More cyclist crashes in poor neighborhood: is it a question of exposure?

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CARSP – 19th of June

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Context and objectives

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Context: more accidents in deprived neigbourhood

- **Poor people** are more involved in road accident

(Roberts, Power, 1996 Hasselberg, Laflamme,Weitofbt, 2001)

- **Poor areas** concentrate more accidents

(Rivara, Barber, 1985 ; Bagley, 1992 ; Aguero-Valverde, Jovanis, 2006)

- **People who live in deprived areas** are more involved in road accident

(Cubbin et al., 2000 ; O'Campo et al., 2000 ; Simpson et al., 2005)

Context: Why deprivation matters in road safety?

- At the individual and family level:
  - Influence the understanding of the risk
  - Influence the exposure to traffic
  - Lower access to a car, loaded work schedule

- At the neighborhood level:
  - Major streets more presents in poor neighborhood…

⇒ **Deprivation was the focus of much attention early 2000s, but not anymore.**

Context: more accidents for cyclists?

• Morency et al. (2012) show that injured pedestrians, **cyclists** and automobile users in Montréal are more important in poor neighborhoods than in wealthy neighborhoods.

• They explain this result by the presence in these neighborhoods of **greater traffic and greater number of intersections**.

• The authors considered population density and modes of transportation to work as variables to quantify pedestrian activity, and traffic data to quantify vehicle volumes.

⇒ **No data were available on cycling. It is now possible to characterize the activities of cyclists more precisely by using the counting data made public since 2013.**

Objective and research questions

The objective is to analyze accident rates involving a cyclist:

- **according to the poverty of the neighborhood where the accident took place**
- **and according to the cycling activity that animates it.**

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Methods

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Bike in Island of Montreal

- 90% of Montrealers report cycling at some point in their lives
- 36% of cyclists drive once a week or more
- Average of 500 km traveled per year. Total annual: 367 million km
- Average distance traveled by cyclists: 3.3 km
- Purchase of 95,000 adult bicycles by Montrealers in 2010

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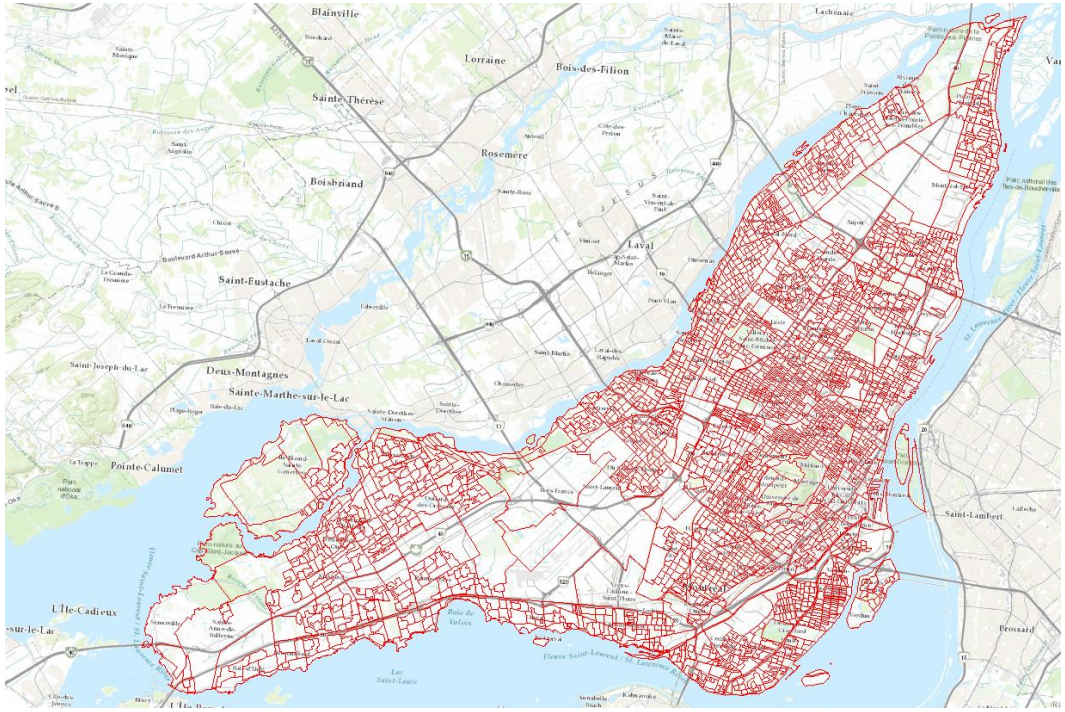
A database in scale of dissemination area

