and transboundary emissions contribute to 44% of NO_2 sources in Hamilton.



Benzene

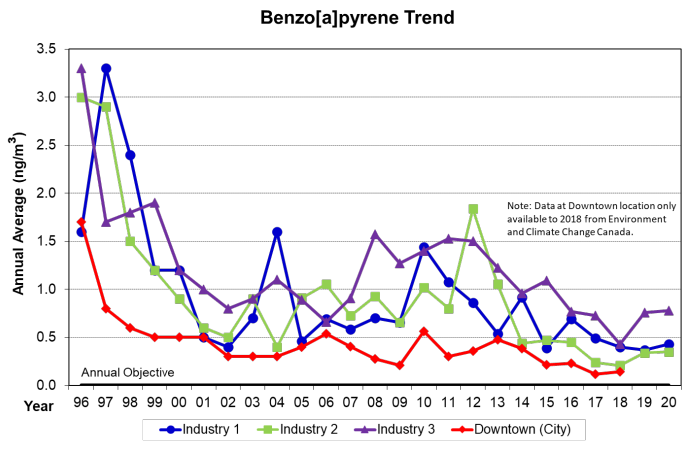
Benzene is a carcinogenic (cancer causing) volatile organic compound (VOC) that is emitted from some operations within the steel industry, specifically coke ovens and coke oven by-product plant operations. Gasoline can also be up to 5% benzene. Vapours containing benzene may be released during pumping at gasoline stations.



Air levels of benzene have been reduced dramatically since the 1990s, due to significant upgrading of coking plant operations, improved operating procedures, and improved control of release of benzene vapours from the coke by-products. Transboundary benzene levels amount to 70% (HAMS[1]) and more work remains to be done to achieve the stringent Annual Objective and reduce exposures to benzene from all sources.

Benzo[a]pyrene

Benzo[a]pyrene (BaP) is also a carcinogen. BaP is a member of a larger class of chemical compounds called polycyclic aromatic hydrocarbons (PAHs), which are emitted when carbon-based fuels such as coke, oil, wood, coal and diesel fuel are burned. BaP generating activities include coke oven operations within the steel industry, incomplete combustion producing smoke such as vehicle traffic, burning of refuse, cooking, tobacco smoking, and wood burning.

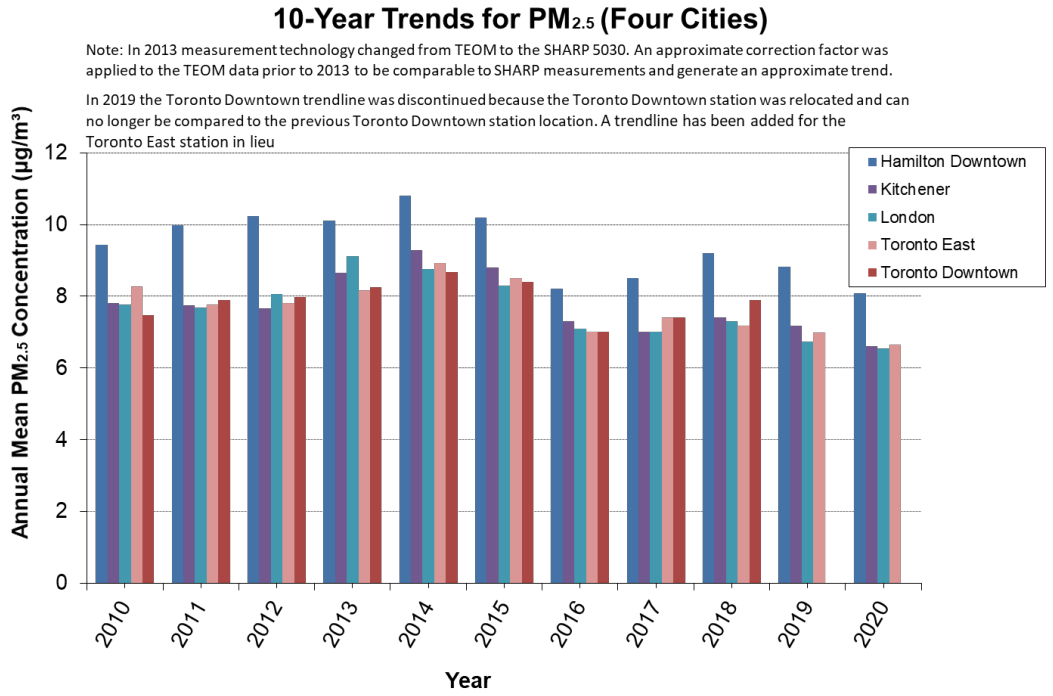


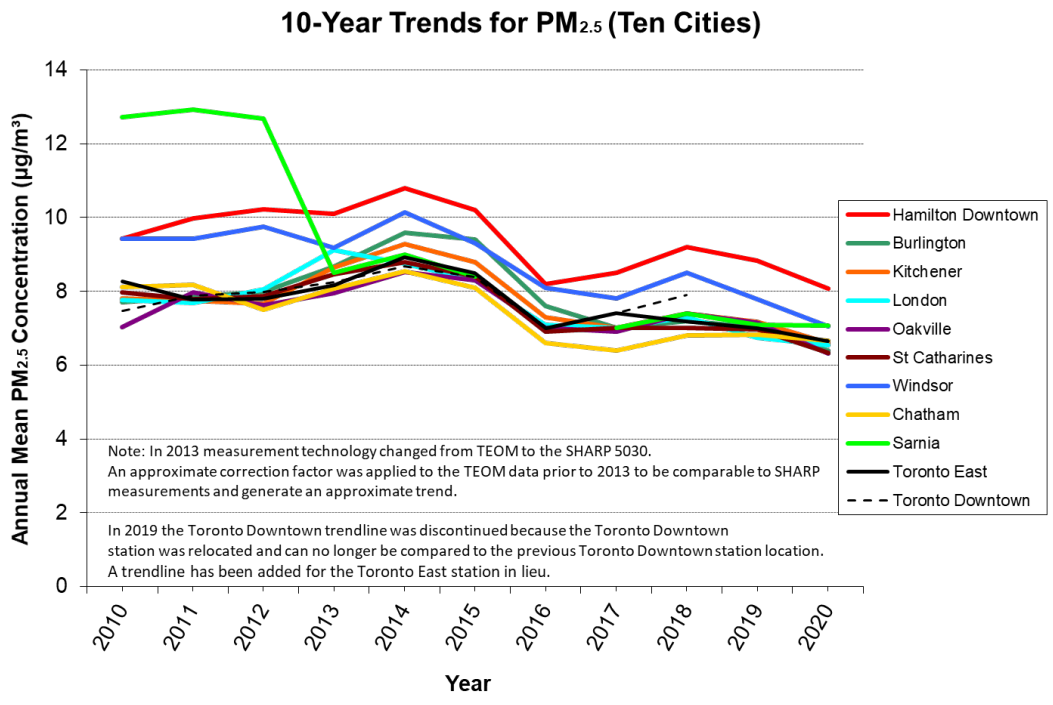
There have been significant decreases in BaP levels since the late 1990s and further decreases since 2013. Source apportionment for BaP from HAMS[1] shows that industrial sources amount to 47% emissions, while transboundary emissions contribute to 29% of BaP emissions in the City of Hamilton.

Please note that BaP concentrations for the downtown Hamilton monitoring station for 2019 and 2020 were not available from Environment and Climate Change Canada.

Multi-City Air Quality Comparisons

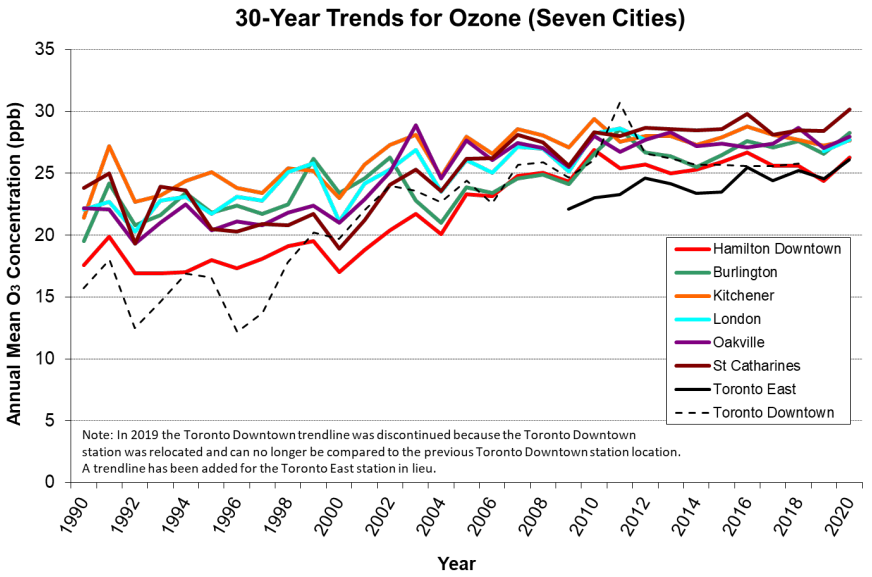
Particulate Material: Respirable Particulate Matter (PM2.5)





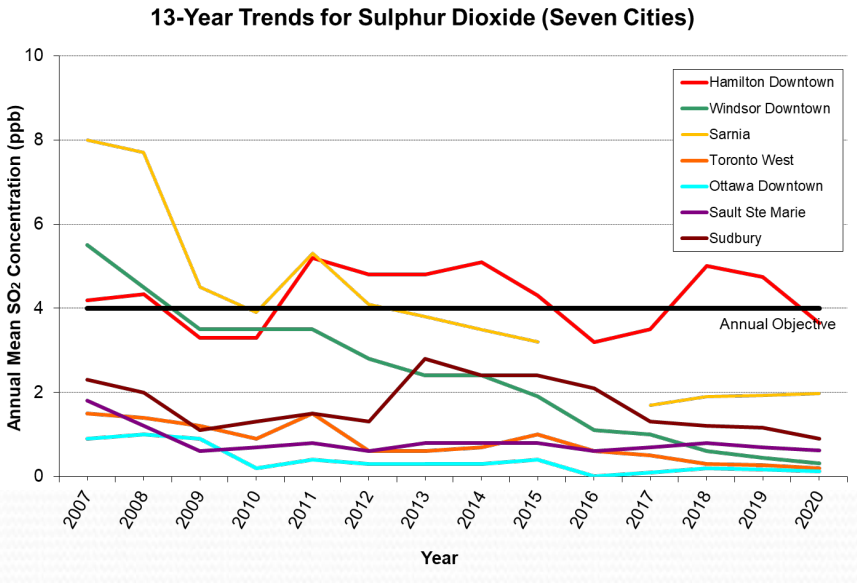
Ozone (O3)

Hamilton's 30-year ozone trend is comparable to many other municipalities. Recent 2020 concentrations show Hamilton having one of the lowest concentrations of O_3. Air pollution from Hamilton can cause increased O_3 concentrations downwind and so reducing air pollutants such as Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOCs) is very important.



Sulphur Dioxide (So2)

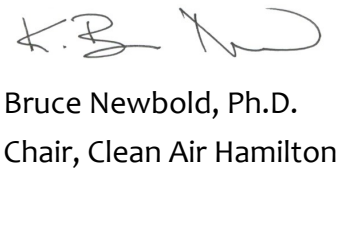
While Sulphur Dioxide (SO_2) concentrations in Hamilton are achieving the Annual Objective of 4 parts per billion (ppb), this is much higher compared to other municipalities. HAMS Sub-Regional Analysis[1] predicts higher levels for SO2 concentration in the industrial core and West-lower areas of Hamilton from industrial and non-road sources.



Acknowledgements

In 2020, the City of Hamilton provided financial and in-kind support to Clean Air Hamilton and its activities. Descriptions of some of the programs supported by Clean Air Hamilton can be found on pages 5 - 8 in this report.

This annual funding is leveraged significantly in two ways: first, Clean Air Hamilton uses these funds in partnership with funds provided by other agencies and institutions to develop programs related to air quality; second, since all of the members of Clean Air Hamilton donate their time and expertise, there is a significant amount of in-kind support provided. It is estimated that Clean Air Hamilton's partners provide well over $200,000 of in-kind support.



Bruce Newbold, Ph.D.
Chair, Clean Air Hamilton

Hamilton Air Monitoring Network
Beach Strip Station 29102

Public Health Services Airpointer

For more information contact Public Health Services (905) 546-2424 ext. 5288

[1] *Golder Associates. 2018, February. "Hamilton Airshed Monitoring System Results". November 1, 2021.*

[2] *Ministry of the Environment, Conservation and Parks. 2010. "Ground Level Ozone". September 19, 2021. <http://www.airqualityontario.com/science/pollutants/ozone.php>.*

[3] *Ministry of the Environment, Conservation and Parks. 2019. "Air quality health index and air quality alerts". September 19, 2021. <https://www.ontario.ca/document/air-quality-ontario-2016-report/air-quality-health-index-and-air-quality-alerts>.*

[4] *Ministry of the Environment, Conservation and Parks. 2010. "Sulphur Dioxide (SO2)". September 19, 2021. <http://www.airqualityontario.com/science/pollutants/sulphur.php>.*

[5] *SENES Consultants Limited. "Health Impacts Exposure to Outdoor Air Pollution in Hamilton, Ontario". February 2012. Final Report: Page 19. September 19, 2021. <https://cleanairhamilton.ca/wp-content/uploads/2017/05/2011-Clean-Air-Hamilton-Health-Impacts-FINAL-1-1.pdf>.*

Air Quality - Additional Resources

To learn more about Clean Air Hamilton and our work visit www.cleanairhamilton.ca.
For annual air quality trends provided by the Ministry of the Environment, Conservation and Parks, please see pages 13 to 21.

Air Quality and Health

To learn about how to protect your health visit: www.airhealth.ca

To learn about Hamilton Public Health Services and actions on air quality visit: http://preview.hamilton.ca/public-health/health-topics/air-quality-pollution-smog

Government Actions on Air Quality

To learn about the Province of Ontario's actions on air quality visit: www.airqualityontario.com/

To learn about the Government of Canada's actions on air quality visit: http://www.ec.gc.ca/Air/default.asp?lang=En&n=14F71451-1

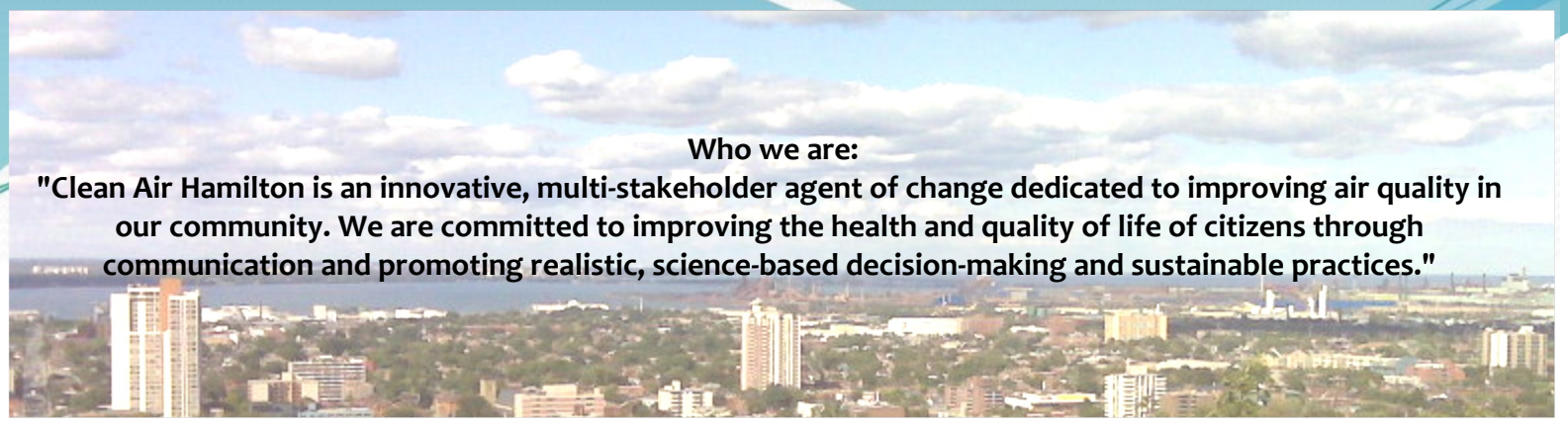
Air Quality Monitoring

For a detailed model of hourly concentrations for a variety of pollutants across Hamilton visit: http://www.hamiltonaqhi.com

To check our air pollution levels in Hamilton and Ministry run air monitors visit: http://www.airqualityontario.com/

To check out the Hamilton Air Monitoring Network visit: http://www.hamnair.ca/

To check out Hamilton Air Quality Health Index website visit: http://www.hamiltonaqhi.com



Who we are:
"Clean Air Hamilton is an innovative, multi-stakeholder agent of change dedicated to improving air quality in our community. We are committed to improving the health and quality of life of citizens through communication and promoting realistic, science-based decision-making and sustainable practices."

