



Climate action for a  
healthy, **equitable**,  
prosperous **Toronto.**

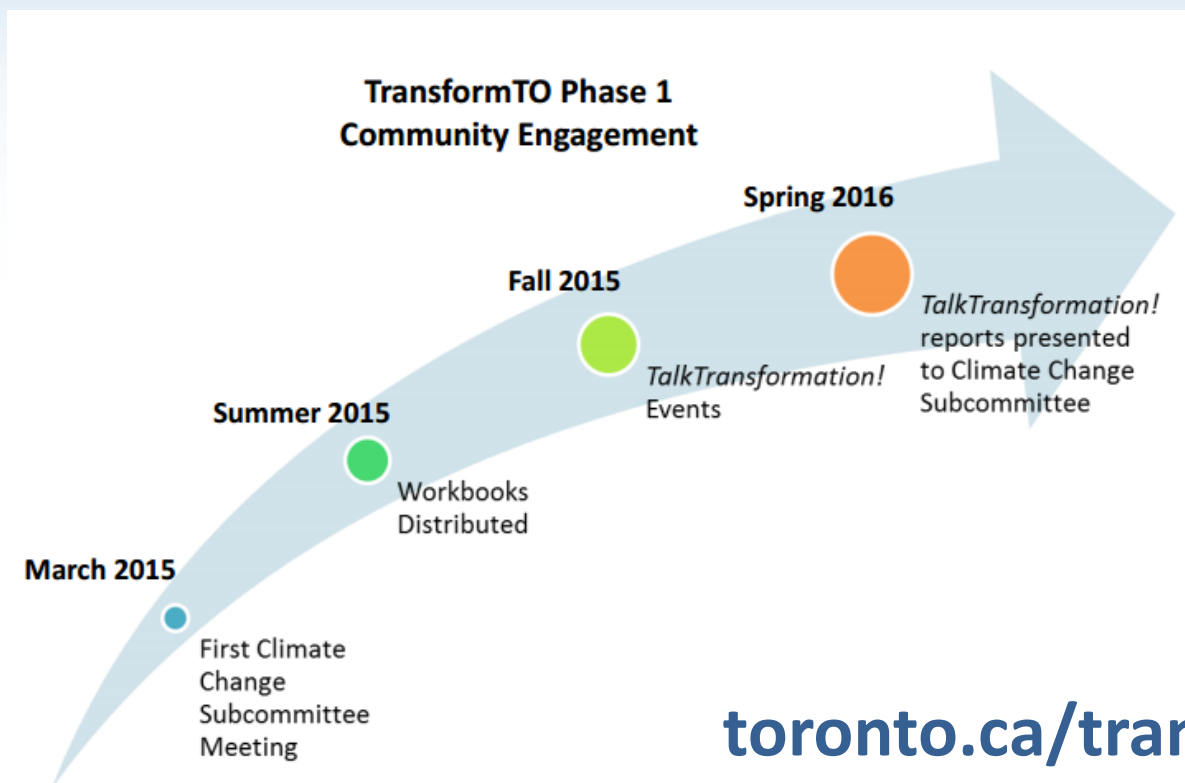
# TALK

# transformation!

**TRANSPORTATION – LOW-CARBON MOBILITY IN  
TORONTO**



Climate action for a  
healthy, **equitable**,  
prosperous **Toronto**.



[toronto.ca/transformTO](http://toronto.ca/transformTO)



# TALK transformation!



## Low-Carbon Transportation in Toronto

What does the community  
have to say?

