DATA NEEDS FOR CONDUCTING HEALTH IMPACT ASSESSMENTS OF VARIOUS TRANSPORTATION INVESTMENT SCENARIOS FOR THE MONTREAL METROPOLITAN REGION

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HEALTHY CANADA BY DESIGN

CLASP – FACE TO FACE MEETING

NOVEMBER 21ST AND 22ND, 2013

WINNIPEG

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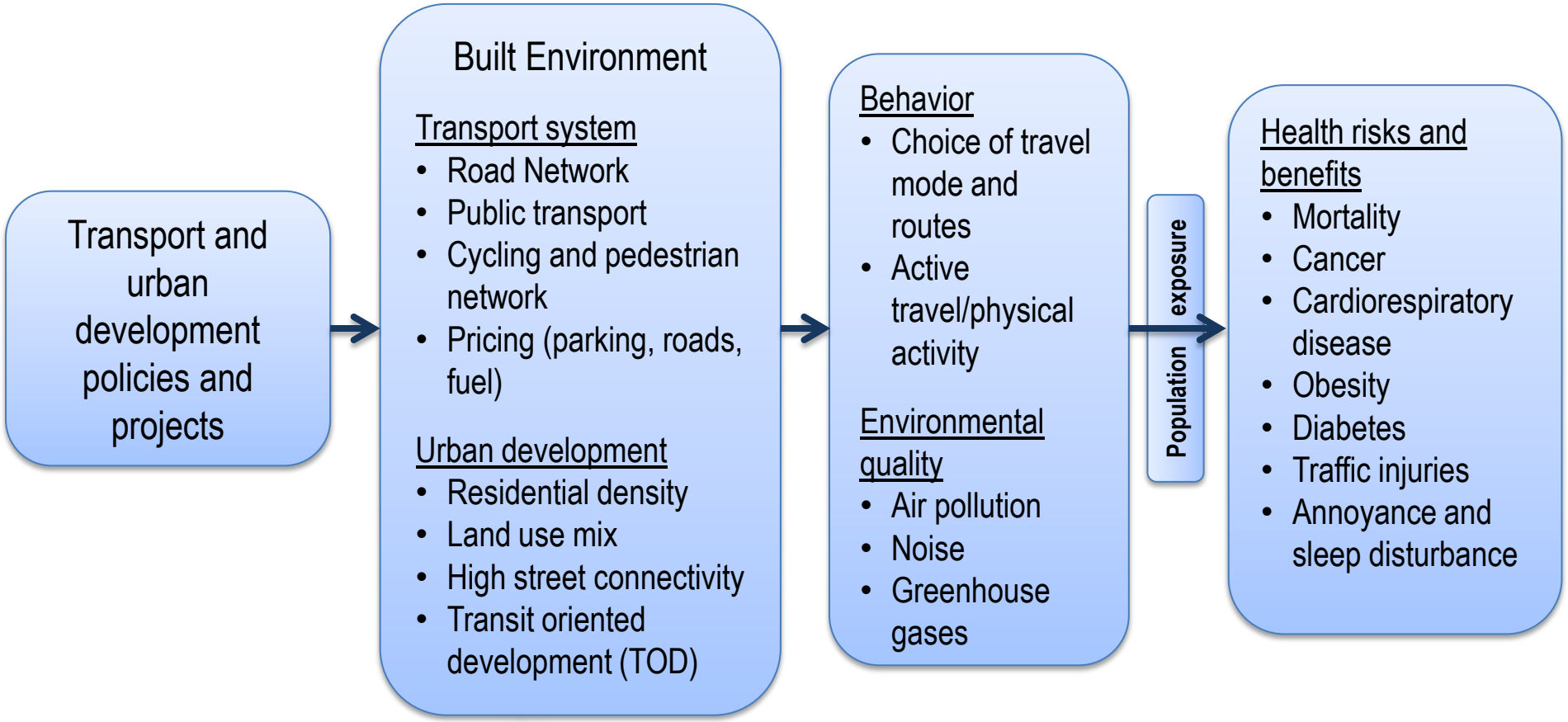
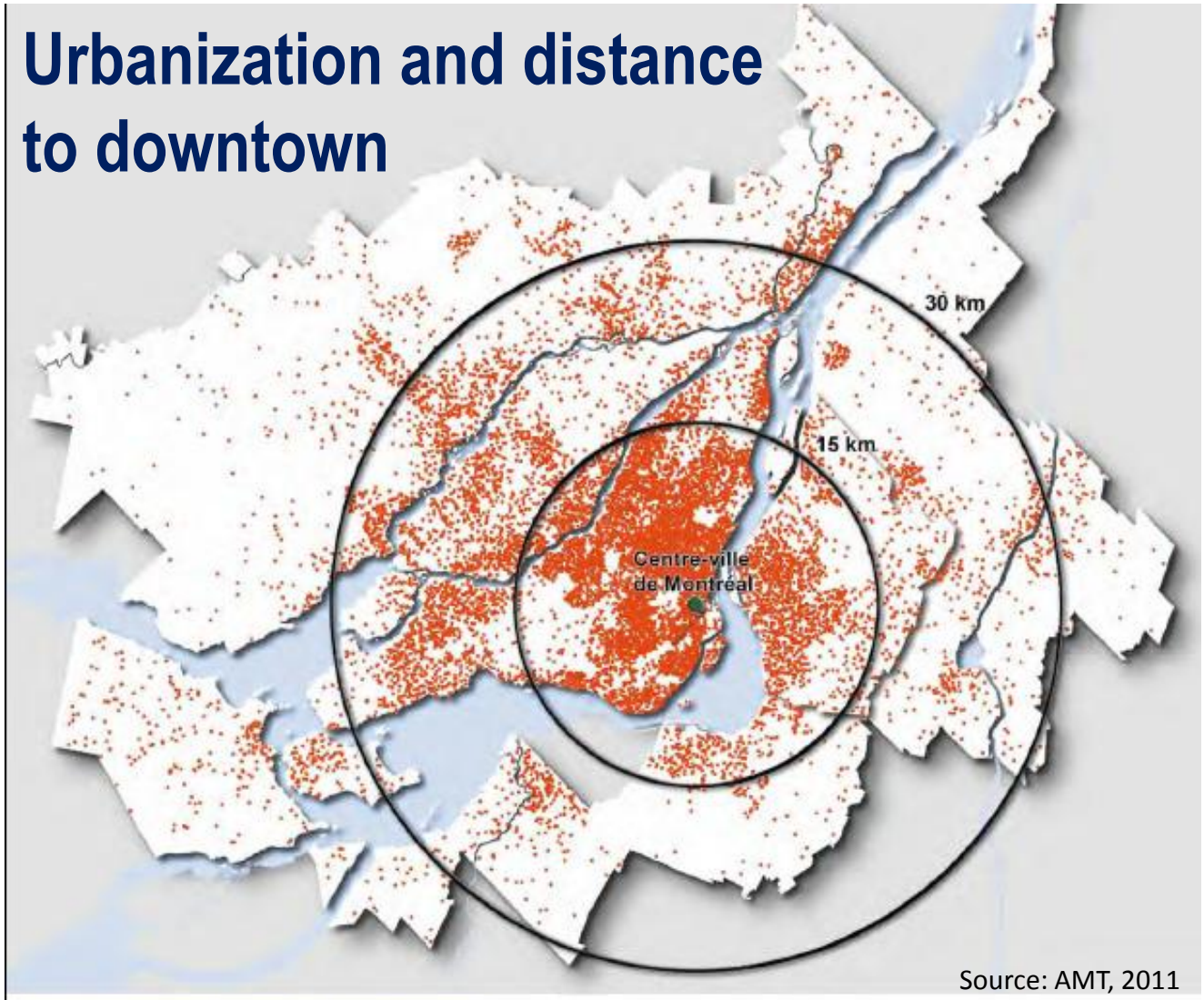
PLAN

