



Sustainability in Hamilton

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Chair, Clean Air Hamilton

Sustainable Development in Communities Workshop

November 26, 2007

Sustainability in Cities - Four Focus Areas

Major
Sustainability
Focus Today

1. Reductions in Energy Usage

- Overall goal - significant GHG reductions
- Use of cleaner, renewable forms of energy

2. Improvements to the Urban Form

- Healthy Cities Initiatives
 - Bike paths, compact neighbourhoods, sidewalks, obesity issues
- Transportation issues:
 - Number of cars and trucks -congestion issues
 - Public transit development

3. Improved Water Quality

- Drinking water quality
- Sewage treatment plant effluent quality

4. Improved Air Quality

- Reductions in mobile & industrial emissions

Hamilton's Sustainability Record

- **Vision 2020**

- Produced reports in 1992, 1998 and 2004 laying out sustainability plans for the future of Hamilton.
- Triple Bottom Line approach – “3-legged stool”
- <http://www.myhamilton.ca/>

- **GRIDS exercise** – sustainable growth plan document

- ***Hamilton, the Electric City (2006)*** – by Richard Gilbert

- ***Hamilton's Corporate Energy Policy (2007)***

- **Recognitions:**

- Dubai Award for Environmental Best Practices (2000)
- *In Post Carbon Cities* by Daniel Lerch (2007), Hamilton is cited as one of the leading sustainability cities in North America.



Dubai Award

1. Climate Change Predictions Abound

FIGURE 1: Changes in mean temperature (°C) between the 2050 horizon and the actual climate, for each season (from an ensemble of CRCM climate change projections, November 2005)

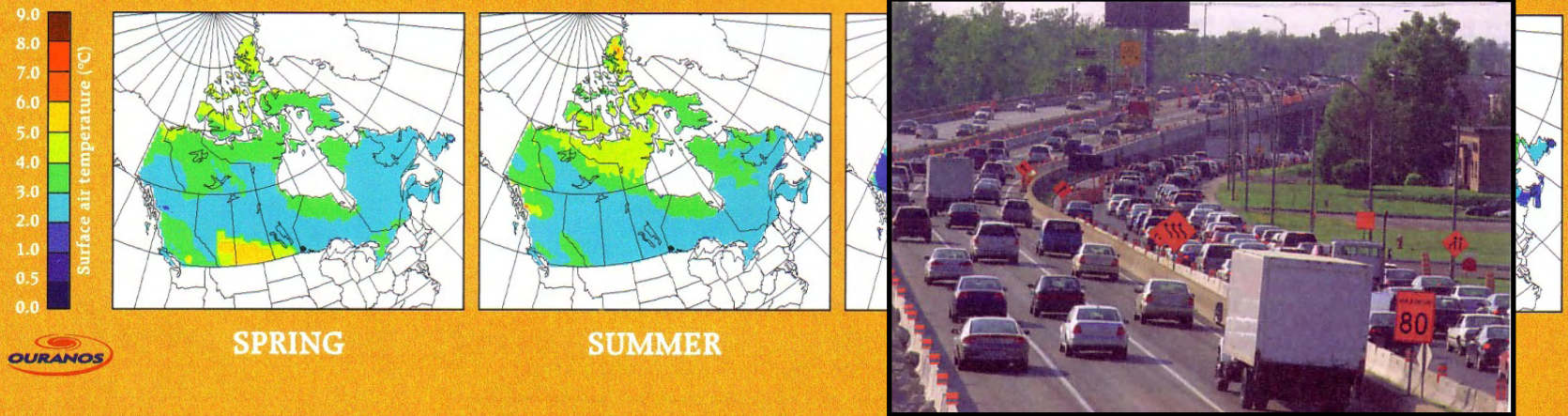
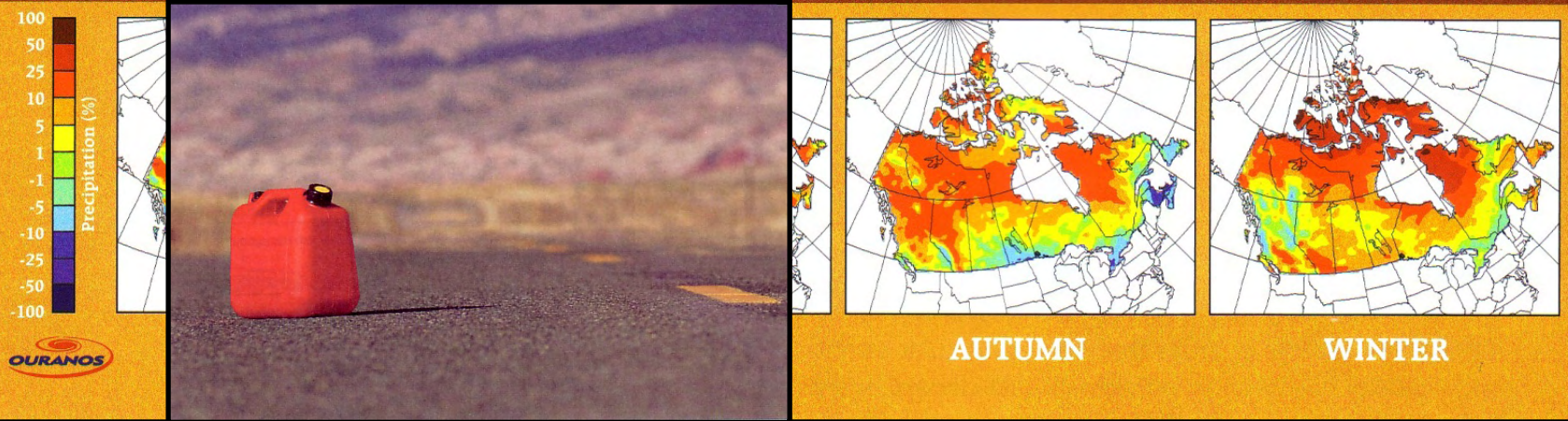


FIGURE 2: Changes in mean precipitation (%) between the 2050 horizon and the actual climate, for each season (from an ensemble of CRCM climate change projections, November 2005)



1. City of Hamilton's New Corporate Energy Policy - November, 2007



Corporate Energy Policy

Energy Policy Background

Council directed Public Works to develop an Energy Policy that recommends:

1. Targets for reduced energy use in City Facilities and timelines for achieving same;
2. Strategies to achieve those targets;
3. A framework for the use of renewable technologies in new City Facilities;
4. The feasibility of designing new City Facilities to LEED standards, or equivalency;
5. The feasibility of producing energy to operate City Facilities and/or partner facilities (e.g. co-generation facilities, district energy facilities).