Summary of workbook ideas

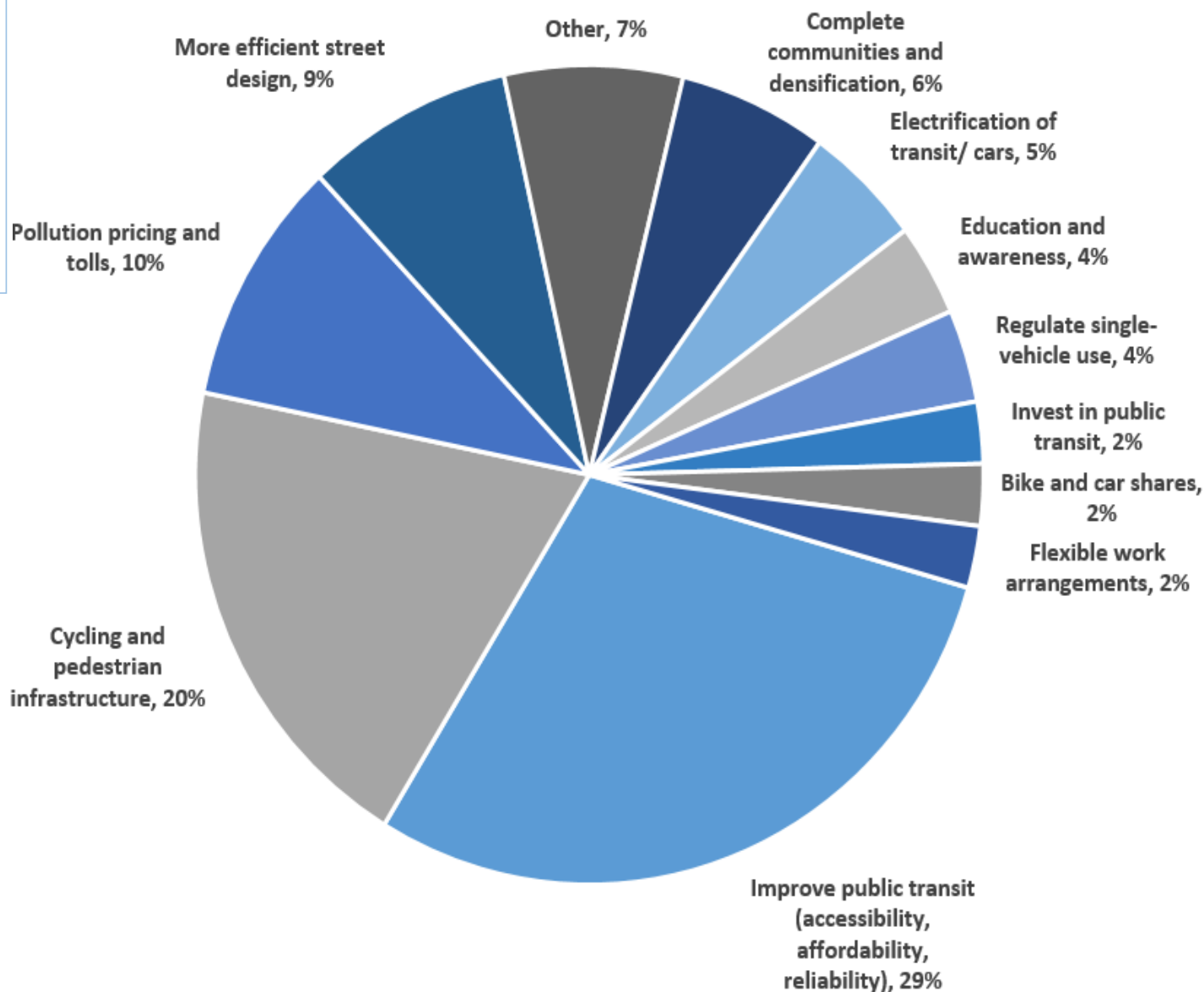


**TORONTO**

**Live  
green**  
Toronto

**TORONTO  
ATMOSPHERIC  
FUND**

## Low-Carbon Transportation Ideas



# Where do Toronto's **greenhouse gas emissions** come from?\*



**Transportation**  
(road vehicles)

41%

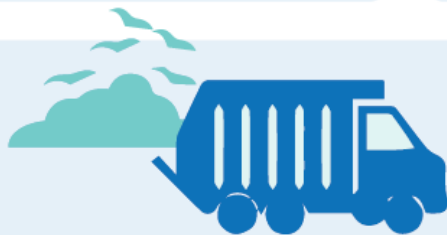


**Residential**

21%

**Commercial  
& Industry** (small)

21%



**Waste Management**  
(transportation, landfill)

11%



**Commercial  
& Industry**  
(large)

6%

\* Based on 2012 emissions of 21 million tonnes



Climate action for a  
healthy, **equitable**,  
prosperous **Toronto.**

# TALK

# transformation!

**TRANSPORTATION – LOW-CARBON MOBILITY IN  
TORONTO**

# #TransformTO



# @LiveGreenTO





PLANNING A GREAT CITY  
**TOGETHER**

# Being the Change

#TransformTO  
November 26 2015

Hilary Holden, Director, Transit and Sustainable Transportation  
City Planning Division



# TRANSPORTATION PLANNING SECTION OBLIGATORY ORG CHART



**Transportation Planning  
Director**



**Transit and Sustainable  
Transportation Director**



**Transportation  
Planning Districts**  
Toronto & East York  
Etobicoke York  
North York  
Scarborough



**Head  
Office**



**Transit  
Implementation  
Unit**



**Metrolinx  
Transit  
Program**





**We are specialized planning professionals  
who combine together transportation  
and land-use planning skills and expertise.**