- Environmental and public health issues associated with the transport system in Montreal
- Transport and urban development policies and projects underway in Montreal
- Integrated health impact assessment
  - Goals
  - Framework
  - Data needs

PUBLIC HEALTH IMPACTS OF TRANSPORT AND URBAN DEVELOPMENT SYSTEMS



Urbanization and distance to downtown

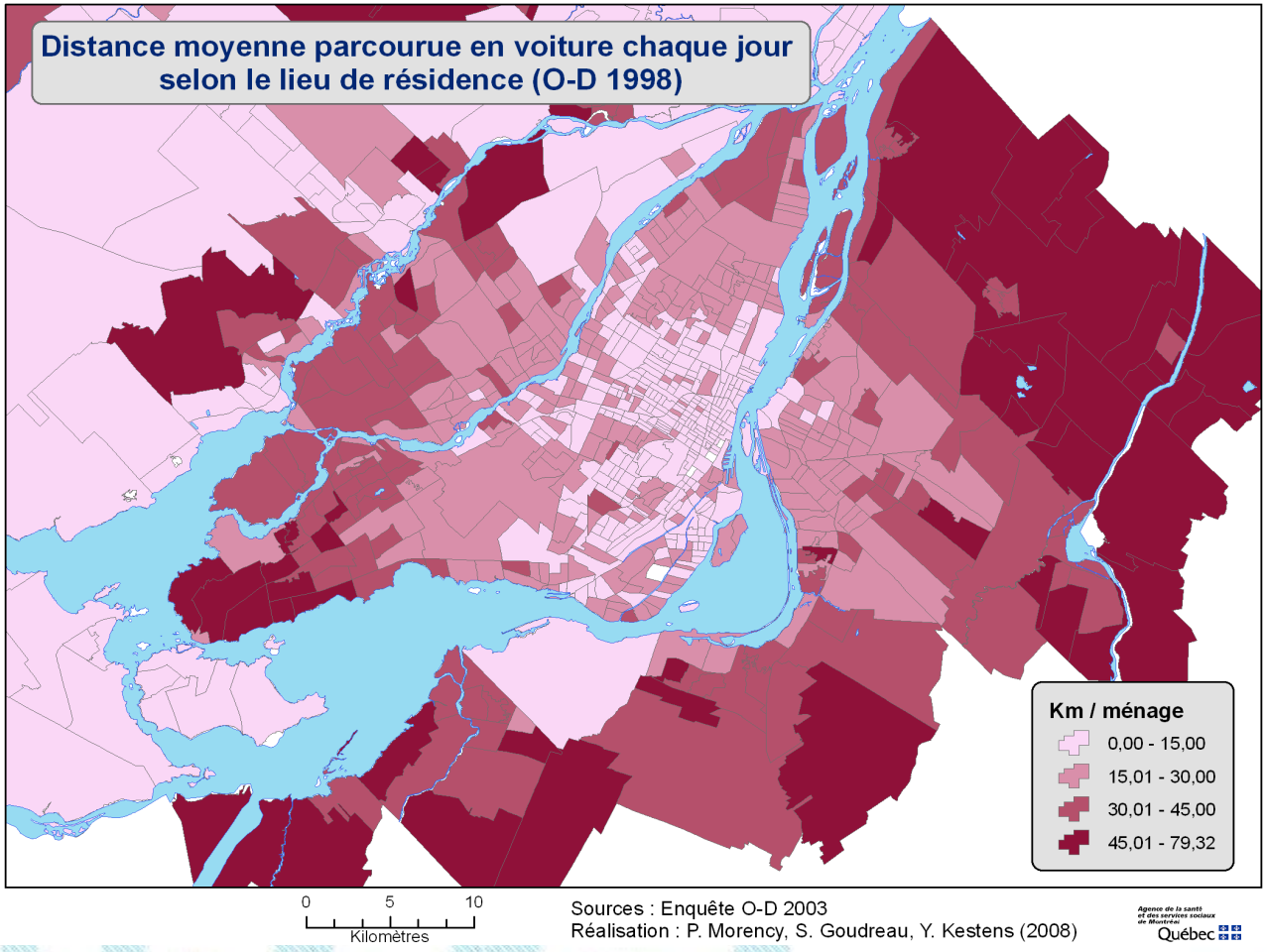


Source: AMT, 2011

Distance du centre-ville	Population centre-ville	% de la population du Grand Montréal
Moins de 15 km	2 125 000	60,3 %
15 à 30 km	1 129 000	32,0 %
Plus de 30 km	270 000	7,7 %