- 3,176 dissemination area (DA) in Montreal



Small area composed of one or more neighbouring dissemination blocks, with a population of 400 to 700 persons.

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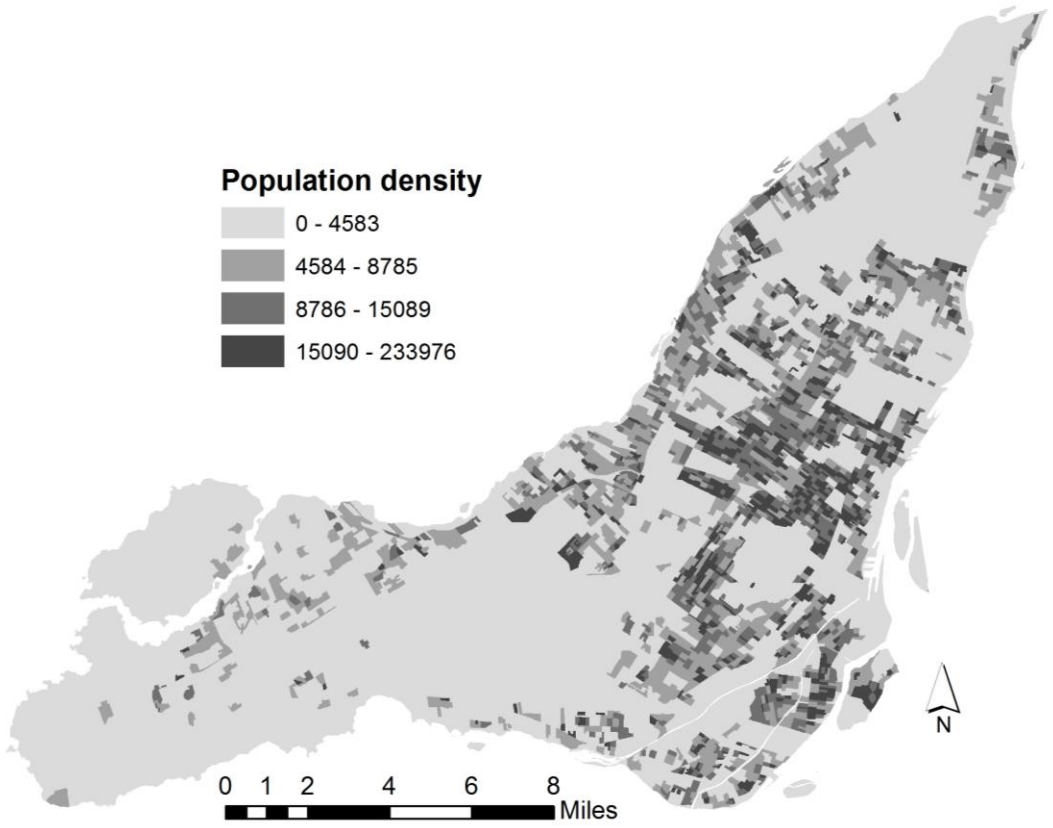
Data description

- Database has data for each dissemination area (DA) in Montreal

- The database will be a combination of several data which come from:
    - Statcan (2006 and 2011) with :
        - Population
        - Population density
        - Inactivity rate
        - Median income
        - % of Low Income
        - Etc.
    - Open data of Montreal for traffic and roads
        - Bike line
        - Traffic
        - Etc.
    - Crash