**We plan sustainable and interconnected transportation networks to improve people's movement choices, to create vibrant public spaces, and to support economic prosperity --- improving the overall quality of life in the City of Toronto.**







## WHAT YOU CAN DO TO HELP BUILD A LOW-CARBON ECONOMY:

- Take public transit, walk, or bike to your destination
- Make your home more energy efficient
- Shop local and purchase products with less packaging
- Compost organic material instead of sending it to the landfill

# Moving Less results from good planning



# Electrification of Transit







# TALK

# transformation!



## Low Carbon Mobility

November 26, 2015

**Ashley Curtis**

Director, Transportation Infrastructure Management  
Transportation Services Division, City of Toronto





# Transportation Infrastructure

Transportation Services manages \$13.5 billion in transportation assets, including more than:

- 5,600 km of roads
- 7,900 km of sidewalks
- 856 km of bike lanes, trails, and routes
- 900 bridges and culverts
- 2,300 traffic signals
- 17,000 bike parking stands
- 480 pedestrian crosswalks
- 1,000,000 signs
- 4,000 bus shelters
- 10,000 pieces of street furniture



# Challenges

- **Transportation accounts for over 40% of Toronto's overall greenhouse gas emissions**
- **To achieve the 2050 reduction targets, GHG emission by the transportation sector must be reduced from 8.6 million tonnes (2004) to 1.3 million tonnes**
- **Growth - The City's Official Plan has targets of 3 million residents and 1.83 million employees by 2031**



# Progress

- Cycling and Pedestrian Infrastructure
- Optimization of Corridor Traffic Signal Timing
- LED Traffic Control Signals
- Clean Roads to Clean Air Program
- Tree Planting, Boulevard Naturalization Program
- Recycling of Asphalt
- Permeable and Porous Surfaces
- Environmental Preferred Pavement Markings
- Support the Green Fleet Plan
- Solar Powered Transit Shelters
- Wayfinding Strategy and Plan
- Car Sharing On-Street Permit Program





# Low-Carbon Transportation Future

## Themes

- **Mobility**
- **Design, Construction & Operation (DCO)**
- **Policies & Regulations**
- **Technology**
- **Awareness and Education**





# Mobility - Enhanced Public Transit

- Buses – coverage & frequency
- Light Rail Transit Lines
  - Eglinton Crosstown
  - Finch West
  - Sheppard
- Facilitate movement e.g. extension of Peak Hour Parking Restrictions
  - King St
  - College St/Carlton St
  - Queen St
  - Dundas St
- Enhanced Transit Priority
- Transit facilities – e.g. stops, ease of payment



# Mobility - Active Transportation

- **Cycling Infrastructure**
  - 10-year Network Plan
  - Expansion of Bike Share Program (Stations & Bikes)
  - Expansion of commuter and Multi-Use Trail facilities
  - Bike parking
- **Pedestrian Infrastructure**
  - Space
  - Essential links
  - Sidewalk provision!
  - Crossing provision incl. retiming
  - Year round maintenance





# DCO - Design & Management of Infrastructure

- Movement efficiency
- Complete Streets
- Expansion of High Occupancy Vehicle Network
- Improve Infrastructure Resiliency
- Infrastructure Enhancement



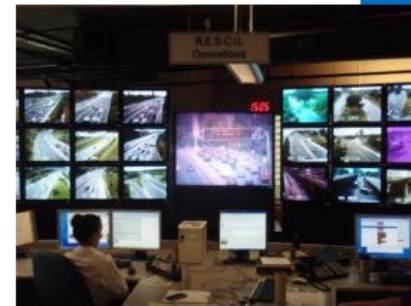


# DCO - Construction Practices and Materials

- **Enhance Construction Program: decrease lane closure and disruption; accelerate construction time – extended work hours**
- **New Asphalt and Concrete Specifications**
  - Implement a Warm Asphalt Program
  - Increase use of Asphalt Recycling Products
  - Alternate Concrete, decrease in GHG emissions at the production stage
- **Development of New Construction Processes, Materials & Practices**

# DCO – Operations

- Intelligent Transportation Systems
- Physical Infrastructure Changes
- Incident and Event Response
- Curb-side Management
- Expand Traveller Information
- Network coordination - Traffic Operation Centre
- Construction Coordination
- Travel Demand Management