Office of Energy Initiatives

1. City of Hamilton's New Corporate Energy Policy - November, 2007

- Community
- People
- Processes
- Finance

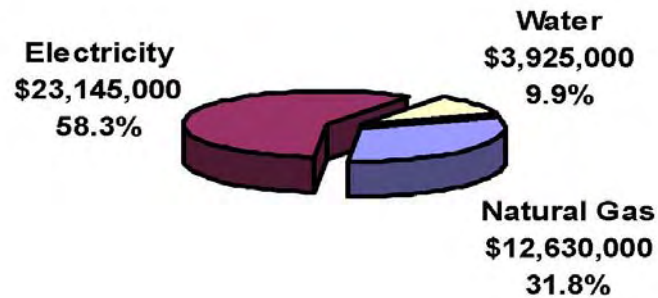


Hamilton
Public Works

Corporate Energy Policy

Annual Energy Costs

City of Hamilton - 2006 Energy Costs



- Energy costs > \$40 million annually.
- > 4,000 electricity, natural gas and water utility accounts.
- Small rate increases can have significant impact e.g. a 2.5% increase costs by \$1 million.
- Utility price increases = 9.5% on average over the past 5-years.

Office of Energy Initiatives

1. City of Hamilton's New Corporate Energy Policy - November, 2007

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Corporate Energy Policy

Targets and Timelines

The Energy Policy calls for **targeted energy reductions** in **energy intensity** of City owned facilities and operations of:

Year	Targeted Energy Reduction	GHG (eCO ₂) Reduction in tonnes	Cumulative Energy Savings
2009	3.0%	7,975	\$2,042,318
2012	7.5%	18,369	\$8,713,473
2020	20%	46,086	\$49,133,085

1. Savings from energy reductions are due to *Energy Conservation and Demand Management (CDM)* activities only.
2. All energy savings through to 2020 are based on 2007 utility rates with *no increases*. *Savings increase as rates go up*.
3. Targets equate to about a 1.5 % reduction in energy per year.
4. Using 2005 as the base year for measuring results against.

Office of Energy Initiatives

1.

City of Hamilton's New Corporate Energy Policy - November, 2007



Corporate Energy Policy

The Public Works Strategic Plan, Innovate Now

The recommendations of the Energy Policy are in step with the Public Works key goal, *to be recognized as the centre of environmental and innovative excellence in Canada*

This Energy Policy and Energy Reserve are unique amongst other Ontario Municipalities. The Energy Policy provides a road map and strategies for changing the way manage our facilities and operations, bringing energy conservation and demand management (CDM) to the forefront of decision making process. It is the smart way to do business and puts the City of Hamilton at the forefront in terms of leadership and innovation.

***The City of Hamilton's New CORPORATE ENERGY POLICY
REDUCES ENERGY - REDUCES COSTS - REDUCES EMISSIONS***

Office of Energy Initiatives

2. Compact Urban Form or Sprawl?

Urban Development Choices



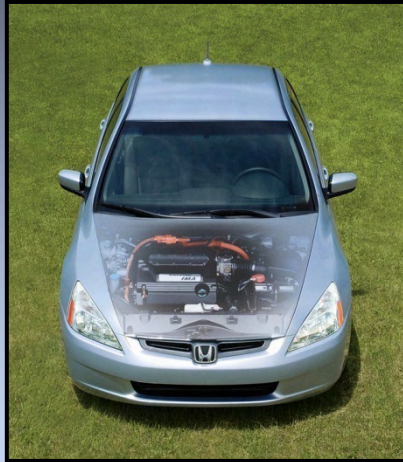
2. Transportation Choices and Air Pollution? Public Investment Choices



Except for Toronto and Montreal, Canadian cities have poorly developed public transit systems.¹⁰

2. Transportation Choices and Air Pollution?

Consumer Choices



Accord
Hybrid
vs.
Porsche
Cayenne



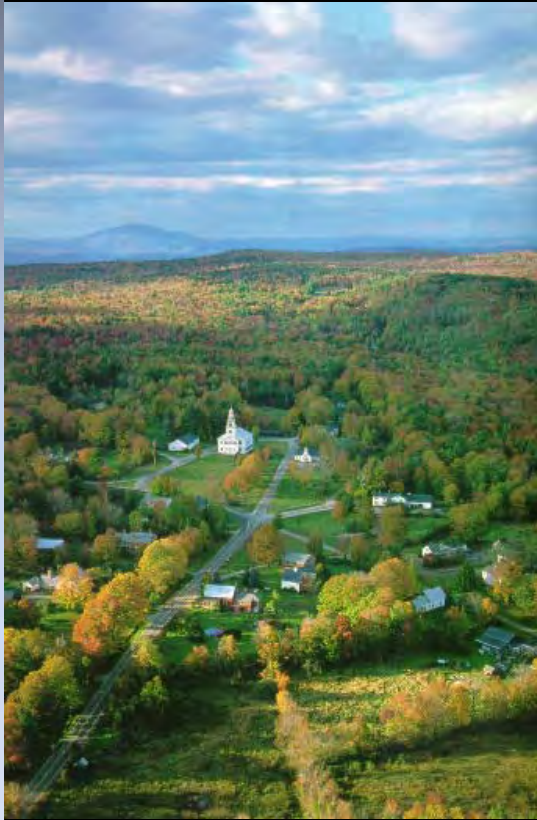
Toyota
Prius
vs.
Hummer
H2



2.

Designing Cities for Healthy Air

Clean Air Hamilton Conference 2004



Cyndi Rottenberg -Walker
Urban Strategies Inc.



2.

3. Reclaim existing before starting anew

Harbour Waterfront Project:
Redesign of an older
neighbourhood and
proposed reuse of
industrial lands.



2.