2020 Members

Bruce Newbold, *Chair* -*McMaster University*

ArcelorMittal Dofasco

Citizens

City of Hamilton - *Community Initiatives**

City of Hamilton Planning - *Community Planning*

City of Hamilton Public Works - *Office of Energy Initiatives*

City of Hamilton Public Works - *Transportation Demand Management**

Corr Research

Environment & Climate Change Canada*

Environment Hamilton

Green Venture

Hamilton Conservation Authority

Hamilton Industrial Environmental Association

Hamilton Port Authority

Hamilton Public Health Services

Health Canada*

McKibbon Wakefield Inc.

McMaster Institute for Health Equity

Ministry of Environment Conservation and Parks (MECP) - *Hamilton Regional Office*

Mohawk College*

Stelco

** indicates "observing member"*

This report and the work of our members is dedicated to the memory of Clean Air Hamilton member
Peter Chernets (1949—2019)

Clean Air Hamilton, December 2020

Production: Public Health Services
City of Hamilton

For further information, please contact:

Coordinator Air Quality and Climate Change
Public Health Services,
Healthy Environments Division,
Healthy & Safe Communities Department
City of Hamilton

110 King St. W. 3rd Floor Hamilton, ON, L8P 4S6
Robert Thompson Building

Email: cleanair@hamilton.ca
or visit our website:
www.cleanairhamilton.ca

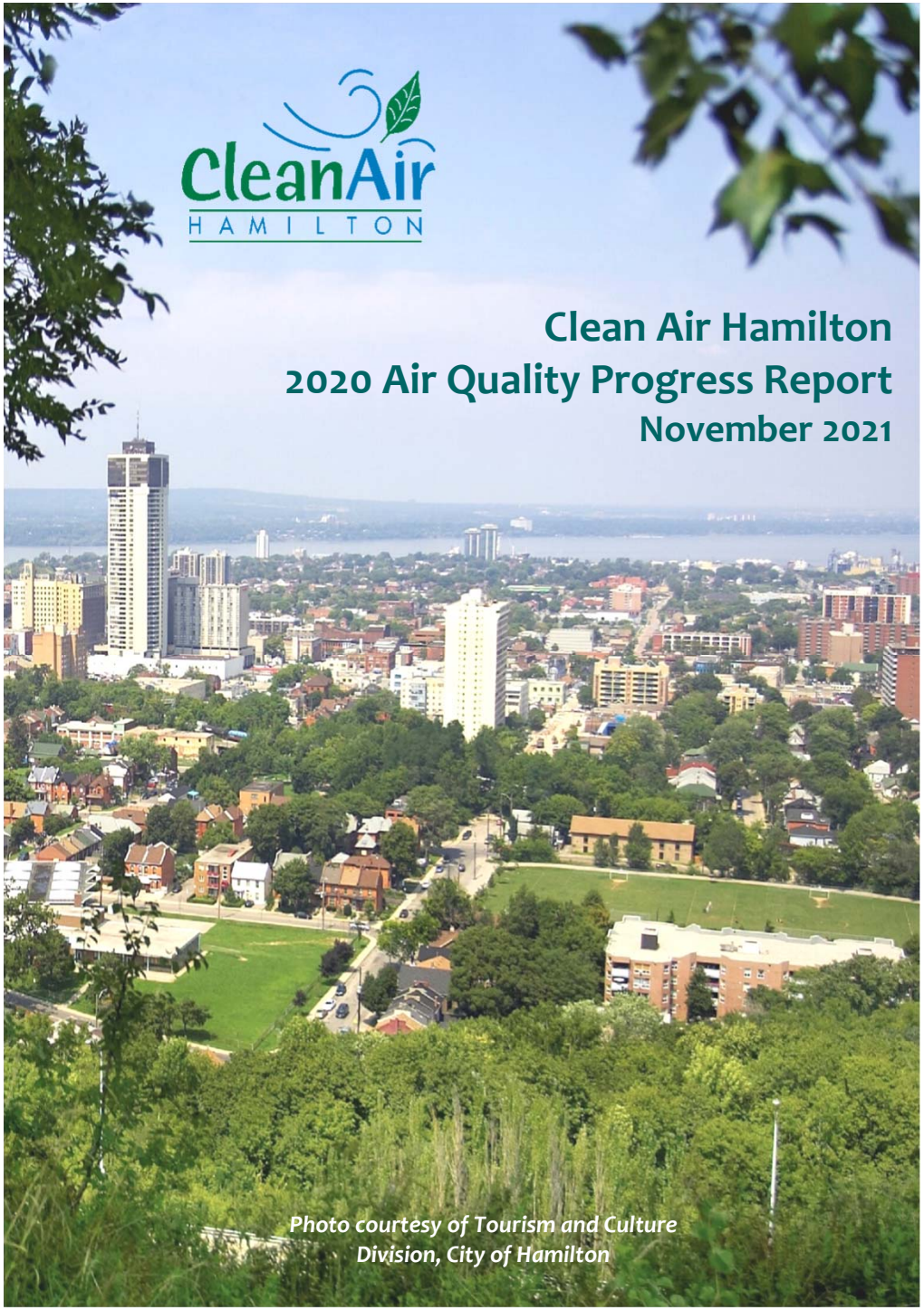
CLEAN AIR HAMILTON 2020 PROGRESS REPORT

January 10, 2022

Hamilton Board of Health

Matthew Lawson
Manager – Health Hazards

Public Health Services
Healthy Environments Division



Bruce Newbold, Ph.D.
Chair
Clean Air Hamilton

www.cleanairhamilton.ca

Clean Air Hamilton

Members:

Local Citizens

Ontario MECP

Health Canada

Environment Canada

ArcelorMittal Dofasco

Stelco

HIEA

Green Venture

McMaster University

- MIHE

Mohawk College

Environment Hamilton

City of Hamilton

- Public Health
- Planning
- Public Works

For the full list of Clean Air Hamilton members, please go to https://cleanairhamilton.ca/members/

- Science based / Diverse / Inclusive / Facilitated Consensus
- CAH established as an implementation committee to act on recommendations contained in 1997 HAQI Reports
- Community based initiatives
- Internationally recognized
- Meet 2nd Monday of each month (virtually in light of the COVID-19 pandemic)

2020 Community Projects Supported Through Clean Air Hamilton

- **Fresh Air for Kids** (Green Venture and Corr Research)
  - Famous Fresh Air for Kids program with anti-idling engagement and campaign at participating schools;
  - Adapted to virtual learning scenario in light of the COVID-19 pandemic;
  - Engaged 218 students in the year.

- **Trees Please** (Environment Hamilton and the Hamilton Naturalists Club)
  - Collection of air quality and tree inventory data following COVID-19 protocols;
  - Inventoried 451 trees in the Parkside Neighbourhood;
  - Increased native tree canopy through tree giveaways (631+);
  - Organized community tree planting in Fall 2020, planted 200 native trees.

CleanAir HAMILTON

Green Venture

Corr Research

ENVIRONMENT HAMILTON

2021 Community Projects Supported Through Clean Air Hamilton

Approved 2021 Projects through Healthy Environment Division's Operating Budget

- **Fresh Air for Kids** (Green Venture and Corr Research)
  - Mobile air monitoring around four schools across Hamilton, virtual class presentations on results and importance of Air Quality Health Index.

- **Air Quality Research Project in Hamilton** (University of Toronto)
  - Using satellite and ground-based measurements to analyze air pollution concentrations during lock-down periods to identify reductions in nitrogen dioxide (NO2) as an indicator for motor vehicle use.
  - Data to be used to understand how Hamilton's air pollution responded to provincial lock-down orders and inform future responses to reduced use of fossil-fuel vehicles.

CleanAir HAMILTON

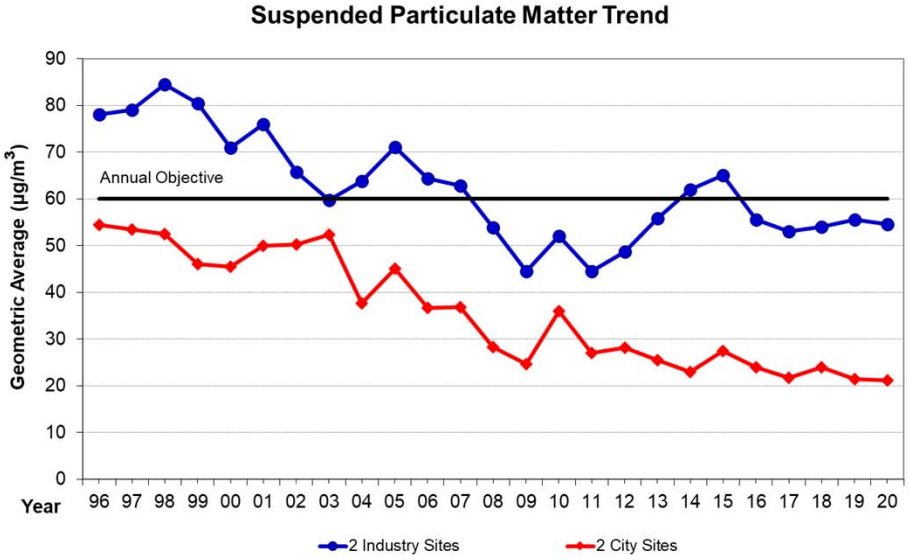
Green Venture

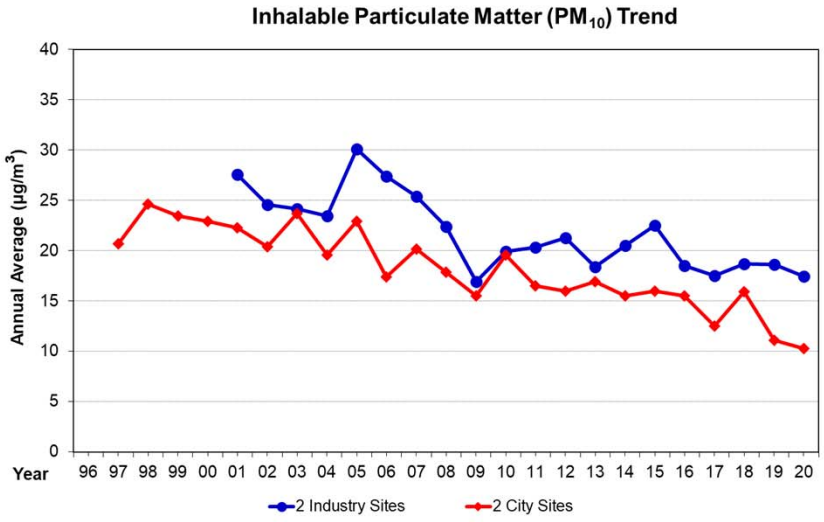
Corr Research

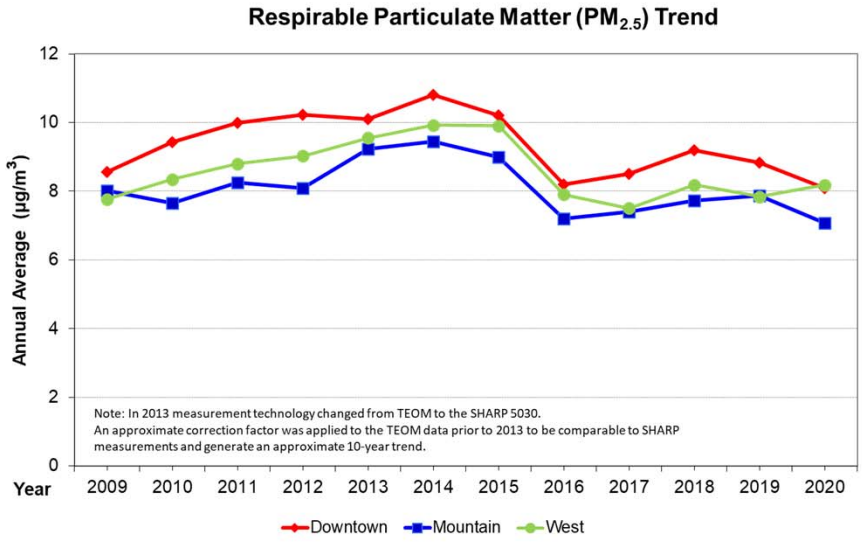
UNIVERSITY OF TORONTO

Hamilton's Air Quality Trends

Particulate Matter (TSP, PM_{10}, $PM_{2.5}$)

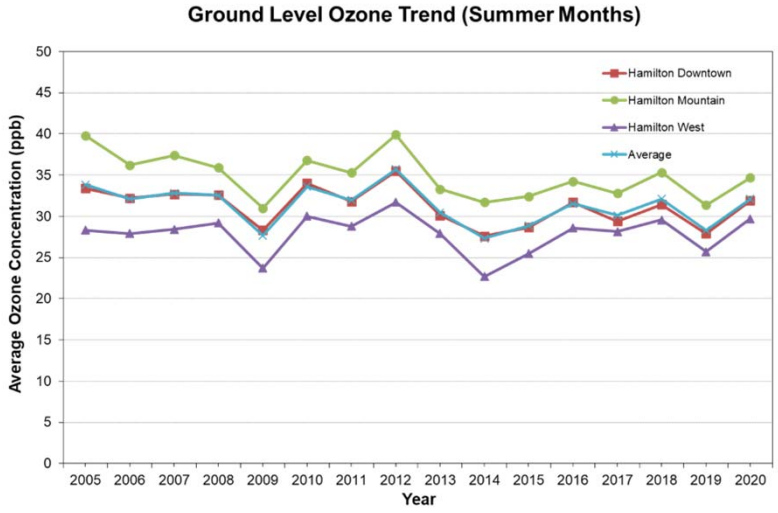


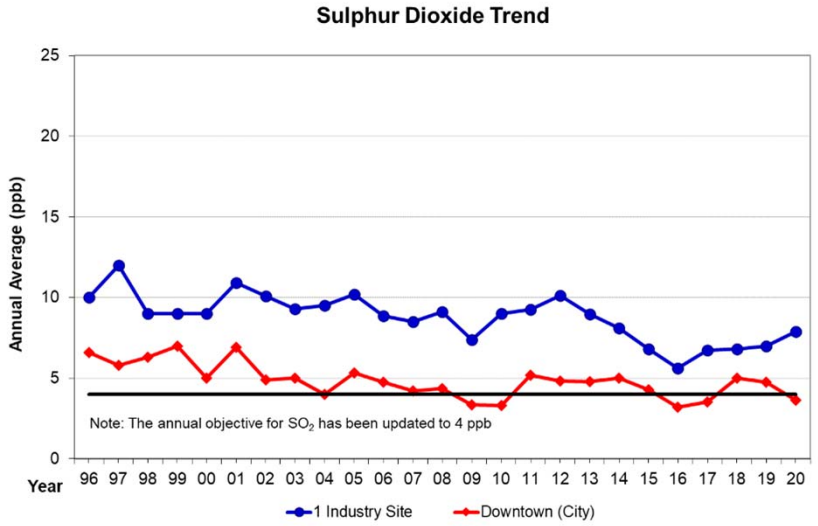


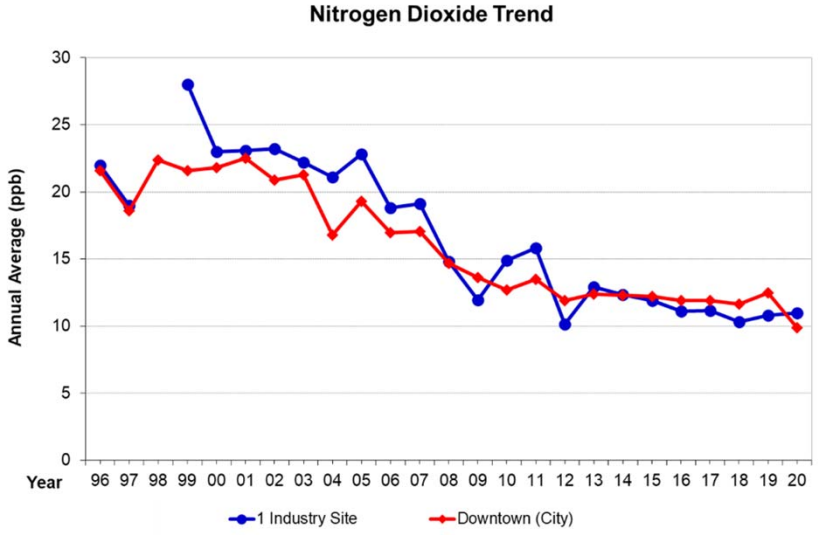


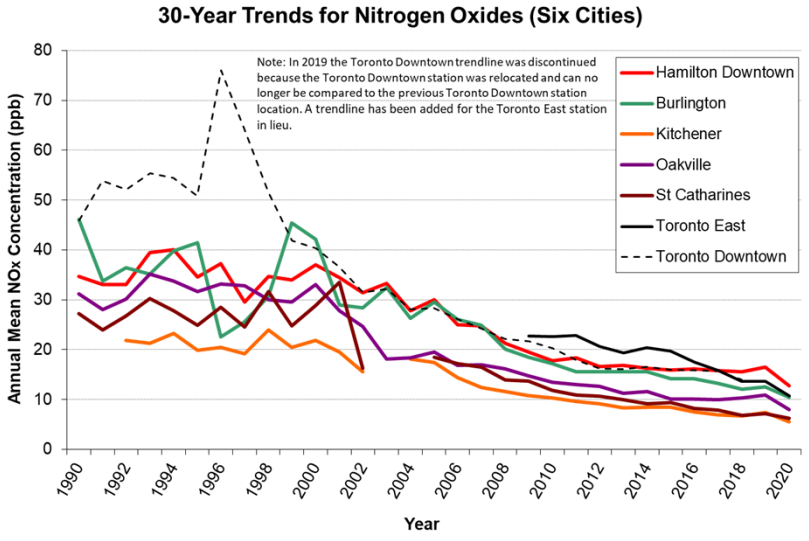
Hamilton's Air Quality Trends

Ozone (O3), Sulphur Dioxide (SO2), Nitrogen Oxides (NOx), Nitrogen Dioxide (NO2)



