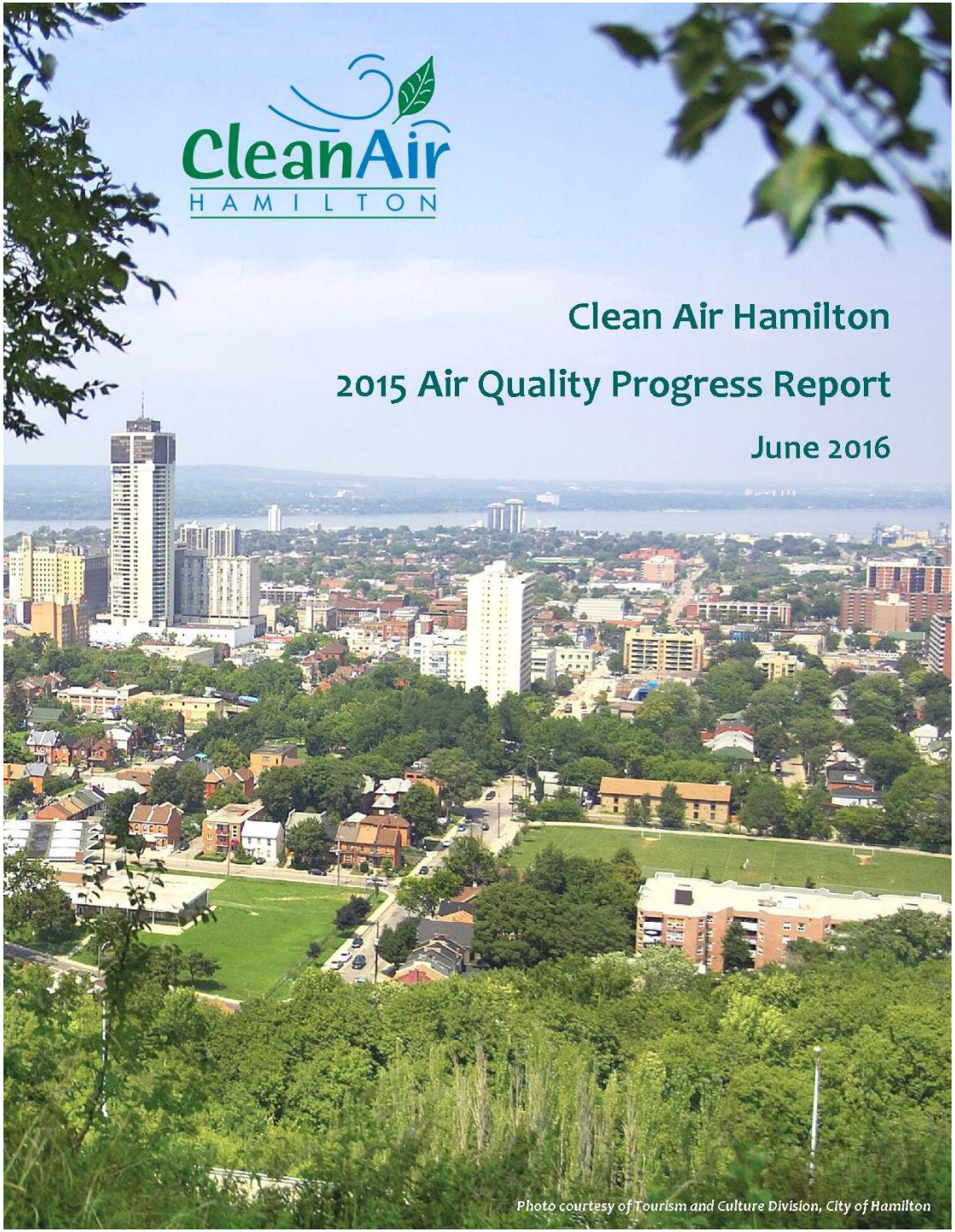


7.1

Denis Corr, Ph.D.
Chair
Clean Air Hamilton

www.cleanair.hamilton.ca

Clean Air Hamilton

Science based / Diverse / Inclusive / Facilitated Consensus

Evolution of Clean Air Hamilton

Hamilton Air Quality Initiative

Clean Air Hamilton

Climate Change

Air Quality Task Force

Clean Air Hamilton

Clean Air Hamilton was established as an implementation committee to act on recommendations contained in 1997 HAQI Reports

and

provide an ongoing forum for air quality stakeholders.

- **Community-based initiatives are directed at:**
  - Researching air quality and health issues related to air quality.
  - Developing policies aimed at improving air quality in Hamilton.
  - Encouraging emission reductions through adoption of best practices.
  - Educating the public on air quality issues, ways to improve air quality and reduce personal exposures.

- **Internationally recognized:**
  - 1500 website hits/week
  - Inquiries are received regularly from organizations and individuals in Ontario, Canada, the U.S. and from around the world (“gold standard”).

Clean Air Hamilton

- **Stakeholders come from across the community:**
  - § Citizens of Hamilton
  - § Ontario MOECC, Health Canada, Environment Canada
  - § ArcelorMittal Dofasco, US Steel Canada, Horizon Utilities Hamilton Industrial Environmental Assn., Rotek Environmental
  - § Green Venture, Environment Hamilton
  - § McMaster University, Mohawk College
  - § City of Hamilton (Health, Planning & Public Works)

- **Ongoing Activities**
  - § Input to federal/provincial/municipal decision making and actions
  - § Air Quality Task Force
  - § Phase 2 neighbourhood monitoring
  - § Real time Hamilton air quality mapping website www.hamiltonaqhi.com
  - § Air quality model for pollution source identification
  - § Dust Control Workshop for construction companies

Evolution of Air Quality Roles

Major Source Control

- Point Sources
- Vehicles

Detailed Local information

- Municipal Health Impacts
- Local/Neighbourhood monitoring

Outreach and Education

Personal Actions/Responsibility

- Control of Emissions and Exposures

Hamilton Air Quality Facts

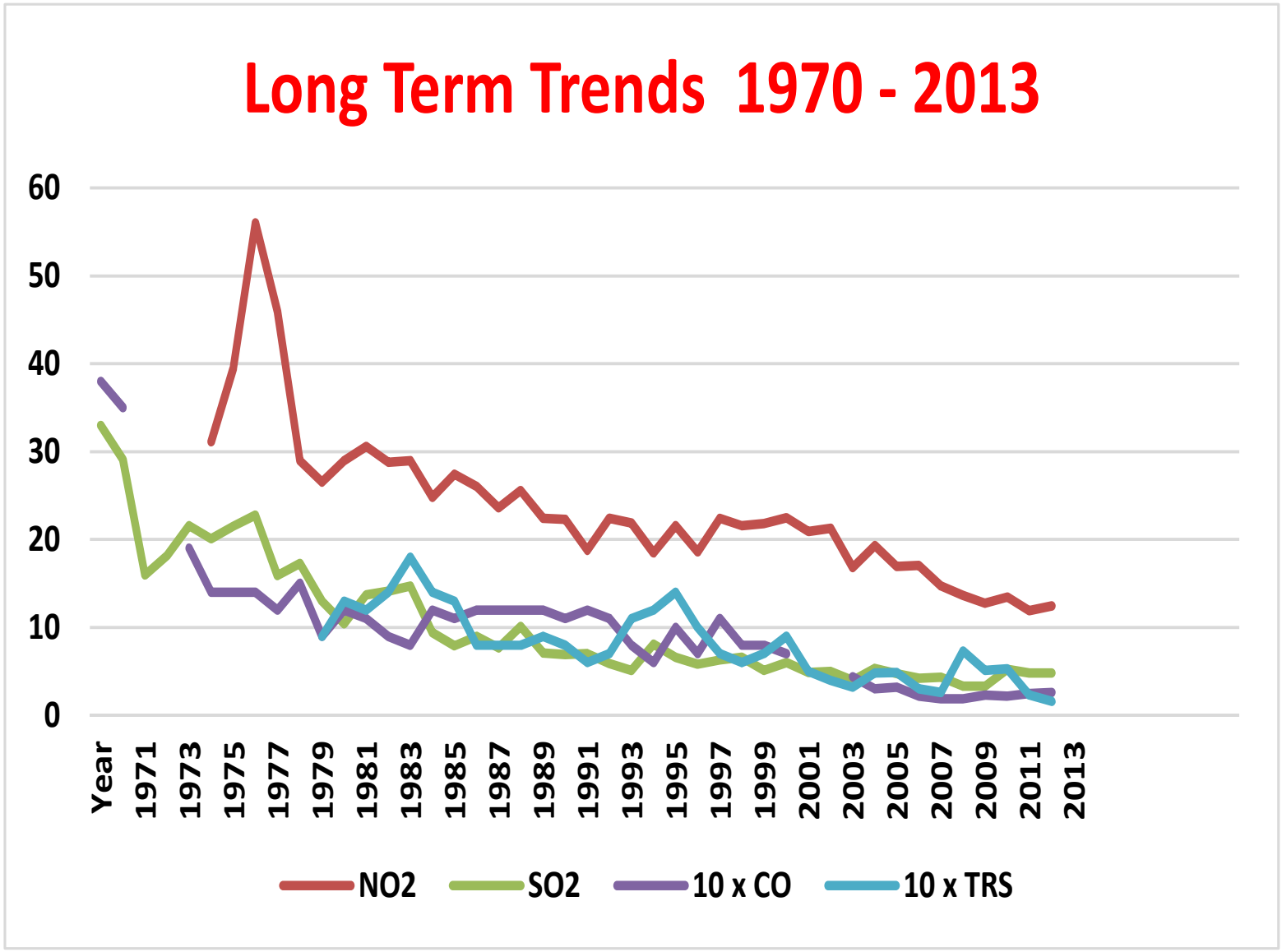
90% improvement in major pollutants (risk factors) since 1970s

80 – 90% improvement in toxics over last 20 years

Climate Change targets met

Active Involvement of all sectors of community, including City Council

Air Quality Trends



Air Quality Trends

Annual percentage decreases over time are significant
(1996 to 2015 MOE downtown air monitoring site)
(PM10 1997 to 2015, PM2.5 1998 to 2015)

- Total suspended particulate (TSP) levels, - 59% down
- Inhalable particulate (PM10), - 30% down;
- Respirable particulate (PM2.5), - 24% down;
- Nitrogen dioxide (NO2), - 51% down;

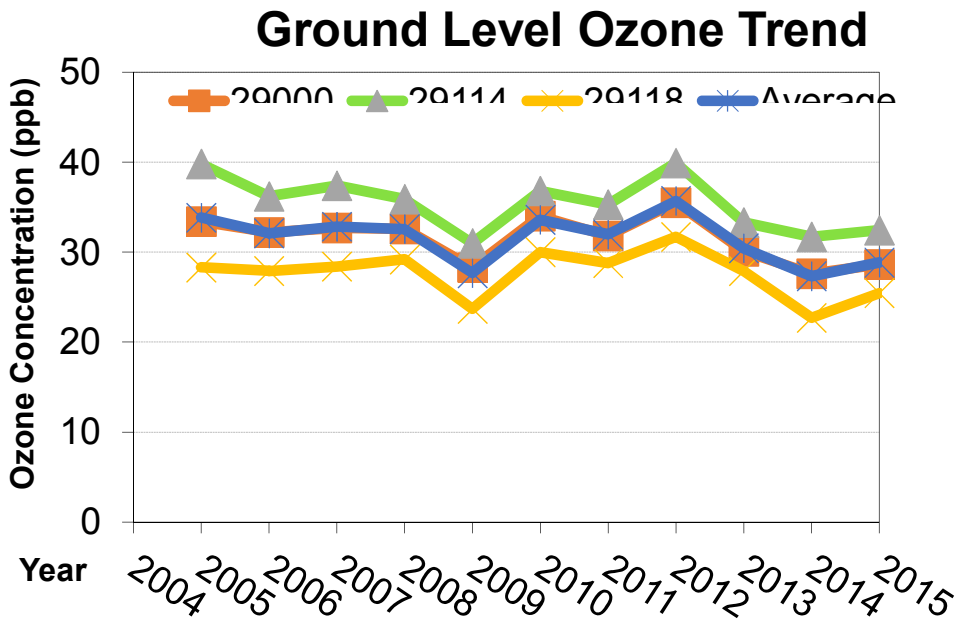
- **Sulphur dioxide (SO2), - 44% down;**
- **Total reduced sulphur odours, - 99% down;**
- **Benzene, - 87% down;**
- **PAH (as BaP) - 72% down**