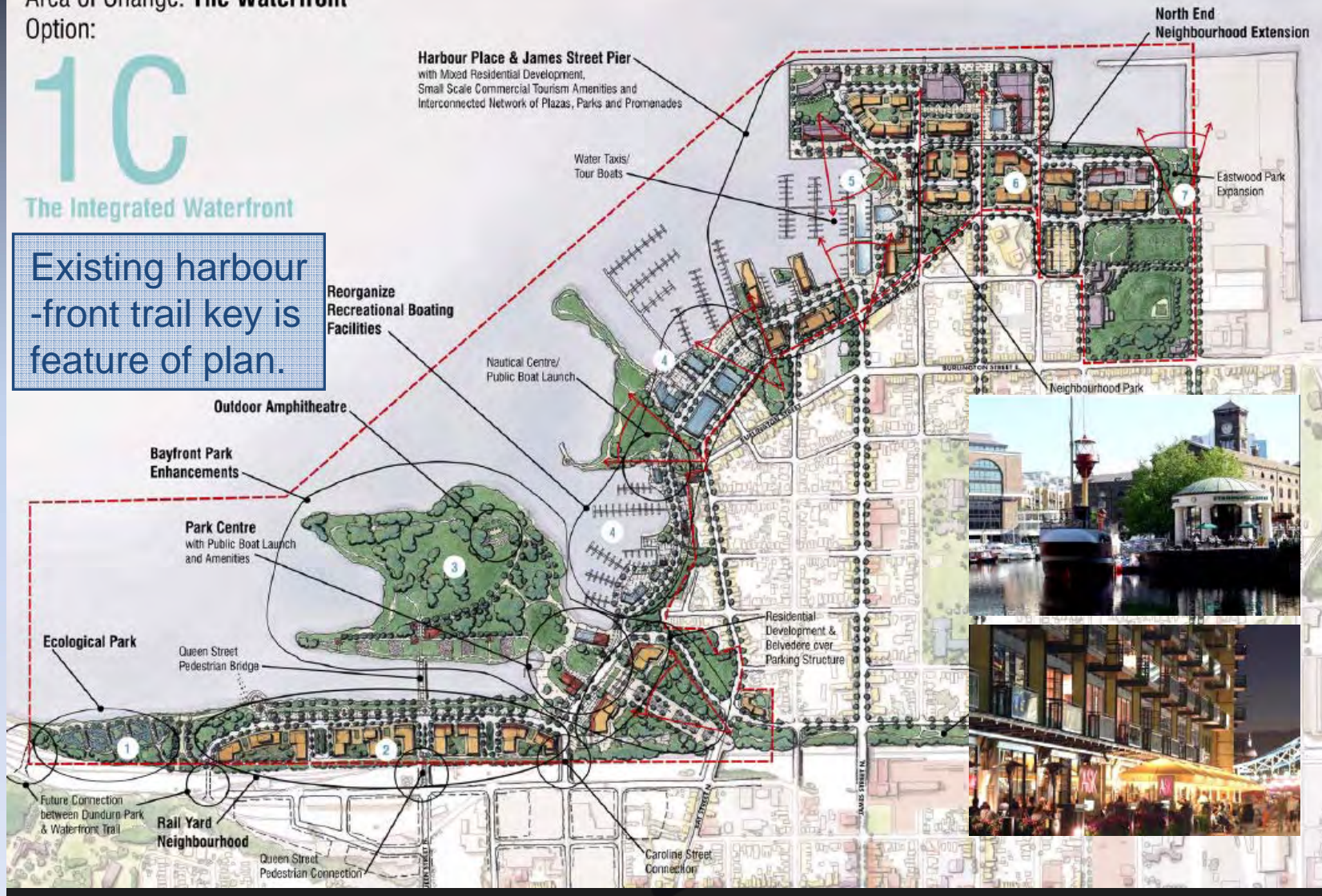
3. Reclaim existing before starting anew

Area of Change: **The Waterfront**
Option:

10

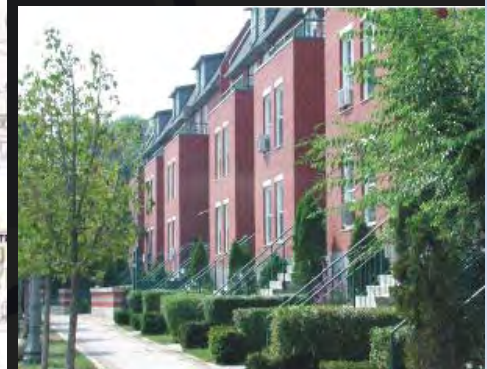
The Integrated Waterfront

Existing harbour
-front trail key is
feature of plan.



2.

3. Reclaim existing before starting anew



Walking and biking spaces are key features of plan.

3. Water Quality Issues Never Go Away

- **Drinking Water Issues**

- Hamilton's drinking water quality is one of the best in N.A.
- Walkerton - a modern wake-up call for governments
- Urban and rural water quality issues are very different
- Water disinfection by-product exposures "on the horizon."

- **Waste Water Issues**

- Sewage treatment plant upgrades are very expensive
- Hamilton will spend \$500M+ to upgrade its STP over 20 years.
- Sewage sludge disposal issues remain unresolved.
- Prescription drugs and personal care products in STP effluents.

4. Poor Air Quality - A Serious Public Health Problem Around the World

- Health effects impacts of poor air quality result from exposures to fine particles and certain gases.
- Ontario Medical Association study (2005):
 1. 5800 premature deaths per year in Ontario due to poor air quality.
 2. Cost to Ontario economy: \$16B per year!
- Clean Air Hamilton study (2003)

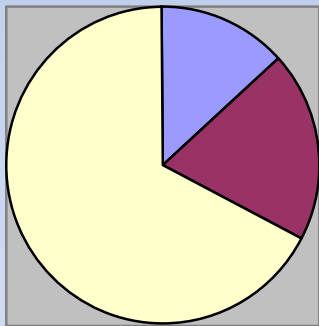
In Hamilton, each year poor air quality results in at least:

 - 100 premature deaths
 - 250 hospital admissions for respiratory problems
 - 825 hospital admissions for cardiovascular problems
 - This represents impacts on only ~350,000 people!

Health Effects Impacts of Air Pollution:

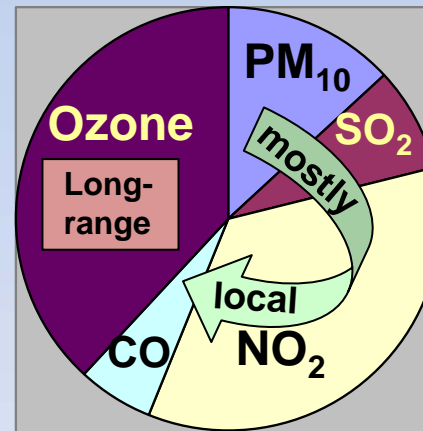
What can be done to reduce exposures and health impacts?

Figure 2: Air Pollution Health Impacts in Hamilton



- Premature Deaths
~100/year
- Respiratory Hospital Admissions
- Cardiovascular Hospital Admissions