1 point = 250 personnes

DAILY DISTANCE TRAVELLED BASED ON PLACE OF RESIDENCE



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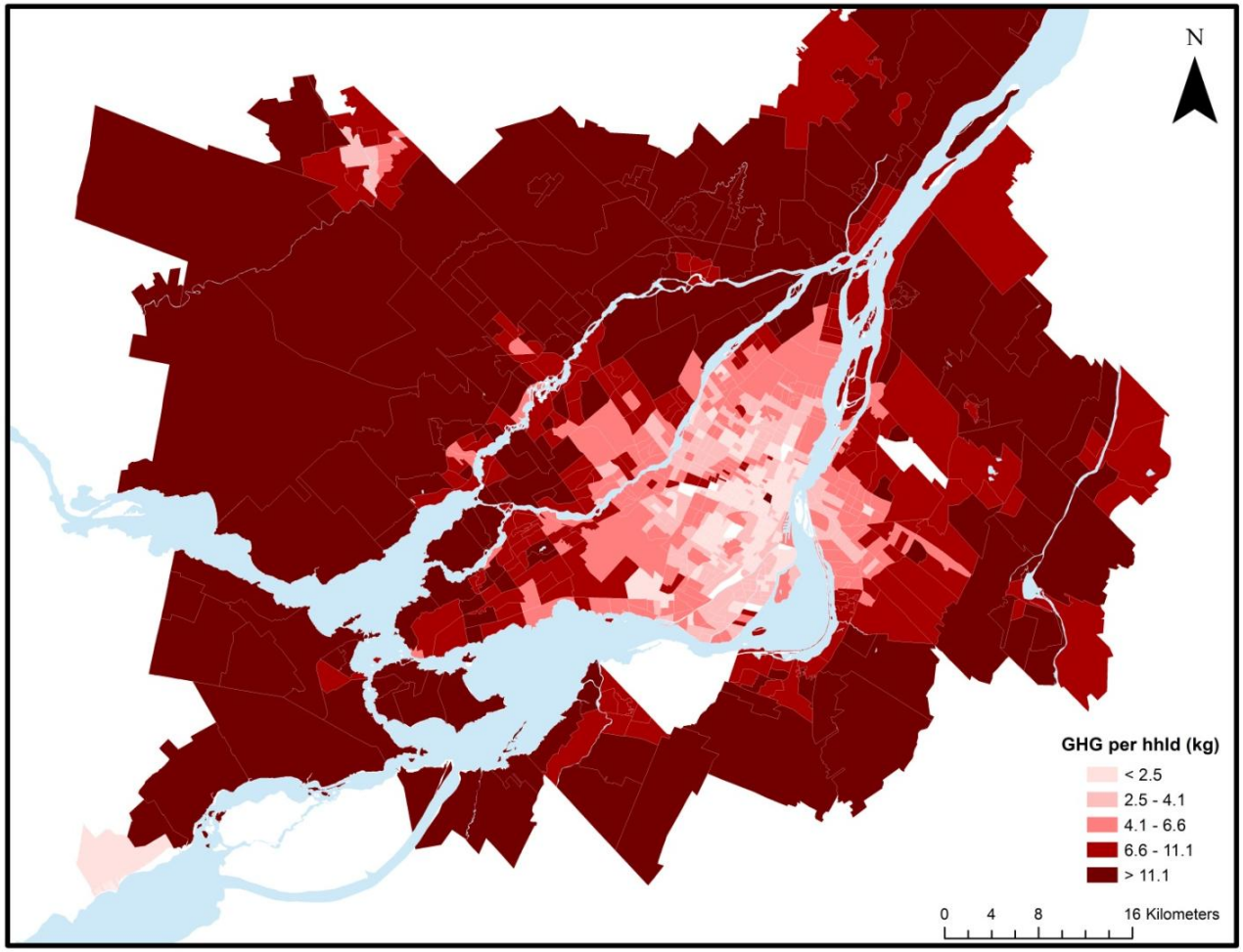
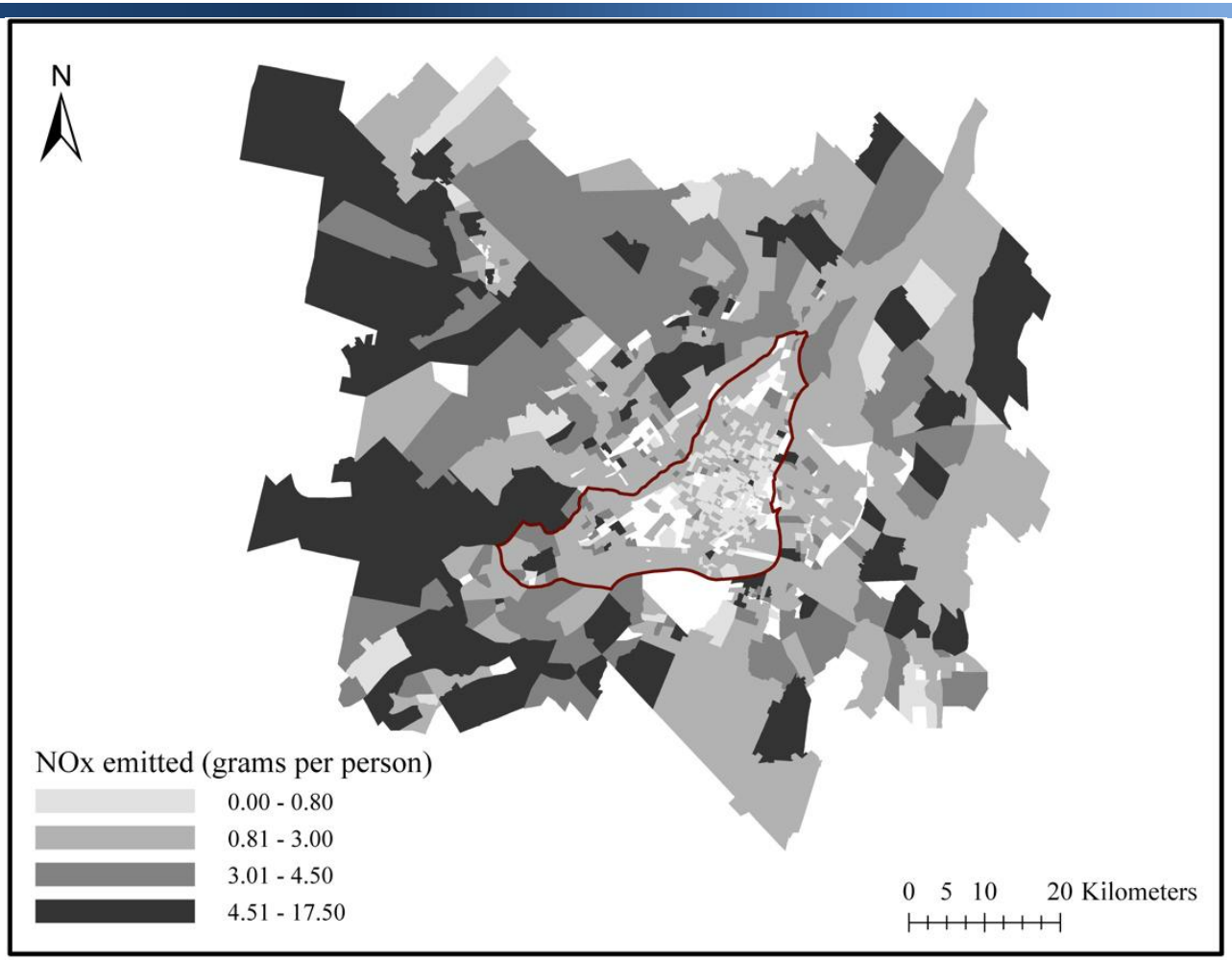
GHG PER HOUSEHOLD



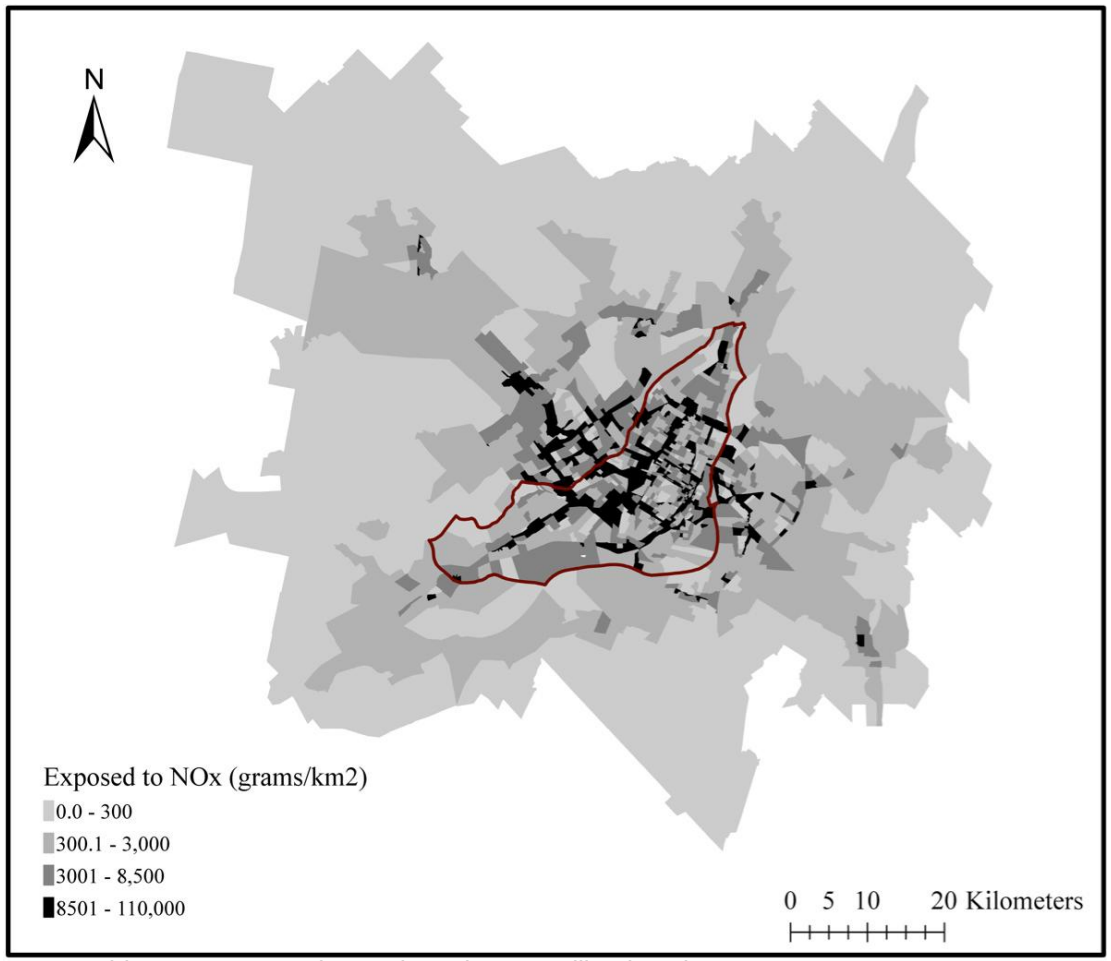
Source: M. Hatzopoulou, McGill university

