Clean Air Hamilton

2016 Air Quality Progress Report

June 2017

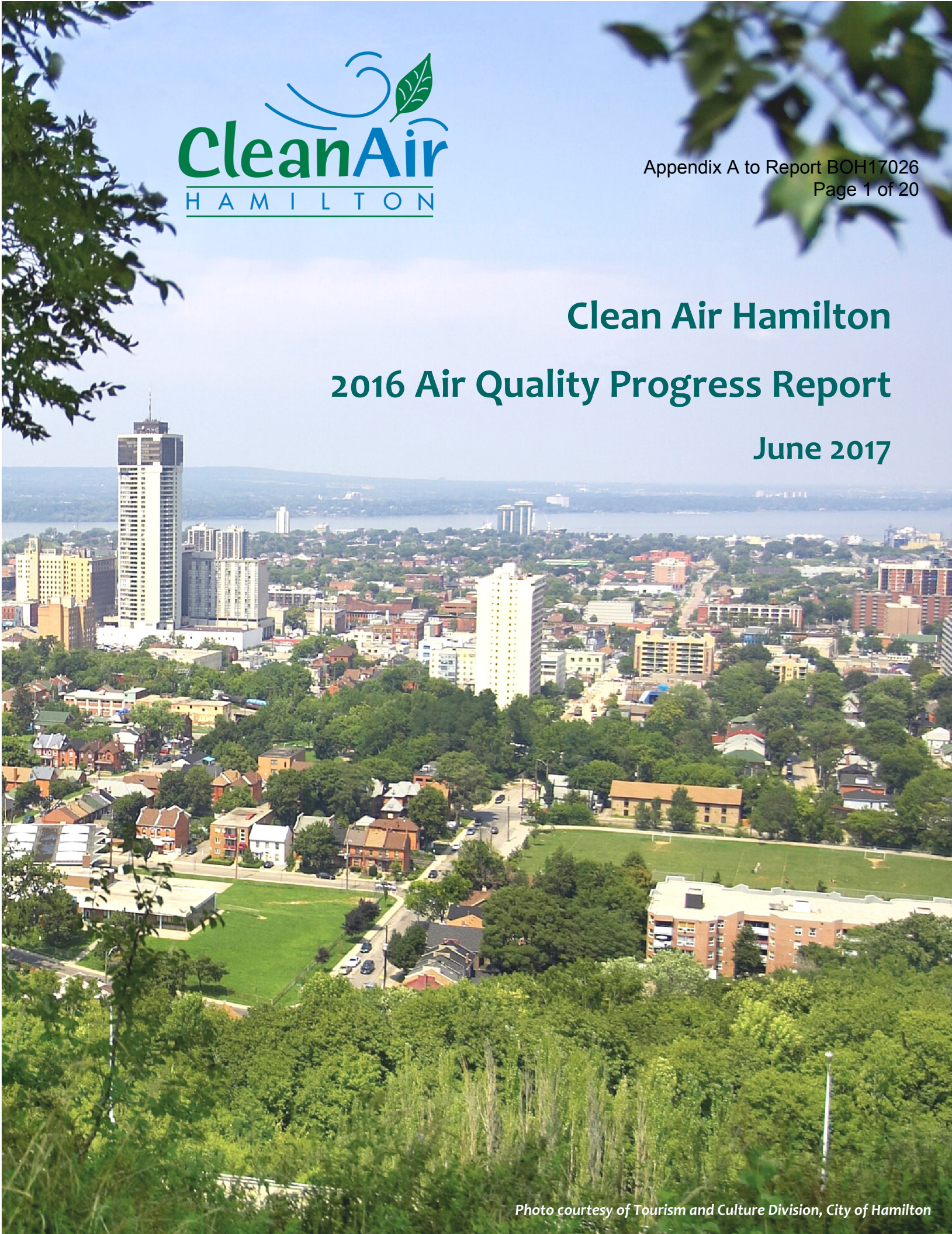

Photo courtesy of Tourism and Culture Division, City of Hamilton

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Top Row (left to right): Karen Logan, Rachel Johnson, Lynda Lukasik, Sean Angel, Michael Gemmell, Peter Chernets, John Lundrigan, Trevor Imhoff (coordinator), Dr. Fran Scott
Bottom Row (left to right): Christine Borselli-Morgan, George McKibbon, Dr. Denis Corr (Chair), Brian Jantzi, Elise Desjardins
Missing: Dr. Matthew Adams, Eniber Cabrera, Michelle Cassar, Dan Dobrin, Adriano Mena, Ted Mitchell, Brian Montgomery, Dr. Sally Radisic, Andrew Sebestyn,

Message from the Chair

Clean Air Hamilton (CAH) is an award winning organization which brings together stakeholders from many different parts of our Hamilton community as well as our federal and provincial partners, working to make our air cleaner.

The following is our Clean Air Hamilton 2016 report. For previous years' activities go to: http://www.cleanair.hamilton.ca.

We are very proud of the dramatic improvements in air quality over the long term in Hamilton. Our air quality is now about 90% better than it was in the 1970s with the largest improvements occurring in locally emitted pollutants. Although we remain a major industrial centre, our air quality is now comparable to Ontario cities and better than other North American or international centres.

Yet as our air quality has gotten better, we have learned more about the health impacts of poor air. Over 150 of our citizens still die each year from the impacts of air pollution, as well as increased hospital admissions, emergency room use, doctors' visits, etc. These health impacts are similar to other Canadian cities (as a proportion of population), but here in Hamilton we know we need to keep doing better.

Our mobile air monitoring and risk analysis has shown that the largest risk factors are due to Oxides of Nitrogen (products of fossil fuel combustion) and Airborne Particles of various sizes (products of combustion, chemical reactions in the atmosphere, directly emitted and re-suspended particles). A particular concern has been that we have been the only municipality in Ontario to exceed the new federal Canadian Ambient Air Quality Standard (CAAQS) for respirable particulate, $PM_{2.5}$. Fortunately we are able to report for 2016 that we now meet this CAAQS. The standard will tighten again in the year 2020, so improvements must continue.

The Provincial and Federal governments have recognized these needs and are currently actively creating legislation in order to improve air quality as well as deal with the challenges of climate change. Clean Air Hamilton and a number of its members and stakeholders have been very involved in the consultations around this legislation. We look forward to bringing these changes to our City.

Our mandate includes informing our citizens of all these issues and giving sound, science based advice and recommendations. Then we can all work to reduce emissions as well as our personal exposures and live healthier lives. Clean Air Hamilton's special projects and this report to helps us do that.

We thank Public Health Services and City Council for their ongoing support of Clean Air Hamilton and its special projects. Special thanks go to Karen Logan, Trevor Imhoff and the committee for their hard work in making our report a reality.