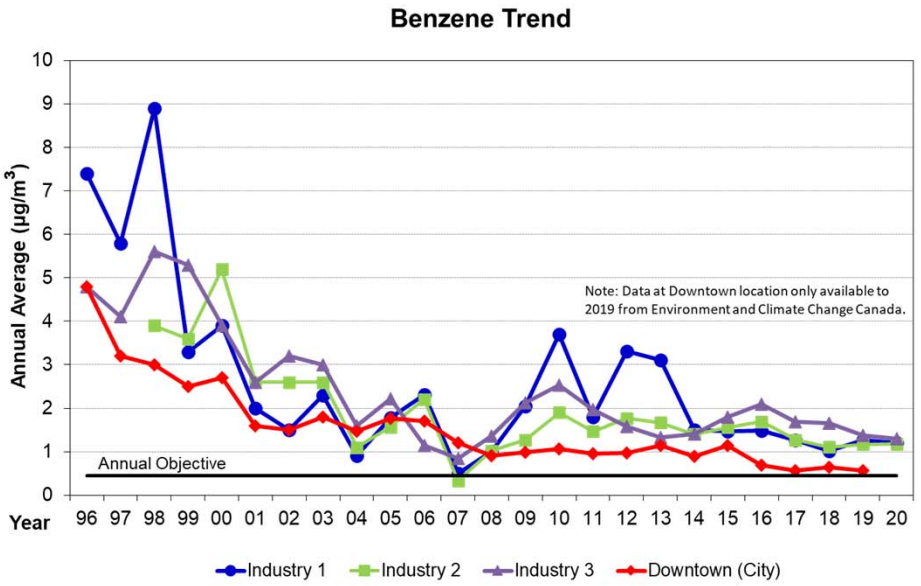


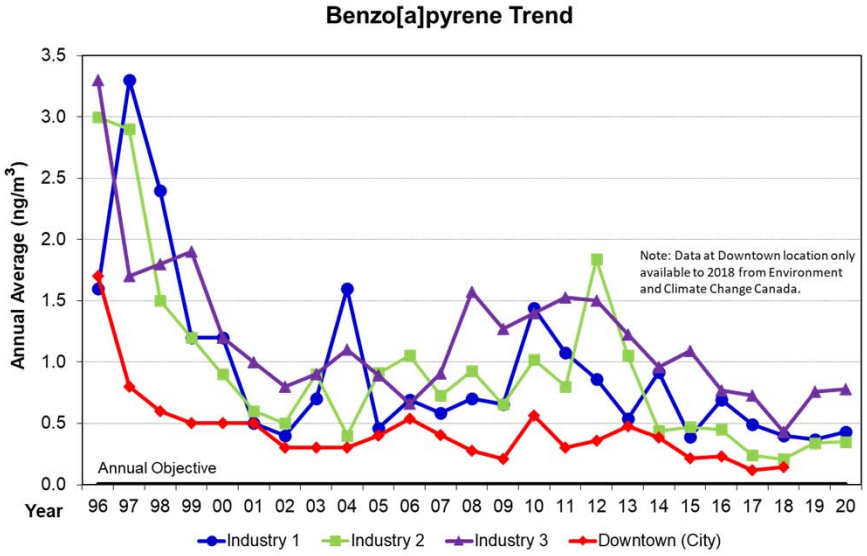




Hamilton's Air Quality Trends

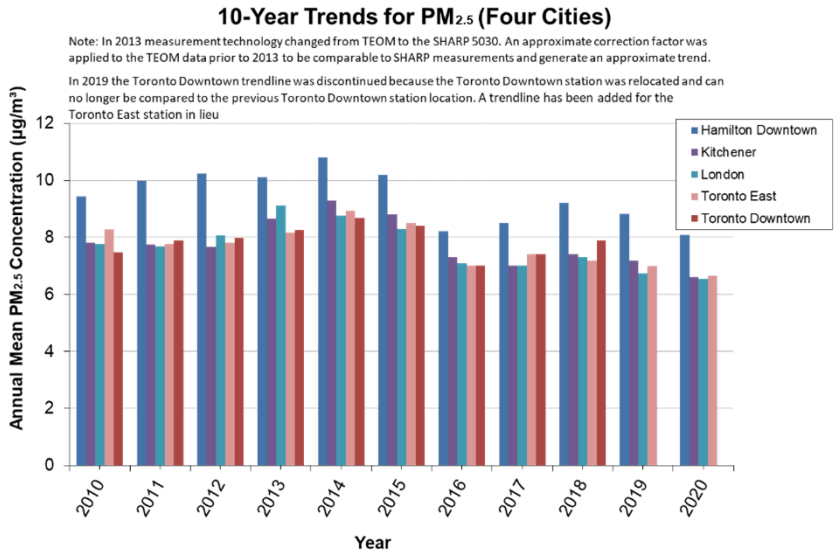
Benzene and Benzo[a]pyrene

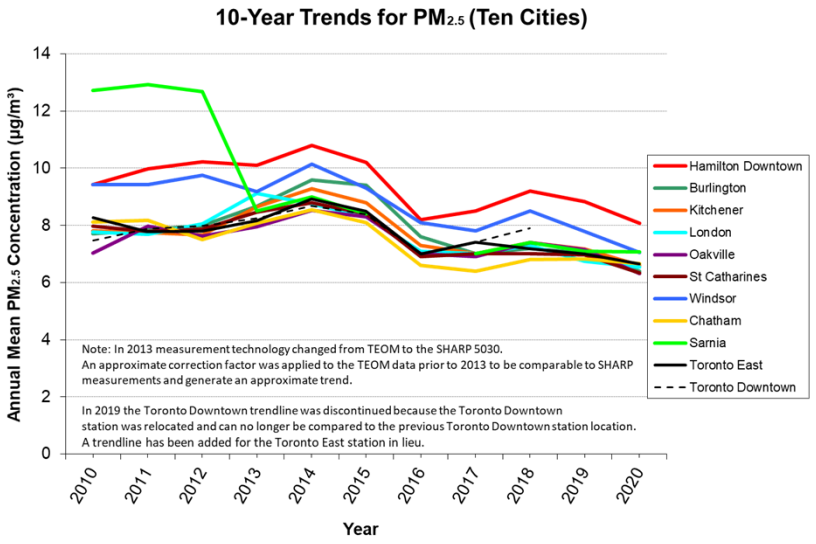


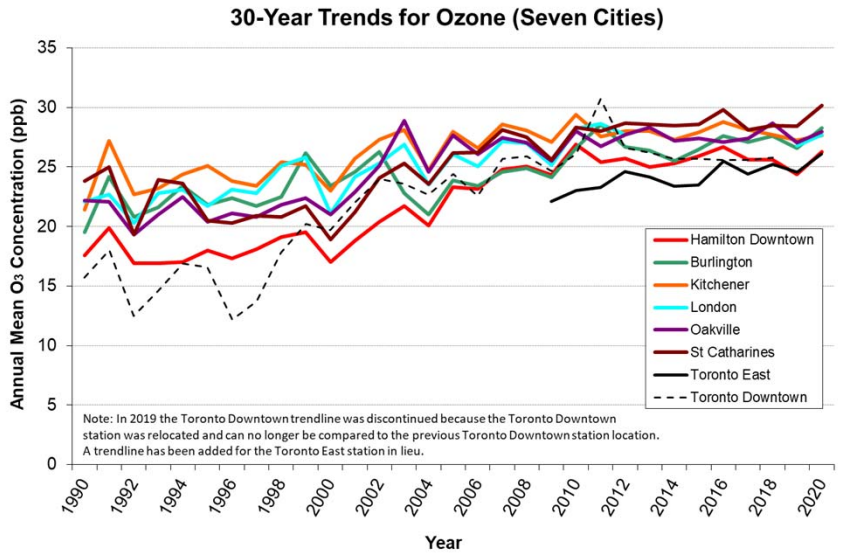


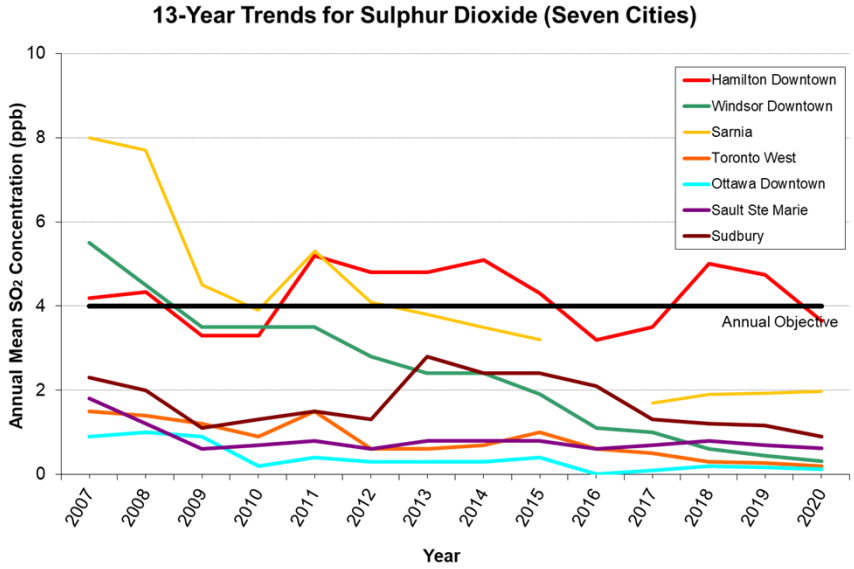
Hamilton's Air Quality Trends

Multi-City Trends for Particulate Matter (PM2.5), Ozone (O3), Sulphur Dioxide (SO2)









Future Actions

- Continue to support education and outreach, air quality monitoring, and using the Hamilton Airshed Modeling System to identify major sources of pollution to prioritize action for maximum air quality improvement and exposure reduction;
- Support initiatives aimed to encourage Hamiltonians to reduce their transportation emissions through the use of alternatives;
- Encourage continued efforts of MECP and industry to reduce air borne contaminants in the City of Hamilton and the Province of Ontario;
- Organize additional UWDW Lunch & Learns (& UWDW conference) to educate and engage the City of Hamilton community on a broad range of air quality topics; and,
- Continue to expand air quality monitoring by undertaking projects with community organizations and academia to better understand air pollution concentrations at the neighbourhood level.

Why?

To ensure the health and well-being of the citizens of Hamilton.

Thank you,

On behalf of

Clean Air Hamilton

COVID-19 Situation Report & Organizational Update

Board of Health

January 10, 2022

Dr. Elizabeth Richardson

Public Health Services
Office of the Medical Officer of Health

Overview

1. Overall Status
2. COVID-19 Situation Report
3. Scarsin Forecast
4. COVID-19 Vaccine Update
5. Hamilton Connected COVID Care

Overall Status

- Omicron driven wave has exponential growth not yet seen in pandemic
- Focus on blunting the wave to preserve care capacity for all who require it
- Currently in modified Step 2 of Roadmap to Reopening
- Scarsin forecasts predict Hamilton to experience hospital admission peak in January 2022 that greatly exceeds previous peak admission levels

Overall Status

- Vaccination status (@ Jan 6, 2022):
  - 1,086,020 doses given;
  - 88.8% of Hamiltonians 12yrs+ vaccinated with one dose, 86.2% with two doses
  - 39.4% of Hamiltonians 5-11yrs vaccinated with one dose
  - 45.1% of eligible Hamiltonians 18yrs+ with third dose

- Blunting this COVID-19 wave remains dependent on vaccination and practice of public health measures

Pandemic Objectives

- Prevent severe illness and death
  - Enhanced public health measures
  - Rapid roll-out of booster doses
  - Focus testing resources on high risk settings, vulnerable populations
- Protect public health & health system capacity
  - For treatment of COVID-19 and non-COVID-19 related illness
  - Focus public health disease control work on high risk settings
  - Ramp down non-urgent surgeries
- Protect in-person learning
  - Support child mental, social, physical health
  - Masks, high efficiency particulate air (HEPA) filters, high contact sports, cohorting
  - Provincial education and child care worker vaccination clinics
- Support individuals and business financially

Pandemic Surveillance
Transition to Severity Indicators

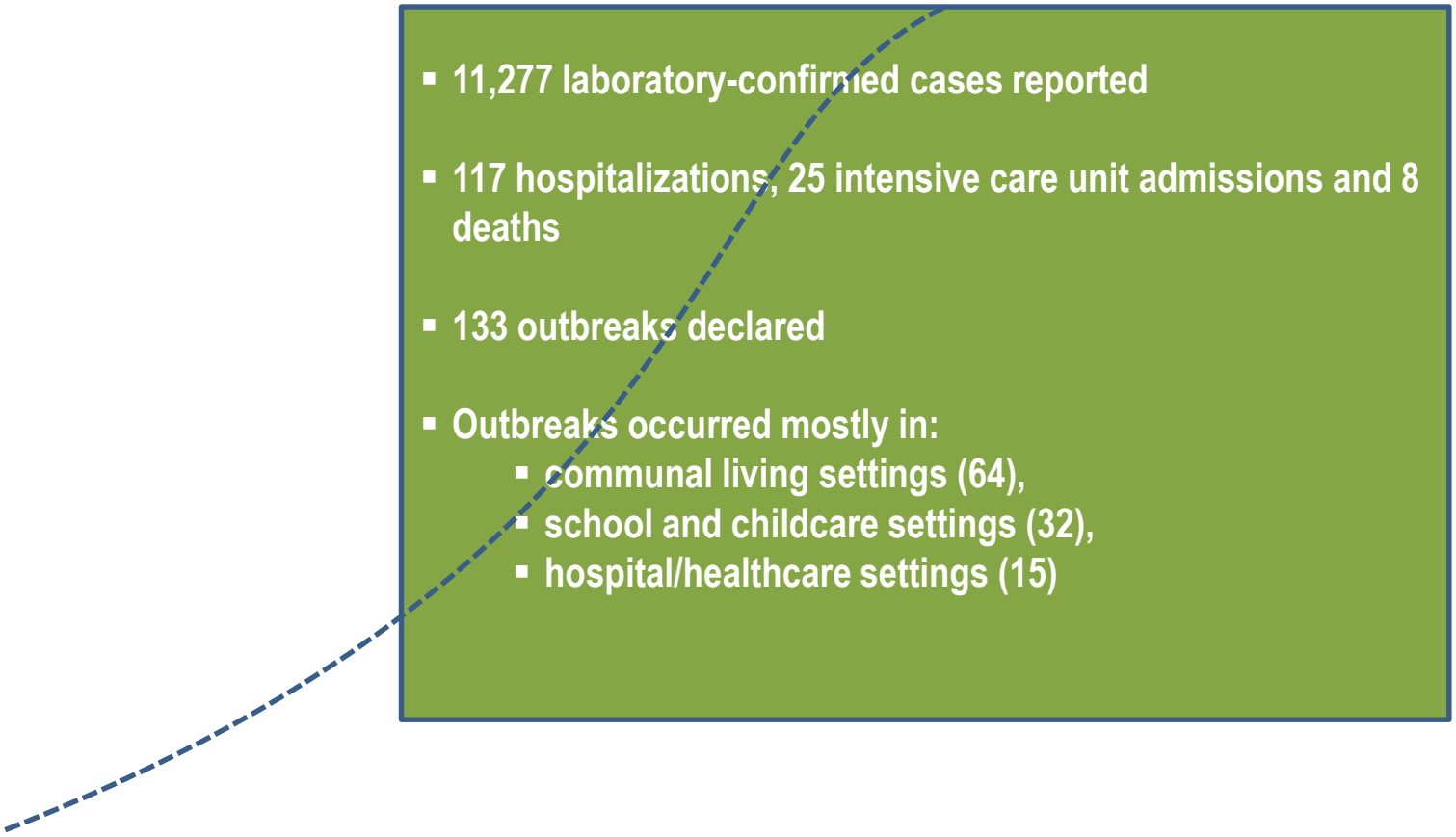
- Outbreaks
  - Number, size, severity
- Hospitalizations
- Intensive Care Unit (ICU) Admissions
- Deaths