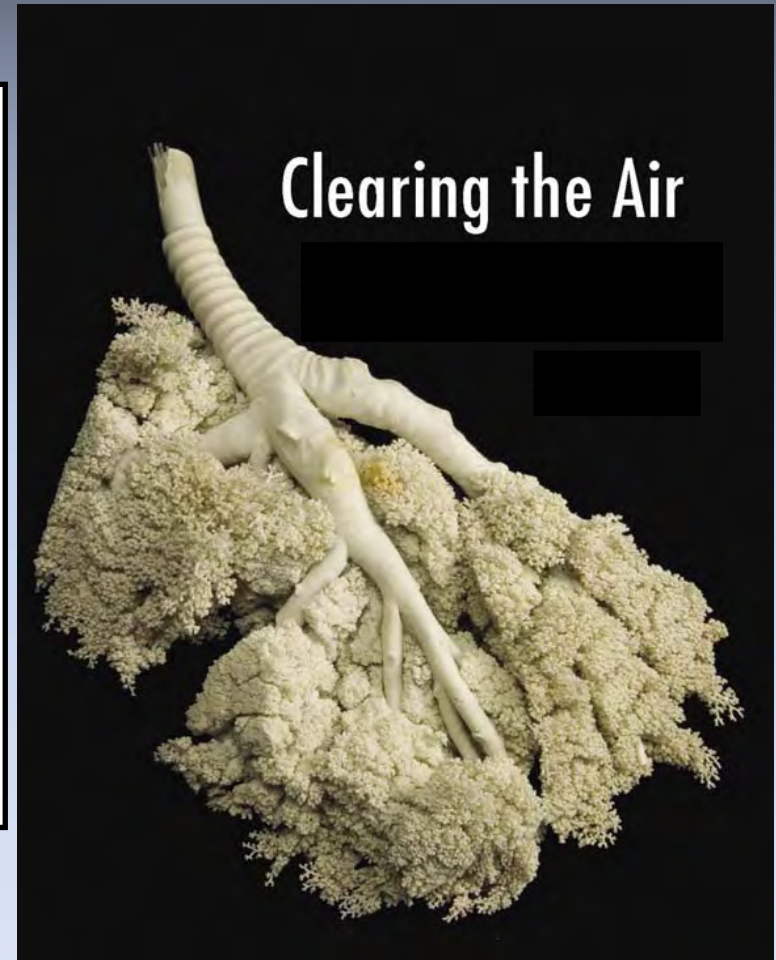
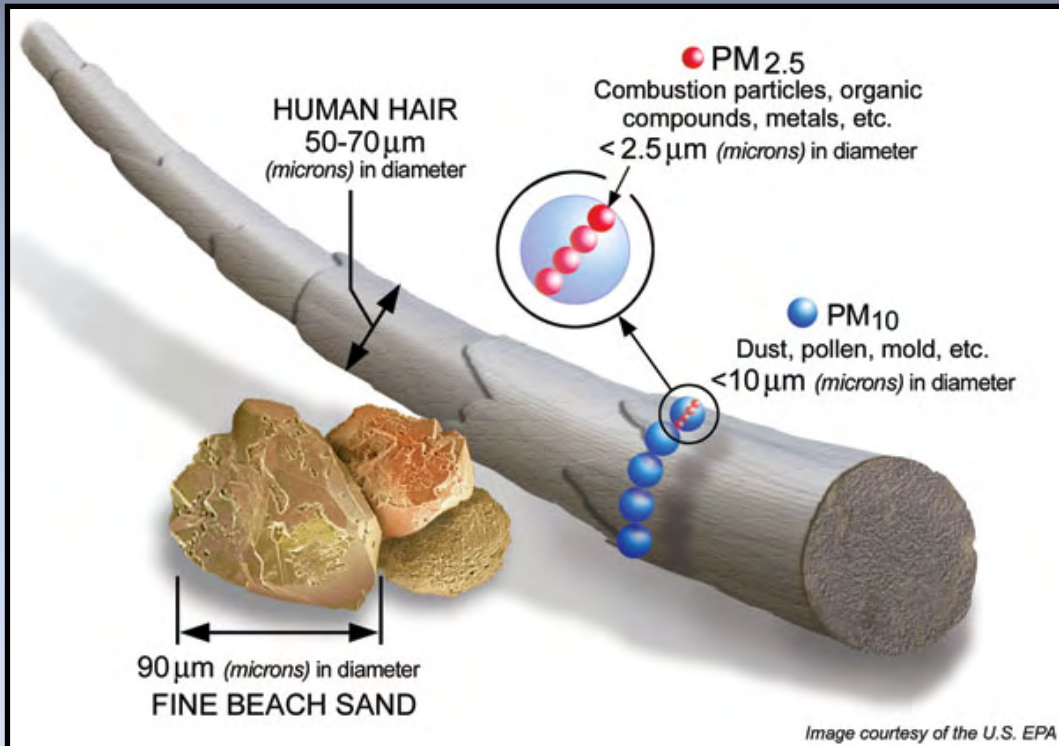
Figure 3: Contribution of Air Pollutants to Air Pollutant Health Impacts, Hamilton (%)



- PM10
- SO₂
- NO₂
- CO
- Ozone

“We” can control local emissions

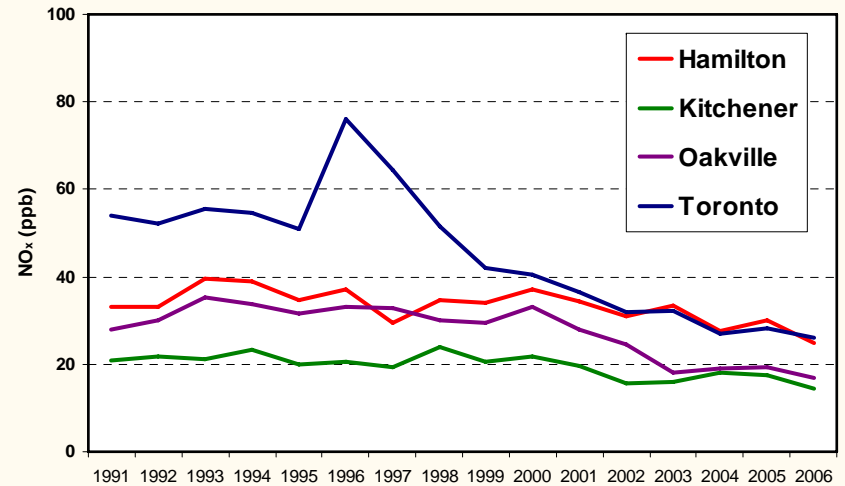
Fine Air Particulate Matter (PM₁₀ and PM_{2.5}) Enters the Upper and Lower Regions of the Lung



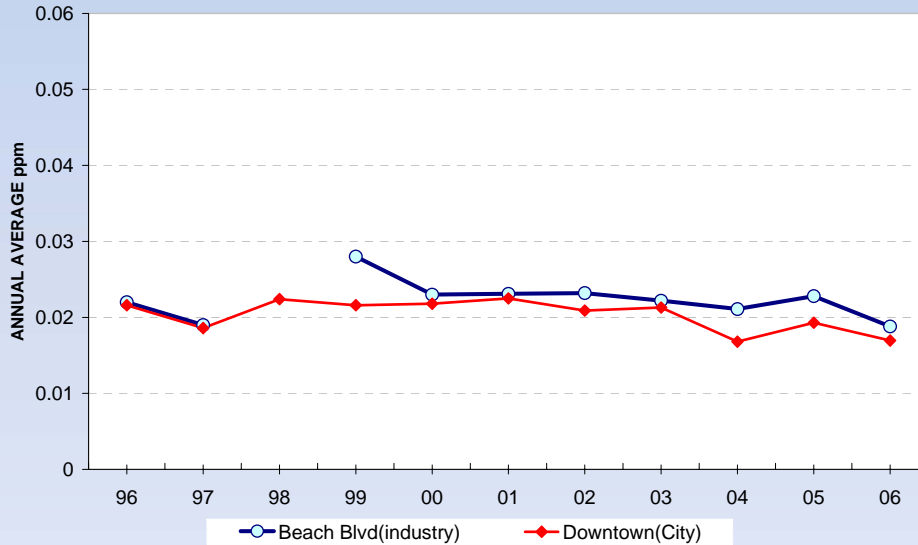
Air Quality Trends: Nitrogen Oxides

Local, Southern Ontario
and Emissions by Sector

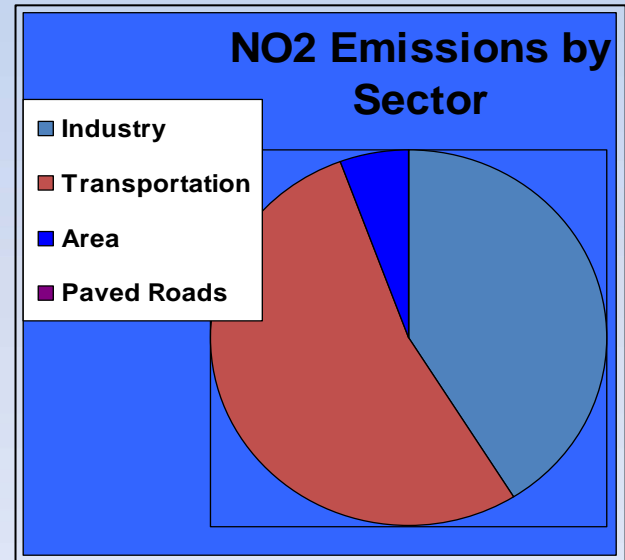
15-Year Trends in Nitrogen Oxides in (Four Cities)