Denis J. Corr, 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 Model. Clean Air Hamilton has identified these 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 Ministry of the Environment and Climate Change and Canadian Ambient Air Quality Standards. This will be done through implementation of a systems level approach and support 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 $PM_{2.5}$ across the City of Hamilton below Canadian Ambient Air Quality Standards by effectively utilizing the airshed model t o create partnerships and pollution inventory specific to street sweeper and dust mitigation programs.

Clean Air Hamilton Meetings

Clean Air Hamilton meetings are held usually on the second Monday of each month located at 71 Main Street West, City Hall, Room 192/93

2016 Meetings	2017 Meetings
January 11, 2016	January 11, 2016
February 8, 2016	February 8, 2016
March 14, 2016	March 13, 2017
April 11, 2016	April 10, 2017
May 9, 2017	May 8, 2017
June 13, 2016	June 12, 2017
July 11, 2016	July 10, 2017
August 8, 2016	August 14, 2017
September 12, 2016	September 11, 2017
October 10, 2016	October 2, 2017
November 28, 2016	November 13, 2017
	December 11, 2017

Photo courtesy of Tourism and Culture Division, City of Hamilton

Clean Air Hamilton (CAH) - 2016 Funded Projects

Clean Air Hamilton is an innovative, multi-stakeholder agent of change dedicated to improving air quality in our community. Hamilton Public Health Services provides $40,000 to fund projects resulting in air quality improvement and awareness. These projects reach thousands of school aged children and contribute to improving Hamilton's air quality through monitoring and planting of trees. Clean Air Hamilton is proud to support the 2016 funded projects.

Totally Transit Kids

Green Venture in partnership with Clean Air Hamilton and the HSR, has been offering bus education and awareness programming since 2007. This program introduces elementary school students to the HSR and provides information and tools required to build confidence and influence transportation choices.

> 'Totally Transit program has reached over 11,000 students'

Between 2007 and 2016, Totally Transit lessons reached over 5,475 elementary school students, as well as 5,850 students who participated in presentations held at various school environmental fairs.

Totally Transit Kids program not only introduces riders to the HSR, but also provides awareness of the positive environmental, health, and community benefits that can be achieved through their use of active and sustainable transportation

There are three options for teachers to have their class participate in the Totally Transit Program. To enroll your class or for more information please contact

Green Venture
education@greenventure.ca

Clean Air Hamilton 2016 Funded Projects Cont'd...

Eco Stars Classroom Challenge

The Eco Stars Classroom Challenge engages students and teachers with practical strategies to reduce carbon dioxide and other greenhouse gas emissions in their classrooms, at home and at play.

Participating classrooms partake in "scavenger hunt" style challenges consisting of actions or activities that will teach them more about air quality, how to improve air quality and how to mitigate and/or adapt to climate change.

All completed actions by the classes will be scored points and added to the **LEARN-CC Hamilton Climate Change Map**

"What a thrill!"
-Grade 5/6 Teacher, Fessenden Elementary School

The top seven classes, with one winner every month of the challenge, will win a free tour of the Green Venture's famous **EcoHouse**! To participate in the Eco Stars Classroom Challenge please contact:

Green Venture
education@greenventure.ca

2016 Eco Stars List of Winning Schools:

Hillcrest

Parkdale

R.A. Riddell

Dundana

St. Marguerite d'Youville

St. Brigid

St. Patrick

Mrs. Dennie's Grade 1 class, Hillcrest Public School

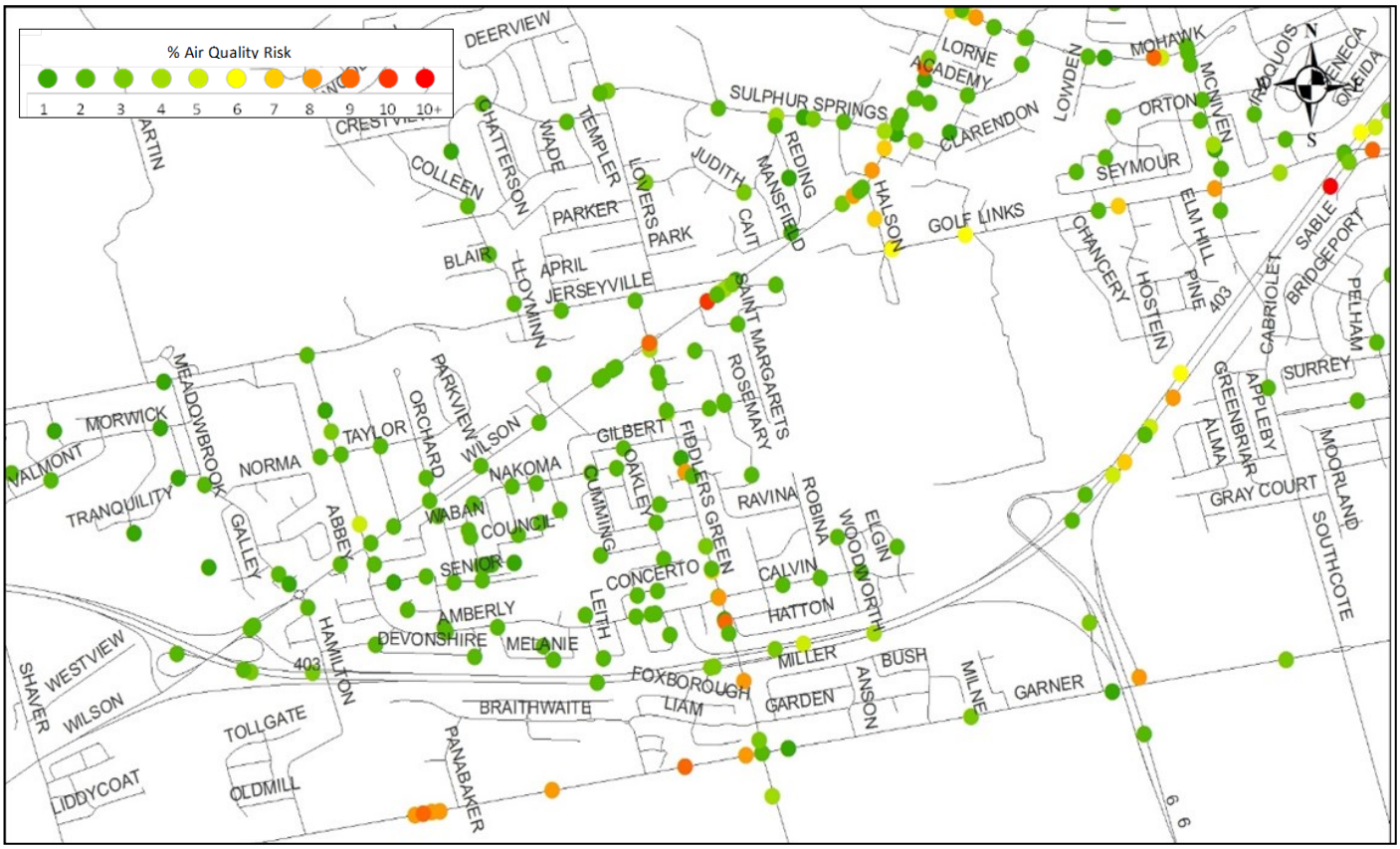
Fresh Air for Kids

Corr Research partnered with the Ministry of Environment and Climate Change (MOECC) and four Hamilton elementary schools to provide eight classes a series of hands-on educational workshops that included activities inside and outside the classroom. Partner schools included Fessenden, Dundas Central, St. Bernadette and Regina Mundi, with two classes at each school.