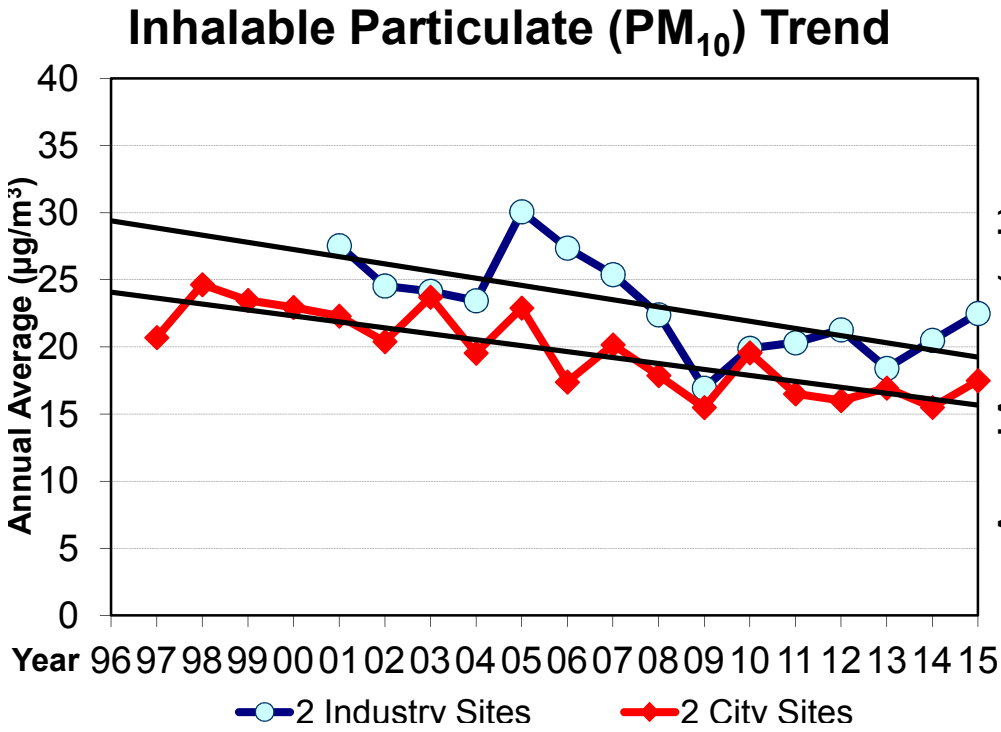
And

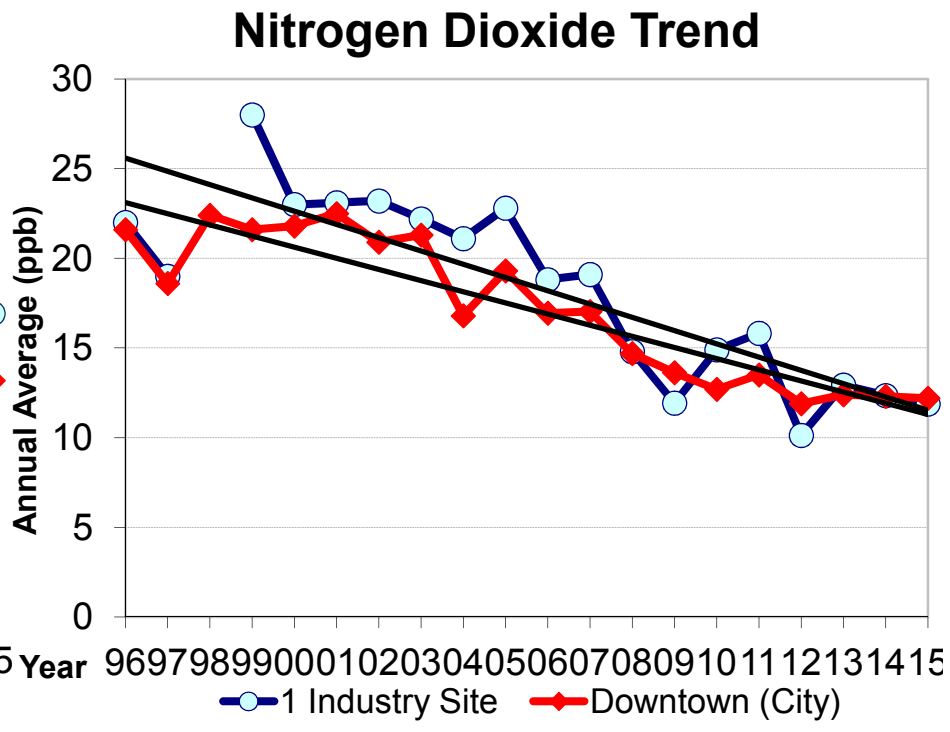
- Deaths due to air pollution decreased from 229 in 2003 to 186 in 2012; a 19% improvement (uncorrected for population increase)

Air Quality Trends:

Steady Decreases in Major Air Pollutants (except ground level ozone)

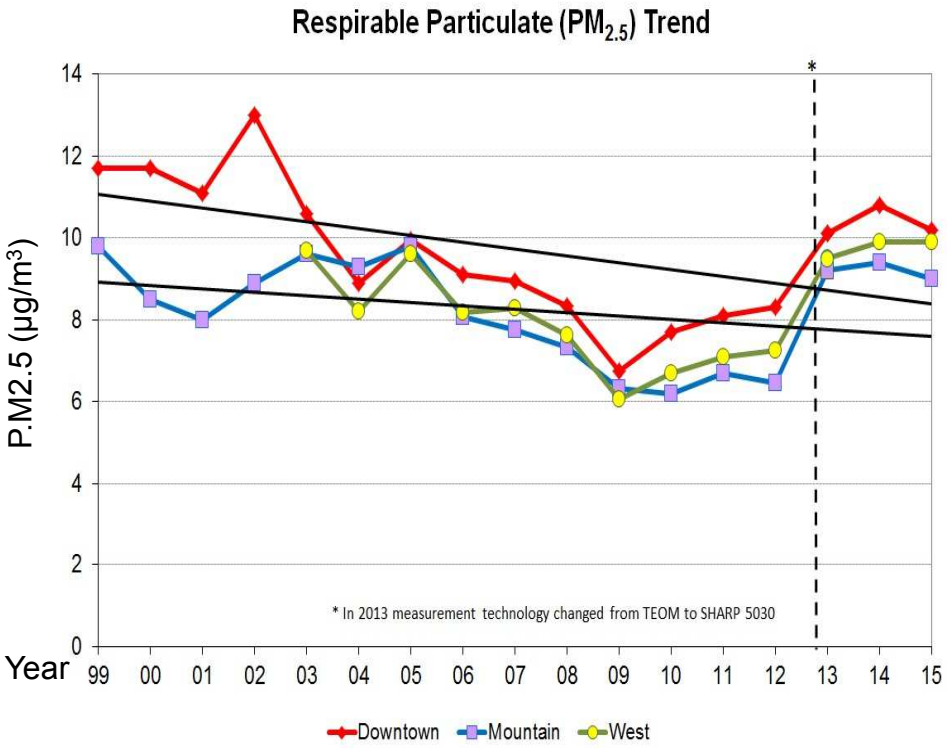


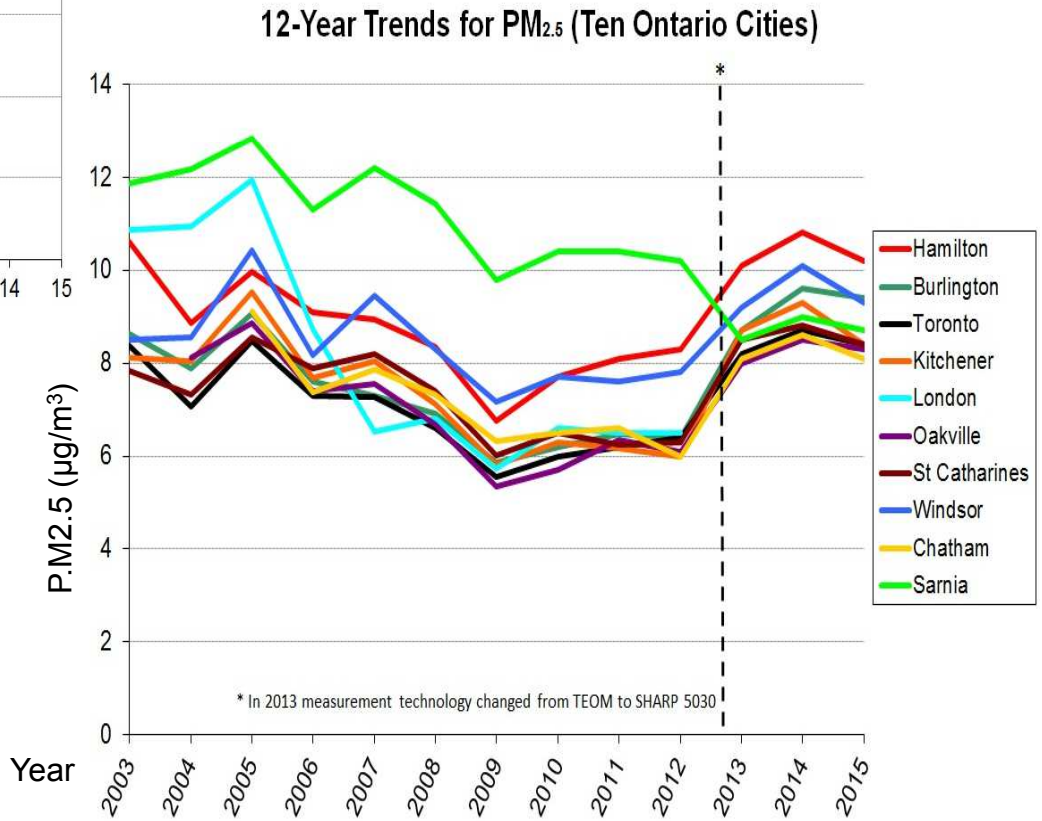




Air Quality Trends:

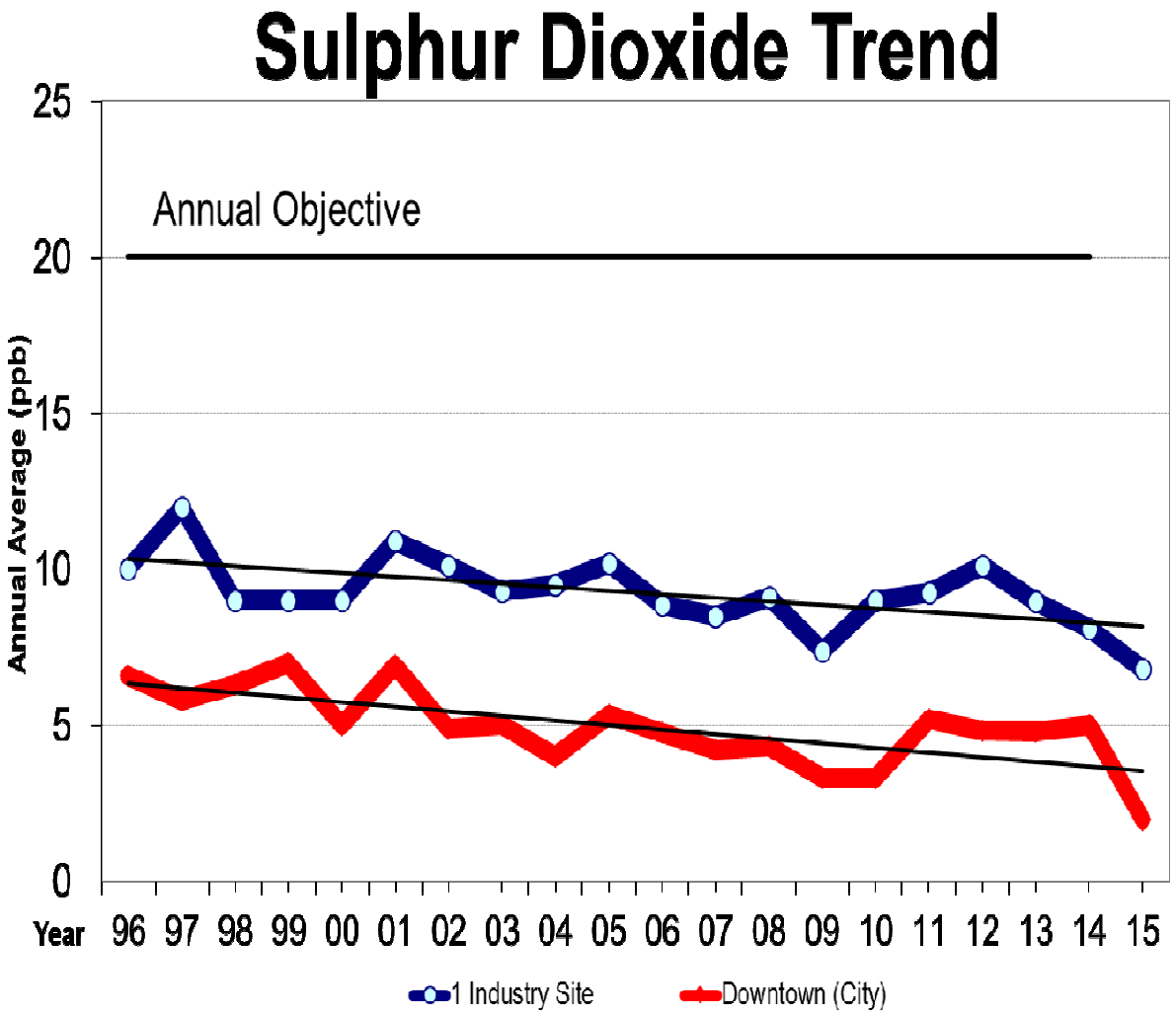
Respirable Particulate PM2.5





Air Quality Trends:

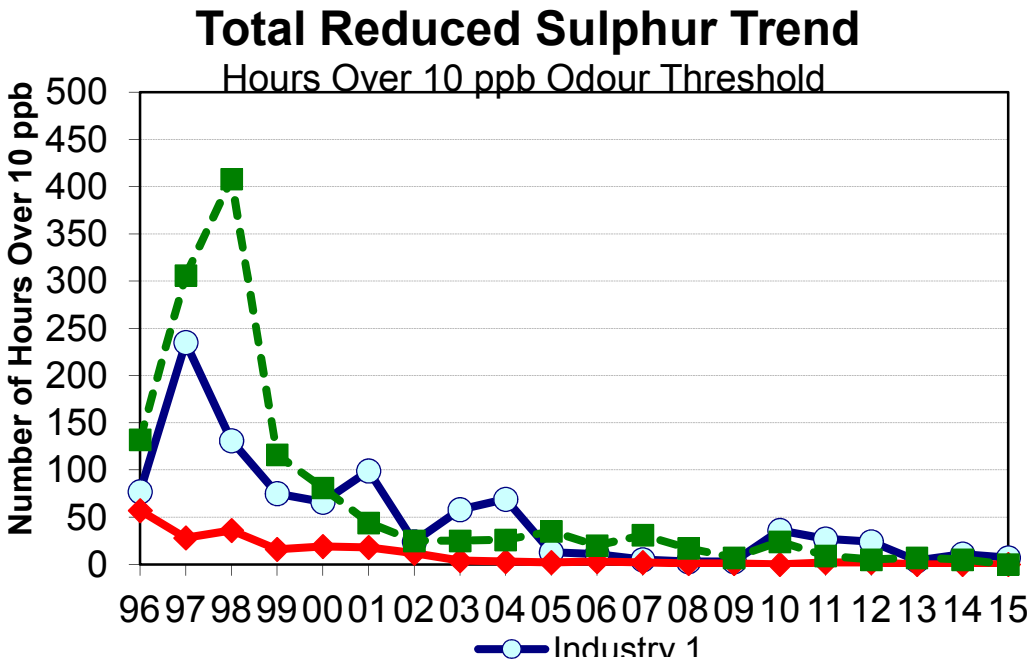
Sulphur Dioxide SO2

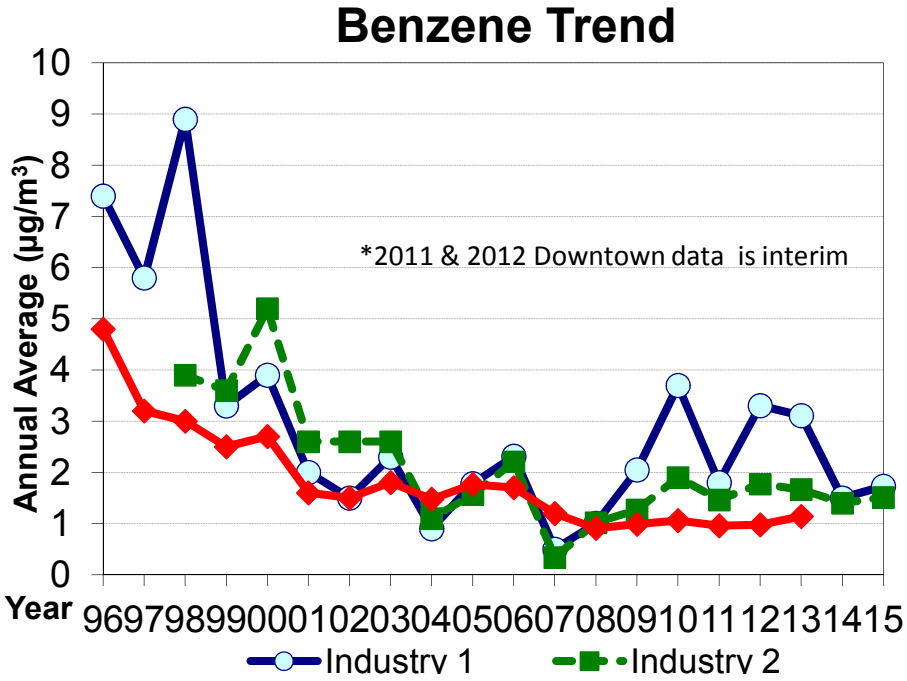


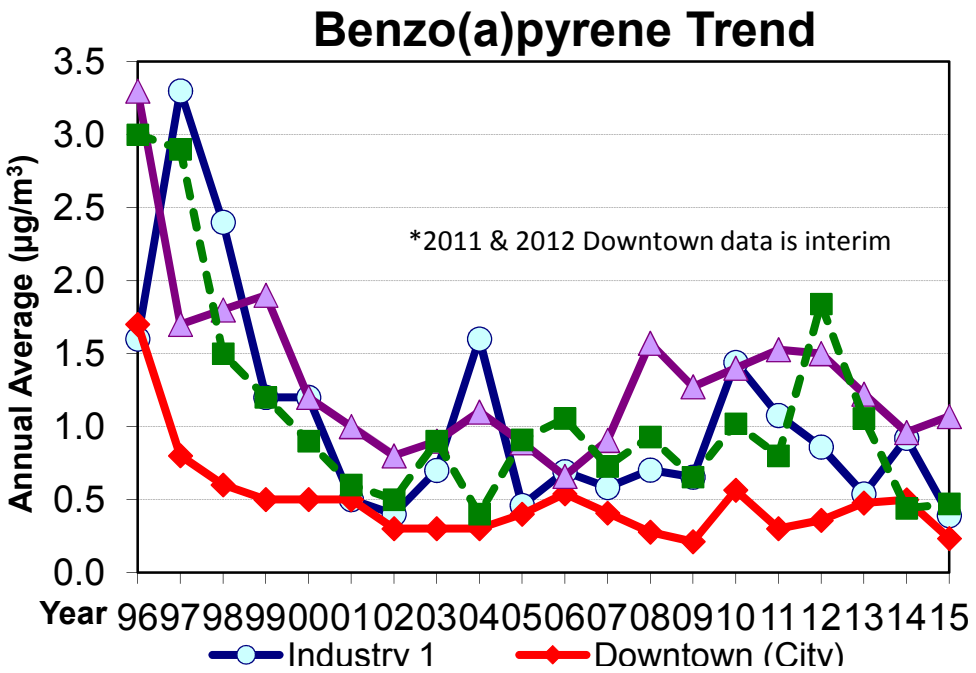
Air Quality Trends:

Total Reduced Sulphur,
Benzene
and Benzo[a]pyrene

Comparisons of 'Downtown' site and "Industry' sites







Are We There Yet?

Unfortunately, No

Estimated 186 premature deaths, 395 respiratory hospital admissions and 322 cardiovascular hospital admissions each year in Hamilton (as of 2011)

Downward trends for some pollutants flattening out

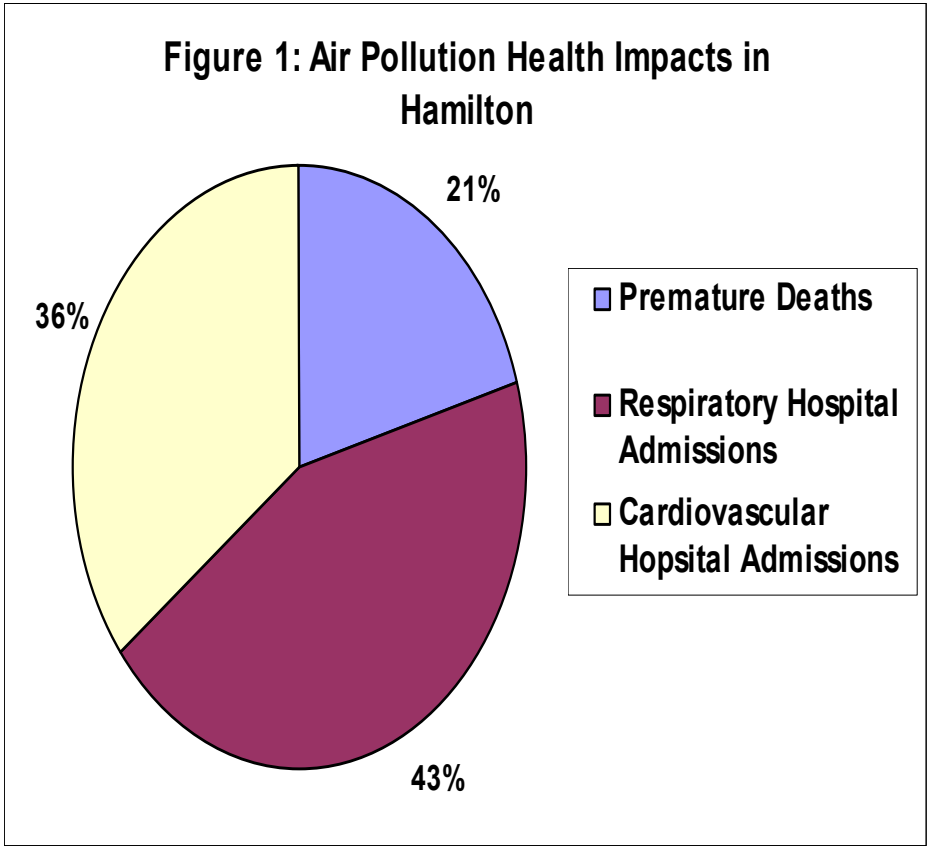
Climate Change new targets

Hamilton Air Quality and Public Health

SENES Health Assessment Report, 2011

5 Key Air Pollutants have the following health effects outcomes in Hamilton each year:

- **> 180** premature deaths
- **> 710** respiratory and cardiovascular hospital admissions



- Most current review of scientific literature on air quality and public health.

- Primary focus remains as reduction of human exposures to:
  1. Particulate Material (PM_{10} and $PM_{2.5}$)
  2. Nitrogen Oxides (NO_x)
  3. Ground Level Ozone (O_3)

So what are we doing about this?

Canadian Council of Ministers of the Environment - new, tighter standards for particulate and sulphur dioxide

Ministry of Environment and Climate Change – Regulation 419, tighter standards, science approach.