SITUATION REPORT

Erin Rodenburg, Epidemiologist

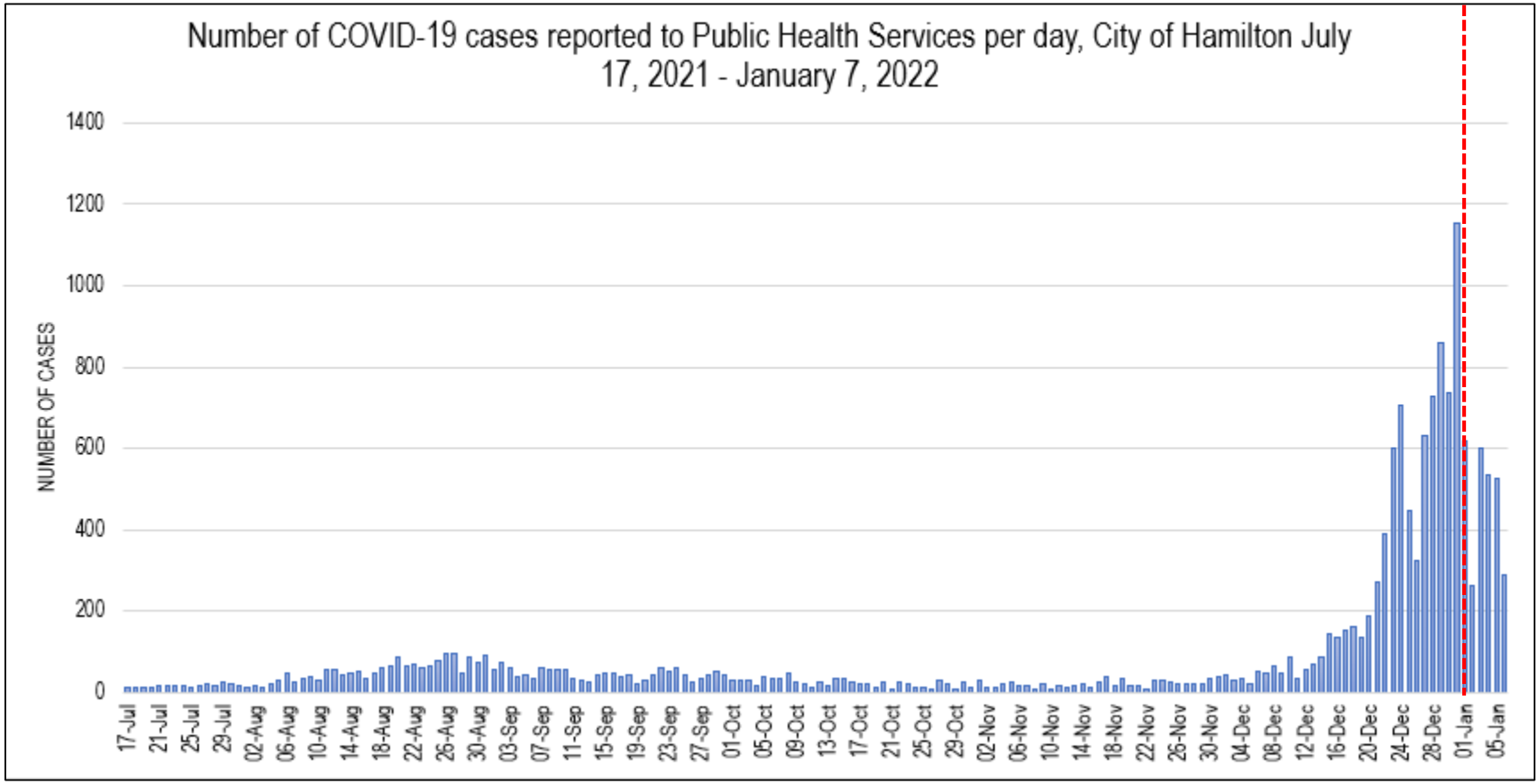
Phases of COVID-19 in Hamilton – Omicron Wave

Phase 1: Pre-peak
December 1, 2021 – January 7, 2022
(~1 month)



- 11,277 laboratory-confirmed cases reported
- 117 hospitalizations, 25 intensive care unit admissions and 8 deaths
- 133 outbreaks declared
- Outbreaks occurred mostly in:
  - communal living settings (64),
  - school and childcare settings (32),
  - hospital/healthcare settings (15)

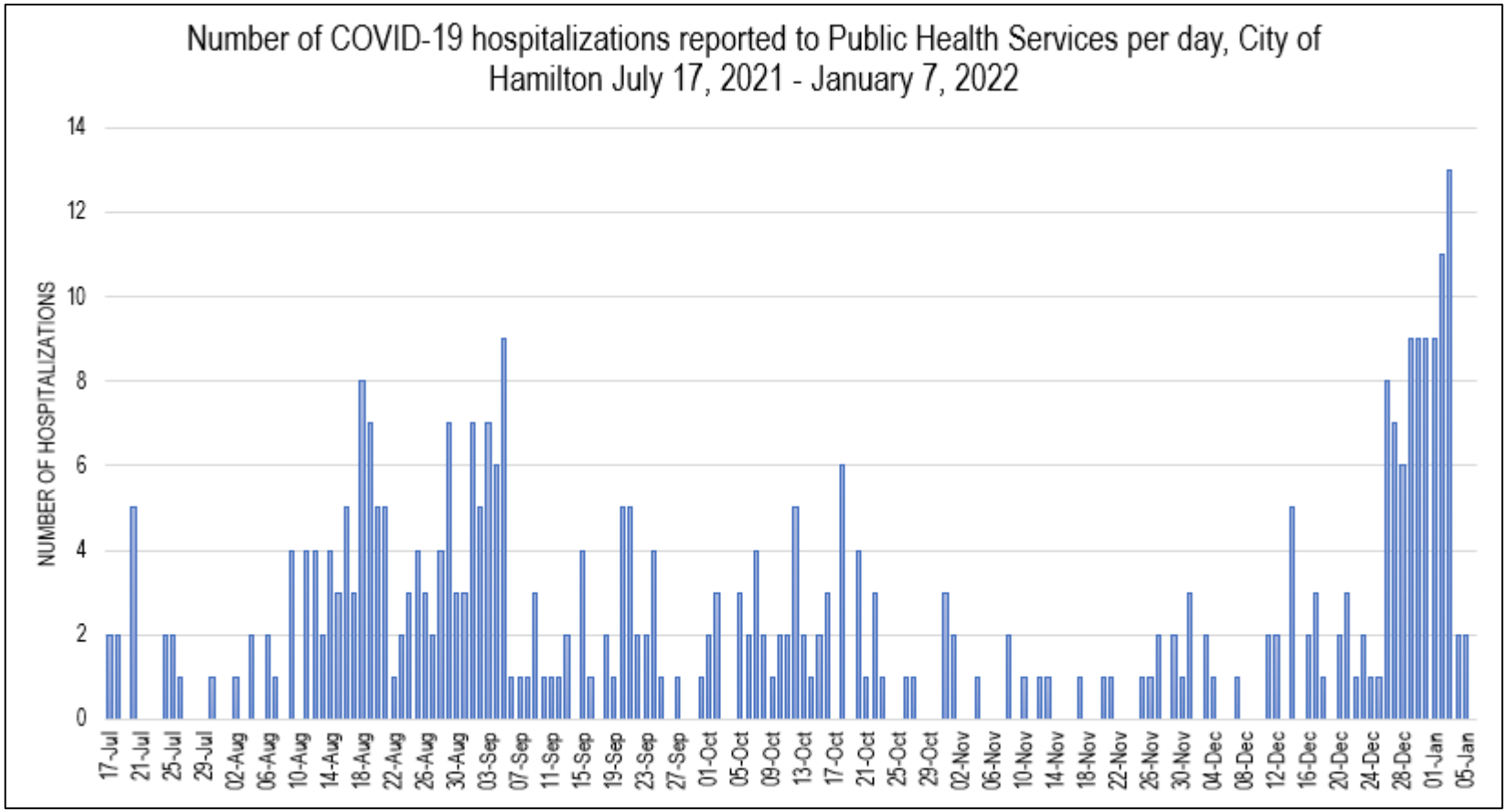
Reported cases



Key Messages

- Hamilton has experienced rapidly increasing COVID-19 case activity because of the Omicron variant
- As of January 7, 2022, there were an average of 634 COVID-19 cases per day reported to Hamilton Public Health
- Caution required as case numbers are underestimated due to changes in testing guidelines and eligibility

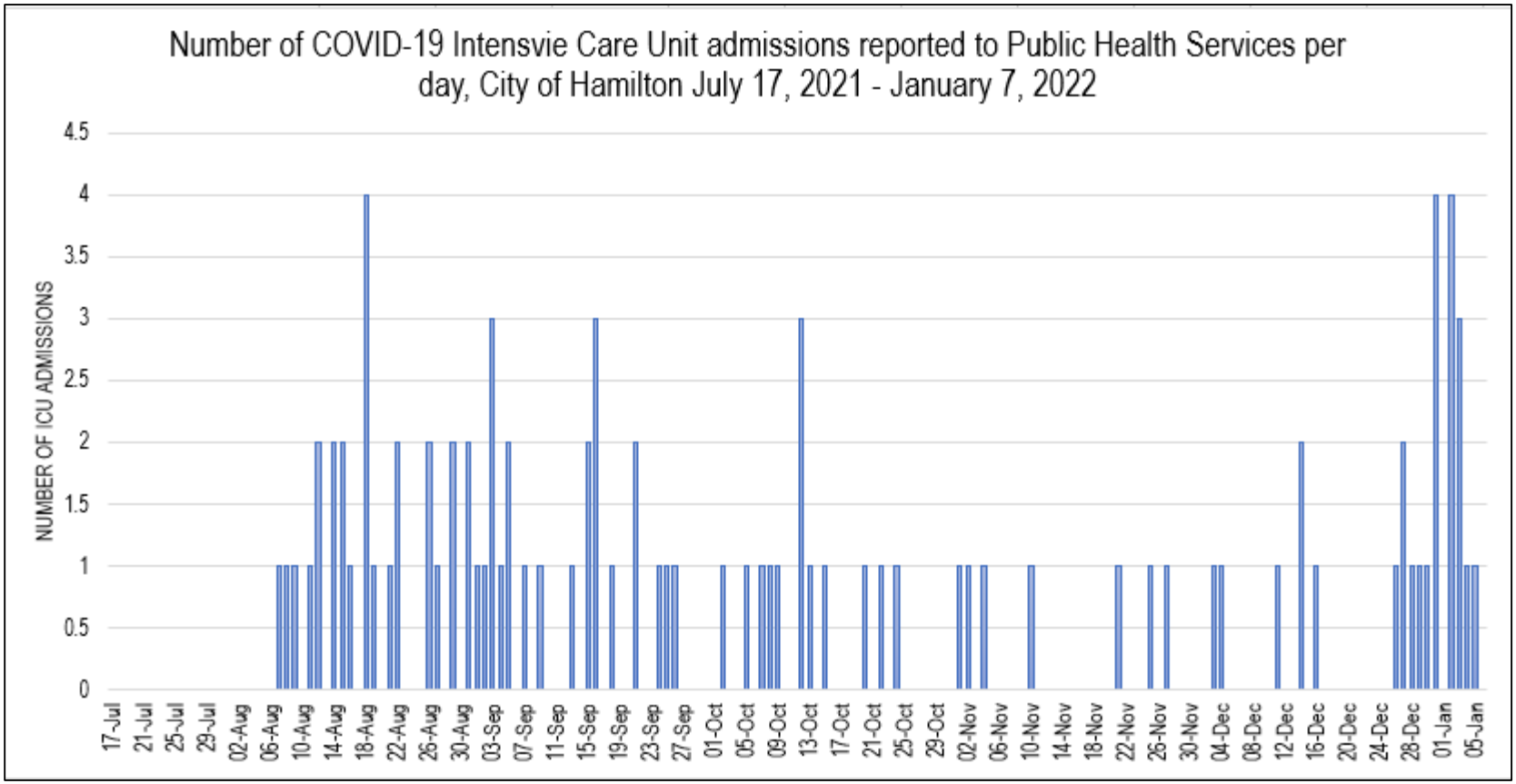
Hospitalizations



Key Messages

- Hamiltonians are experiencing increasing COVID-19 hospitalization, largely due to the Omicron variant
- As of January 7, 2022, there were approximately 8 COVID-19 hospitalizations per day reported to Hamilton Public Health

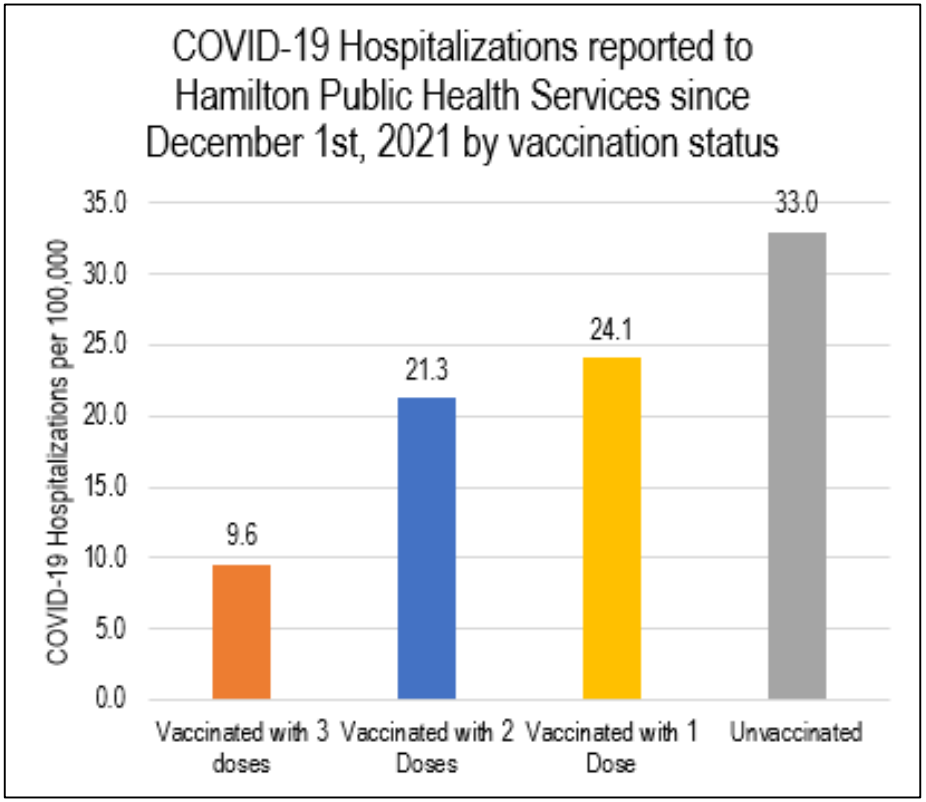
Intensive Care Unit (ICU) Admissions

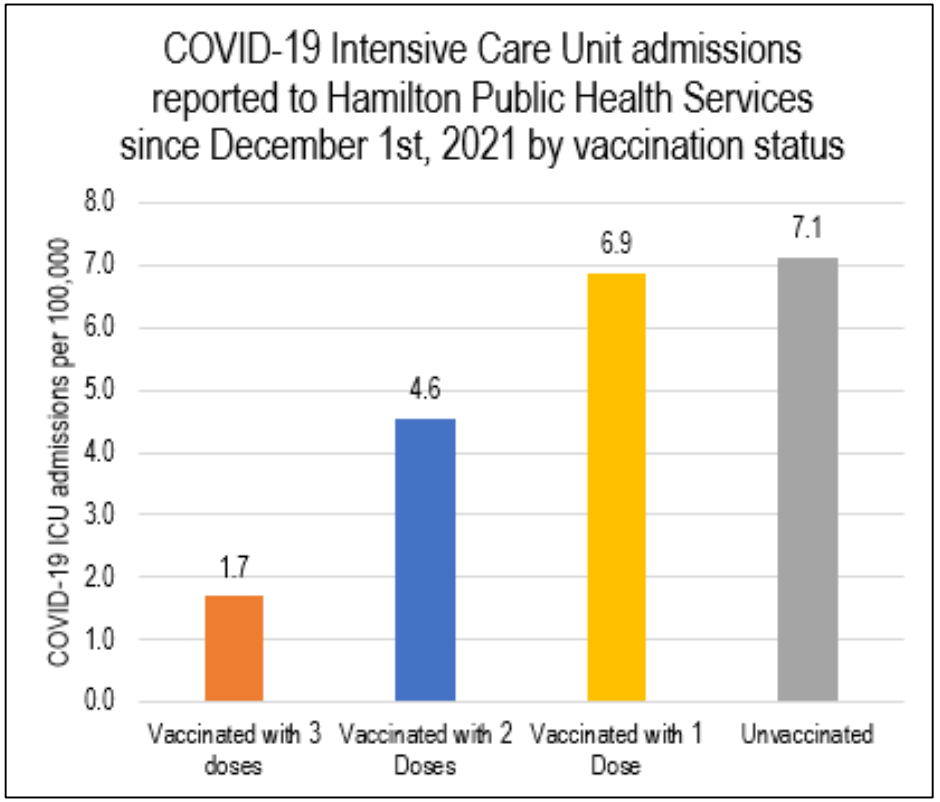


Key Messages

- COVID-19 Intensive Care Unit admissions have begun to increase and are already as high as previous peaks in the pandemic
- As of January 7, 2022, there was an average of 2 COVID-19 Intensive Care Unit admissions per day reported to Hamilton Public Health