Students were educated on the importance of air quality, the Air Quality Health Index and gained an awareness of how their actions can impact and improve the air in their neighbourhoods. Students measured air quality inside the classroom as well as on major commuting routes that they would use to travel to school, then graphed the results.

The MOECC Mobile Air Monitoring van was also used to monitor air quality in the vicinity of the schools These data were developed into air quality maps (see below) which students used to decide on their best ways to travel to and from their school .

Fessenden Public School Mobile Air Monitoring



Clean Air Hamilton 2016 Funded Projects Cont'd...

Idling Reduction Campaign

Hamilton Conservation Authority
Healthy Streams...Healthy Communities!

Hamilton Conservation Authority (HCA) staff over the years has noticed many visitor vehicles within the park are leaving their engine running for extended periods of time.

With help of Clean Air Hamilton funding, forty (40) signs were purchased and distributed across Conservation Authority owned parking lots.

Locations of the anti-idling signs installed include:

Dundas Valley—Gate House Museum
Dundas Valley—Trail Center
Eramosa Karst
Devils Punch Bowl
Christie Lake Beach Marina
Lakeside Marina
Tews Falls
Valens Lake
Fifty Point

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

Hamilton Air Quality Health Index Mapping Update

With the help of Clean Air Hamilton funding, Prof. Matthew Adams, Ryerson University/ University of Toronto, performed an extensive update on the Hamilton AQHI website. Mobile air pollution data was uploaded that was collected during the most recent round of neighbourhood air quality monitoring by **Corr Research Inc.**

Now citizens can access hourly conditions during the past five years, as well as selected events (e.g. highest concentrations). This feature is best demonstrated when a person notes some personal effect, such as an odour or news about elevated concentrations.

www.hamiltonaqhi.com

Citizens can go on the website and look up the AQHI for the time they were affected. This interaction should lead to more interest in additional resources such as:

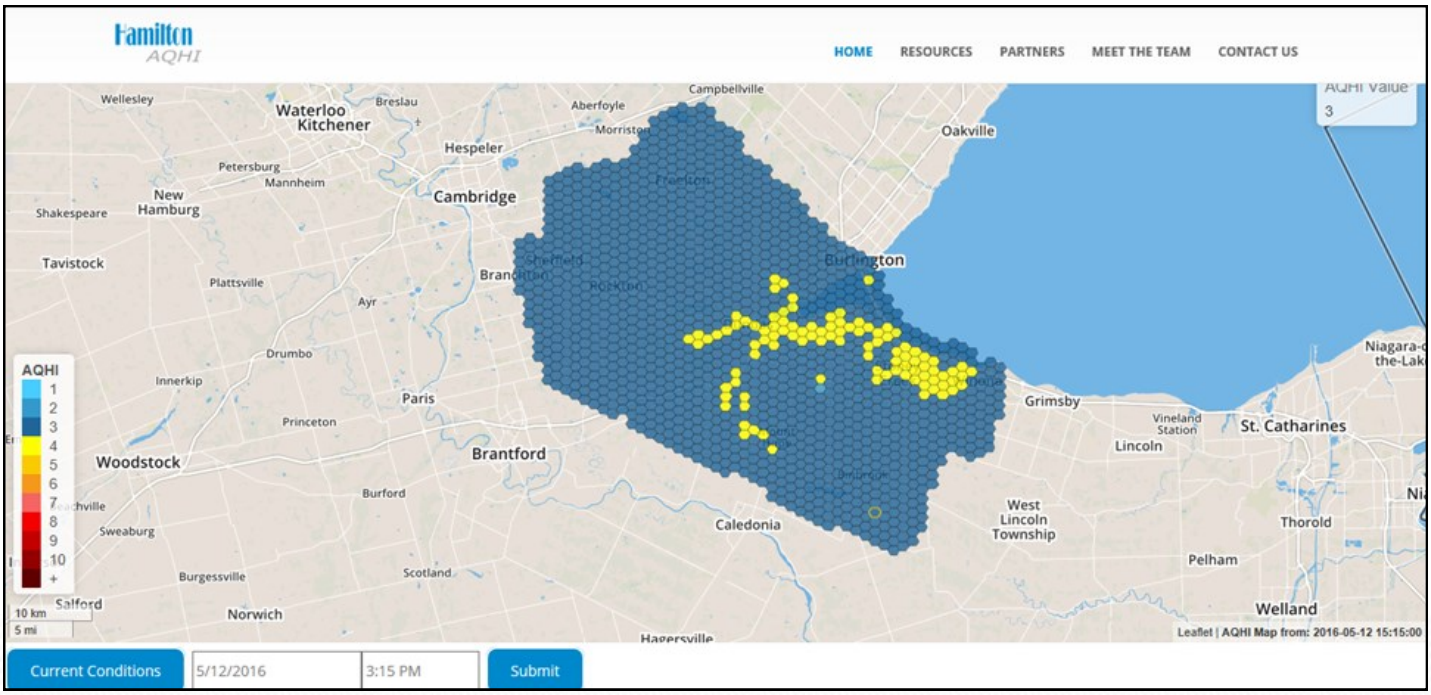
Environment and Climate Change Canada Air Quality Health Index; or

Air Quality Ontario

Reduction of air pollution exposure is a key component of improving overall public health. The importance of reducing exposure will increase due to our ageing population and incidences of compromised respiratory and cardiac function.

Current AQHI systems utilized by government agencies can be limited in geographical context. This website presents community air quality information to residents of the City of Hamilton that will help behavioural change to reduce air pollutant exposure.