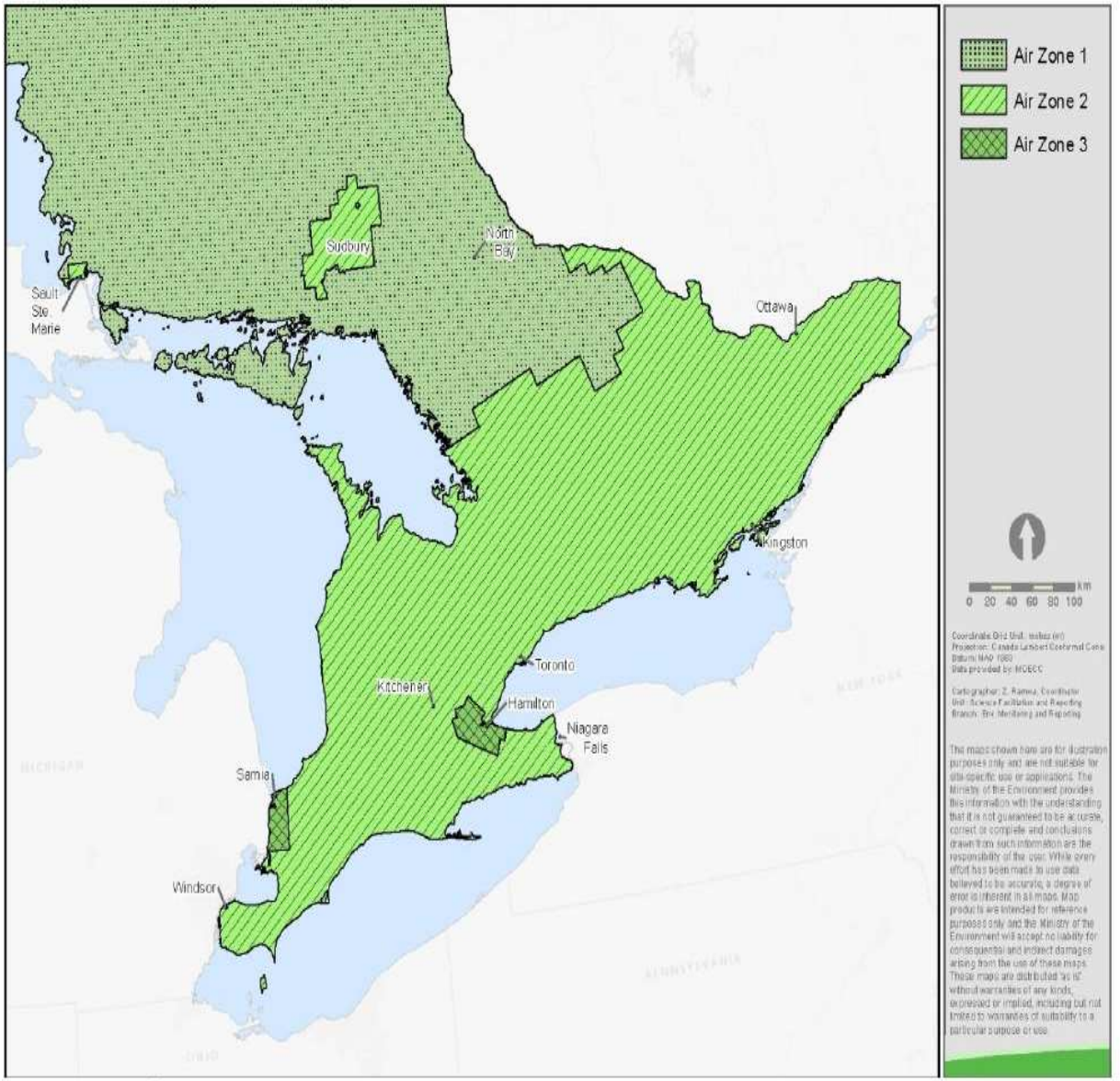
Air Quality Management Zones - Hamilton =Zone 3

Ministry of Environment and Climate Change, Hamilton Office –

Applying U.S. EPA protocols to local coke ovens - Forecast for Particulate, BaP and Benzene, -

30% reduction in suspended particulate matter, benzene and benzo[a]pyrene from coke ovens within the first couple of years – 40% reduction by 2020

Southern Ontario and Near-North View of Air Zones



Air Zone	Geography
Zone 1	Majority of Northern Ontario
Zone 2	Majority of Southern Ontario, Sault. Ste. Marie and the City of Greater Sudbury
Zone 3	City of Hamilton, Sarnia-Area (including the city of Sarnia and Township of St. Clair)

Annual Report

Trevor Imhoff

Karen Logan

Brian Montgomery

Lynda Lukasik

Jim Stirling

Andy Sebestyen

Kathryn Enders

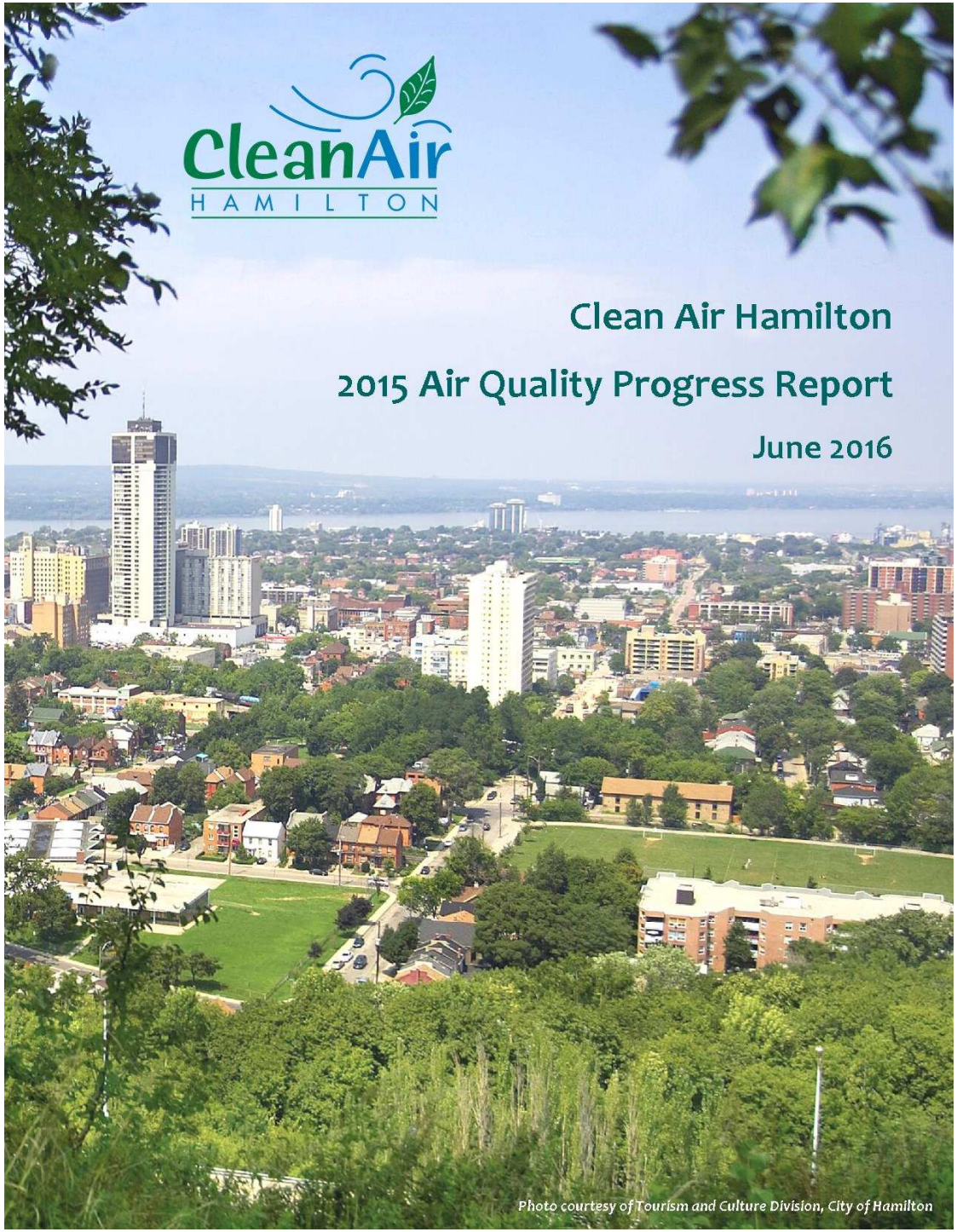
George McKibbon

Denis Corr

Matt Adams

Matt Lawson

MOECC (Geoff Knapper, Mark Smithson, Halim Abdihalim, Dan Dobrin)



2015 Community Projects Supported Through Clean Air Hamilton

- Neighbourhood Mobile Monitoring
  Air quality monitoring at the neighbourhood level by Corr Research Inc. using MOECC mobile air monitoring van

- Trees For Hamilton
  Coordination of three tree planting locations in 2015 across Hamilton

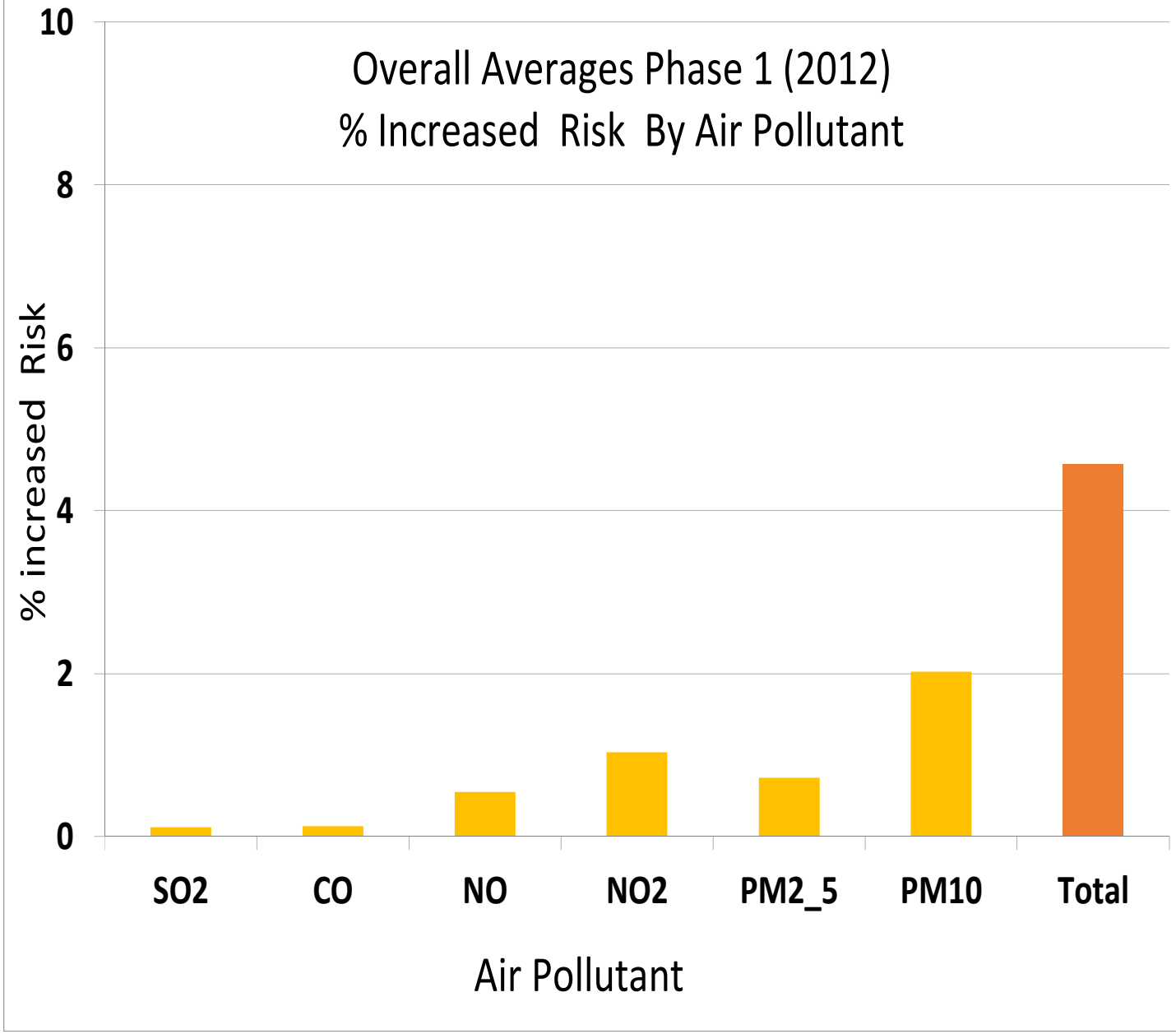
- Fresh Air For Kids
  Air Quality education and better ways to get to school using mobile air monitoring data http://www.youtube.com/watch?v=bAIhVs_sEpk

- DASH/MASH Program
  Evaluate feasibility of active transportation highway across foot of escarpment and mountain brow