Severity Indicators by Vaccination Status

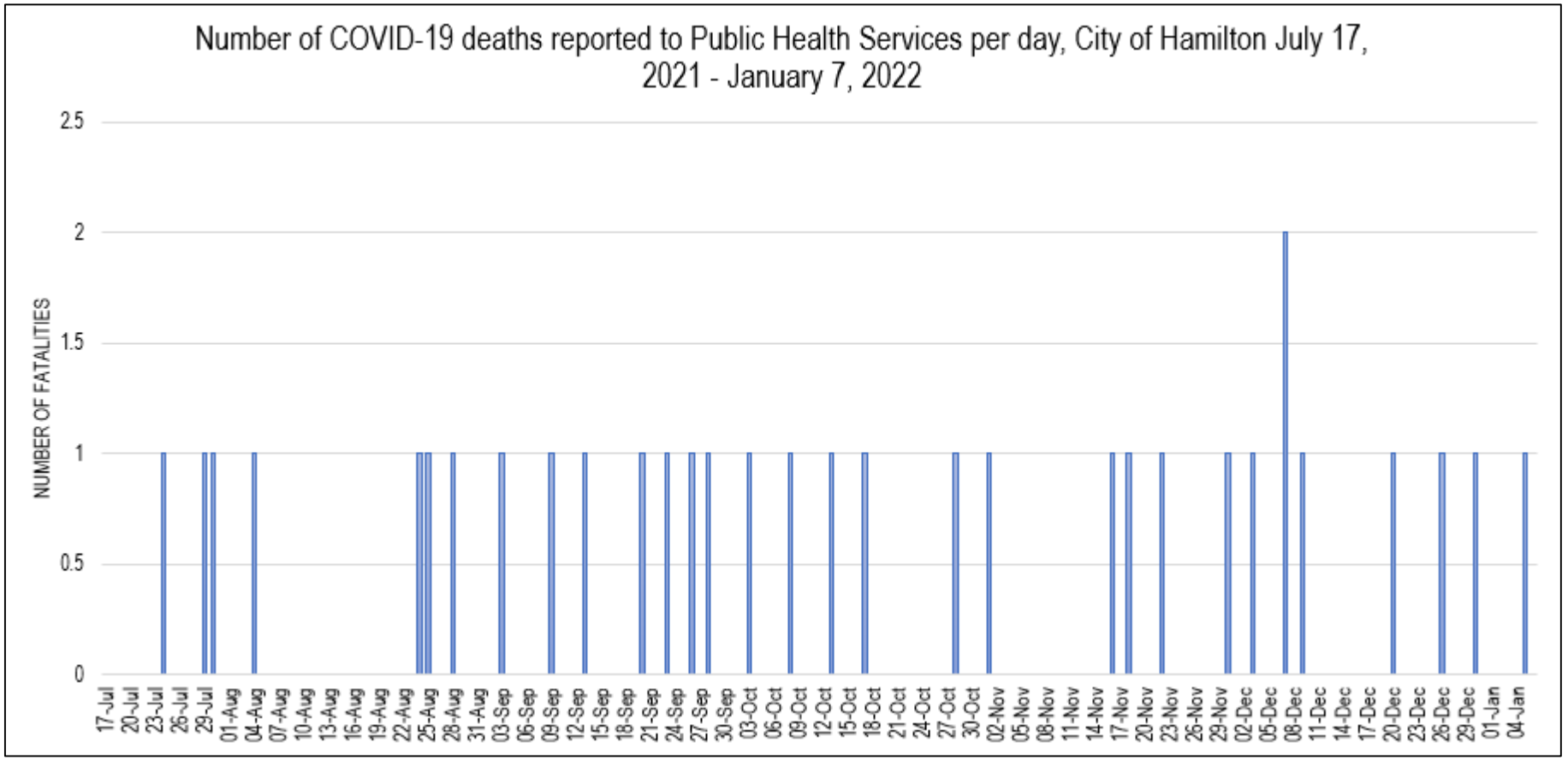




Key Messages

- The risk of severe outcome (hospitalization or Intensive Case Unit admission) due to COVID-19 during the omicron wave is lower for those with any number of COVID-19 vaccine doses compared to those who are unvaccinated
- A 3rd dose of a COVID-19 vaccine provides the most protection against these outcomes, highlighting the continued importance of vaccination

Fatalities



Key Messages

- COVID-19 fatalities are being closely monitored; they remain stable and relatively low
- As of January 7, 2022, there was less than 1 COVID-19 fatality per day reported to Hamilton Public Health
- Note that COVID-19 fatalities are a lagging indicator, we have not yet reached the time we would expect to see an increase

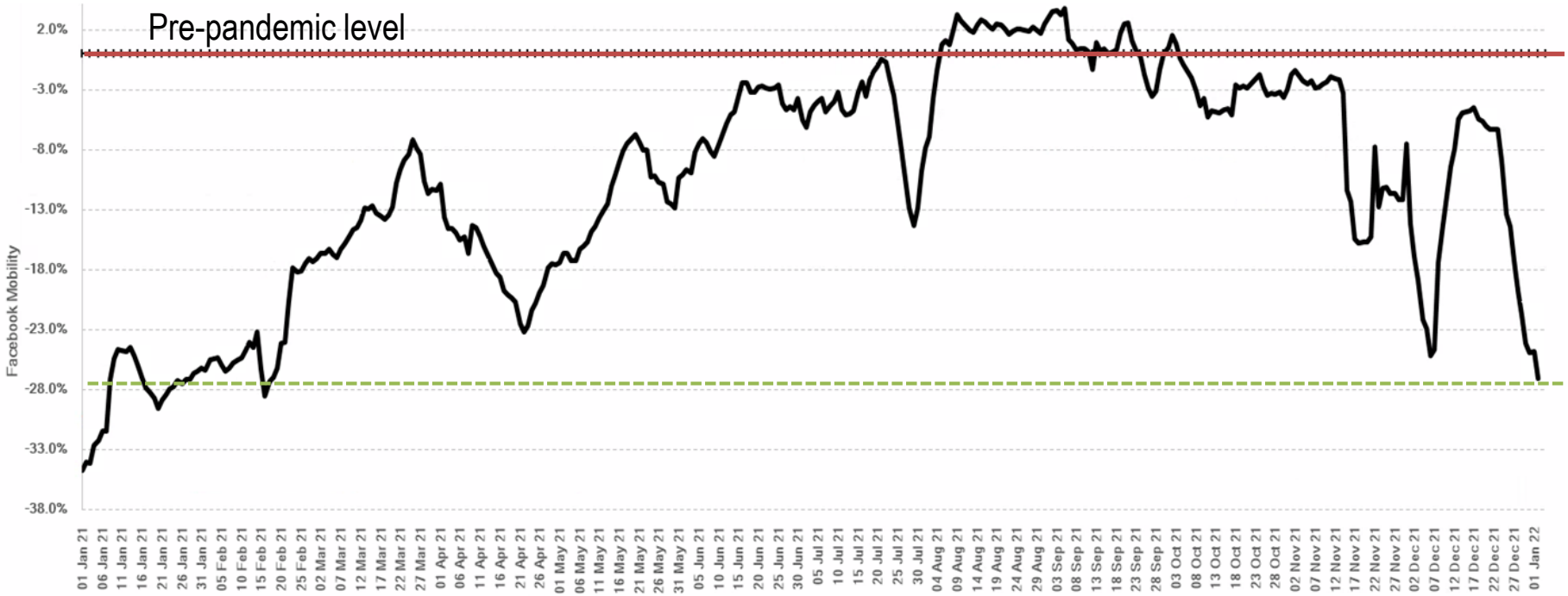
SCARSIN FORECAST

Ruth Sanderson, Epidemiologist

Scarsin Forecast Key Messages

- Focus is on blunting the wave to preserve care capacity for everyone who needs it
- Forecast provides two different scenarios assuming different levels of severity for Omicron (40% risk of hospital admissions compared to Delta is better case scenario; 50% for comparison):
  - Both adjust for new Ontario provincial orders issued January 3, 2022 (modified Step 2 of Roadmap to Reopen); includes remote learning for schools to January 17, 2022, and additional physical distancing measures (retail/ entertainment/ restaurant sectors)
- Omicron driven Wave 4 is at a point of high unpredictability
- Scarsin forecast indicates healthcare capacity will be further stressed – anticipated peak in Hamilton in mid-January 2022 that exceeds previous peak admission levels

Community Mobility, Hamilton

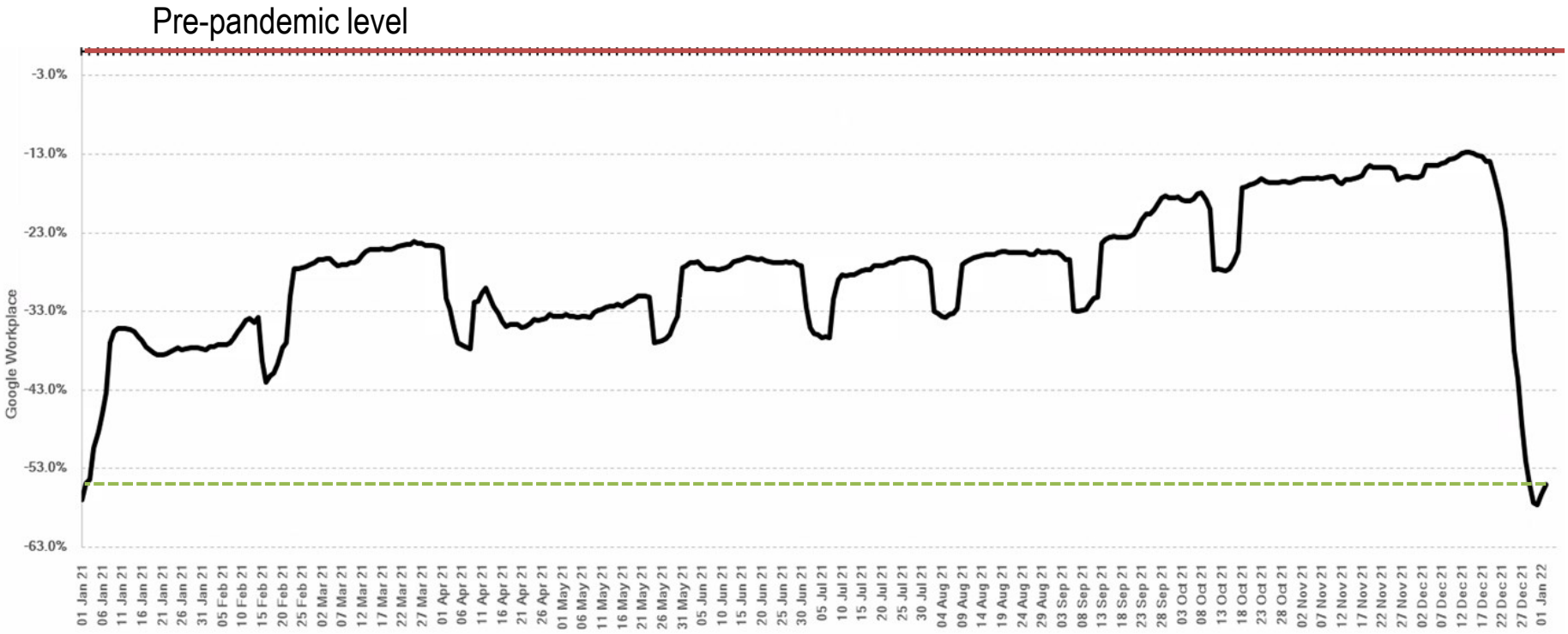


Data Source: Scarsin Decision Support System retrieved Jan 7, 2022

Key Messages:

- Community mobility increased prior to holidays and plunged from 6% below pre-pandemic levels on December 23, 2021 to 27% below pre-pandemic levels by January 2, 2022. As an indicator of community contacts – it will be helpful if we can keep community mobility lower.

Workplace Mobility, Hamilton



Data Source: Scarsin Decision Support System retrieved Jan 7, 2022

Key Messages:

- Workplace mobility plunged from 12% below pre-pandemic levels on December 16, 2021, to 55% below pre-pandemic levels on January 2, 2022. Again, where feasible it will be helpful to keep workplace mobility low.

Overview of Scenarios and Assumptions

Scenario 1 – Omicron Better Severity Scenario

Omicron severity greatly reduced from Delta's (i.e., appears that 40% of Delta's severity is reasonable assumption and consistent with recent United Kingdom studies)

Scenario 2 – Omicron Base Scenario

Omicron severity reduced from Delta's (i.e., at 50% of Delta's severity)

Scenarios Assume:

-- Public health measures aligned with recent provincial announcement
- (e.g., school closure/online learning to January 17, 2022; delayed university reopening to February 2022; masking 70%; community mobility set at 15% below pre-pandemic levels in January 2022 and gradually increasing to 10% below; workplace mobility updated to 27% below pre-pandemic levels and gradually increasing to 20%)
-- Waning 2nd dose immunity
-- Vaccinations aligned with Hamilton targets: (e.g., children 5-11 years old achieve at least 50% first dose by end of January 2022; entire adult 18+ years old population to achieve at least 70% 3rd dose coverage by end of January 2022)

-Limitation:

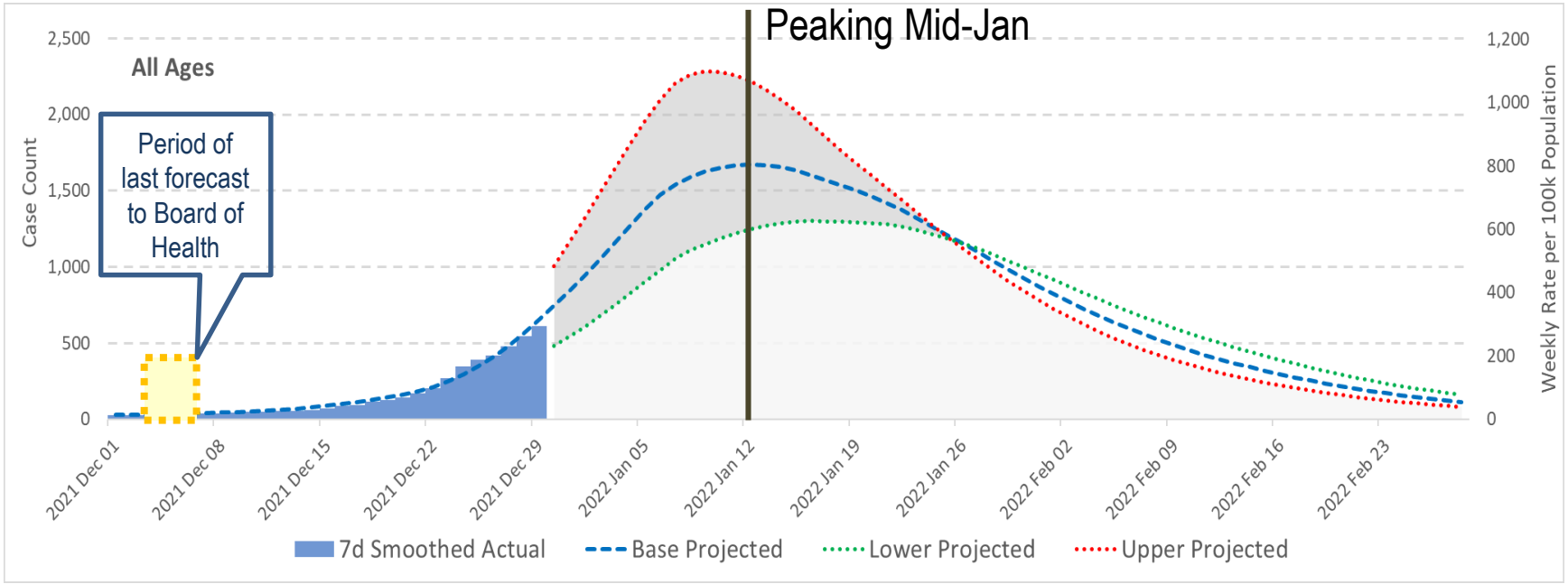
-- Major changes in testing practices will likely reduce future
- reported cases

-Updated Data:

- Vaccination/case/hospital data retrieved January 2, 2022
- Uses recent Ontario hospitalization values by age group to forecast hospital admissions and intensive care admissions for Hamilton