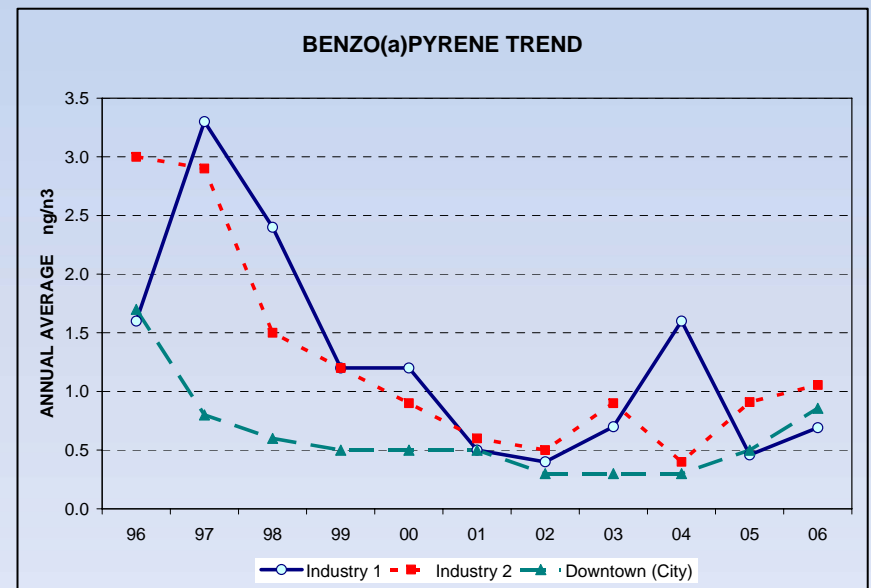
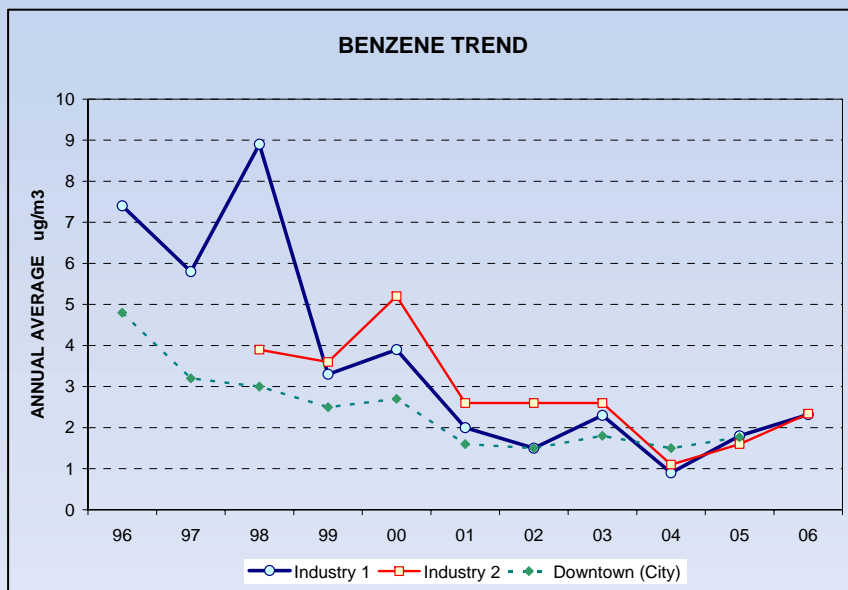
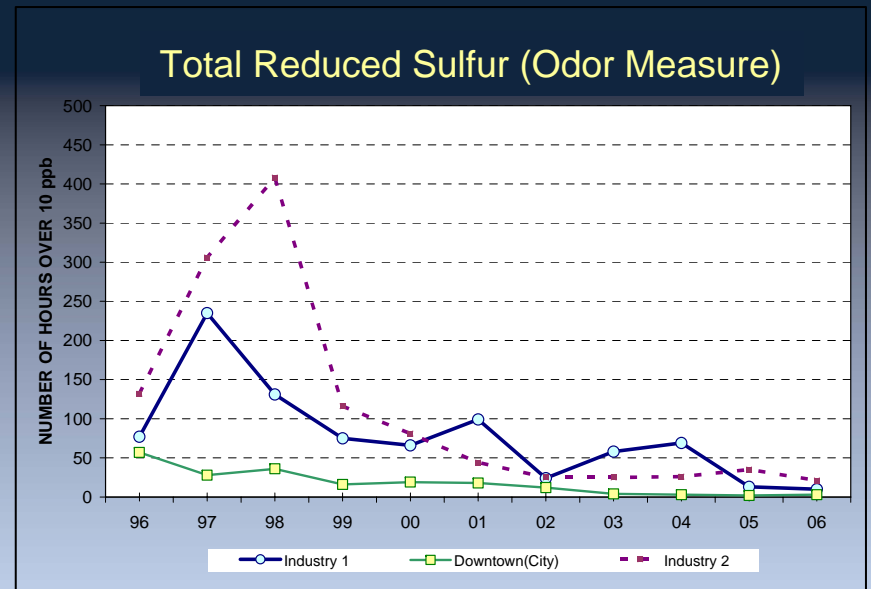
NITROGEN DIOXIDE TREND