Hamilton AQHI May 12, 2016

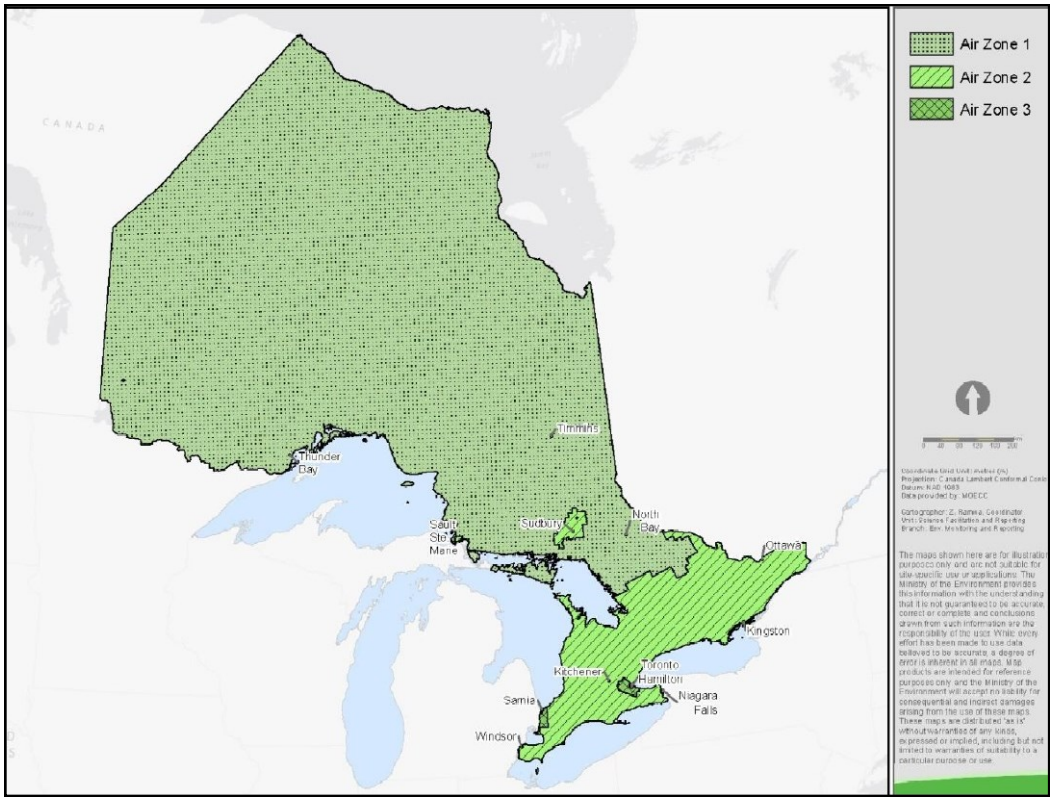


Delineation of Ontario Air Zones

Ontario is implementing the Air Quality Management System (AQMS). A flexible cross-Canada framework developed through the Canadian Council of Ministers of the Environment. The AQMS is a comprehensive approach consisting of an interconnected set of drivers and mechanisms to achieve continuous improvements to overall air quality using an all sources approach[1].

Ontario has finalized its decision to delineate its air zones into three zones:

Air Zone 1—Areas with limited pollution from either point or non-point sources or transboundary influence; where air quality management activities are focused on maintaining good air quality



Air Zone 2—Areas under pressure from multiple sources including some or all of the following: non-point sources, smaller point sources, individual large industrial point sources, transboundary influences; where air quality management activities are focused on multiple broad-based initiatives targeting many sources.

Air Zone 3—Areas with a concentration of large industrial sources; where air quality management activities are focused on the abatement of local industrial emissions as well as non-industrial sources[1].

Hamilton is classified as Air Zone 3, Clean Air Hamilton continues to work with Ministry of the Environment and Climate Change staff on the new Air Quality Management System approach to improve the overall air quality across Hamilton.

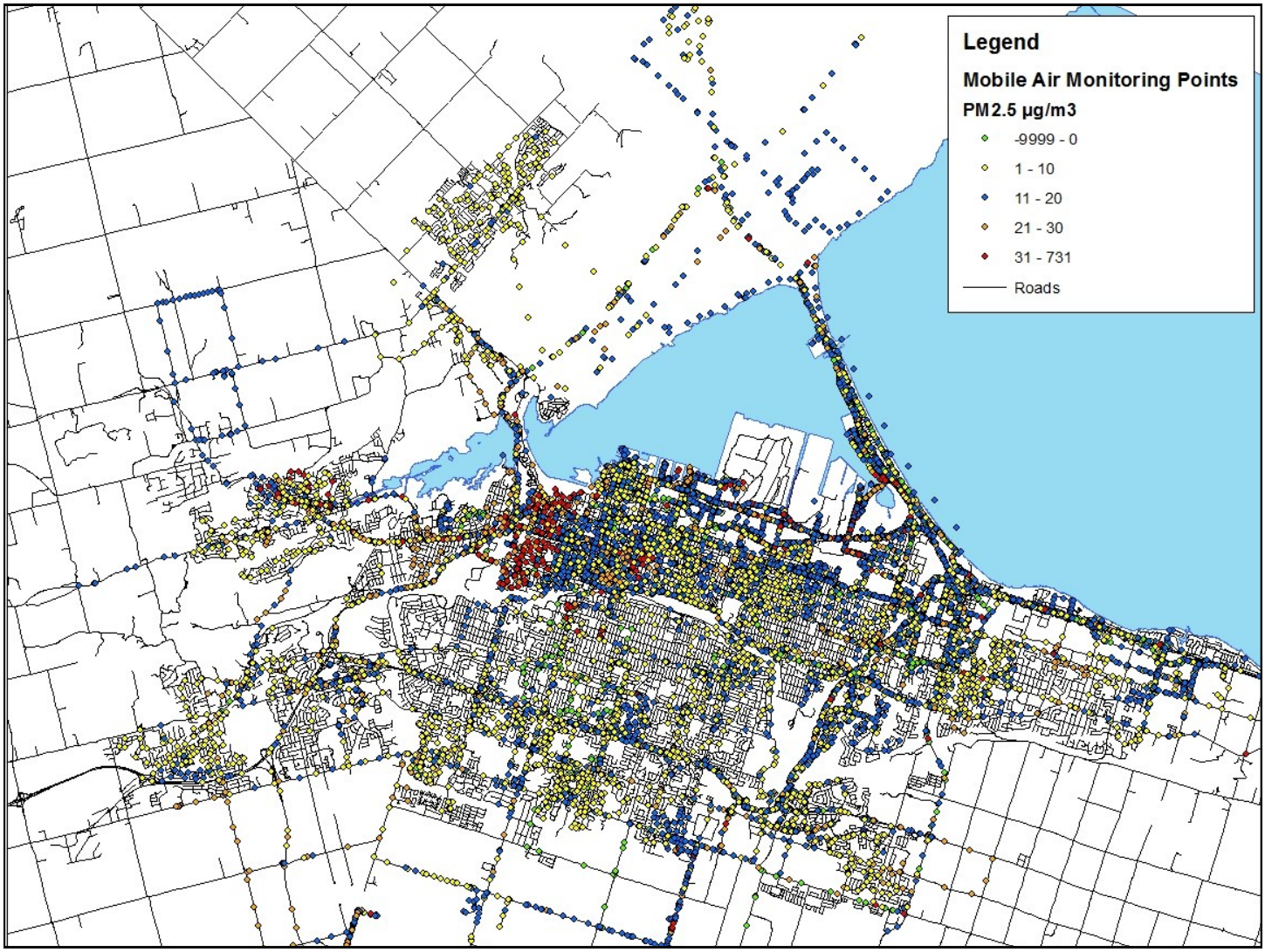
[1]Government of Ontario.(2016). Environmental Registry. Retrieved from: https://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTI1MjE2&statusId=MTkzMDMw