Scarsin Cases Forecast

Scenario 1 – Omicron Better Severity: COVID-19 Cases Among Hamiltonians



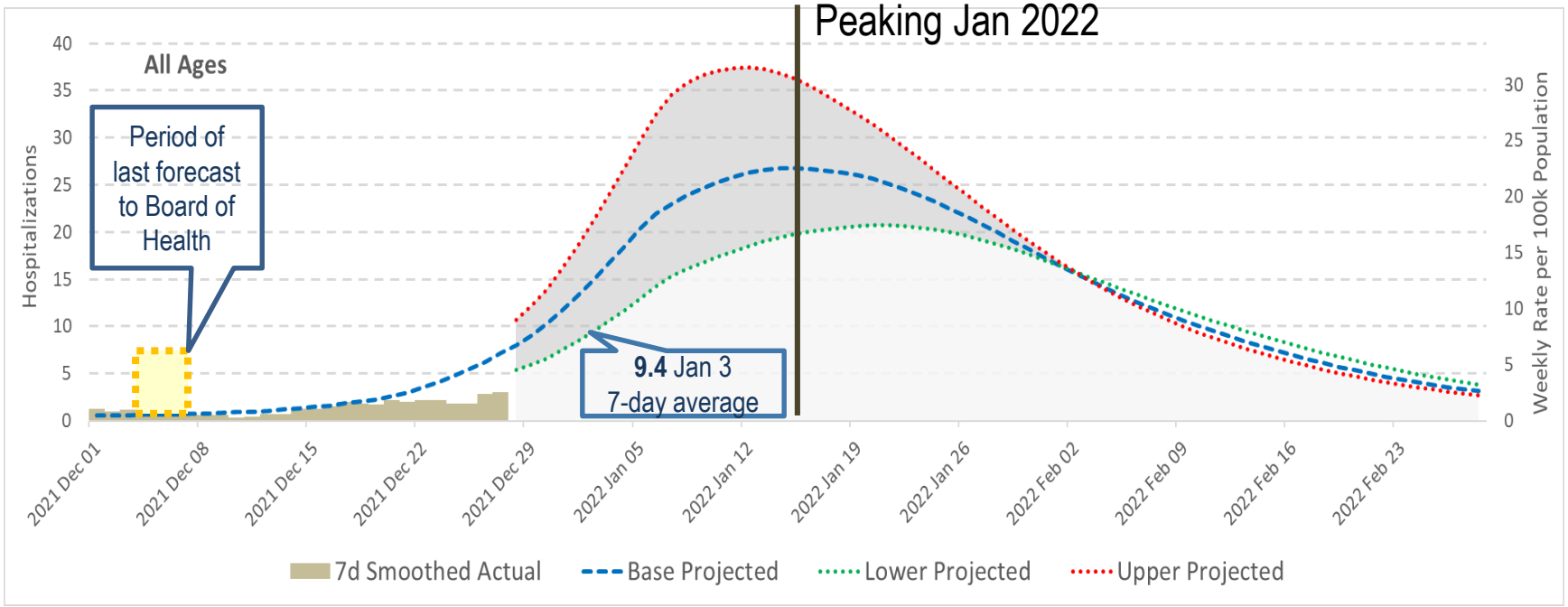
Data Source: Scarsin Decision Support System retrieved Jan 4, 2022

Key Messages:

- Forecast predicts substantial future case growth; peaking mid-January, 2022 at over 1500 cases (actual cases will be higher than reported due to testing changes) which could rise to over 2000 cases per day. Predict 40,875 cases between January 10 – February 28, 2022. Most cases will be in those 20-59yrs (67%), followed by 0-19yrs (21%) and 60yrs+ (12%).

Scarsin Hospitalizations Forecast

Scenario 1 – Omicron Better Severity: COVID-19 Hospital Admissions Among Hamiltonians



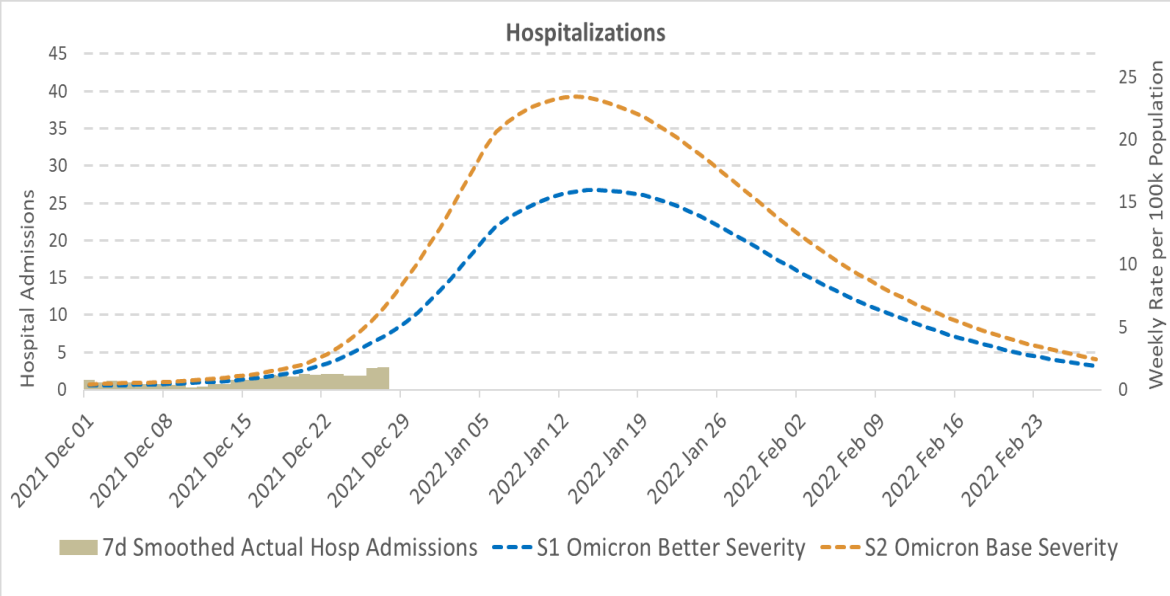
Data Source: Scarsin Decision Support System retrieved Jan 4, 2022

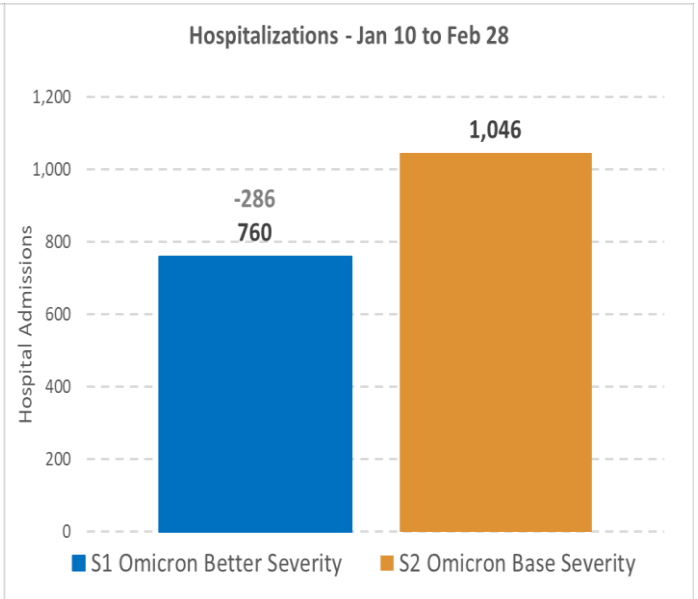
Key Messages:

- Scenario 1 – Omicron better (reduced) severity scenario predicts 760 new hospital admissions among Hamiltonians from January 10, 2022, to February 28, 2022. Hospitalizations peak just a few days later than cases in January. Current hospitalizations may substantially increase to just over 25 admissions at the peak mid-January 2022.

Scarsin Hospitalizations Forecast

Scenario Comparisons, COVID-19 Hospital Admissions Among Hamiltonians



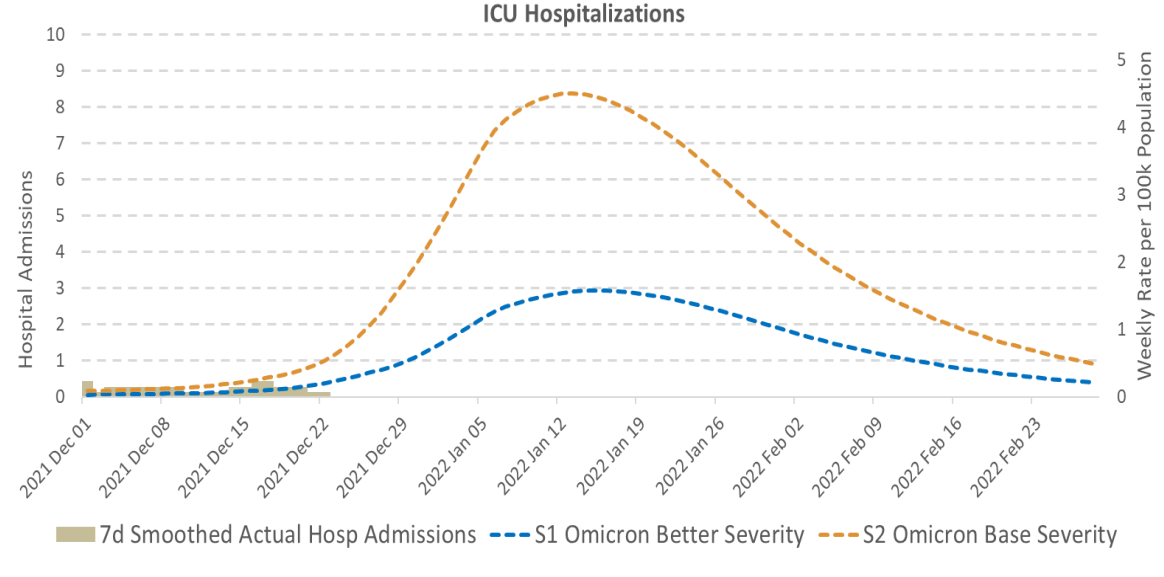


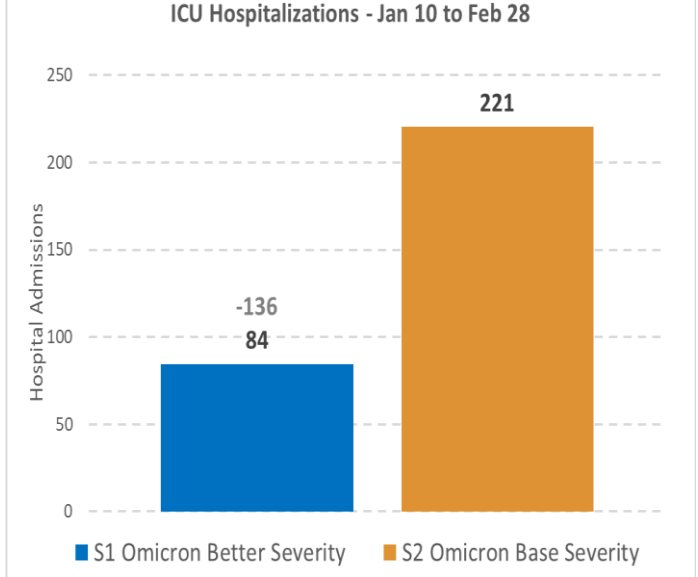
Data Source: Scarsin Decision Support System retrieved Jan 4, 2022

Key Messages:

- Scenario 1-Omicron, the better (reduced) severity scenario, predicts 760 new hospital admission among Hamiltonians, which is 286 fewer admissions than Scenario 2 with higher levels of severity from January 10, 2022, to February 28, 2022.

Scenario Comparisons, COVID-19 Intensive Care Unit (ICU) Admissions Among Hamiltonians





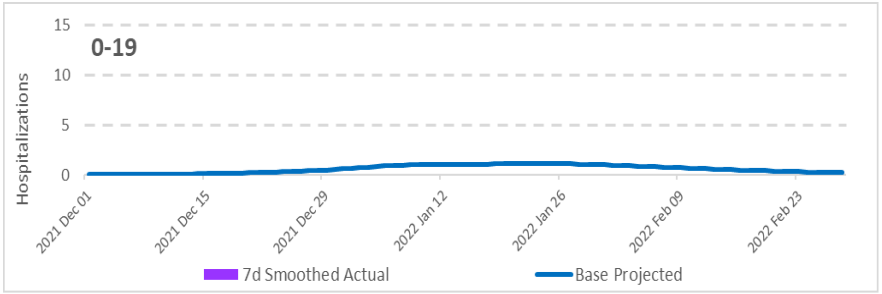
Data Source: Scarsin Decision Support System retrieved Jan 4, 2022

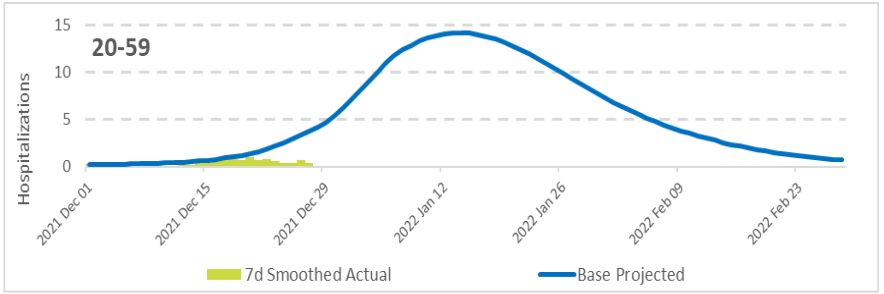
Key Messages:

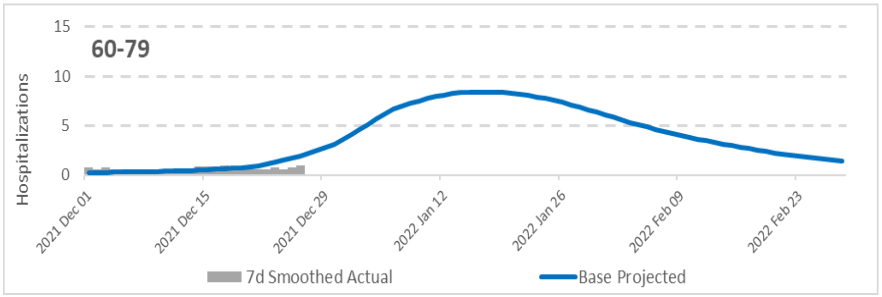
- Scenario 1- Omicron Better Severity Scenario predicts 84 Intensive Care Unit admissions January 10 – February 28, 2022, 136 fewer than Scenario 2.

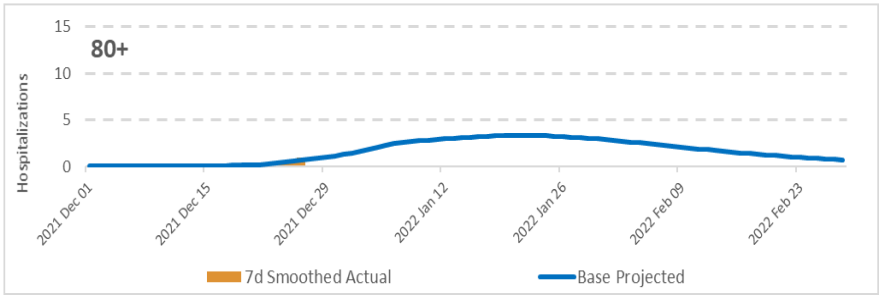
Scarsin Hospitalizations Forecast

Scenario 1 – Omicron, COVID-19 Hospital Admissions by Age Group, Hamiltonians









Data Source: Scarsin Decision Support System retrieved Jan 4, 2022

Key Messages:

- While only 12% of cases are predicted in those 60yrs+, 49% of new hospital admissions will be among those 60yrs+; 5% will be among those 0-19yrs, and 45% in those 20-59yrs from January 10 to February 28, 2022. However, of the 119 deaths that are forecast; 86% in those 60yrs+ (not shown).