- Totally Transit Kids
  Older adults
  School-aged children

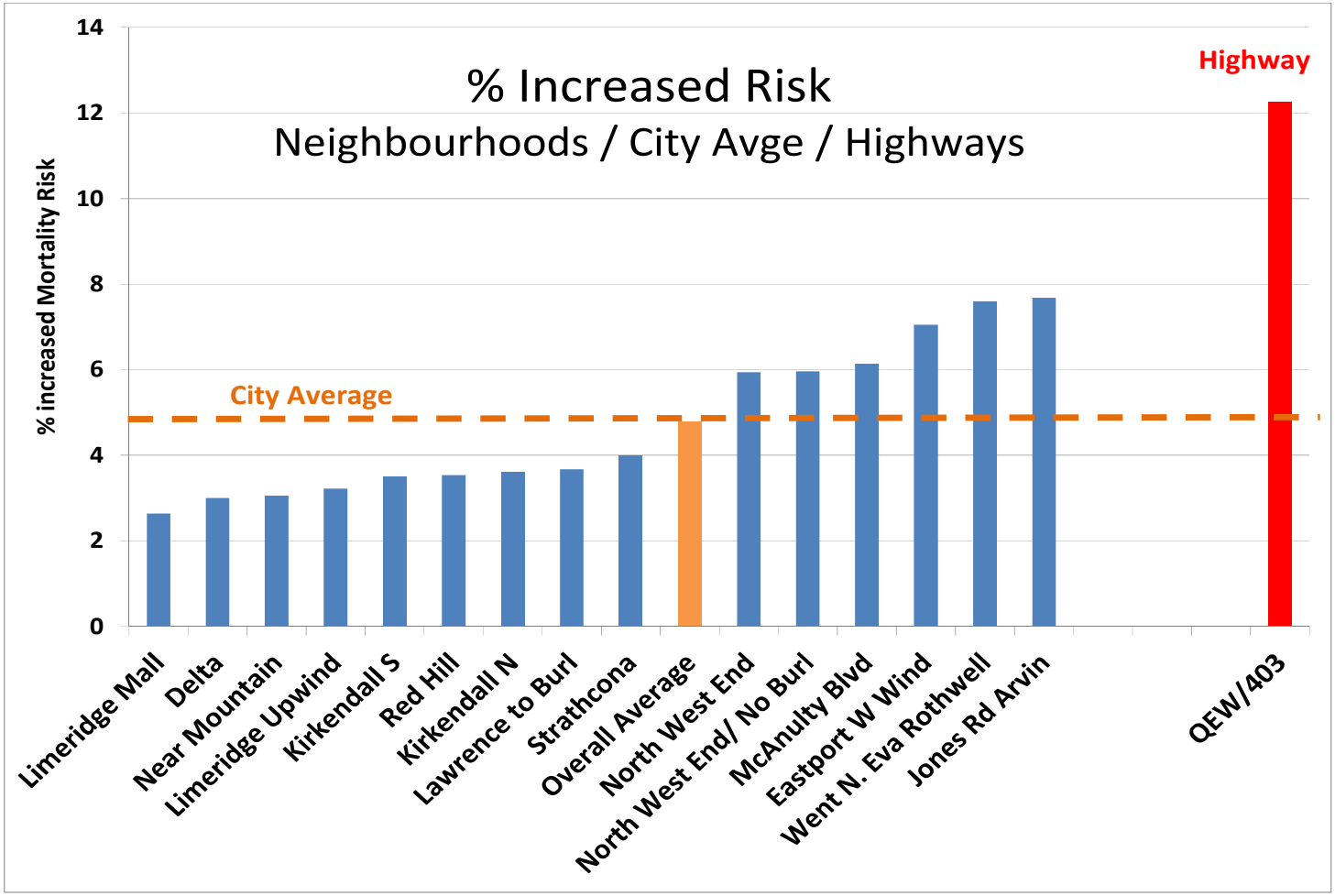
- Climate Change Hamilton
  Reached over 20,000 residents to raise awareness about climate change, local action and adaptation and mitigation goals

Neighbourhood Mobile Monitoring Phase 1



Mobile Air Monitoring: Neighbourhoods Study Phase 1

Air quality measurements were performed in 15 neighbourhoods and along QEW and Hwy. 403; 26 neighbourhoods requested measurements.



Mobile air monitoring data was converted into % increased risk of mortality using SENES report values.

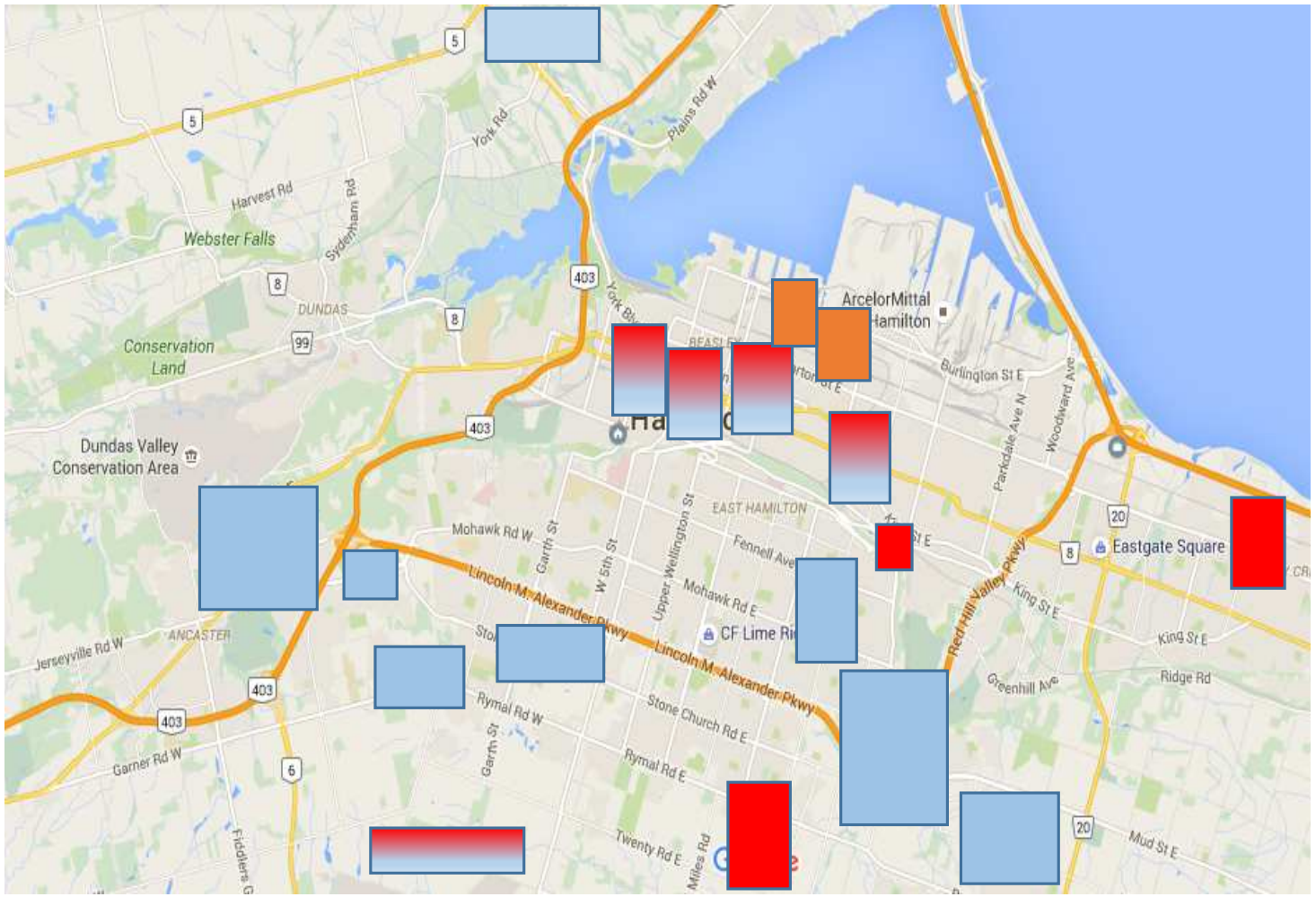
2015 Phase 2 Neighbourhood Mobile Monitoring

- **Summary Findings**
  - 15 neighbourhoods monitored + special requests
  - For SW winds overall increased risk = 2.6%
  - For NE winds overall increased risk = 4.1%
  - Risk evaluated by pollutant type
  - PM10 and NO2 cause most risk
  - Downtown neighbourhoods show highly variable differences with NE winds (some SO2 impacts)
  - Surrounding neighbourhoods mainly clean with specific exceptions
  - Nebo Road/Jones Rd highest values overall

- **Locations:**
  - Jolley Cut Area
  - Upper Gage/Upper Ottawa/East Mountain Park
  - Gourley (Garth, Linc, West 5th, Stonechurch)
  - Ancaster (Wilson/Fiddlers Green)
  - Meadowlands (Horning, Oakes)
  - Rymal and Paradise (Falkin West and East)
  - Linc/Red Hill Intersection Area
  - Rymal/Mud Area
  - Sanford School Area (Gibson)
  - Cope St (Normanhurst)
  - South Sherman (St Clair)
  - Fruitland and Barton
  - Durand

Additional requests from Cllr Jackson, detailed monitoring of Hampton Heights, Sherwood Secondary School, Kenilworth Traffic Circle and Nebo Road