NO2 Emissions by Sector

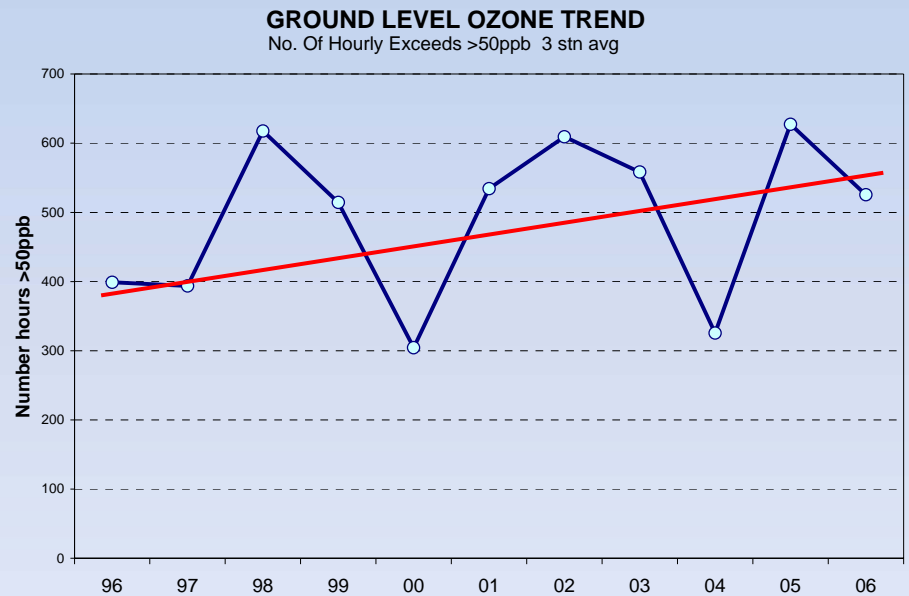
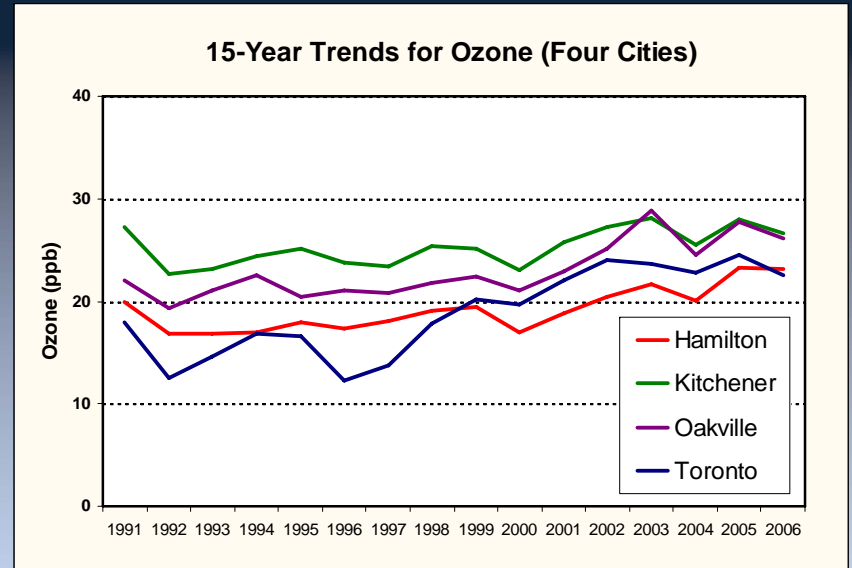
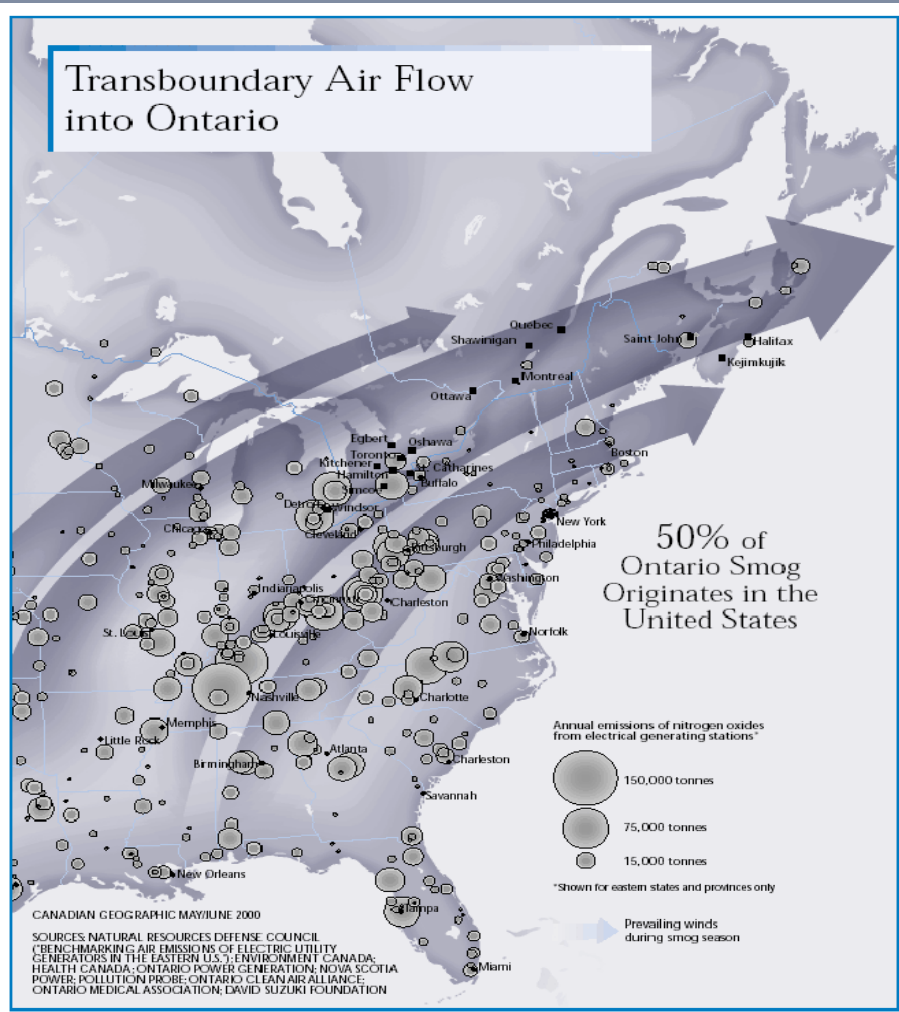


Emissions reductions by steel industry in recent years have resulted in measurable improvements in air quality in Hamilton over past 10 years.