Scarsin Forecast Summary

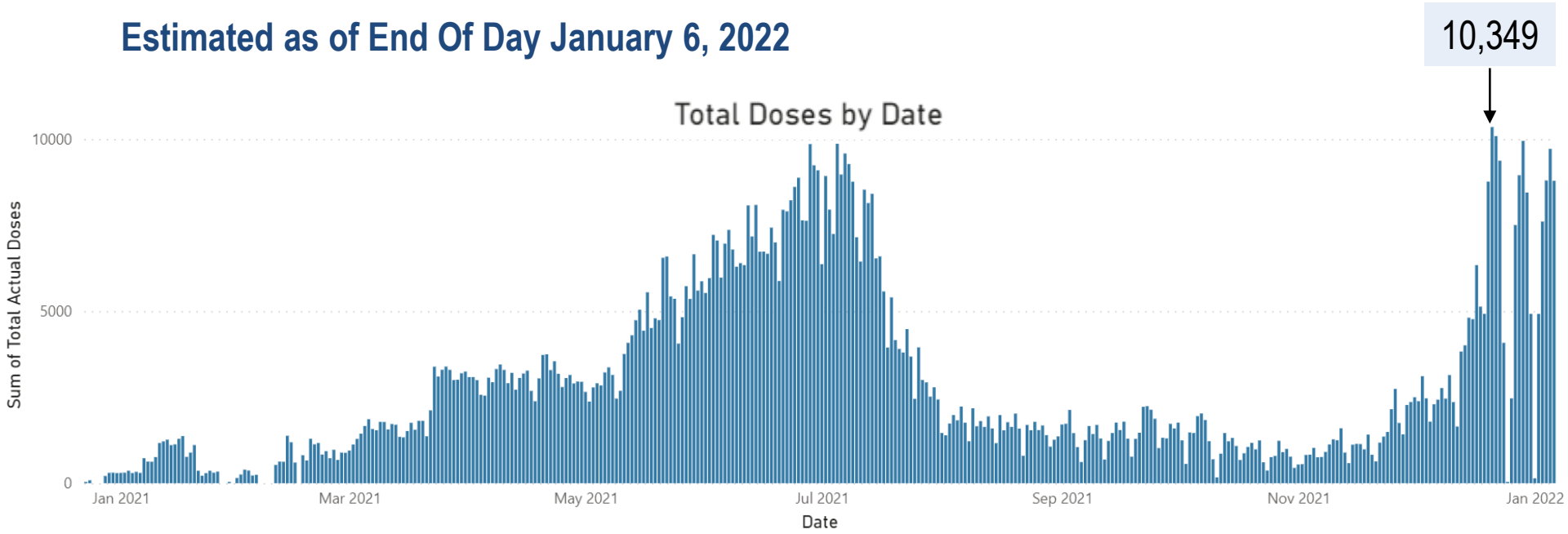
- Information on the severity of Omicron is still emerging, however, the sheer volume of cases is driving-up hospitalizations predicted to peak in January 2022:
  - The peak of total new hospital admissions, including intensive care unit admissions, is anticipated to be far greater than seen in previous waves
- Severe outcomes will disproportionally occur more among those aged 60yrs and over (12% of cases but 49% of hospital admissions/ 86% of deaths)
- Further model adjustments will be incorporated to further refine hospital and Intensive Care Unit admissions as additional information becomes available
- Vaccinations remain a key strategy combined with ongoing reductions in contacts, masking and physical distancing to blunt the Omicron fueled wave. Anticipated anti-viral treatments may help to reduce severe outcomes

COVID VACCINE UPDATE

Melissa Biksa, Manager – COVID-19 Vaccine

COVID-19 Vaccine – Doses Administered in Hamilton

Estimated as of End Of Day January 6, 2022

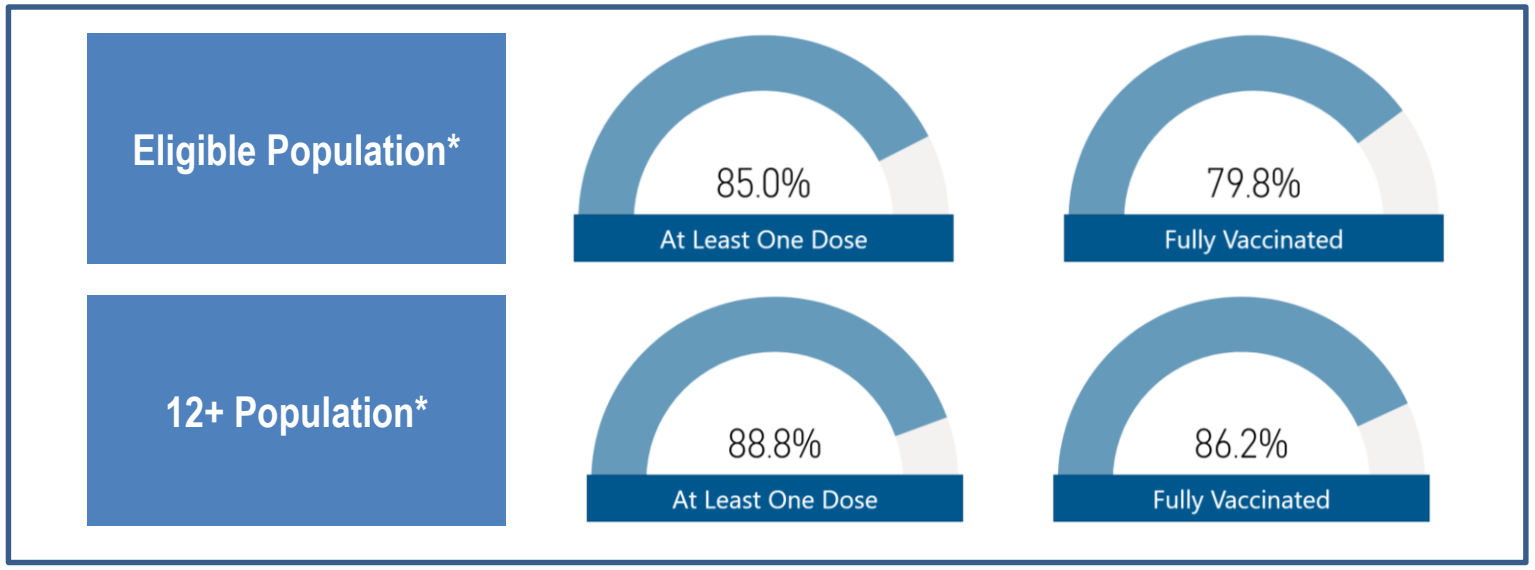


- Over **1.08 Million** COVID-19 vaccine doses administered in Hamilton since December 23, 2020
- Significant increase beginning mid-December 2021, reaching peak of **10,349** doses administered on December 21, 2021
- 3rd doses driving recent throughput, accounting for over 90% of daily doses administered

Sources: IntelliHealth (COVAXon Data Load)

COVID-19 Vaccine – Overall Coverage

Estimated as of End Of Day January 6, 2022



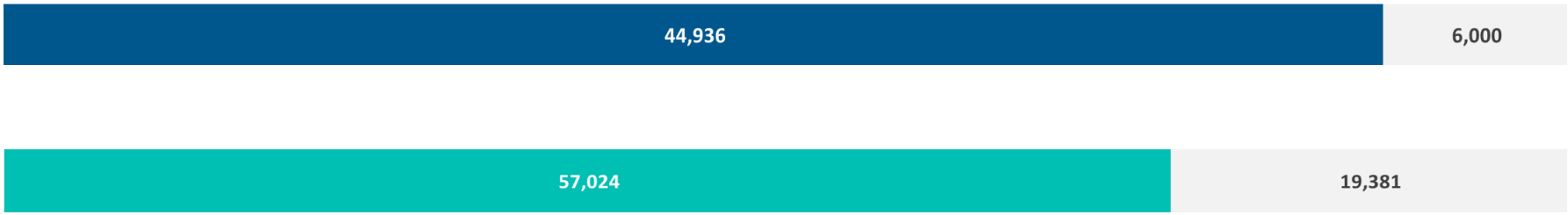
3rd doses administered to **45%** of people currently eligible**,
which represents **37%** of 18+ year old population residing in Hamilton

Note: Includes Hamilton residents and individuals vaccinated in Hamilton who cannot be assigned to a health unit region.
*The eligible population includes individuals born in 2016 or earlier. The 12yrs+ population includes individuals born in 2009 or earlier.
**Defined as being 18+ years of age and at least 56 days from administration of second COVID-19 dose.
Sources: IntelliHealth (COVAXon Data Load); IntelliHealth (Population Projections, 2020).

COVID-19 Vaccine – Overall Coverage

Estimated as of End Of Day January 6, 2022

	Previous (Dec 24, 2021)	Previous (Dec 31, 2021)	CURRENT (Jan 7, 2022)	Trend
% change in 1st dose coverage among Hamilton's population aged 5+yrs in the past week	84.3% (+0.5%)	84.6% (+0.3%)	**85.0% (+0.4%)**	--
% change in 2nd dose coverage among Hamilton's population aged 5+yrs in the past week	79.3% (+0.2%)	79.5% (+0.2%)	**79.8% (+0.3%)**	--
% change in 3rd dose coverage among Hamilton's population aged 18+yrs in the past week	22.3% (+10.0%)	29.6% (+7.2%)	**37.5% (+7.9%)**	--
# of 1st doses administered to Hamilton's population aged 5+yrs in the past week	3,199	1,725	**1,928**	--
# of 2nd doses administered to Hamilton's population aged 5+yrs in the past week	1,321	1,072	**1,532**	--
# of 3rd doses administered to Hamilton's population aged 18+yrs in the past week	47,504	34,056	**36,765**	--



Sources: IntelliHealth (COVAXon Data Load); IntelliHealth (Population Projections, 2020).

COVID-19 Vaccine – Pediatric Population

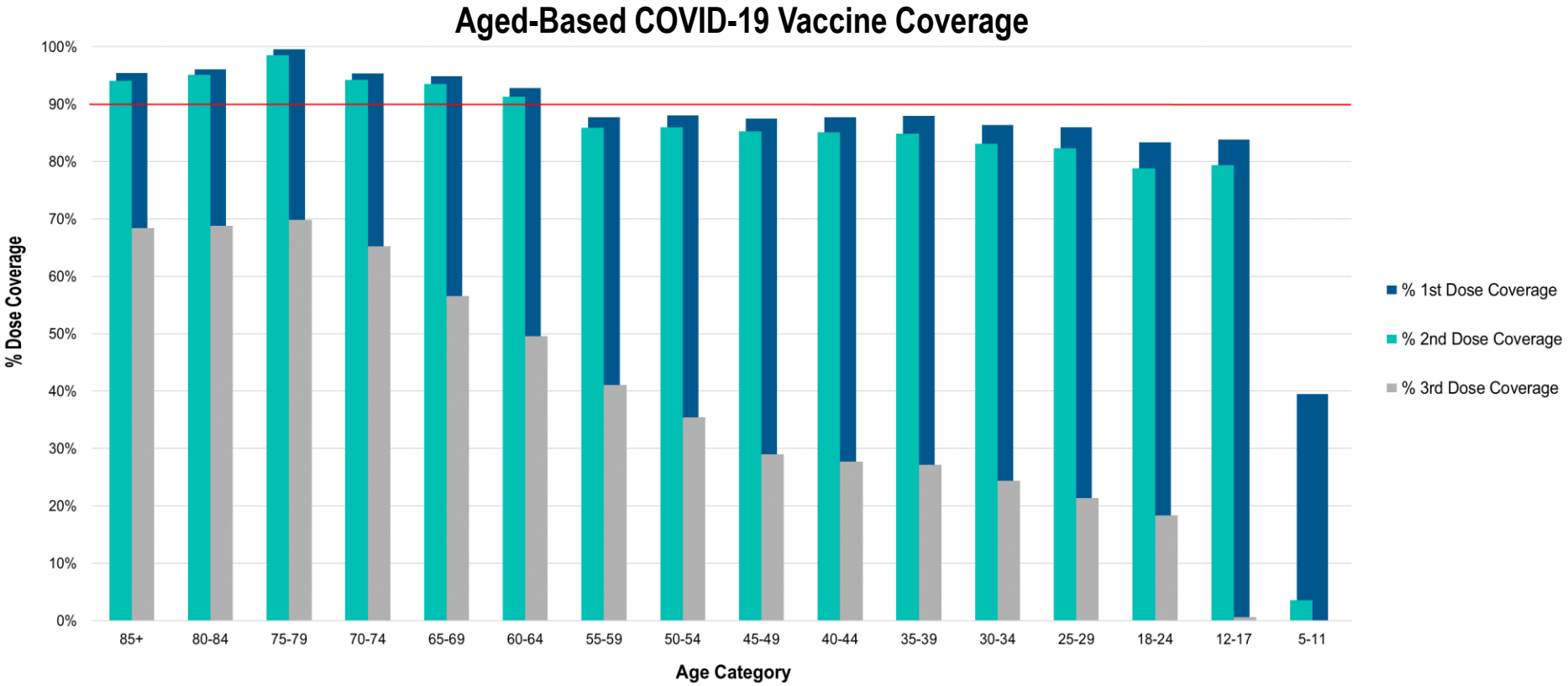
Estimated as of End Of Day January 6, 2022

- Over **16,800 1st doses** administered to pediatric population in Hamilton **(39.4% coverage)**
- Quick uptake in first two weeks (November 25 to December 8, 2021)
- Geographic variation in coverage
  - Highest in Dundas, Ancaster, Glanbrook, Lower West
  - Lowest in Lower Central, Lower East, Lower Stoney Creek and East Mountain

Note: Includes Hamilton residents and individuals vaccinated in Hamilton who cannot be assigned to a health unit region.
The pediatric population includes individuals born 2010 to 2016.
Sources: IntelliHealth (COVAXon Data Load); IntelliHealth (Population Projections, 2020).

COVID-19 Vaccine – Coverage by Age

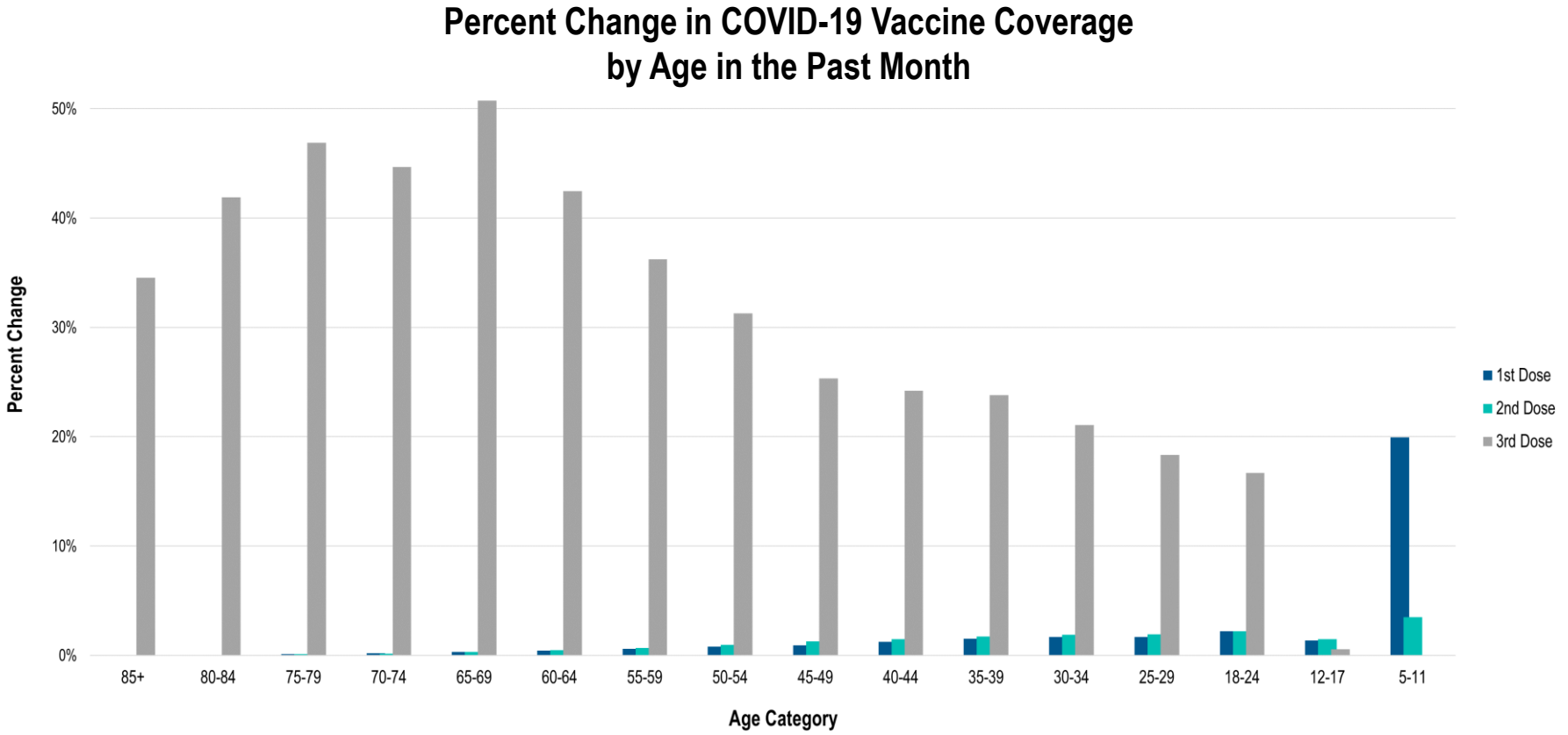
Estimated as of End Of Day January 6, 2022



Sources: IntelliHealth (COVAXon Data Load); IntelliHealth (Population Projections, 2020).

COVID-19 Vaccine – Coverage by Age

Estimated as of End Of Day January 6, 2022



Sources: IntelliHealth (COVAXon Data Load); IntelliHealth (Population Projections, 2020).