**City of  
Toronto**

**Congestion  
Management  
Plan**

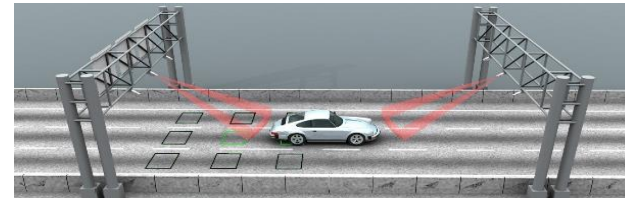
**2014-2018**



OCTOBER 2013

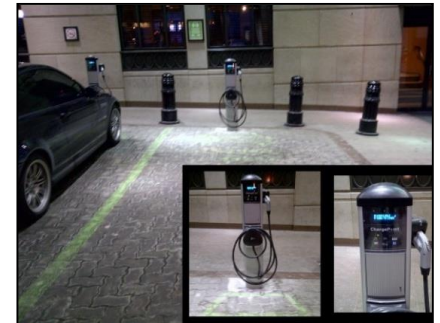
# Policies & Regulations

- Development & Growth
- Carbon Tax
- Route management e.g. Truck Route Policy
- Tolling and Congestion Pricing
  - **Tolling:** recover that infrastructures' capital, operating and maintenance costs.
  - **Pricing:** demand management tool:
    1. **Reduce Congestion** : increase travel time savings, provide consistent free-flow traffic and improve route reliability
    2. **Achieve Modal Shift** - use of non-car modes including transit
    3. **Reduce GHG Emissions** – reduce single car occupancy trips



# New Technology

- Alternative fuels – including Electrical Vehicles and Related Infrastructure
- Ongoing improvements in vehicle mpg and fuel standards
- Autonomous Vehicles
- Behavioural Modifications
  - On-line retail
  - Teleconference/videoconference
  - Telecommuting
  - Alternative work arrangements





# Awareness and Education

- Using all forms of media to communicate travel information, promote mode split and behaviour change.....
- TDM Programs
- Personal Travel Planning



**Rethink** your commute.

  
**Smart Commute**  
A Program of METROLINX

# OPTIONS FOR REDUCING GHG EMISSIONS FROM TRANSPORTATION

## TALK TRANSFORMATION! LOW CARBON TRANSPORTATION IN TORONTO

MARIANNE HATZOPOULOU

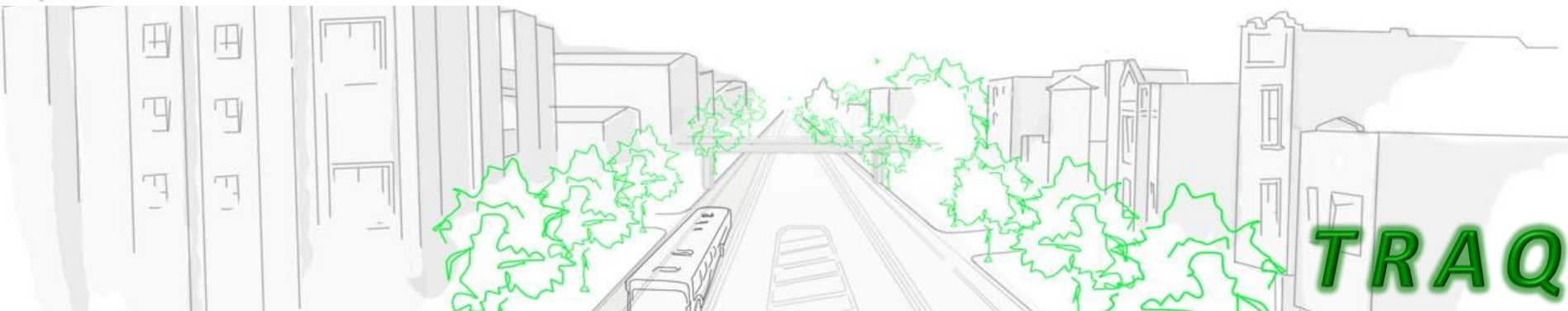
ASSOCIATE PROFESSOR, CIVIL ENGINEERING, UNIVERSITY OF TORONTO

[marianne.hatzopoulou@utoronto.ca](mailto:marianne.hatzopoulou@utoronto.ca)



UNIVERSITY of TORONTO

The Transportation & Air Quality Research Group



November 25, 2015

In order to brainstorm possibilities to reduce GHG emissions from transportation, we need to begin by investigating the:

## **SPATIAL DISTRIBUTION OF EMISSIONS**

**TRAQ**



# Where are the largest emitters? Where in the region do most of the emissions occur?

- I would like to start by introducing you to two studies demonstrating the spatial distribution of emissions in Toronto and Montreal