Population density in 2006



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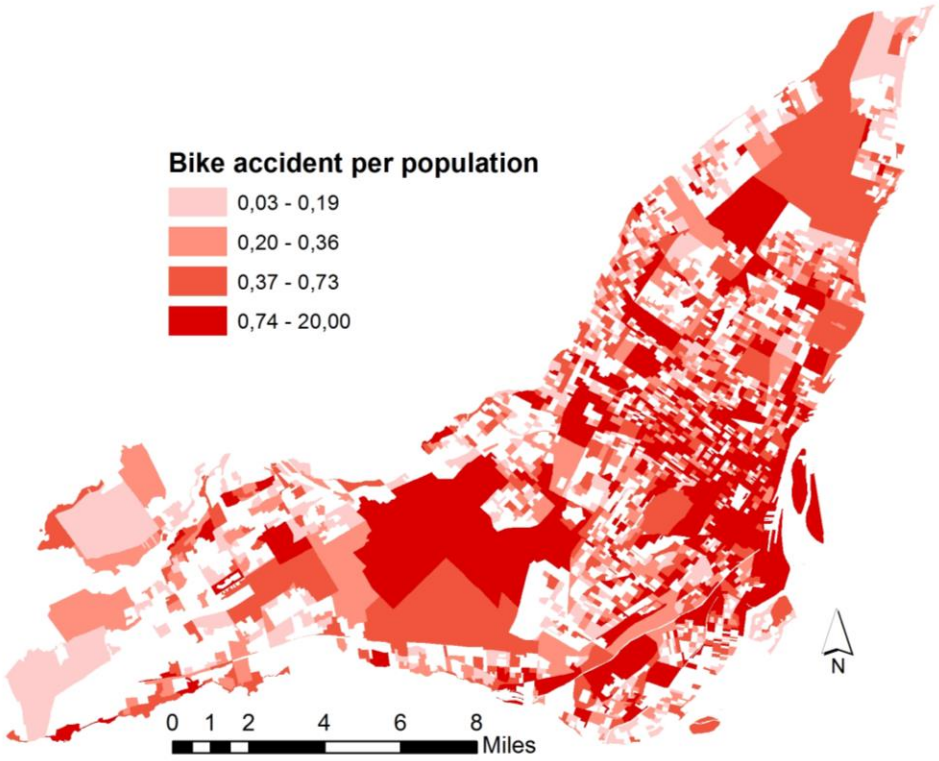
Crash per population



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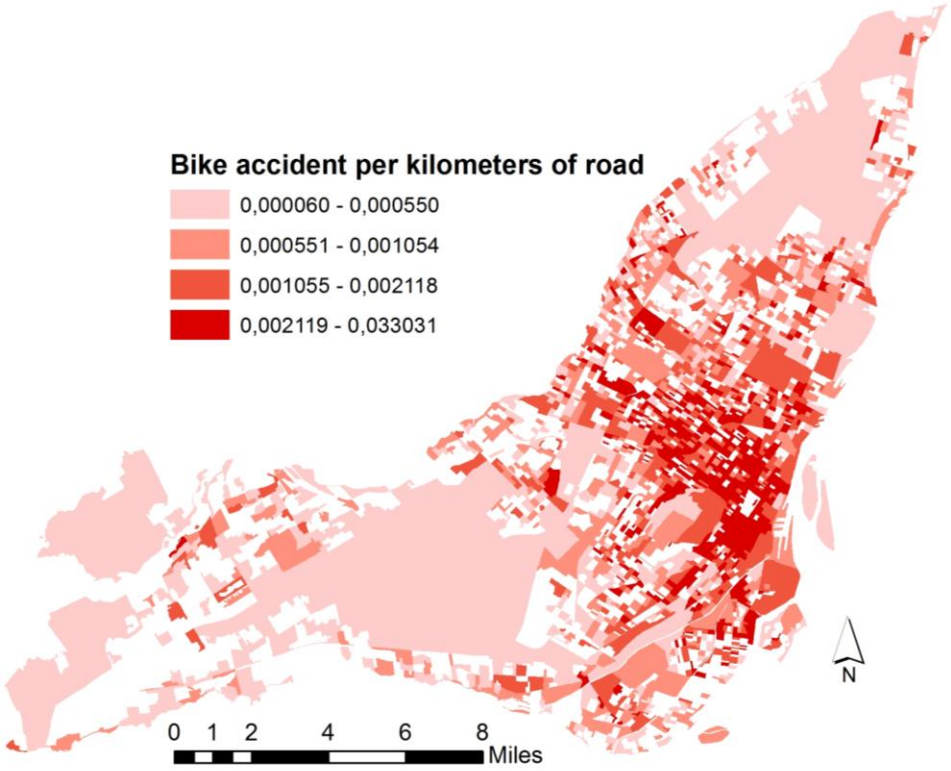
Crash per kilometers of road