Neighbourhood Mobile Air Monitoring

Dr. Denis Corr of Corr Research Inc. and chair of Clean Air Hamilton has collected air quality data points utilizing the Ontario Ministry of the Environment and Climate Change's mobile air monitoring van since 2005. The mobile monitoring van measures a variety of pollutant concentrations.

Phase two of the Hamilton Neighbourhood Monitoring was completed which identified Nebo Road and Barton/Fruitland Road as relatively high pollution areas. Scientist now agree that exposure to $PM_{2.5}$ is the main contributor to respiratory and cardiovascular health related impacts.

Mobile Monitoring of $PM_{2.5}$ Concentrations 2005-2016 Hamilton, Ontario



Message from the Ministry of the Environment and Climate Change

Air quality has improved significantly across the province over the last 10 years, with large decreases in harmful pollutants such as nitrogen dioxide, carbon monoxide, fine particulate matter, and sulphur dioxide.

Achieving further improvements in combating air pollution is a top priority in Ontario.

In 2016, the ministry conducted 390 inspections of Hamilton area industrial and commercial facilities to assess compliance with Ontario's environmental regulations and to support clean air, water and land. These inspections, along with reactive incident response, ensure that industry continues to take action to improve environmental performance including:

- capital investments to replace aging infrastructure;
- incorporating newer, more modern pollution controls;
- increased maintenance to proactively identify issues and prevent emissions and spills to the environment;
- reducing opacity and other toxic air emissions; and
- extensive monitoring and reporting to reduce the frequency of environmental incidents.

The ministry monitors visual emissions in the industrial core to encourage a further reduction in particulate from local sources. In 2017, we expanded our opacity monitoring program to include a wider selection of industries and weekend observation. Ministry staff also participate in Clean Air Hamilton's particulate subcommittee along with local industry to identify and encourage voluntary measures to reduce particulate.

Hamilton's integrated iron and steel facilities continue to implement action plans to better manage emissions. Facilities have adopted US air pollution control rules and best management practices for coke oven monitoring. Daily audits assess emissions and work to reduce emissions of benzene, benzo(a)pyrene and suspended particulate matter to ensure consistent air pollution control measures across facilities.

As these facilities progress through the new coke oven monitoring protocols and towards increasingly stringent ministry limits, we expect to see a 30% reduction in suspended particulate matter, benzene and benzo[a]pyrene air emissions from the Hamilton facilities within two to three years and to up to a 40% reduction by 2020.

Ontario continues to develop new Technical Standards that require industries to take progressive actions, such as investing in best available technology to reduce emissions of priority contaminants. Technical standards were finalized in 2016 for the petroleum and petrochemical industries to address sources of benzene, benzo(a)pyrene and 1,3 butadiene.

We are also consulting on proposed stricter air standards for sulphur dioxide.

Hamilton is a leader in developing collaborative approaches to improving air quality, monitoring, research and sharing information with the broader community. The ministry looks forward to our continued work with Clean Air Hamilton, the community and local industry to reduce air contaminants from all sources in Hamilton.

Ambient Air Quality Trends and Comparisons

Pollutant Percent Reduction From Regression Trends 2016

- **Total Suspended Particulate (TSP) levels - 55% total reduction over 20 years;**
- **Inhalable Particulate Matter (PM_{10}) levels - 33% total reduction over 19 years;**
- **Respirable Particulate Matter ($PM_{2.5}$) levels - 26% total reduction over 17 years;**
- **Nitrogen Dioxide (NO_2) levels - 53% total reduction over 20 years;**
- **Sulphur Dioxide (SO_2) levels - 47% total reduction over 20 years;**
- **Total Reduced Sulphur odours - 99% total reduction over 20 years;**
- **Benzene levels - 87% total reduction over 20 years;** and**
- **PAH (measured as benzo[a]pyrene) levels - total 76% total reduction over 19 years. ****

*Expressed as number of hours above 10 ppb threshold.

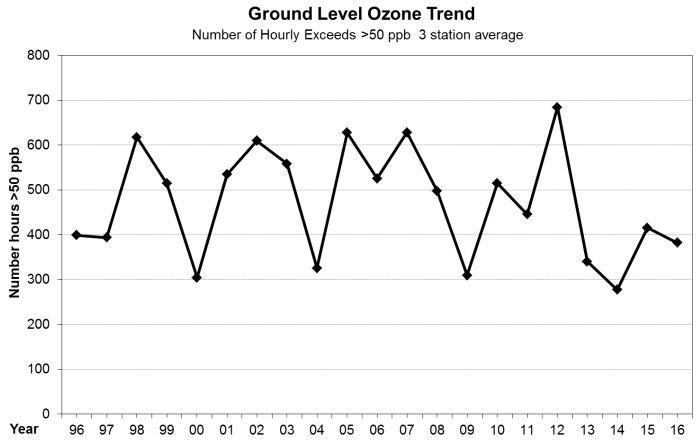
**Benzene and PAH not available from Station 29000 for 2016 yet.

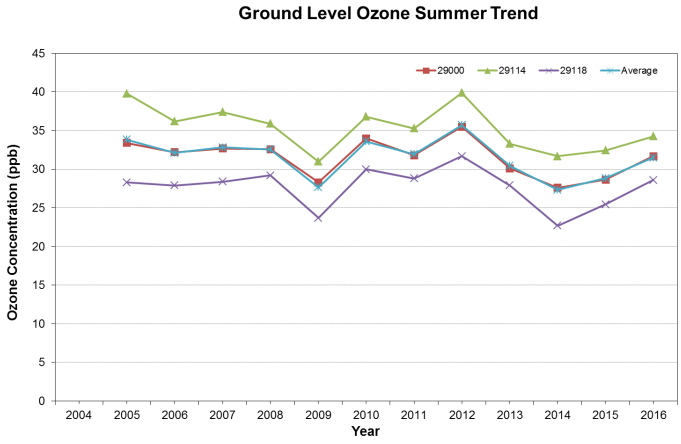
Ground Level Ozone (O_3)

Ground level ozone (O_3 or tropospheric ozone) is formed when pollutants are emitted and react with the presence of sunlight. This is why O_3 concentrations are higher during summer months. Sources include: coal-fired power plants, vehicles and urban activities.