EMITTED NO_X PER PERSON FOR THE MONTREAL METROPOLITAN REGION



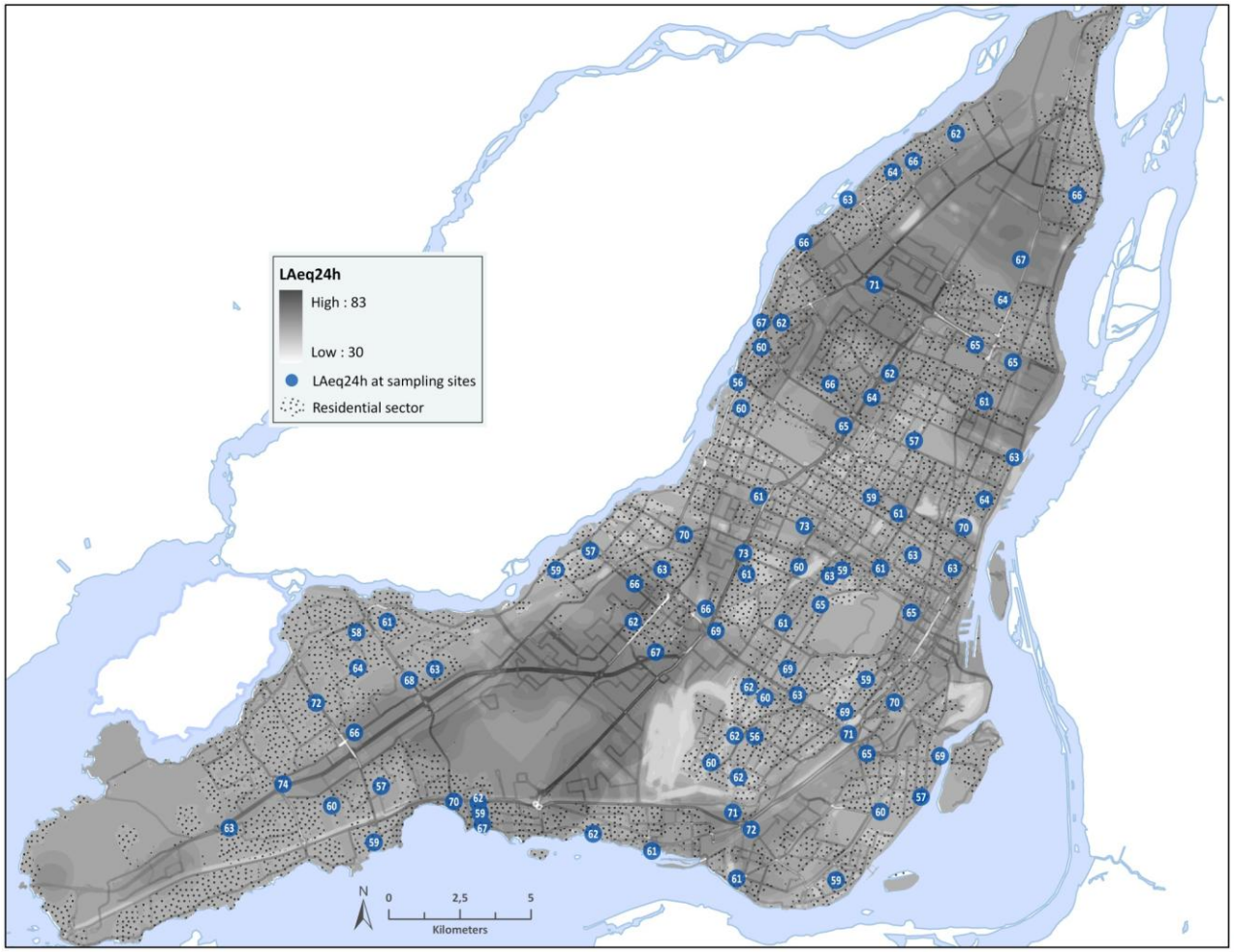
Source: M. Hatzopoulou, McGill university