Hamilton Neighbourhoods Phase 2 Sampling Areas



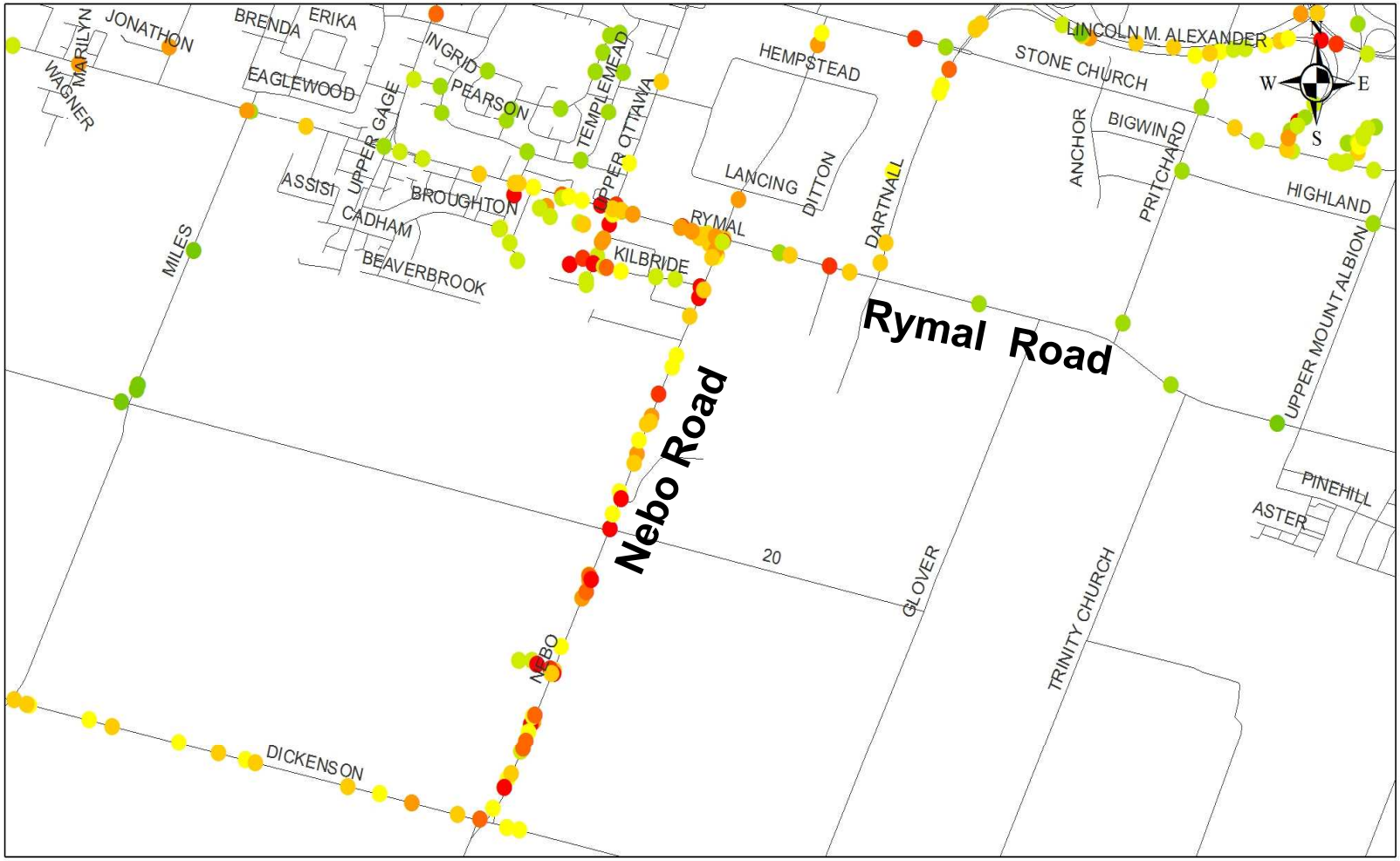
Lower Risk, All Winds

Higher Risk, NE Winds

Highest Risk,

Lower Risk, All Winds, Downtown

Air Pollution Measurements
Nebo Rd Rymal



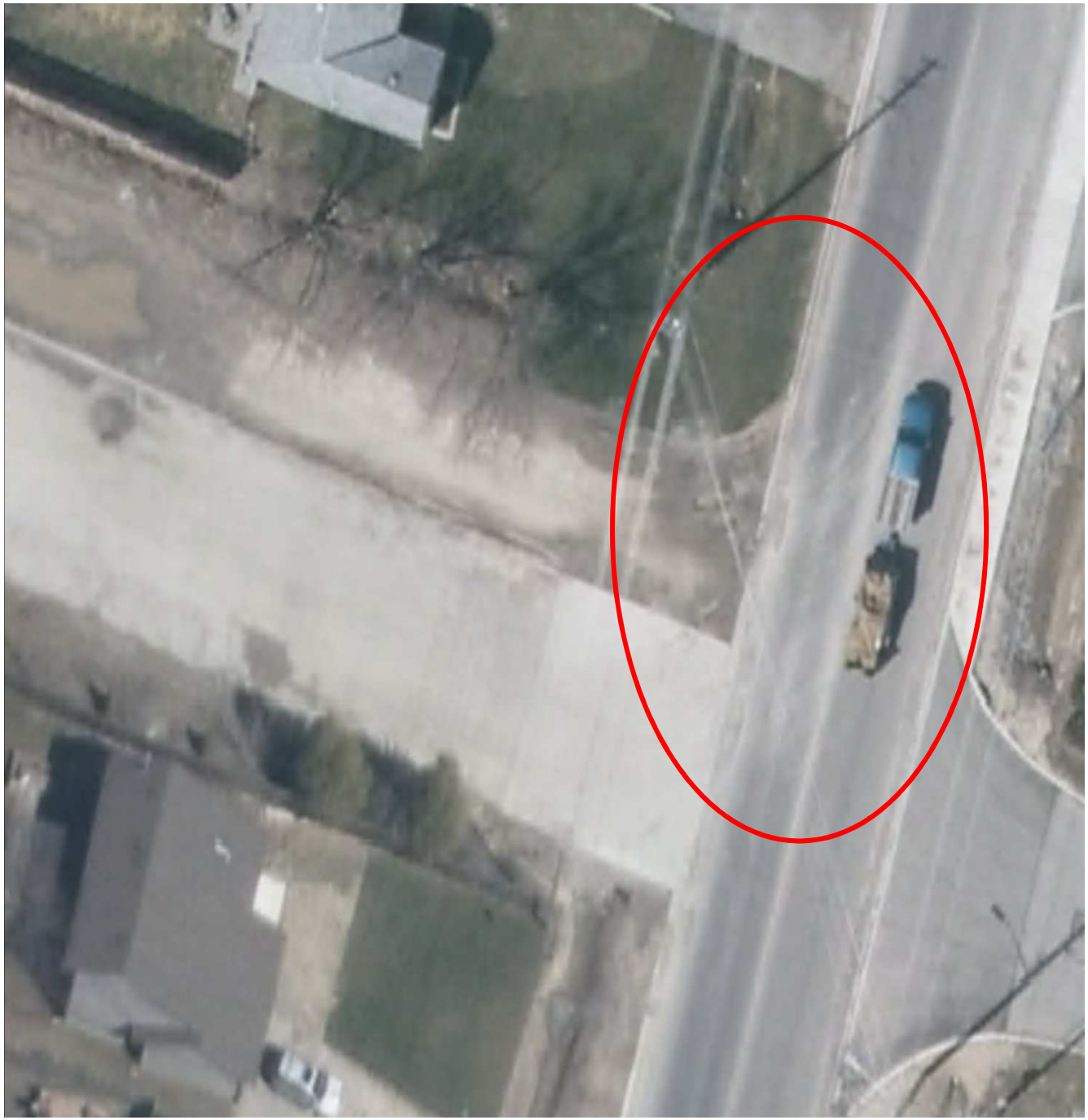
% Air Quality Risk

1 2 3 4 5 6 7 8 9 10 10+

Kilometers

0 0.4 0.8 1.6

Nebo Rd - Satellite View



Trees For Hamilton

- Coordinated 3 tree plantings in the Fall of 2015
- Planted 125 native trees, evergreens and shrubs
- Volunteers included:
  - 2 Volunteers from Trees for Hamilton
  - 12 volunteers from St. John's Lutheran Church Youth Group; and
  - 2 Hamilton Conservation Authority Staff.

Fresh Air For Kids

Van outfitted with a range of real-time monitors for:

CO

NO

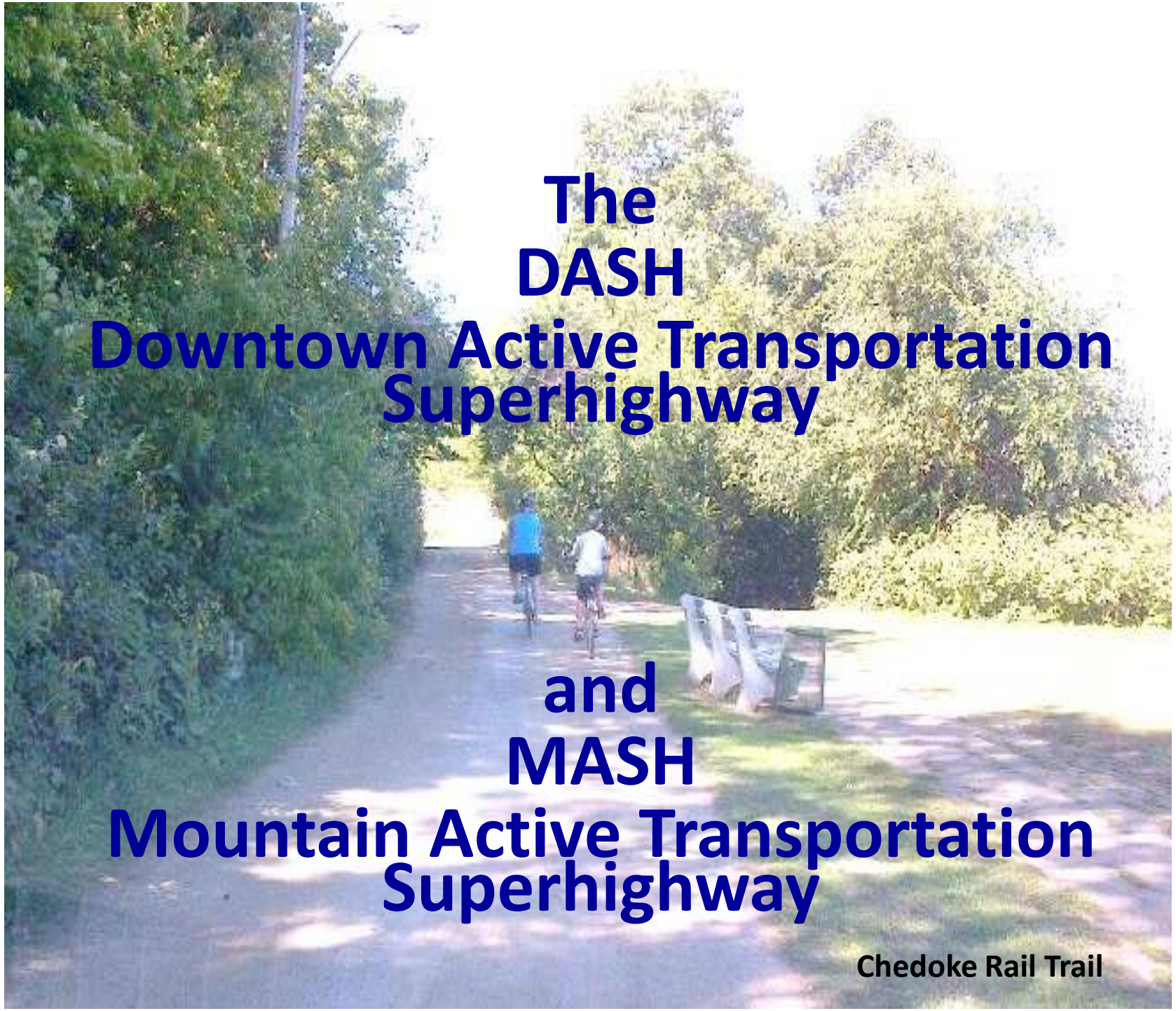
NO_2

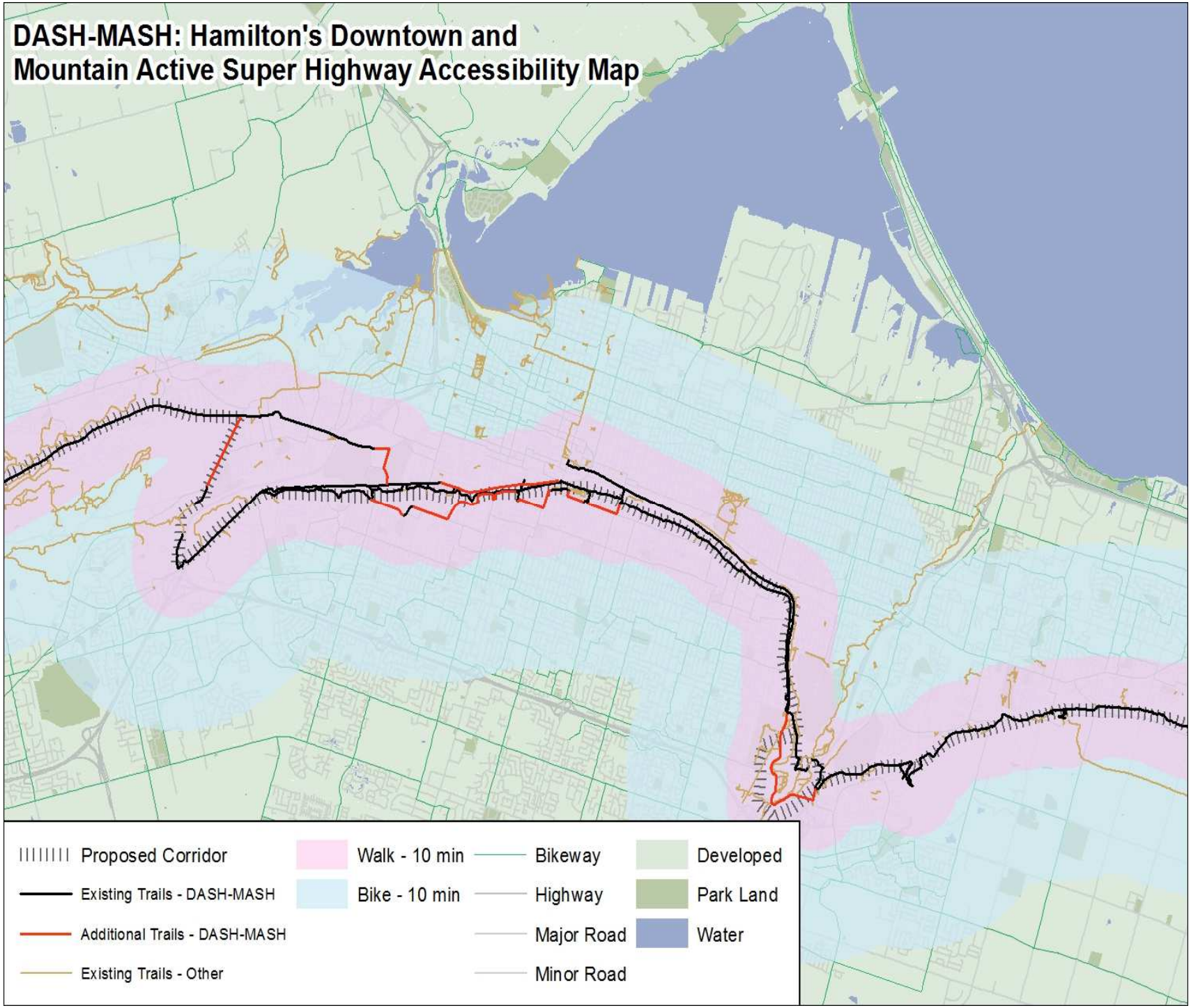
PM_{10}, $PM_{2.5}$, PM_1

SO_2

A GPS system

Air Pollution Measurements, Neighbourhood of Holy Name of Jesus School, Hamilton


The
DASH
Downtown Active Transportation
Superhighway
and
MASH
Mountain Active Transportation
Superhighway
Chedoke Rail Trail


DASH-MASH: Hamilton's Downtown and
Mountain Active Super Highway Accessibility Map
Proposed Corridor
Existing Trails - DASH-MASH
Additional Trails - DASH-MASH
Existing Trails - Other
Walk - 10 min
Bike - 10 min
Bikeway
Highway
Major Road
Minor Road
Developed
Park Land
Water