The trend in O_3 shows that concentrations have been highly variable in the past 10 years with the trend line flat. O_3 is a main contributor for Hamilton`s smog days and unlike other pollutants the majority of O_3 comes from sources upwind of Hamilton and are expected to originate in the Midwest Ohio Valley region. Sources from Hamilton contributing to O_3 pollution will affect areas downwind of Hamilton which makes lowering O_3 emissions very important.

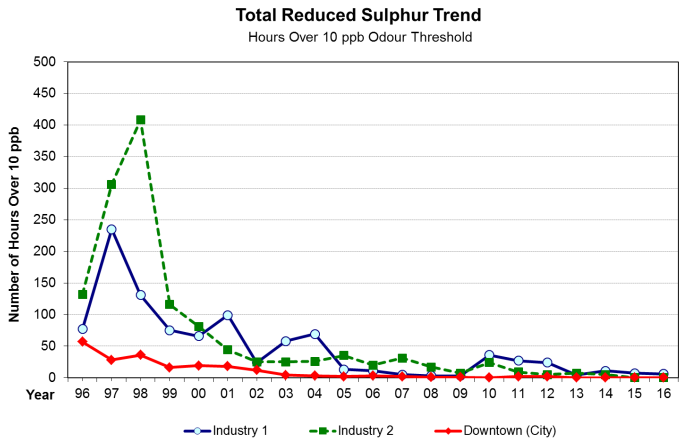
The Government of Ontario has been dedicated to lowering O_3 precursor emissions by eliminating all coal-fired power plants in Ontario.





Ambient Air Quality Trends and Comparisons

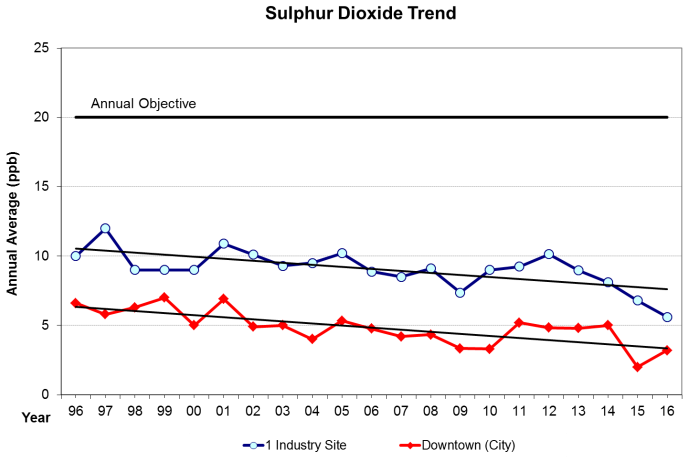
Total Reduced Sulphur (TRS)



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. 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 (SO_2)



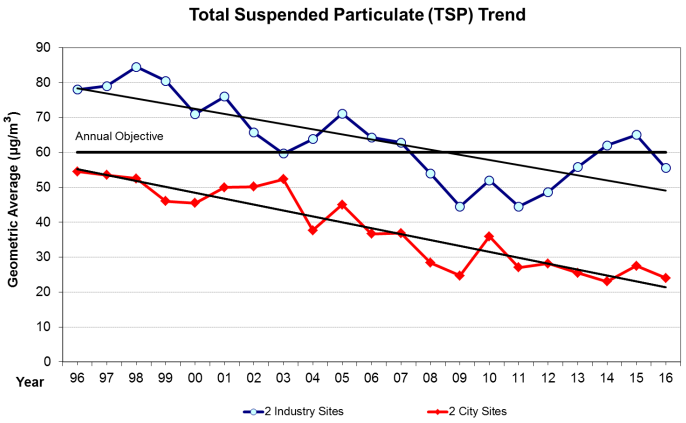
Sulphur Dioxide is the product of industrial activity with over 90% generated within the City. SO_2 is not only a respiratory irritant but is converted in the atmosphere over several hours to sulphuric acid (H_2SO_4), which is then converted to sulphate particles. These particles tend to be acidic in nature and cause lung irritation.

Significant reductions in air levels of SO_2 were made in the 1970s and 1980s. Since 1998, there has been a gradual and continuous decline in air levels of SO_2 besides the recent increase in 2016.

Public Health Services Airpointer located at Sam Manson Park

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.

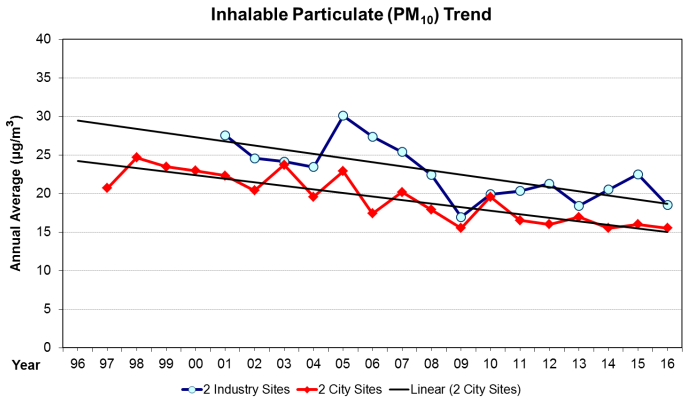


There has been a steady decline in TSP at City sites while levels have risen in previous years at industry sites. There was a decline in 2016 lowering emissions at industry sites below the annual objective.

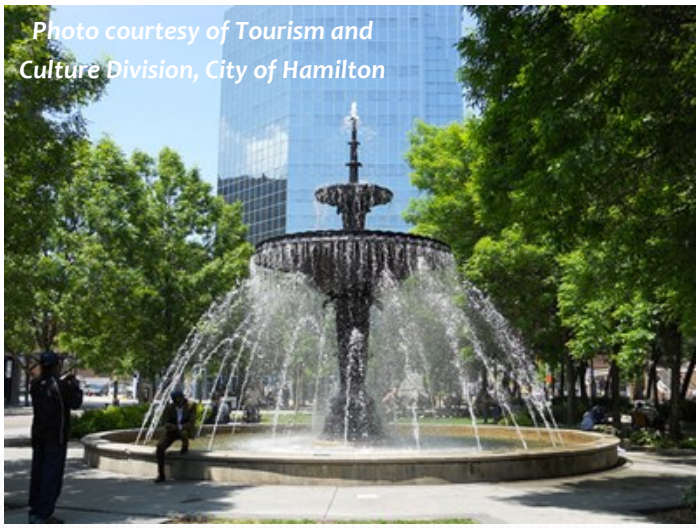
Included in the TSP category are inhalable particulates (PM_{10}) and respirable particulates ($PM_{2.5}$). It is possible to determine the net amount of particulate material in the air with sizes between about 45 µm and 10 µm, by subtracting PM_{10} from the TSP value.