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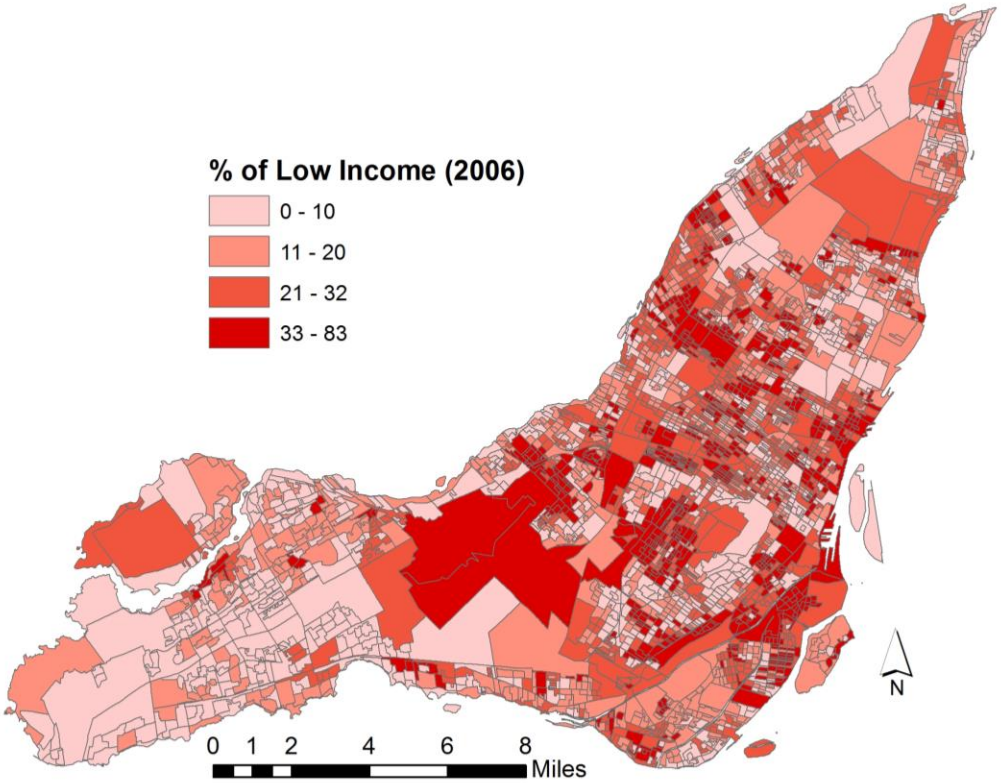
Low Income in 2006