**TRAQ**

# Integrating an Activity-Based Travel Demand Model with Dynamic Traffic Assignment and Emission Models

## Implementation in the Greater Toronto, Canada, Area

Jiang Yang Hao, Marianne Hatzopoulou, and Eric J. Miller

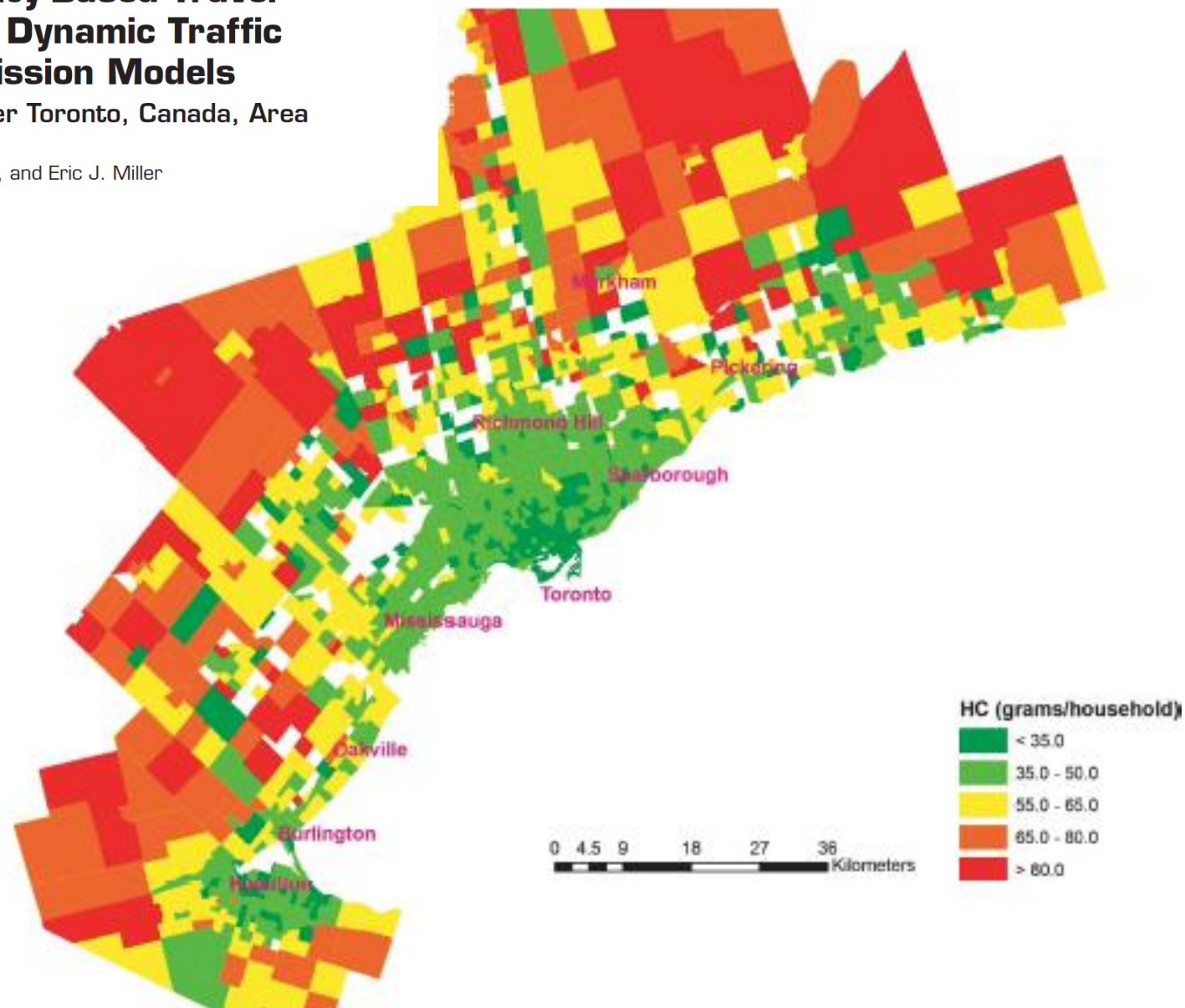


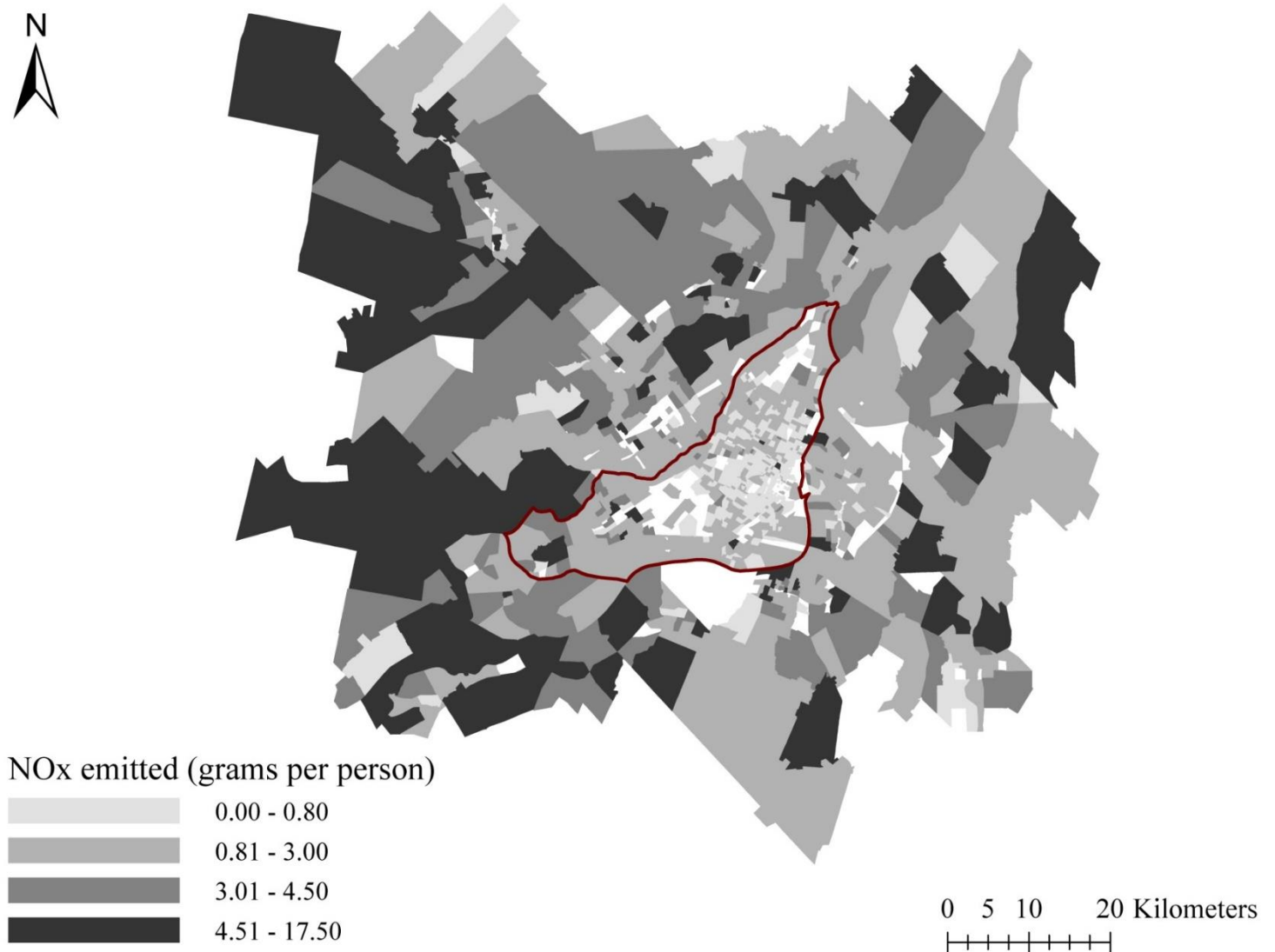
FIGURE 7 Analysis of household emissions.

# Land-use and socio-economics as determinants of traffic emissions and individual exposure to air pollution



Timothy Sider, Ahsan Alam, Mohamad Zukari, Hussam Dugum, Nathan Goldstein, Naveen Eluru, Marianne Hatzopoulou\*

*Department of Civil Engineering and Applied Mechanics, McGill University, 817 Sherbrooke St. W., Room 492, Montreal, QC H3A 2K6, Canada*