Dash – Mash Facts

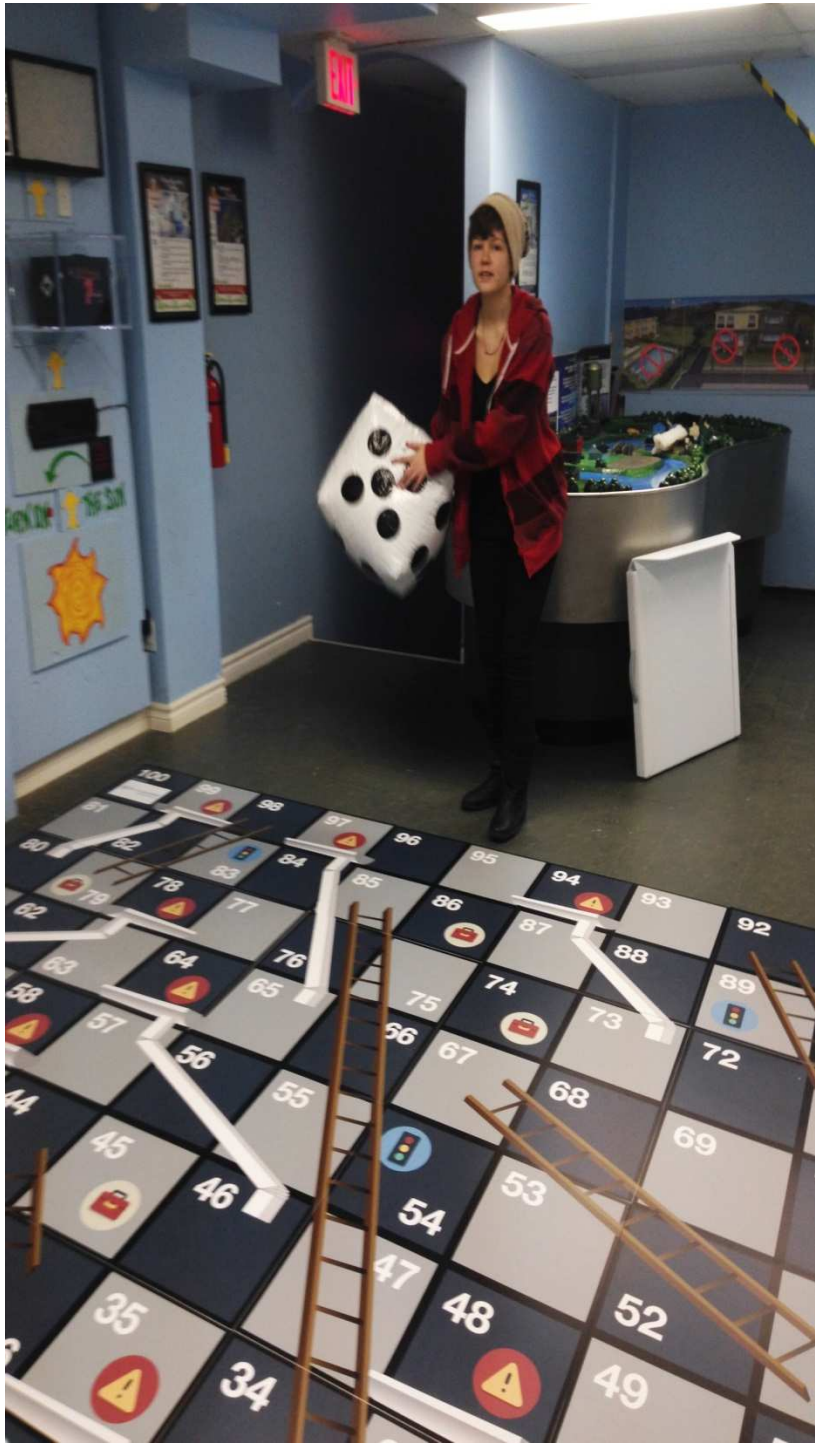
- 93% is already in existence, only 7% of the DASH MASH would have to be built.
- 13 of the 15 Hamilton Wards would be intersected by the path.
- 78 km of already existing multi-use path is included in the 108 km DASH-MASH plan, while 22 km of existing trail and sidewalk would require conversion. For the remaining 7.8 km, no paths currently exist.
- 125,000 Hamilton residents are within a ten-minute walk.
- 370,000 Hamilton residents are within a ten-minute bike ride.
- 113 of the 115 Social Bicycle Hubs are within the ten-minute cycling distance.
- Within the 10-minute biking radius of the DASH-MASH, there are 518 kilometers of bikeways.

Totally Transit Kids

- Introduces elementary students to the HSR and building confidence.
- Since 2007, 4,600 elementary students, another 5,700 at environmental fairs.
- Since 2013, 173 older adults.
- Provides awareness of positive health and environmental benefits of sustainable transportation.

Climate Change Hamilton

- Provides awareness and advice on managing environmental impacts through GHG reduction and adaptation measures to:
  - Local Individuals;
  - Businesses;
  - Organizations; and
  - Community Groups.
- In 2015 reach over 20,000 residents through:
  - Hamilton Climate Change Action Charter.
  - Map Climate Change website.
  - Providing tools and resources.



Air Monitoring

- **Air Monitors collect outdoor air quality data.**
  - Data used to compare levels of air pollutants to standards.
  - Data can be used to identify sources of air pollutants, and
  - Data can be used to evaluate the potential impacts of air emissions on human health.

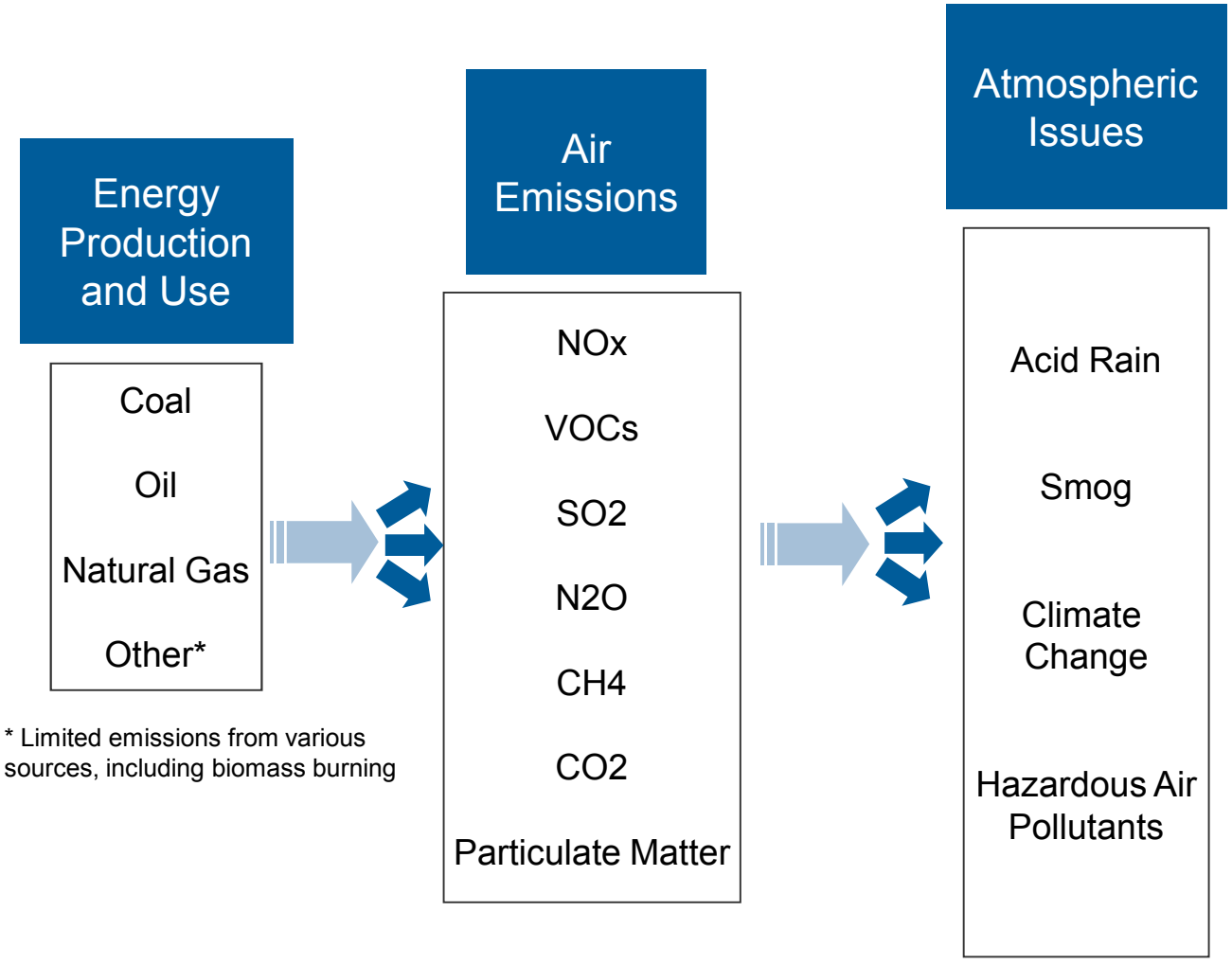
- **Fixed monitor networks: three networks in Hamilton.**
  1. Ontario Ministry of the Environment's network of three Air Quality Index (AQI) stations (downtown, west end, mountain).
  2. Hamilton Air Monitoring Network (HAMN) of 17 stations in the east end industrial core primarily.
  3. Public Health Services, 2 AirPointer moveable stations.

- **Mobile air monitoring: uses a van outfitted with air monitors.**
  - Can make measurements anywhere in City and can monitor while moving along roads.
  - Can measure what citizens are actually breathing in their locality.
  - Can identify local sources of air emissions.
  - Can be used to make comparisons between neighbourhoods, along streets/highways and at locations with suspected emissions.

Air Quality Task Force

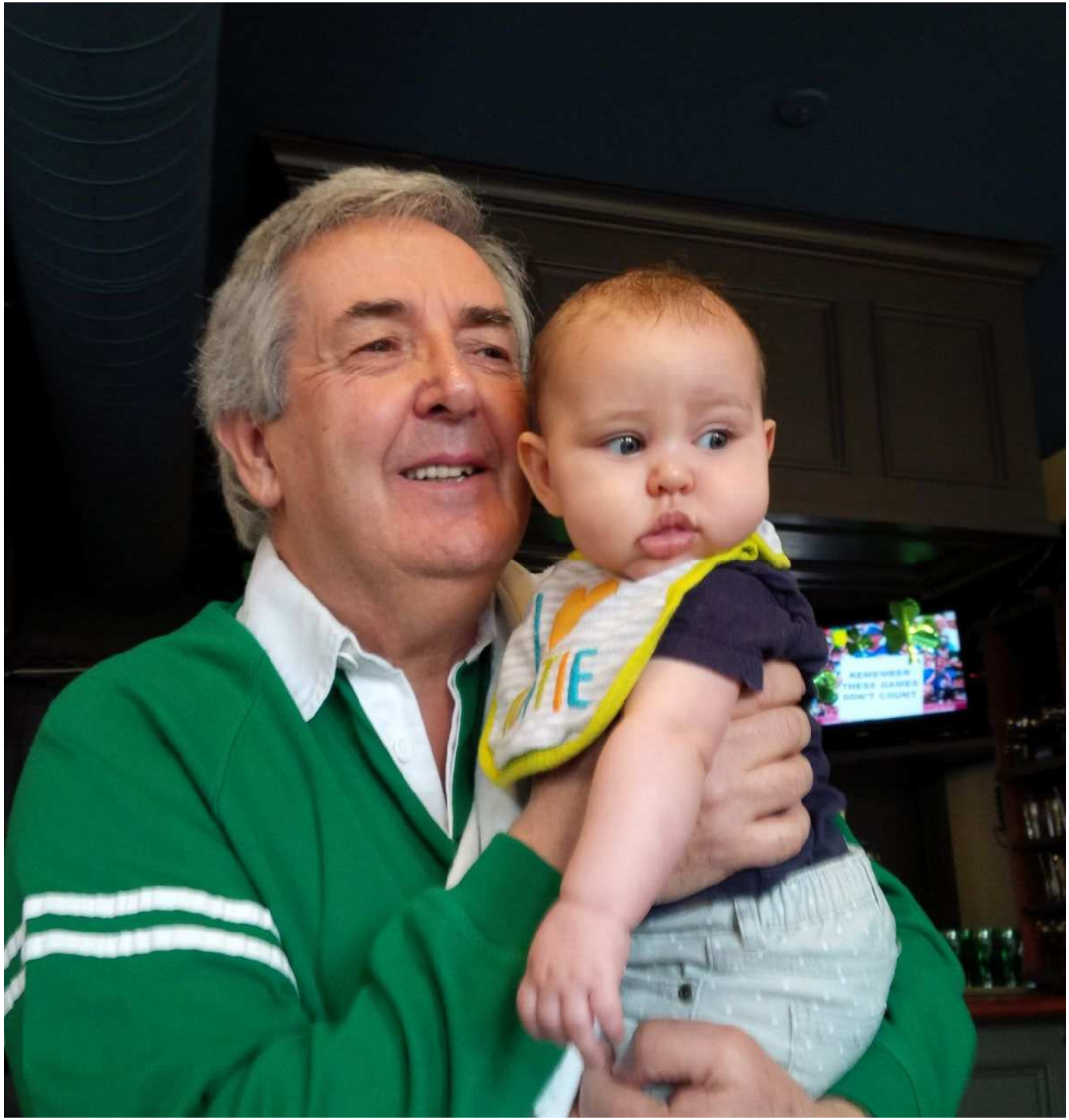
- Request by Board of Health to look at and recommend "actions that can be taken by the City to reduce air pollution in Hamilton".
- The AQTF responded with an Action Plan in 2013.
- 10 Recommendations in the areas of air modelling and monitoring, planning, education and outreach, green infrastructure, and updating of municipal by-laws aimed at decreasing particulate matter in the environment.
- The full AQTF Action Plan approved by the Board of Health can be found in
  http://www.cleanair.hamilton.ca/downloads/AQTF%20Action%20Plan.pdf .
- The 10 recommendations–are expected to work synergistically to achieve air pollution reductions in the City of Hamilton.