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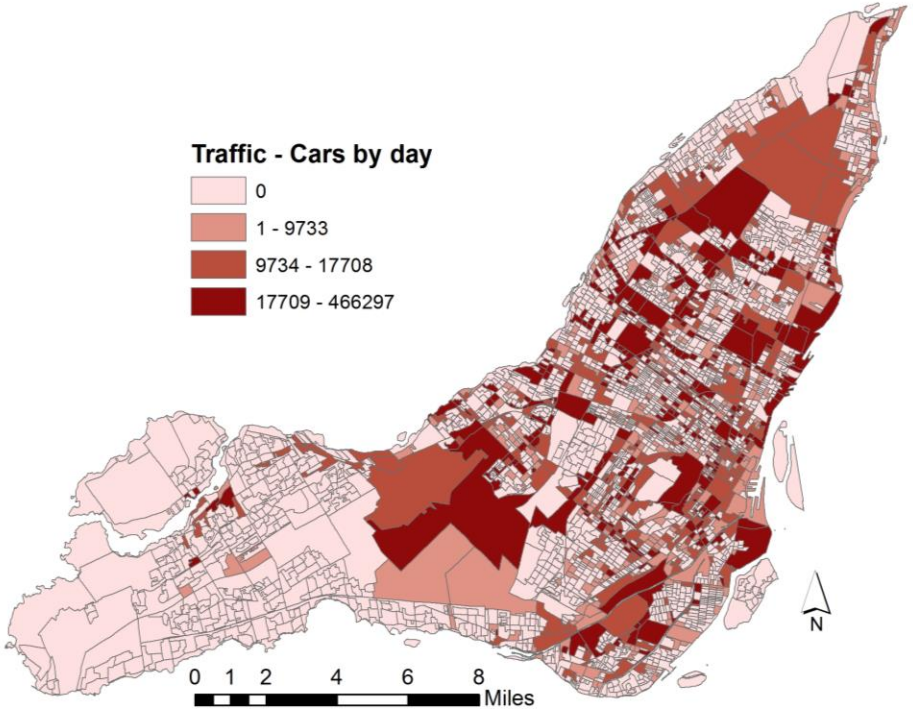
Traffic - CARS



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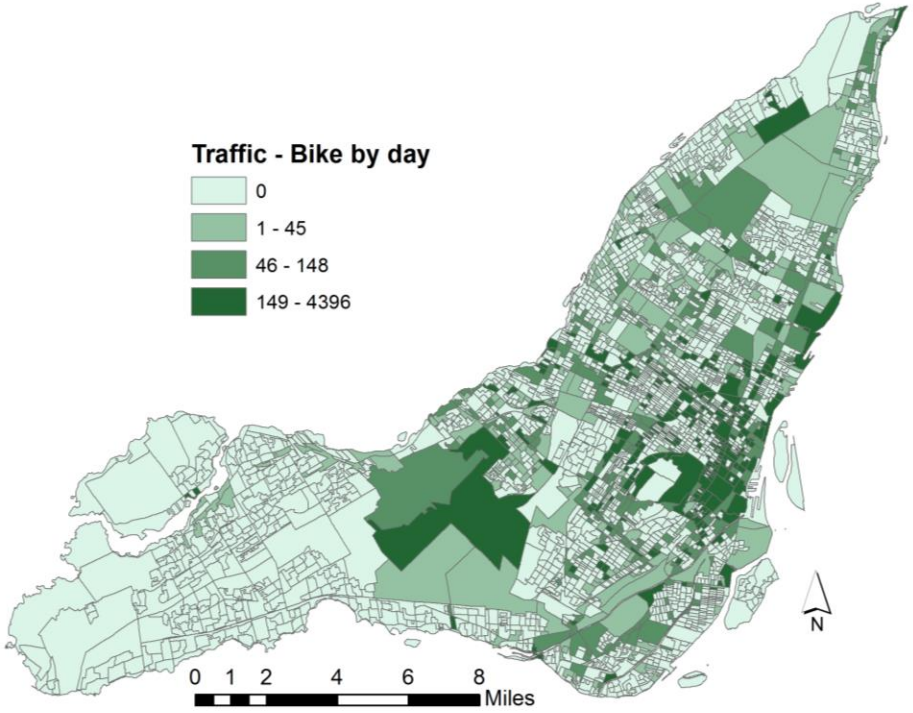
Traffic - BIKE



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Preliminary results and lines of research

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For further research

• Preliminary results show a greater cycling activity in Montreal's central neighborhoods, but not just the disadvantaged ones, as does the concentration of collisions involving a cyclist.

• The location of cycling counts does not allow for an exhaustive spatial analysis of the entire road network, but adds to the understanding of the risk for cyclists in Montreal.

• Further analyzes will be underway to better identify the most important explanatory factors in the risk of cyclist collisions (arterial impact, built environment, employment rate, etc.).

Thanks !

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