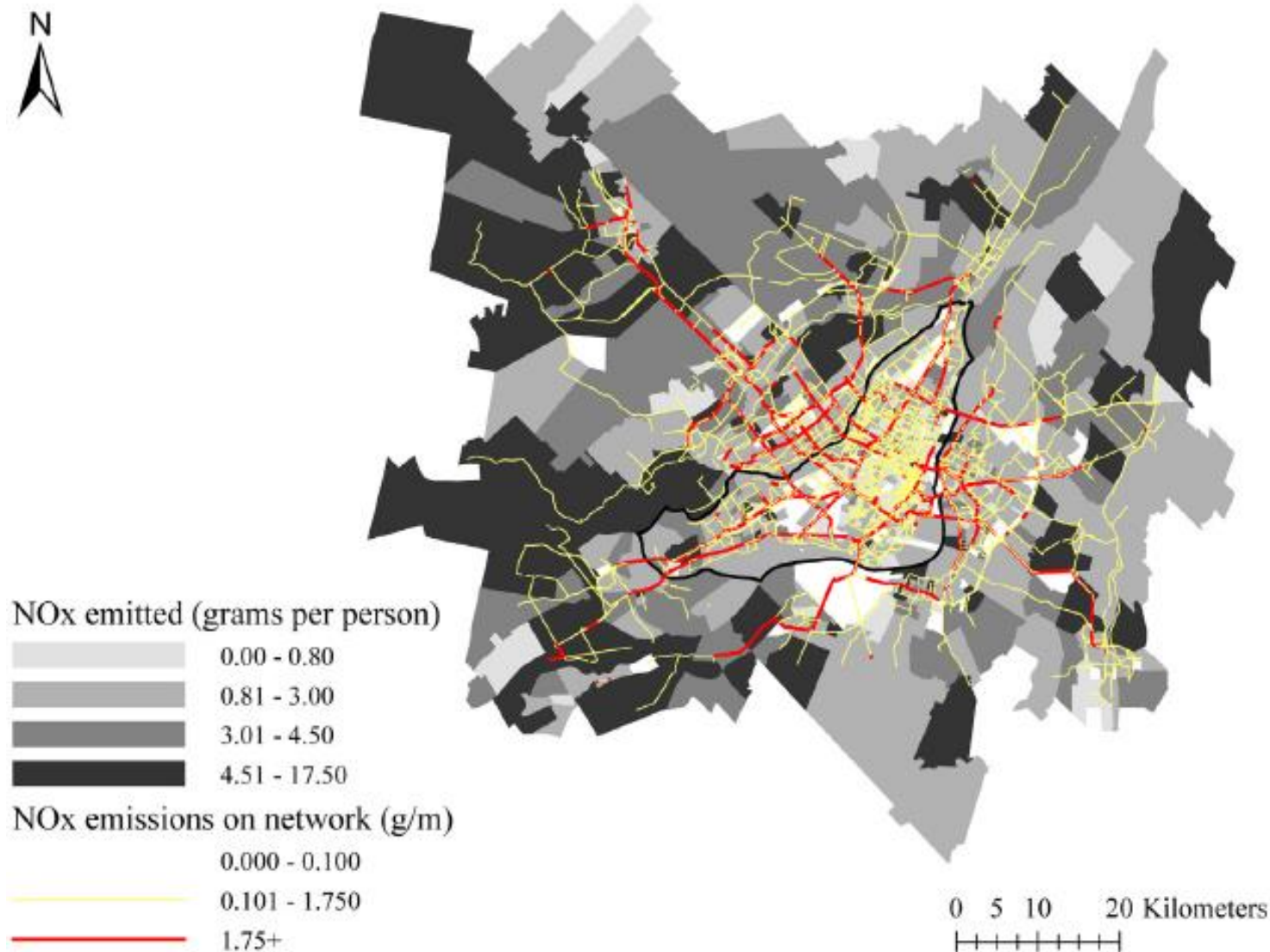


# Land-use and socio-economics as determinants of traffic emissions and individual exposure to air pollution



Timothy Sider, Ahsan Alam, Mohamad Zukari, Hussam Dugum, Nathan Goldstein, Naveen Eluru, Marianne Hatzopoulou\*

*Department of Civil Engineering and Applied Mechanics, McGill University, 817 Sherbrooke St. W., Room 492, Montreal, QC H3A 2K6, Canada*







Although the majority of emissions are “experienced” within the city boundary:

**MOST EMISSIONS ARE ASSOCIATED WITH TRIPS ORIGINATING OR ENDING IN THE SUBURBS**

**TRAQ**

# Focus on the Suburbs

- Better regional transit
- Options to access transit using active transportation both at the origin and at the destination
  - “Reverse commuters”
- System approach to transit investments
- Active transportation in the suburbs
  - Most short trips that occur within the suburbs are done by car