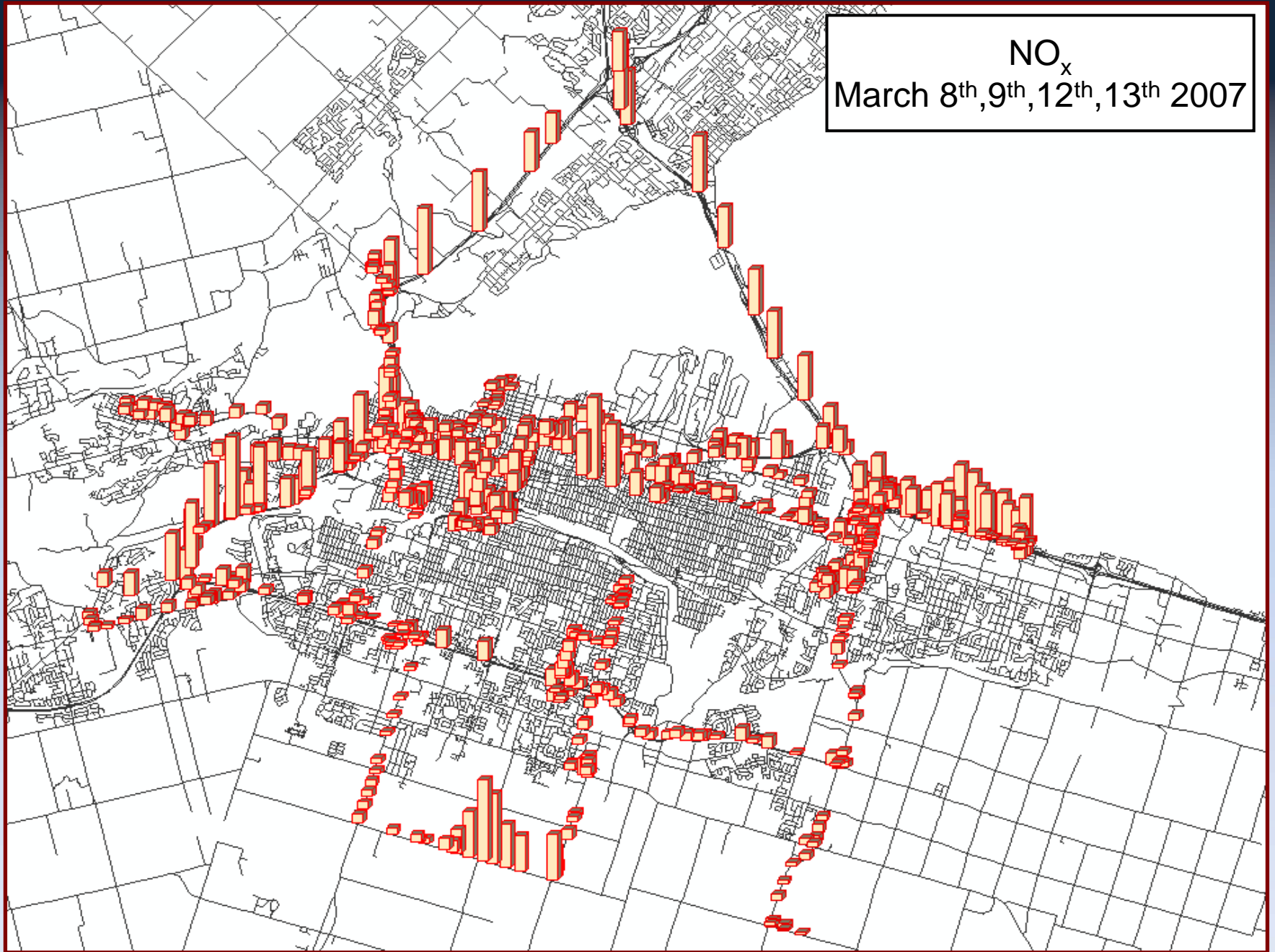


Air Quality Trends: Ozone

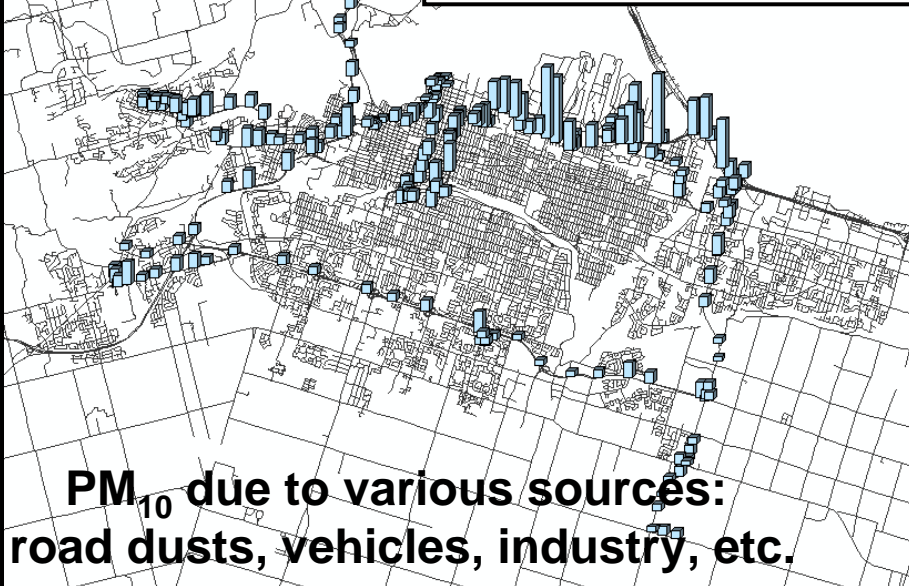
Local, Southern Ontario, Trans-boundary Impacts



NO_x
March 8th, 9th, 12th, 13th 2007



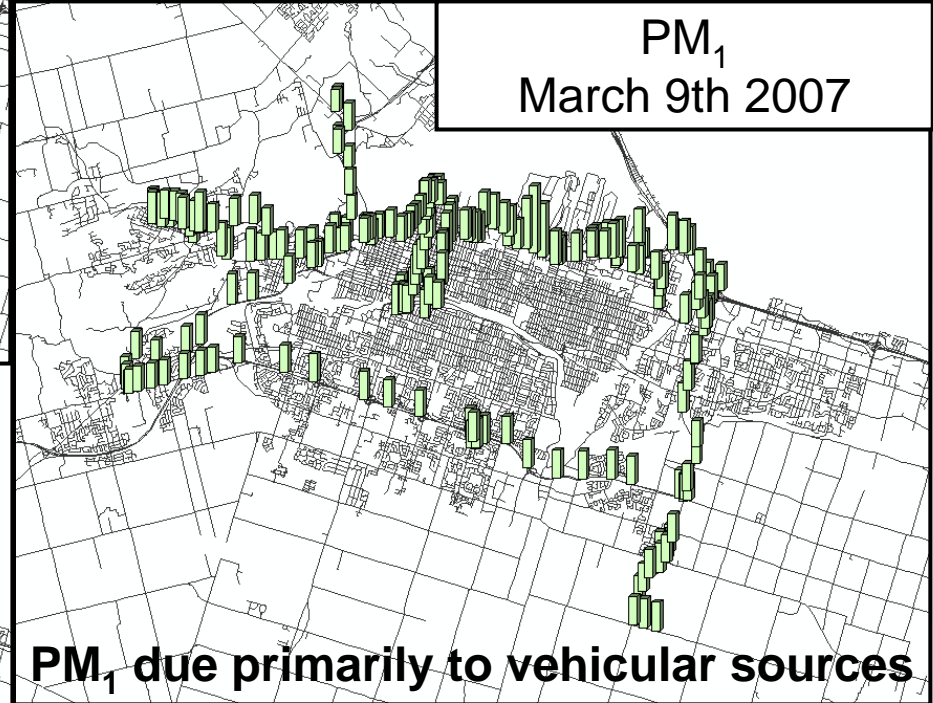
PM₁₀
March 9th 2007



PM₁₀ due to various sources:
road dusts, vehicles, industry, etc.