EXPOSURE TO NO_X EMISSIONS PER KM^2 FOR THE MONTREAL METROPOLITAN REGION



Source: T. Sider, M. Haztopoulou and N. Eluru,McGill university

MODELLING OF NOISE LEVELS ON MONTREAL ISLAND



Source: S. Goudreau, Smargiassi et coll., submitted

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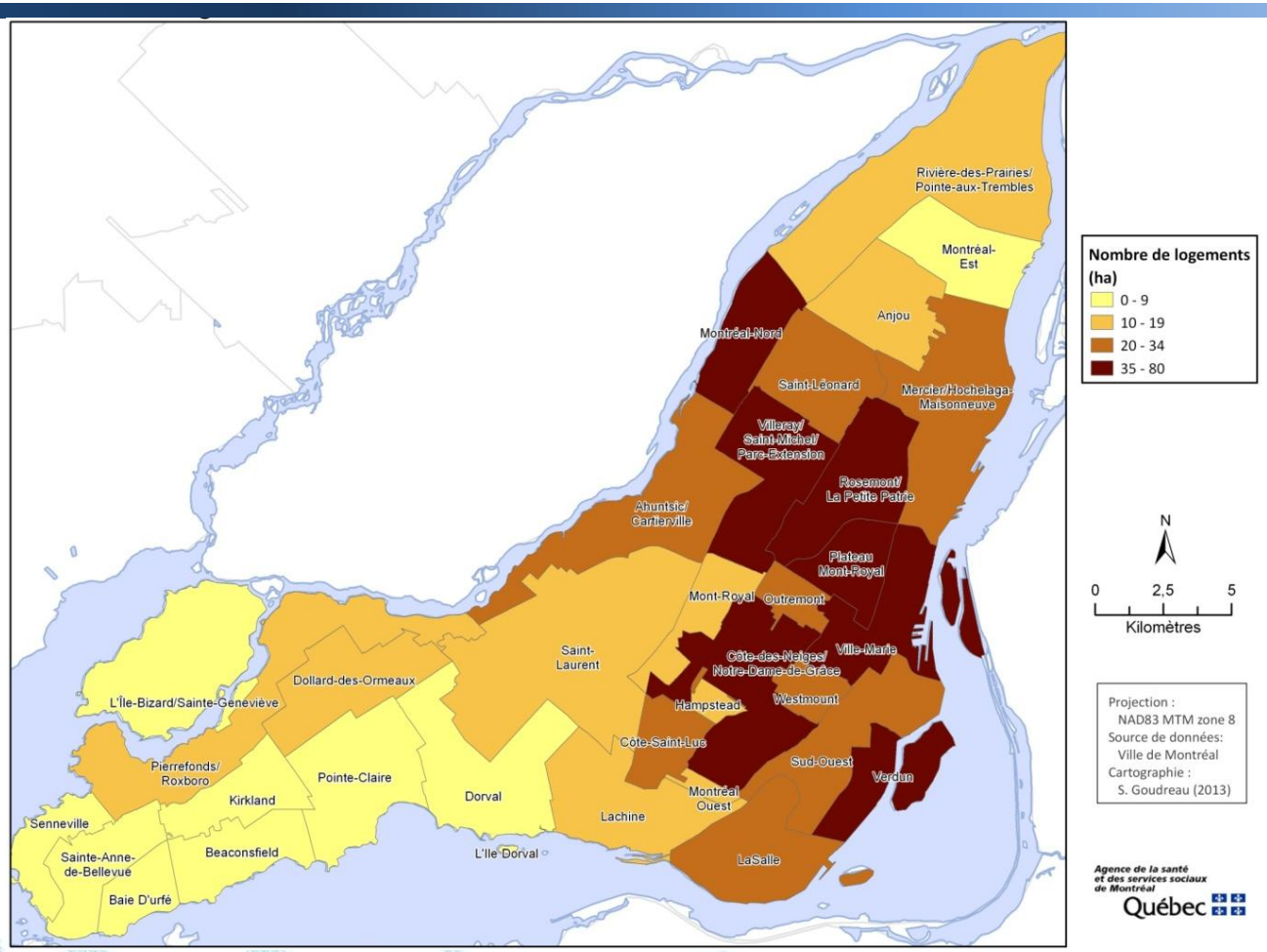
DENSITY OF DWELLINGS, ISLAND OF MONTREAL



Source: S. Goudreau, MPH (data OD 2008)

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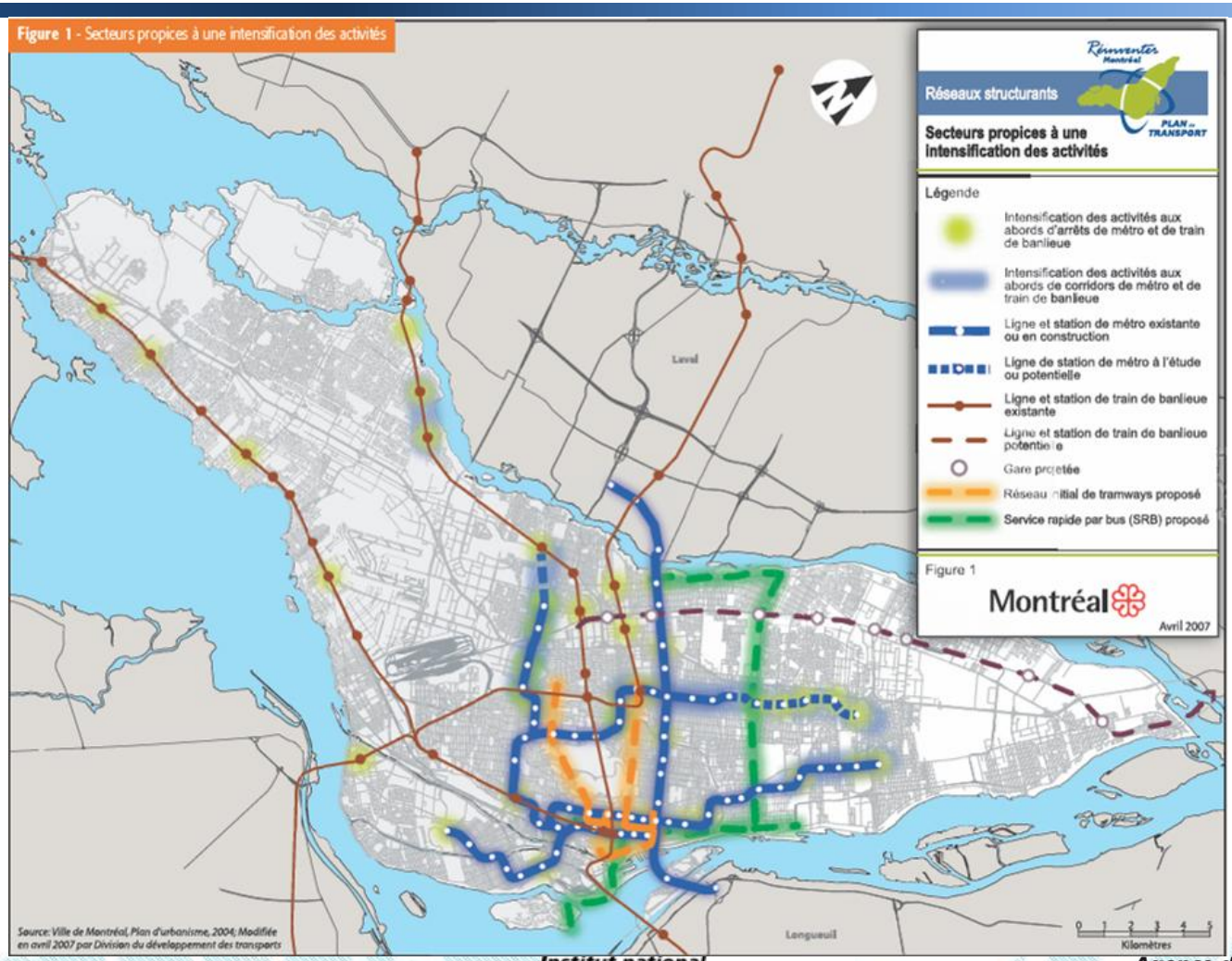
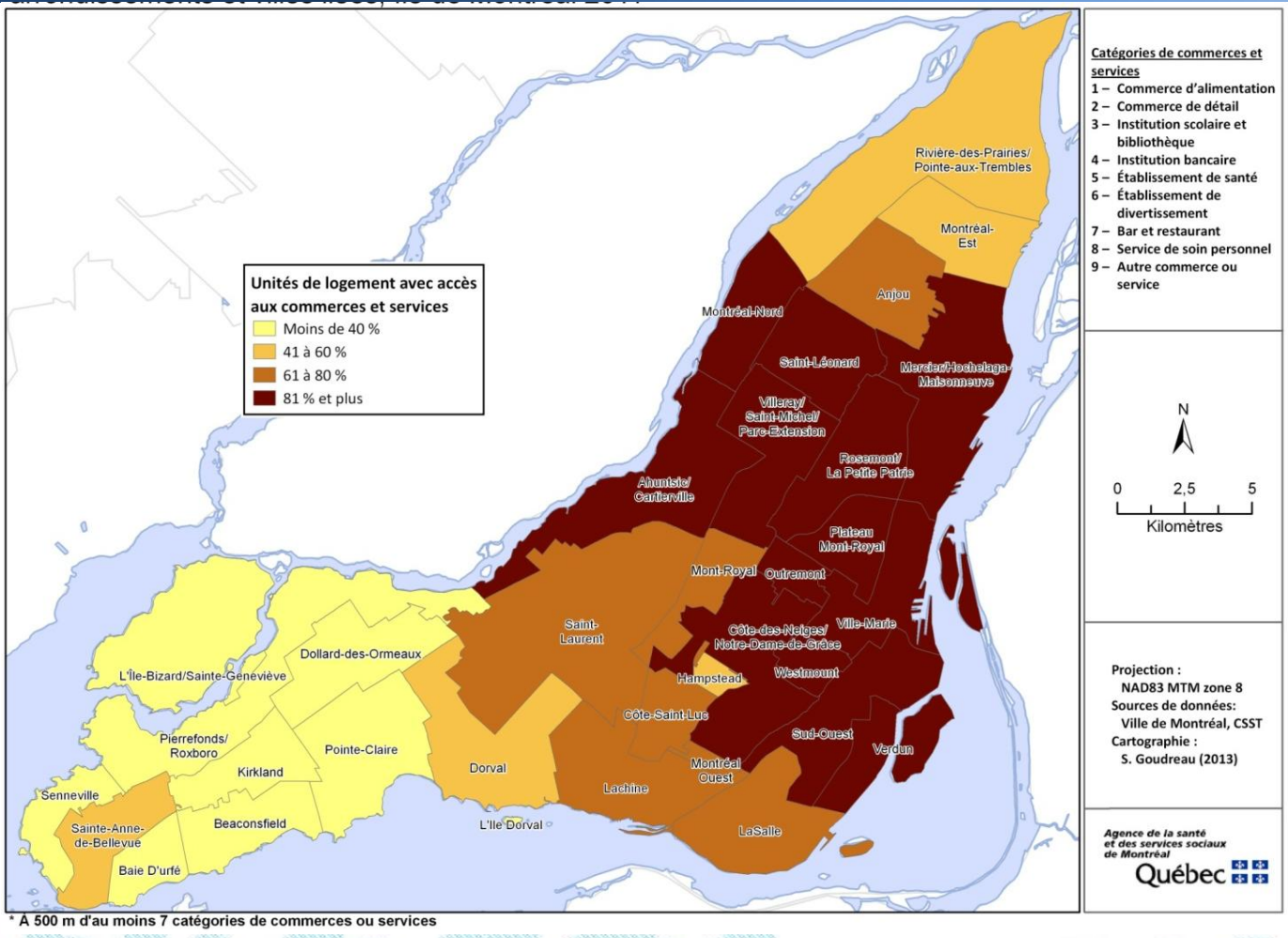
SECTORS CONDUCIVE TO AN INTENSIFICATION OF ACTIVITIES