# Focus on the Suburbs Co-benefits of GHG reduction policies

- Air pollution
- Physical activity
- Health

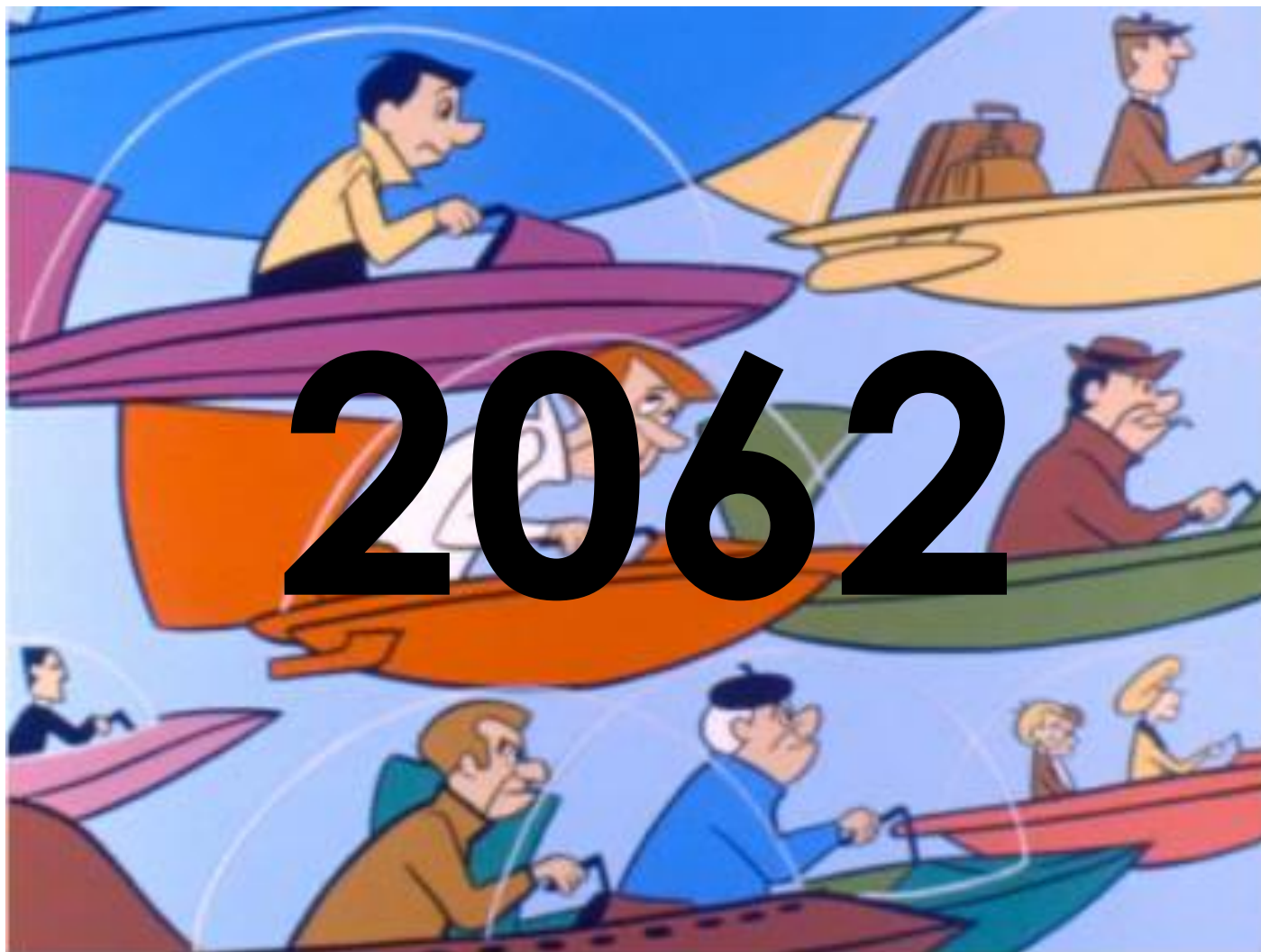
***TRAQ***





# Talk Transformation: Low Carbon Mobility

Adam Arnold, URBANTRANS  
November 15, 2015



# The Future is CHOICE

A range of options to suit different needs

Equality of access to alternative modes

Expansion of infrastructure and technology: not just in transportation, but in work practices and broader society



Make driving alone less appealing  
and convenient



Road pricing  
Congestion  
Parking



## Position the new alternatives better



- Make the alternative appealing TO THE USER
- Understand the market and shifting demographics: **35 years from now**
- Start NOW: construction mitigation as a gateway



## **A sea change in our priorities**

Where we live, where we work and  
our expectations of access

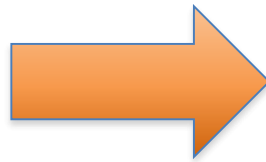
How we live, how we work

Give decision makers the confidence  
to make big decisions that support  
these priorities





# 35 Years from Now...



**...he thinks about mobility as much as he does now**



# Contact Information

**Adam Arnold**

UrbanTrans

416 452 1270

[arnolda@urbantrans.com](mailto:arnolda@urbantrans.com)





Climate action for a  
healthy, **equitable**,  
prosperous **Toronto.**

# TALK transformation!

TRANSPORTATION – LOW-CARBON  
MOBILITY IN TORONTO

Questions &  
Answers

# Thank you!

[toronto.ca/transformto](http://toronto.ca/transformto)

email: [transform@toronto.ca](mailto:transform@toronto.ca)