Particulate Material: 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 has been linked to respiratory, cardiovascular and other health impacts in humans.[1]



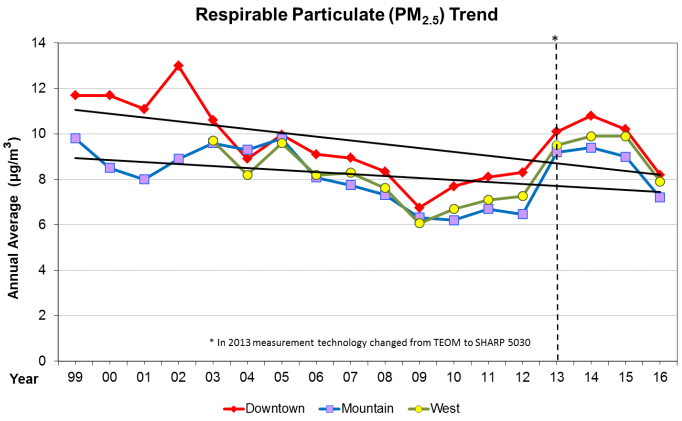
PM_{10} is primarily derived from vehicle exhaust emissions, industrial fugitive dusts, and the finer fraction of re-entrained road dust.
PM_{10} at City sites has decreased by about 21% over the past decade. This is likely a combination of better performance of vehicle fleets, better management of dust track-out by industries, and the use of better street sweepers and street sweeping practices by the City.



Ambient Air Quality Trends and Comparisons Cont'd...

Particulate Matter: Respirable Particulate Matter ($PM_{2.5}$)

The Ontario government started measuring $PM_{2.5}$ across Ontario in 1999. $PM_{2.5}$ makes up about 60% of PM_{10} and is mostly derived in cities from vehicle emissions.

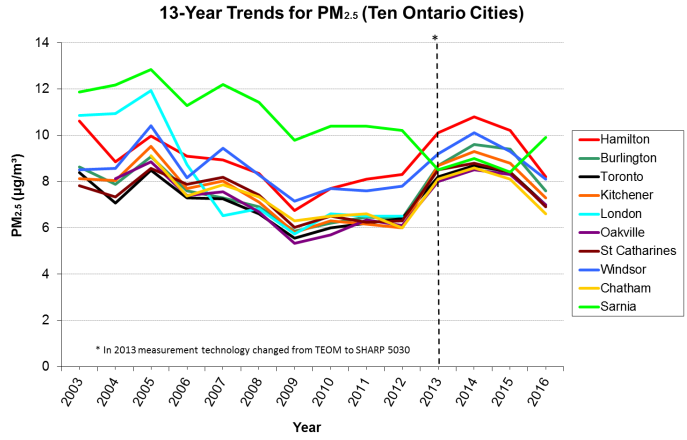


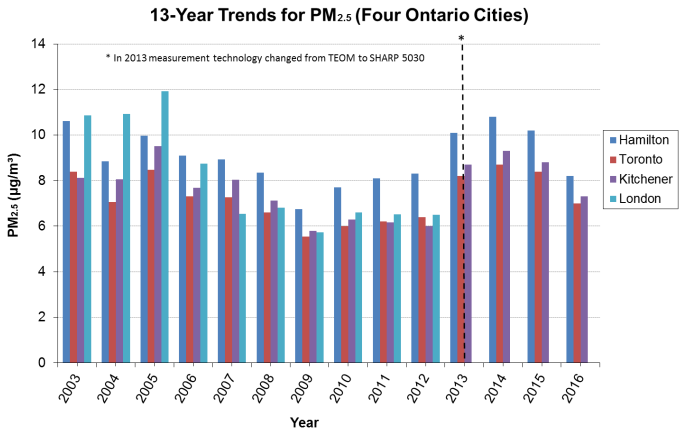
Scientists now agree that exposure to the small particles and the organic substances is the likely cause of the observed respiratory and cardiovascular health impacts attributed to particulate material exposure. [1]

The trend in $PM_{2.5}$ showed a 3.5% decrease per year since 1999 until 2009 at the downtown and mountain AQHI sites. 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 $PM_{2.5}$ monitoring technology. There has been a decline in $PM_{2.5}$ concentrations across Hamilton and is now below the Canadian Ambient Air Quality Standards (CAAQS). CAAQS are becoming more stringent in 2020 and therefore more work will be needed to meet the future standards.

Public Health Services Airpointer

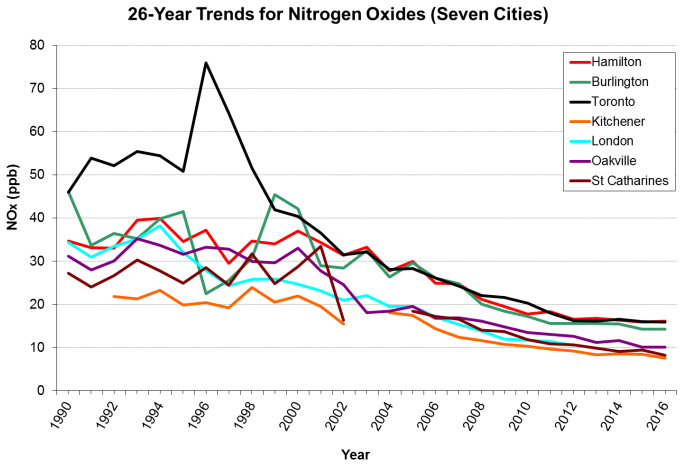
For more information contact Public Health Services (905) 546-2424 ext. 5288





[1] *SENES Consulting Ltd. (2011). Health Impacts Exposure to Outdoor Air Pollution in Hamilton, Ontario . Retrieved from www.cleanair.hamilton.ca/downloads/2011%20Clean%20Air%20Hamilton%20-%20Health%20Impacts%20FINAL%20.pdf (i.e Inhalable particulate matter (PM10) is the airborne particles that have diameters of 10 µm or less. PM10 makes up 40-50% of TSP in Hamilton and has been linked to respiratory, cardiovascular and other health impacts in humans.[1])*