Air Quality & Climate Change



Source:
Pollution Probe, 2003

Hamilton is 75 metres (245 ft) above sea level


REMEMBER
THESE GAMES
DON'T COUNT

Climate Change

Concerns:

- Flooding;
- Heat;
- Tree loss;
- Drastic or unpredictable;
- Increased pollution.

Facts:

- In Hamilton, climate change emissions have been declining since 2006
- 29% lower in 2012 than in 2006
- Biggest sources are energy usage by industry, commercial and residents followed by transportation
- New targets of 50% by 2030, 80% by 2050 established
- Ontario to spend $7 Bill in next 4 years (Hamilton to receive $7M initially to upgrade public housing).

Hamilton Community Climate Change Action Plan (2015)

- Agriculture
- Transportation
- Energy
- Local Economy/Business
- Health
- Water & Natural Heritage
- Buildings and Infrastructure
- Awareness

Need to move towards leadership and implementation of these actions

On behalf of

Clean Air Hamilton

CleanAir HAMILTON

Additional Information / Resources

Electric Cars

Ontario to invest $277 M

- Rebate of up to $14,000 for every purchase.
- Up to $1,000 to install home charging.
- Removing provincial portion of the HST.
- Extra subsidy program for low– and moderate-income households to get older cars off the road and replace with electric.
- Free overnight electricity for charging.
- More charging stations at government buildings, including LCBO outlets.

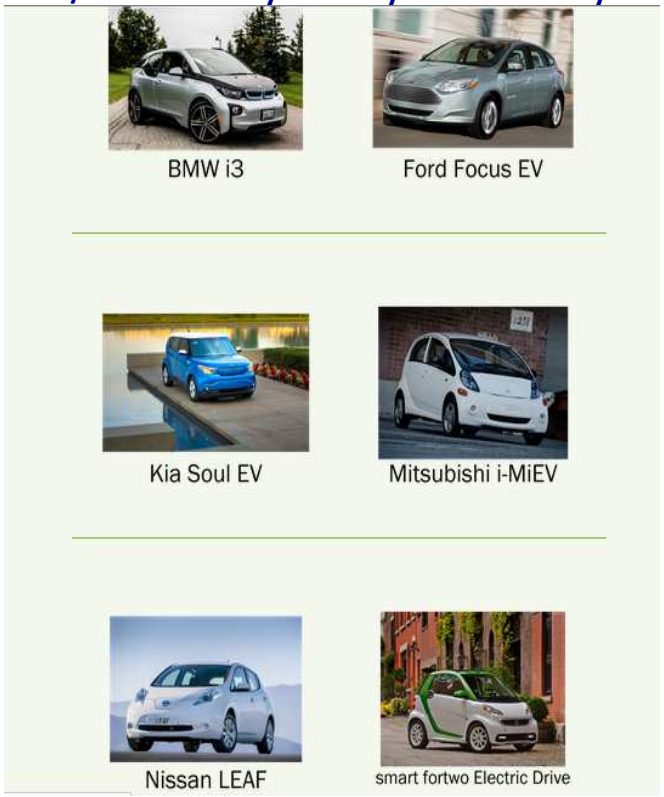
Plug'n Drive

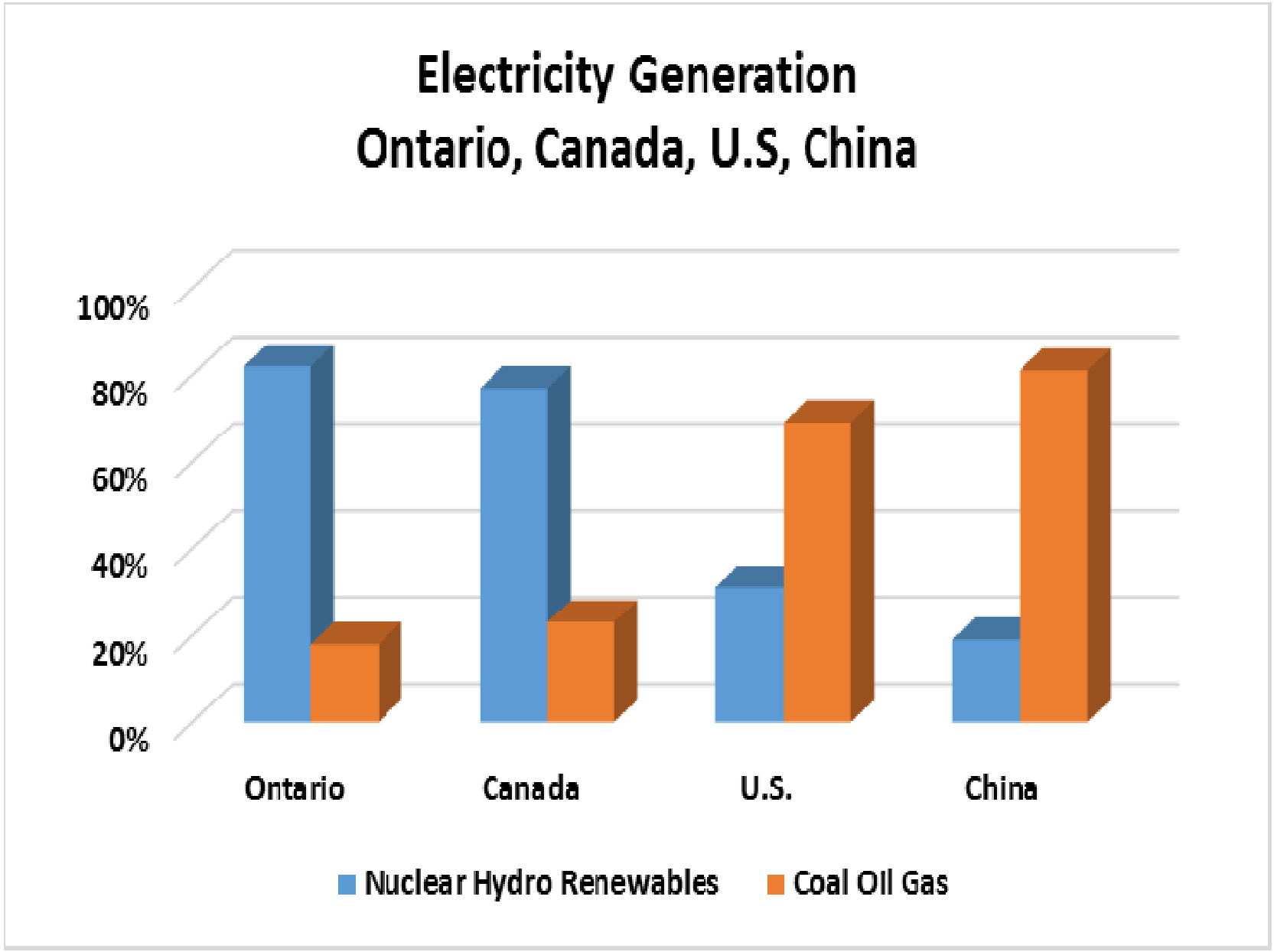
$32,000 - $14,000 = $18,000

Save $2000/yr for 5 yrs
$18,500 - $10,000 =$11,500

Range 100 – 140 km

Fleet Demo/Feasibility Study as with hybrids?




Electricity Generation
Ontario, Canada, U.S, China
100%
80%
60%
40%
20%
0%
Ontario
Canada
U.S.
China
Nuclear Hydro Renewables
Coal Oil Gas

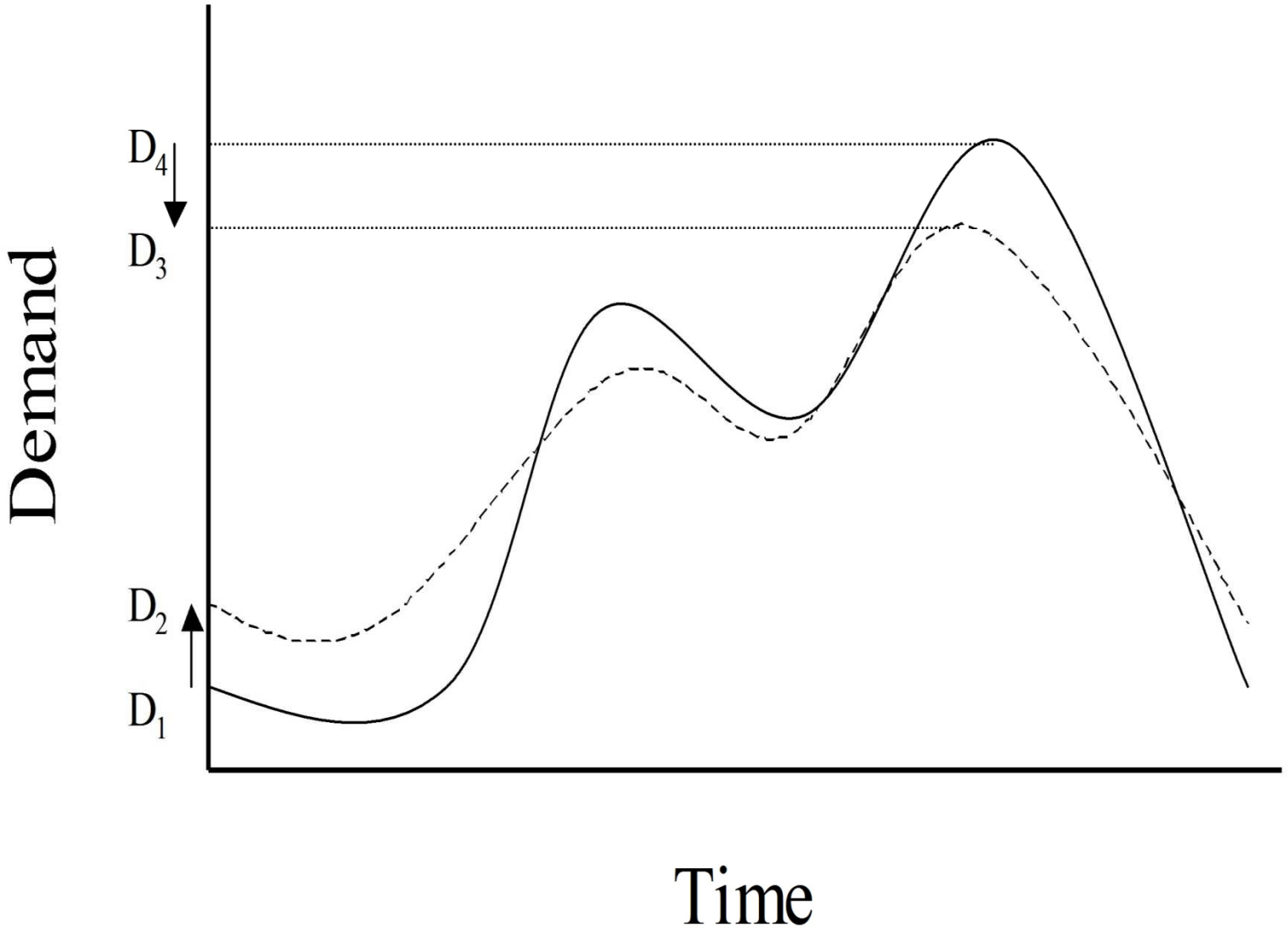


Figure 1: Demand curve changes with shifted load

LRT

Free Solar Cells For All

www.hamiltonaqhi.com