PROPORTION OF DWELLINGS HAVING ACCESS TO COMMERCIAL ESTABLISHMENT AND SERVICES NEARBY, ISLAND OF MONTREAL



Source: S. Goudreau, MPH (data OD 2008)

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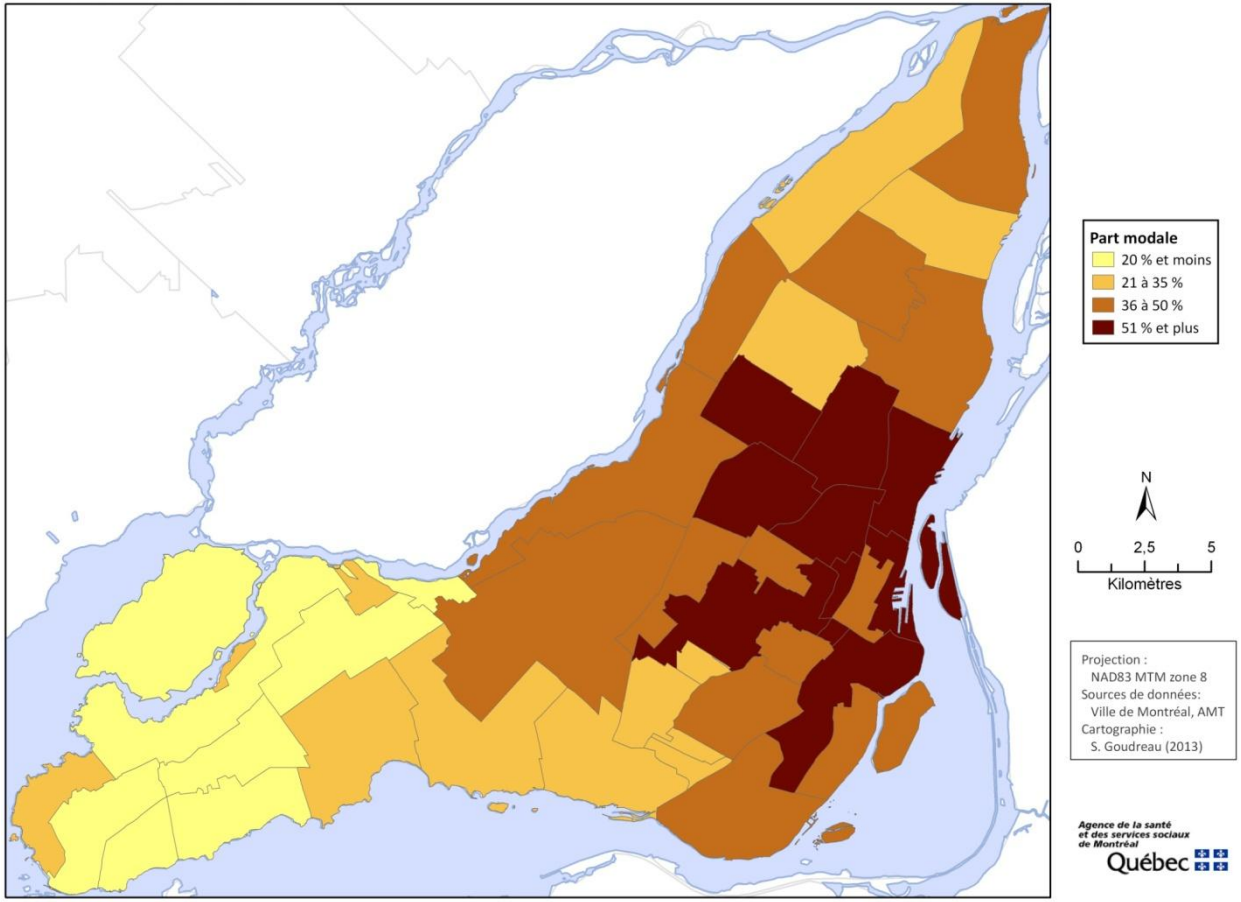
PROPORTION OF ACTIVE TRIPS (ACTIVE AND PUBLIC TRANSPORTATION) DURING MORNING RUSH HOUR IN MONTREAL)

Part modale des déplacements actifs (TA et TC) en période de pointe du matin, île de Montréal 2008



Source: S. Goudreau, MPH (data OD 2008)