COVID-19 Vaccine – Operational Update

- Significant scale-up in clinic operations in response to Omicron variant
  - Focus on maximizing reach through established sites
  - Access preserved for 1st & 2nd doses, including for 5 – 11 year old population
  - 3rd dose walk in added at Centre on Barton (January 5, 2022)

- Eligibility
  - 5 – 11 Year Old Population: 2017 cohort by birth date
  - 3rd Doses: 18yrs+, 3 months post-2nd dose
  - 4th Doses: Residents of long-term care, retirement homes, & other seniors congregate settings

COVID-19 Vaccine – Next Steps in Program Evolution

- Bookings slowing as reach 40% mark as in previous campaigns

- Continue to vaccinate high risk groups as soon as possible
  - Broad access to clinics
  - Walk-ins for 50yrs+
  - Large scale and community based clinics
  - Return to senior's congregate settings for fourth doses

- Support return to onsite education through collaboration with school boards, child care system
  - Promote/assist with access to existing clinics
  - Open to walk-ins for children
  - Provincial clinic for education and child care workers
  - Additional mobile school clinics after seniors complete

COVID-19 Vaccine – Plans for Mid-to-Late January 2022

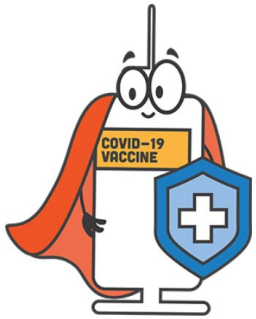
- Large-Scale Clinics
  - Transition Limeridge Mall clinic to one shift to increase capacity of our mobile stream - Week of January 17, 2022
- Mobile
  - Support and provide 4th doses to retirement homes & other senior congregate settings, while continuing community pop-up clinics
  - School-based clinics to follow after 4th doses in congregate settings
- 5-11 Year Old Population
  - Implement walk-ins for 5-11 year olds at large-scale clinics starting Monday, January 10, 2022
  - Continue community clinics
  - Add school-based clinics after congregate settings complete

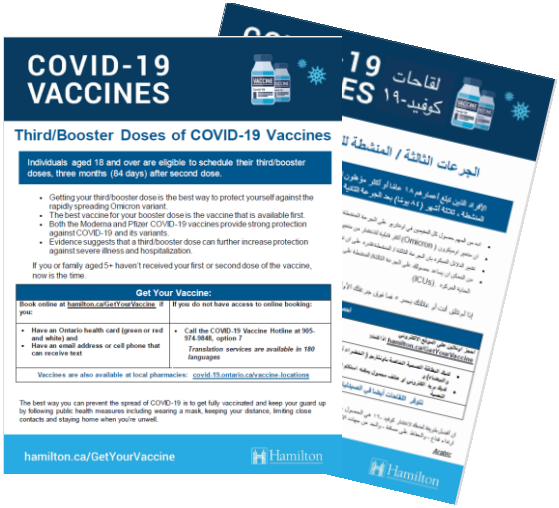
Vaccine Confidence

Pediatric Strategy 5-11 years

3rd Dose Strategy

Community Engagement & Tailored Materials





Thank You to Our Community Partners

2021 Community Booking and Outreach Funding Recipients

- De dwa da dehs nye>s Aboriginal Health Centre
- Afro Canadian Carribean Association of Hamilton & District
- Amitie Canado Congolaise
- Asociación Fraternidad Hispana
- Association de la Communaute Ivoirienee de Hamilton
- Centre de Sante Hamilton Niagara
- Circle of Friends for Newcomers
- Corktown Neighbourhood Association
- Hamilton Centre for Civic Inclusion
- Helping Hands Street Mission (Hamilton)
- Eva Rothwell Centre
- Niwasa Kendaaswin Teg
- P&J Consulting
- Refuge Hamilton Centre for Newcomer Health
- Seeds of Leadership
- South Asian Heritage Association of Hamilton & Region
- YWCA Hamilton

Thank you to all members of the Vaccine Readiness Network for their commitment and contributions.

Hamilton Connected Covid Care

Dr. Tammy Packer

Chief, Dept. of Family Medicine, SJHH and HHS

Member, Primary Care Executive, Greater Hamilton Health Network

HAMILTON CONNECTED COVID CARE

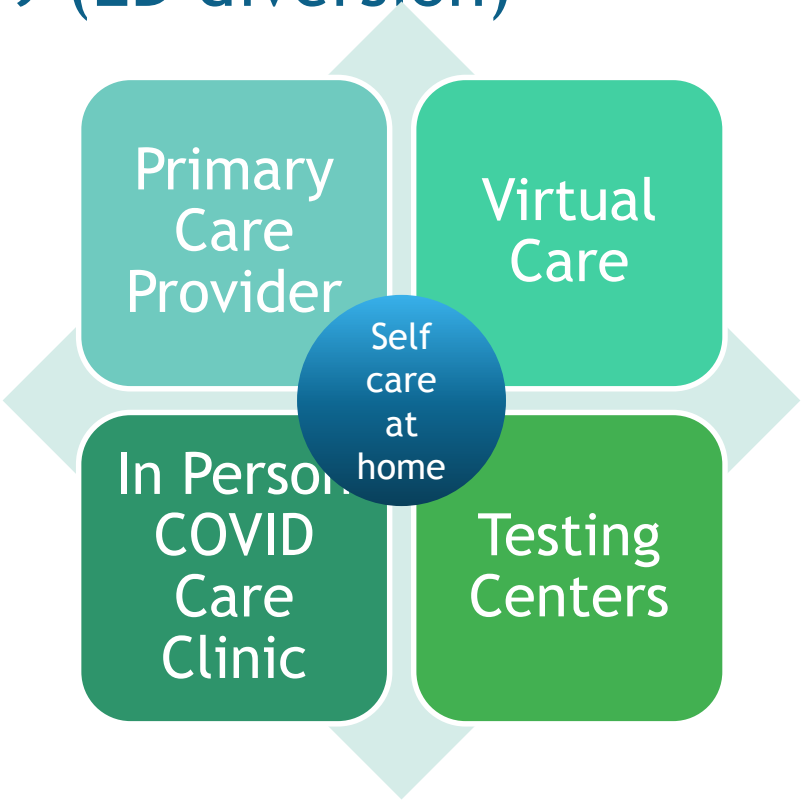
Greater Hamilton Health Network

Building Community Health Together

January 10, 2022

Goal: Integrated planning across sectors to meet the need for ED diversion for mild-moderate COVID 19 patients

Four Pathways of care for those with COVID-19 (ED diversion)



Key Message: Self Care at Home

Communicated publicly

- Communicate education and resources for self-care at home to public, providers
- Broad based and inclusive strategy
- Materials are available for posting online from Primary Care
- Shared resource materials across all elements

Primary care as first point of access

- The first step for additional support (beyond self-care) that will be communicated to the general public as part of the communications plan is to call your family doctor re; mild/moderate COVID-19 care and guidance
- Ensure continuity of care is maintained with patient's normal care provider whenever possible
- Facilitate primary care support for those without access
- Primary care to utilize validated Hamilton Family Medicine (HFAM)/Ontario Health Covid @ Home pathways for community assessment, monitoring and management

Virtual Care : Two pathways

VIRTUAL EMERGENCY DEPARTMENT VISIT
URGENTCAREONTARIO.CA

COVID VIRTUAL COMMUNITY WARD PRIMARY CARE SUPPORTED

Virtual Urgent Care

- If an individual does **not** have a family doctor, or cannot access their family doctor, they may visit the Virtual Urgent Care clinic via https://www.urgentcareontario.ca/ or by calling 1-844-227-3844 from Monday – Friday between 12 – 6PM

- This will be communicated publicly as an option for those without access to a family doctor

- Materials on self-COVID-19 care will be provided to patients post-Virtual Urgent Care visit

- Individuals will be risk categorized and triaged accordingly to receive follow up via their primary care provider/ COVID-19 CARE Clinic/Virtual Community Ward

COVID Virtual Community Ward

- Patients can be referred to the COVID-19 Virtual Community Ward from Virtual Urgent Care, the Assessment Centre, or St. Joseph's Healthcare Hamilton/Hamilton Health Sciences Emergency Departments.
- The virtual ward is intended to provide 5-7 days of monitoring (occasionally up to 14 days) for high and moderate-risk patients to help keep them safe at home and identify need for in person and acute/emergent care
- Risks include both medical and Social Determinants of Health
- Monitoring which involves proactive primary care outreach to moderate and high risk patients over a 5-10 day course is understood as an important Emergency Department diversion strategy
- This option does not replace normal primary care provider and is only for covid monitoring

In Person COVID-19 Care Clinic

- A physical location will be opened in proximity to the St. Joseph's Healthcare Hamilton Emergency Department to be used for in-person COVID-19 assessment clinic ***once local Emergency Departments (St. Joseph's Healthcare Hamilton, Hamilton Health Sciences) exceed a defined capacity threshold.*** This threshold has been identified and is linked to excess Emergency Department volumes across the city
- The clinic will be communicated to all potential referral sources prior to go live
- Sources of access would include referral from Primary Care, Virtual Urgent Care, Emergency Departments, Virtual Community Ward, Telehealth, the Assessment Centre and Emergency Department walk-ins

Pre-Go Live Basics

The following items are in development with the aim of implementing this model the week of January 10, 2022:

- Communications
- Self-Care Resources
- Virtual Urgent Care pathways
- Virtual Primary Care Community Ward
- Primary Care Engagement and Education
- Emergency Department Provider Engagement
- COVID-19 Care Clinic at St. Joseph's Healthcare Hamilton
- Note: Referral to Monoclonal Antibody Therapy Clinic through these channels has been included in planning

QUESTIONS?

CITY OF HAMILTON
PUBLIC HEALTH SERVICES
Public Health Services - Healthy Families Division

TO:	Mayor and Members Board of Health
COMMITTEE DATE:	January 10, 2022
SUBJECT/REPORT NO:	Interim Plan to Improve Staff Recruitment and Retention (BOH22002) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Carolyn Hureau (905) 546-2424 Ext. 6004
SUBMITTED BY: **SIGNATURE:**	Dr. Elizabeth Richardson, MD, MHSc, FRCPC Medical Officer of Health Public Health Services

RECOMMENDATION

That the Board of Health authorize the conversion of 40 full time equivalent (FTE) temporary positions to permanent over complement positions to support the recruitment and retention of key staff in order to continue responding to COVID-19 and rolling out the vaccination program.

EXECUTIVE SUMMARY

Since January 2020, Public Health Services (PHS) has continued to respond to the COVID-19 pandemic. During this time, substantial resources were required to effectively respond to COVID-19, including the roll-out of the vaccination program. This involved the redeployment of existing staff as well as the recruitment of additional staff to increase surge capacity for COVID-19. Despite this, resources continue to be stretched with the further rollout of vaccinations for the 5-11-year-old population, an increase in third dose eligibility, and recent increases in cases and outbreaks related to the Omicron variant.

Staff turnover and fatigue is at a critical point, further adding to workforce pressures. The most significant staff turnover rate has occurred for the temporary nursing workforce at a rate of approximately 35%. As a result, several temporary COVID-19 positions that were approved through the 2021 budget process remain unfilled. This situation is not unique to Hamilton; health human resources continue to be strained across the province and

beyond. Several key positions and skillsets within the public health sector are in high demand making it a challenge to recruit and retain staff. Many organizations in response have decided to recruit additional permanent staff in response, making temporary jobs unattractive. Given this competitive market, transitioning 40 FTE temporary positions to permanent over complement positions is a significant lever in recruiting for key positions, retaining staff and most importantly creating a more stable workforce to effectively serve our community. The province has indicated the costs associated with COVID-19 will continue to be funded in 2022.

Over time, as COVID-19 transitions to an endemic state and provincial direction is provided related to the ongoing management of COVID-19 through a sustained program (as opposed to an emergency response), it is anticipated the resources required for an ongoing program for COVID-19 will be of similar FTE.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: Both the approved 2021 Annual Service Plan and Budget (ASPB) and the proposed 2022 Budget include the costs for all temporary COVID-related staff, including these 40 FTE. The Province has indicated that they will continue to fund COVID-19 extraordinary costs in 2022.

Staffing: The 40 FTE positions to be converted from temporary to permanent status will come from the following job classifications, with the exact mix to be determined based on the market situation at the time of recruitment:

- Public Health Nurses
- Public Health Inspectors
- Program Managers
- Epidemiologists
- Health Strategy Specialists
- Program Evaluation Coordinator
- Project Manager

The conversion of these positions will support recruitment and retention of key positions in a competitive market. An ongoing program for COVID response is anticipated to be of similar size to this number of FTE. However, if the affiliated work and funding ends, a corresponding 40 FTE would be decreased in the future. It is anticipated that any reduction could be implemented through workforce attrition.

Legal: Boards of health are accountable for meeting all requirements included in the Ontario Public Health Standards pursuant to the Health Protection and Promotion Act. As well, the Province has directed boards of health to continue to do what is necessary to respond to COVID-19 cases and outbreaks and implement the vaccination program.

HISTORICAL BACKGROUND

Since January 2020, PHS has continued to respond to the COVID-19 pandemic. During this time, substantive resources were required to carry out critical functions in order to minimize the spread of COVID-19 and vaccinate Hamiltonians. This involved the redeployment of existing staff to COVID-19 as well as the recruitment of additional staff to increase surge capacity.

The number of required staff for the COVID response has fluctuated throughout the pandemic. In July 2020, the Board of Health approved an increase of 75.14 FTE to continue responding to COVID-19 (BOH20013). In 2021, the Board of Health approved the ASPB that included an increase of 110.24 FTE to support COVID-19 disease control and 287.60 FTE (399.25 FTE annualized) to plan and deliver the COVID-19 vaccination program (BOH21004). Due to significant recruitment challenges, PHS has not been able to fill all these positions. As of December 13, 2021, 111.25 FTE temporary COVID-19 positions were unfilled. Further details about recruitment and retention challenges is provided in the Analysis and Rationale for Recommendation section below.

Overall, PHS resources continue to be stretched due to the length of the pandemic response and the sustained, significant demands related to COVID-19 (e.g., rollout of vaccinations for the 5-11-year-old population, an increase in third dose eligibility, and recent increases in cases and outbreaks related to the Omicron variant third doses, etc.).

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Boards of health are legislated to deliver the programs and services outlined in the Ontario Public Health Standards pursuant to the Health Protection and Promotion Act. The Province has been clear that boards of health are expected to take necessary measures to respond to COVID-19 within their jurisdictions while continuing to maintain critical public health programs and services.

RELEVANT CONSULTATION

Staff have consulted with Human Resources, Talent & Diversity to discuss ongoing workforce pressures and strategies for recruitment and retention that are referenced within this report. PHS Finance and Administrative staff have also been consulted and have provided the financial information for this report.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Staff turnover within PHS is at a critical point. The turnover of temporary new staff hired for COVID-19 since January 1, 2020 has presented staffing challenges for PHS. The most significant turnover has occurred for the temporary nursing workforce at a rate of approximately 35% of all nurses hired for the COVID response. This situation is not unique to Hamilton; health human resources continue to be strained across the province and beyond. Currently, there are unprecedented labour shortages as a result of both increased competition across all settings and an increasing number of staff facing burnout and mental health challenges as a result of the prolonged emergency response.

There are several other factors contributing to these recruitment and retention challenges. First, there is a currently a high demand for certain skillsets and professional designations within the public health sector that are critical to support the pandemic response, including public health inspectors, public health nurses and epidemiologists. As a result, several temporary COVID-19 positions that were approved through the 2021 budget process remain unfilled. Second, it is anticipated that upcoming staff retirements will contribute to PHS workforce pressures over the next few years. Retirement risk data provided by Human Resources, Talent & Diversity, indicates that 6.7% of all PHS employees are at high retirement risk (approximately 27 FTE). High risk is defined as employees that could retire now, up to and including August 31, 2022.

In collaboration with Human Resources, Talent & Diversity, several strategies to support recruitment and retention have been employed to date, including extending temporary contracts based on anticipated operational needs and promoting job postings through additional channels such as LinkedIn and other profession-specific job boards to reach a broader audience of potential candidates. Despite this, recruitment and retention challenges have persisted.

Staff consulted with Human Resources, Talent & Diversity regarding the challenges with posting temporary positions for certain COVID-19 roles. Human Resources, Talent & Diversity supports posting permanent over complement positions as a strategy to increase the candidate pool at this time, as many candidates will not consider a temporary position. These permanent postings will attract a more extensive and diverse candidate pool. Successfully filling additional permanent postings will yield multiple benefits including greater stability and versatility of resources within the team, improved effectiveness and consistency of service delivery as well as provide significant security and peace of mind for our employees in what has perhaps been the most challenging public health environment we have experienced to date. This stability and security will result in greater staff engagement and improved morale. For this reason, PHS is recommending the conversion of 40 FTE temporary positions previously approved

through the 2021 budget process to permanent over complement positions. This will assist PHS in successfully filling positions that have remained unfilled to date.

In addition to increasing permanent over complement FTE, PHS will continue and enhance the following strategies to address the workforce pressures:

- formalize a workgroup focused on PHS workforce recruitment and retention in partnership with Human Resources, Talent & Diversity;
- continue offering exit interviews to PHS employees that resign to better understand retention issues;
- initiate a stay interview pilot with a sample of existing staff to gather information about the reasons they choose to continue working at PHS; and,
- identify and implement successful strategies utilized during past nursing shortages (e.g., extended orientation and mentorship programs).

ALTERNATIVES FOR CONSIDERATION – Not Applicable

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Healthy and Safe Communities
Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

APPENDICES AND SCHEDULES ATTACHED – Not Applicable