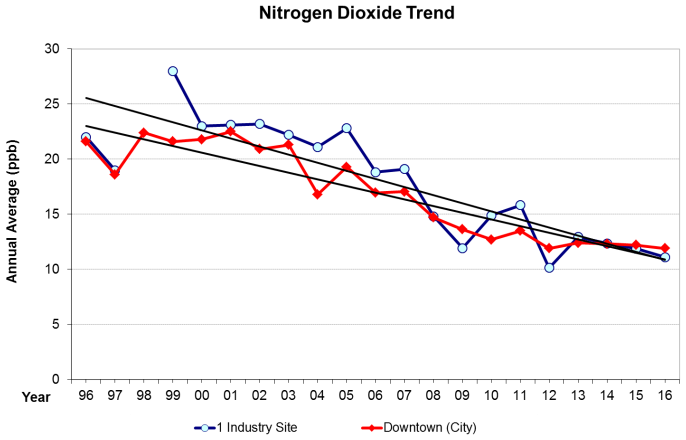
Nitrogen Oxides (NO_x)



This chart displays the steadily decreasing trend of Nitrogen Oxides (NO_x) in all the cities, including Hamilton. Since the 1990's both Toronto and London have seen reductions in NO_x levels of approximately 60%. Hamilton's NO_x levels have decreased by approximately 46% since 1990.

The slower decrease of NO_x levels in Hamilton is presumably due to the fact that Toronto and London do not have other sources (ex. industrial emissions) that contribute to overall NO_x levels that Hamilton has. The decrease in NO_x levels is a reflection of improvements in emission performance of the vehicle fleets in Ontario over the past decade.

Nitrogen Dioxide (NO_2)

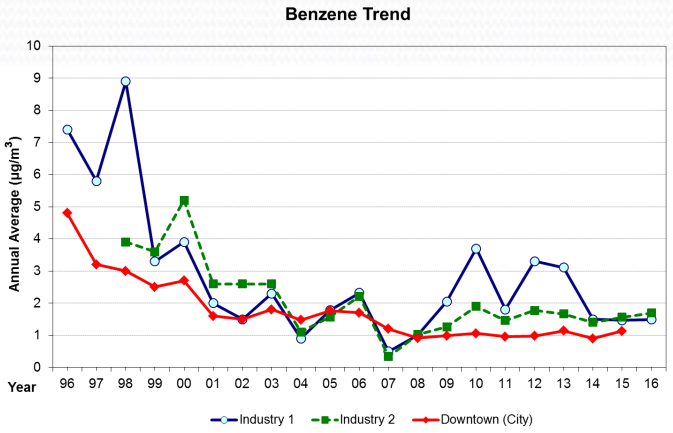


Nitrogen Dioxide (NO_2) is formed in the atmosphere from nitric oxide (NO) which is produced during combustion of fuels (i.e gasoline, diesel, coal, wood, oil and natural gas) and is responsible for a significant share of the air pollution-related health impacts in Hamilton. The leading sectors producing these emissions are the transportation and industrial sectors. The level of vehicle use across Hamilton has increased slightly during the past decade, however overall NO levels have decreased most likely due to improved engine technologies.

Both NO and NO_2 are routinely measured and their sum is reported as Nitrogen Oxides (NO_x) to reflect the presence of both species in urban areas. Ultimately all of the NO is converted to NO_2 which reacts with water in the atmosphere to produce nitric and nitrous acids (HNO_3 and HNO_2, respectively); these acids are converted into nitrate salts that constitute about 25% of the mass of fine particulate matter or $PM_{2.5}$.

New Hamilton Air Monitoring Network Beach Strip Station 29102

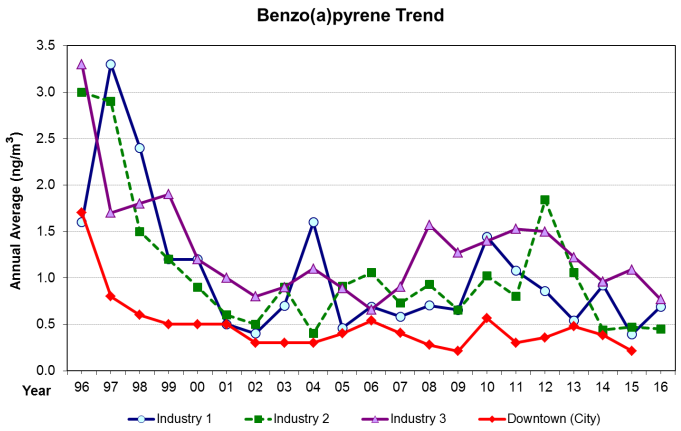
Benzene



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

Air levels of benzene have been reduced dramatically since 1990s, due to significant upgrading of the coking plant operations, improved operating procedures and improved control of release of benzene vapours from the coke by-products. More work remains to be done to reduce low concentration exposures of benzene. Benzene concentrations for downtown for 2016 were not available.

Benzo[a]pyrene



Benzo[a]pyrene (BaP) is also a carcinogen and capable of causing cancer in both animals and humans. 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.

The principal sources of BaP in Hamilton are released from coke oven operations within the steel industry. There have been significant decreases in BaP levels since the late 1990s. BaP concentrations for downtown for 2016 were not available.

Conclusions

The City of Hamilton currently provides an annual contribution of $56,000/year in support of Clean Air Hamilton and its activities. Descriptions of some of the programs supported by Clean Air Hamilton can be found on pages 9 - 11 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 in in-kind support

Denis J. Corr, Ph.D.
Chair, Clean Air Hamilton

Air Quality - Additional Resources

To learn more about Clean Air Hamilton and our work visit www.cleanair.hamilton.ca or follow us on Facebook.

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."

2016 MEMBERS

Denis Corr, *Chair* - *Corr Research*

Trevor Imhoff - *Air Quality Coordinator* - *Clean Air Hamilton*

ArcelorMittal Dofasco

Citizens

City of Hamilton - *Community Initiatives**

City of Hamilton Planning - *Community Planning*

City of Hamilton Public Works - *Energy Office*

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

Environment Canada*

Environment Hamilton

Green Venture

Hamilton Conservation Authority

Hamilton Industrial Environmental Association

Hamilton Public Health Services

Health Canada*

Horizon Utilities

McKibbon Wakefield Inc.

McMaster Institute for Healthier Environments

Ministry of Environment and Climate Change (MOECC) - *Hamilton Regional Office*

Mohawk College*

Ontario Environmental Assessment Corporation (OEAC)

Stelco

** indicates "observing member"*

CleanAir HAMILTON

This report and the work of our members is dedicated to the memory of
Dr. Brian McCarry (1946—2013)
Chair of Clean Air Hamilton from 1997—2013

Clean Air Hamilton, June 2017

Production: Public Health Services
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