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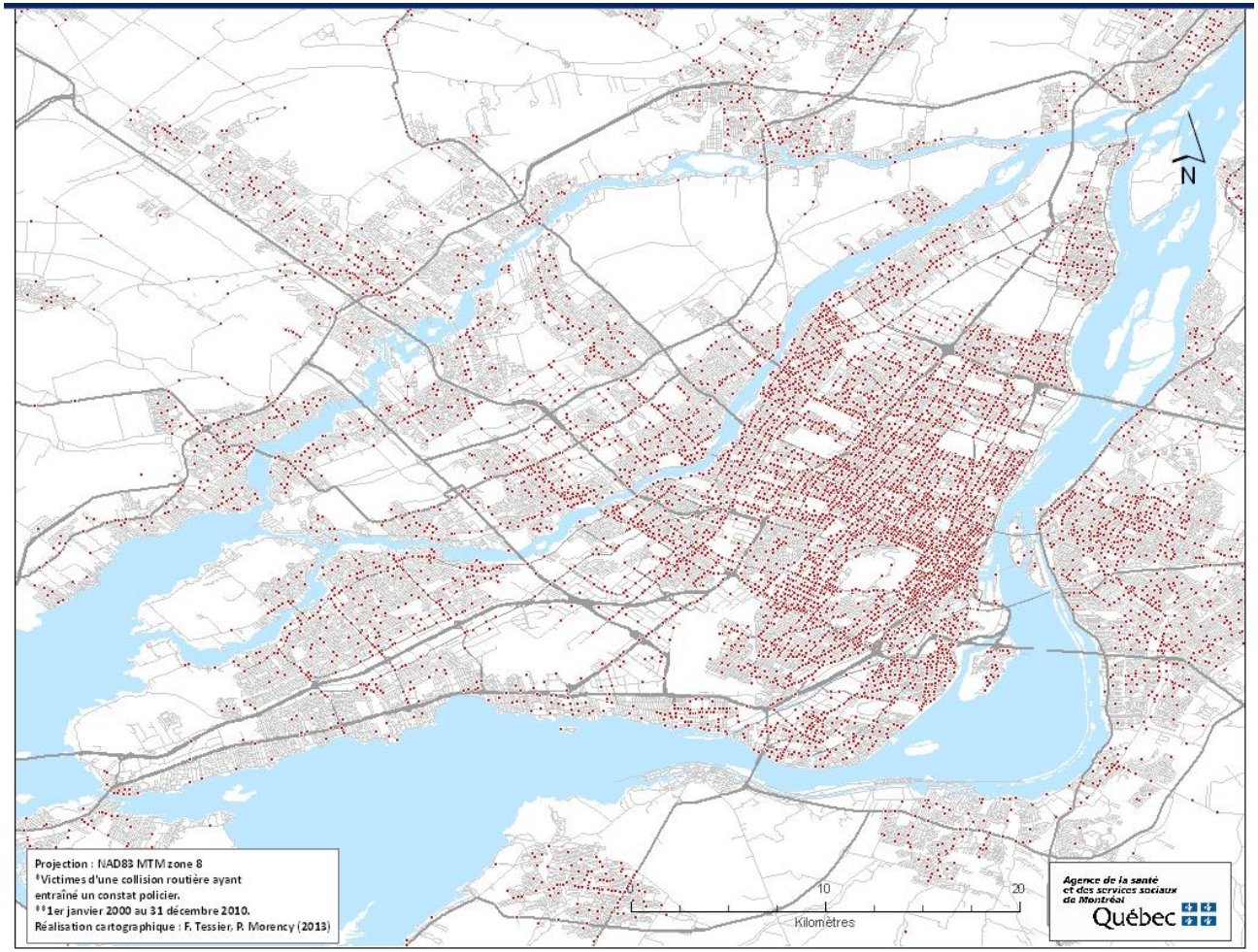
INJURED PEDESTRIANS



Source: Patrick Morency, MPH

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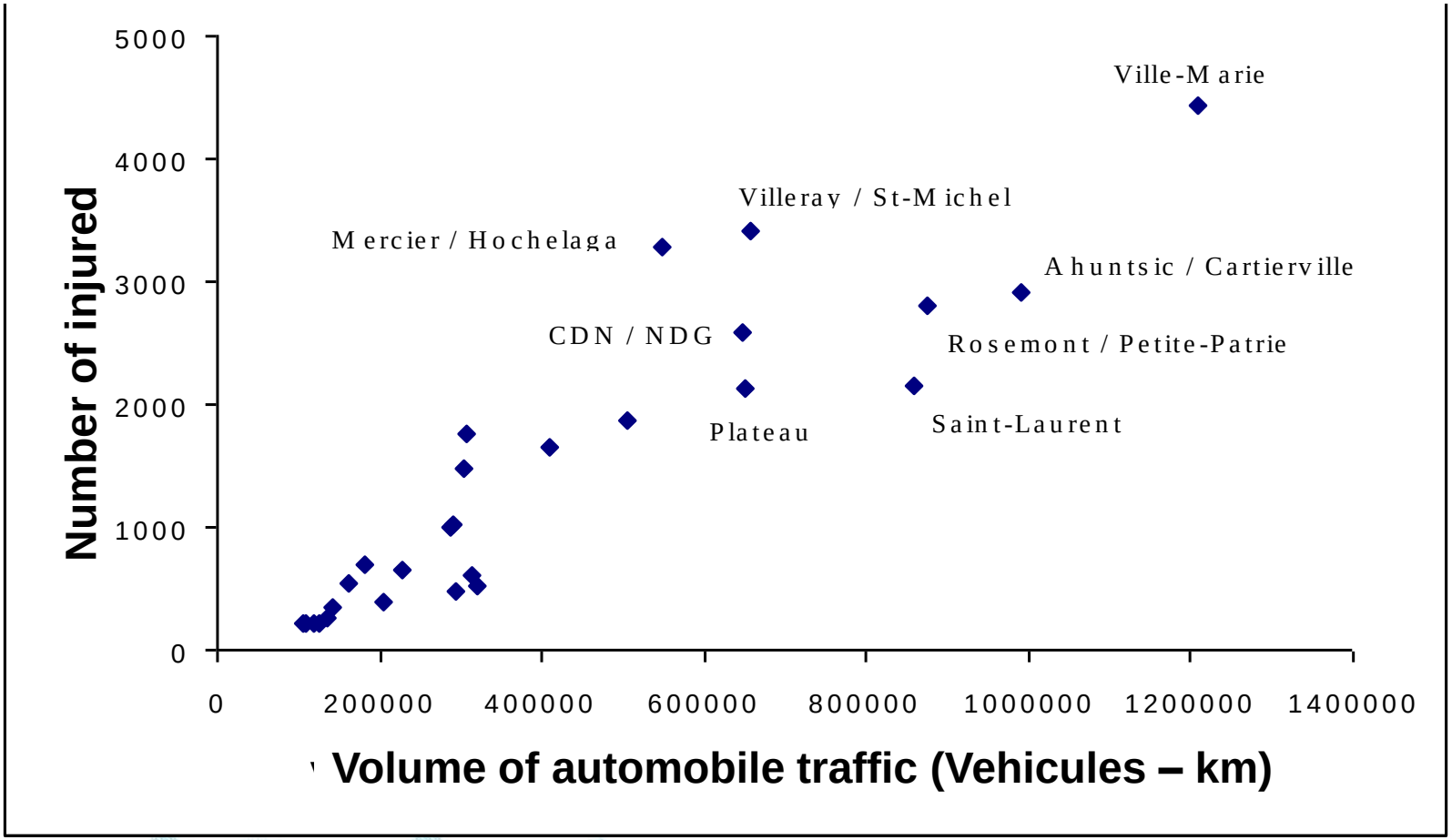
CONTEXT - THE NUMBER OF ROAD INJURIES INCREASES WITH THE VOLUME OF TRAFFIC



Source : P Morency, MS Cloutier, Urgences-santé 1999-2003; C. Morency. Enquête O-D 1998.