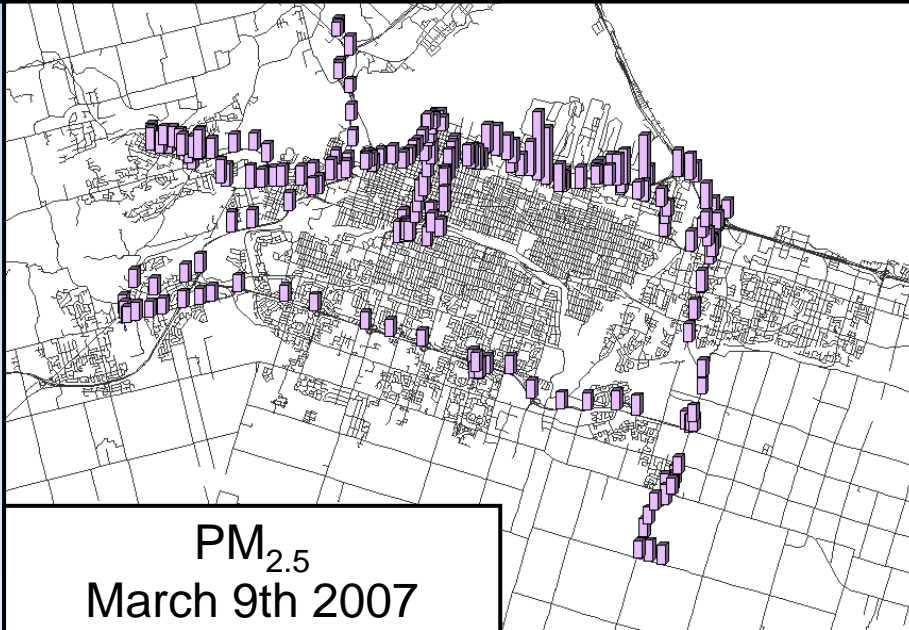
PM₁ levels are surprisingly
uniform across the City
compared to PM₁₀ levels.

PM₁
March 9th 2007

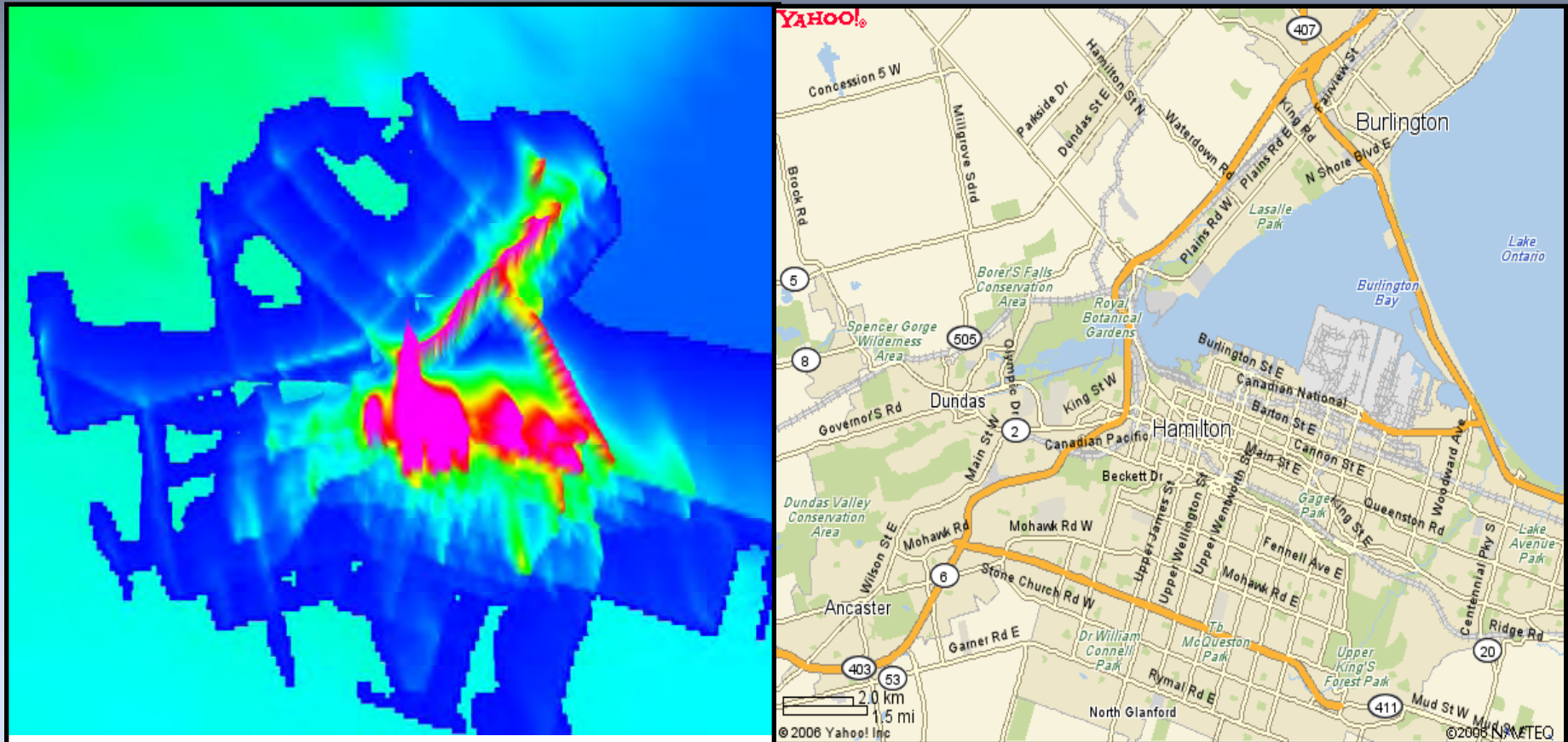


PM₁ due primarily to vehicular sources

PM_{2.5}
March 9th 2007



Modeling of Traffic Emissions of Volatile Organic Compounds (VOCs) in Hamilton



Courtesy of Dr. J. Wallace, McMaster Spatial Analysis Group

Map: Yahoo

Sustainable Planning: Actions and Changes for the Future

- **Sustainable Needs for the Future:**
 - Urban Planning: need for compact, sustainable urban developments
 - Public Transit: need for continued investments
 - Energy Efficiencies: need for improvements in vehicles, homes, etc.
 - Alternative Fuels & Energy Technologies: City should lead the way
 - **Continued Emissions Reductions: by both industry and citizens**
 - **Emissions Reductions from US Coal-fired Power Plants: reduce ozone.**
 - **Continuing Partnerships Important: between City, MOE, Env. Canada, local industries, McMaster Univ., citizens**
- **Poor Air Quality Trends is a serious public health issue:**
 - **Significant reductions in combustion-derived emissions**
 - **PM, NO₂, SO₂ and odours are locally generated, and therefore locally manageable.**
 - **Anti-idling By-law: recently passed - a step in the right direction.**
 - **Road Dust: need for increased street sweeping of traffic corridors**

Bottom Line: extraordinarily large infrastructure expenses required to attain sustainability.



Thank You

On Behalf of
Clean Air Hamilton