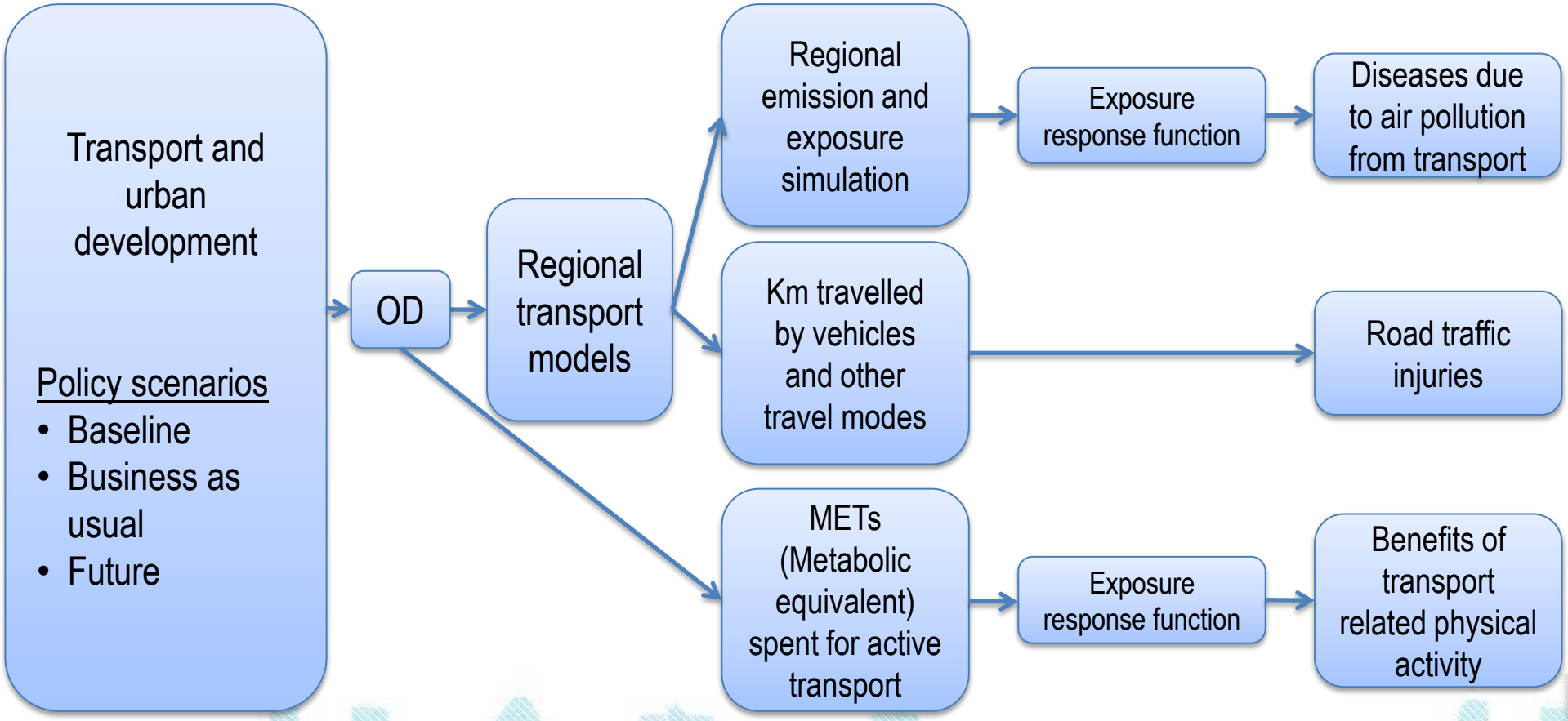
RECENT OR PLANNED TRANSPORT AND URBAN DEVELOPMENT PROJECTS – MONTREAL REGION

- Turcot
- Champlain bridge
- Highways 25 and 19
- Light train system on Champlain
- Extension of subway to Anjou
- Rapid bus system
- Cycling network
- Road pricing
- Transit oriented development plan at the metropolitan level
- Reduction of greenhouse gases (30 % by 2020)
- Montreal Transport Plan

INTEGRATED HEALTH IMPACT ASSESSMENT OF VARIOUS TRANSPORT AND URBAN DEVELOPMENT POLICIES AND PROJECTS

- **Goal**
  - Influence decision makers for the development of optimal policies and projects that promote public health
- **Specific objectives**
  - Provide quantitative data on the public health impacts or benefits of transport and urban development policies and projects to decision makers

FRAMEWORK FOR CONDUCTING AN INTEGRATED A HEALTH IMPACT ASSESSMENT



INTEGRATED HEALTH IMPACT ASSESSMENT FOR THE MONTREAL METROPOLITAN REGION

AIR POLLUTION

Number of cases attributable to

- All cause mortality
- Cardiovascular mortality
- Incidence of asthma in children

MAJOR DATA NEEDS AND METHODS

- Modeled Nitrogen oxides (NOx) levels
  - from a regional transport model and a dispersion model (Hatzopoulou and Eluru, McGill)
- Exposure-response functions, mainly from the literature
- Calculation of cases attributable to future scenarios compared to baseline

INTEGRATED HEALTH IMPACT ASSESSMENT FOR THE MONTREAL METROPOLITAN REGION

BENEFITS OF PHYSICAL ACTIVITY

Number of cases avoided due to transport related physical activity

- All cause mortality
- Cardiovascular mortality
- Diabetes type II

DATA NEEDS AND METHODS

- METs (Metabolic Equivalent) spent for active transport based on
  - estimated distances walked from Origin-Destination (OD) survey 2008 and modelled future scenarios
  - Walking speeds (from literature)
  - MET intensities of physical activity (Ainsworth et al.)
- Non-transport related physical activity (in METs) (Montreal's TOPO survey 2012)
- Exposure-response functions from literature
- Calculation of cases attributable to future scenarios compared to baseline

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INTEGRATED HEALTH IMPACT ASSESSMENT FOR THE MONTREAL METROPOLITAN REGION

ROAD TRAFFIC INJURIES

Number of injuries for

- Vehicle occupants
- Pedestrians*

DATA NEEDS AND METHODS

- Km travelled by vehicles and by pedestrians*
  - Estimated from Origin-Destination (OD) survey and by regional transport model (Eluru and Hatzopoulou, McGill)
- Numbers and gravity of injuries
  - SAAQ and Med-Echo databases
- Calculation of injury rates of vehicle occupants and pedestrians for the baseline and future scenarios

* Cyclists may be included if data are sufficient

TEAM PROJECT

- Audrey Smargiassi (INSPQ – UdeM)
- Lise Gauvin (UdeM)
- Louis Drouin (DSP de Montréal)
- Marianne Hatzopoulou (McGill)
- Naveen Eluru (McGill)
- Patrick Morency (DSP de Montréal)
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- François Tessier (DSP de Montréal)
- Anne Pelletier (DSP de Montréal)