

Mapping transport externalities on children's health

Shabnam Abdollahi. PHD Student, Shabnam.abdollahi@polymtl.ca
Superviseur : Prof.Owen Waygood et Prof. Marie-Soleil Cloutier

Abstract

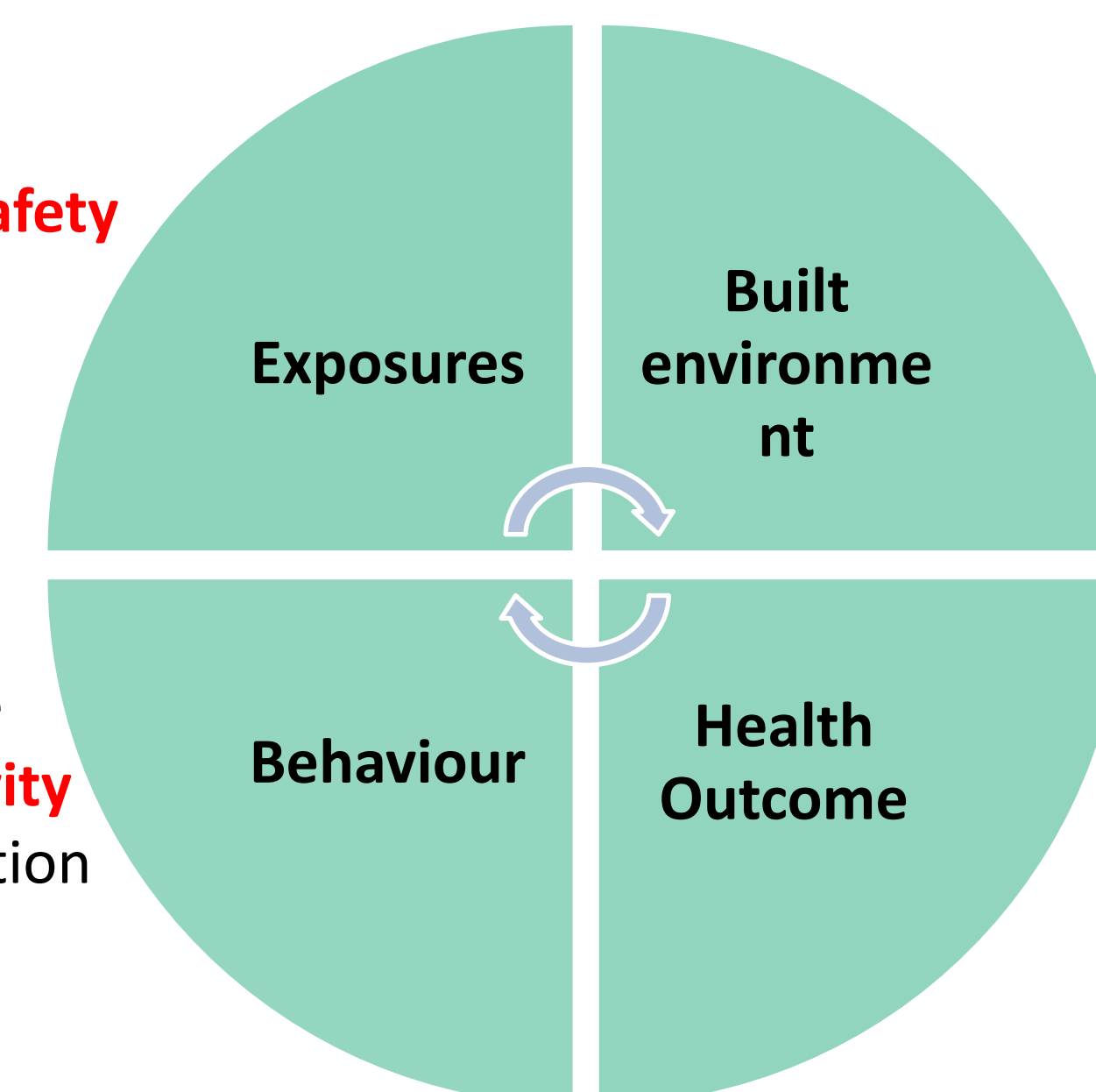
With the rapid growth of urbanization, children's safety is one of the most critical problems in many countries, mentioned as a fundamental challenge of sustainable development. Transportation has several health, environmental, social, and aesthetic consequences. Possibility of collision can affect travel decisions, travel destinations, and activity patterns, as well as the safety of children and others.

Although this emerging evidence concerns the potential effects of transportation on broader determinants of children's health and safety, it is not well synthesized and remains relatively intangible. People may understand the general influence of traffic and the built environment on children's health, but it is difficult for planners to identify problematic places and work to fix them without the tools to highlight the location of issues. Visualization of such information will help decision-makers address the problem.

Objectives

- ❑ Assessing the relationship between **children's safety** and the distribution of **roadway infrastructure** and **built-environment**
- ❑ Create a tool to visualize transport externalities on children's safety
- ❑ Analyze and create mitigation methods to decrease the impact of near-environment exposures, emphasizing transport infrastructure and built environment solutions.

- Air Pollution
- **Traffic danger/safety**
- Noise



- Transportation Infrastructure
 - Land-use (destinations)
 - Pedestrian Environment
 - Greenspace
- Biological Response
 - (BMI/Obesity ,Systemic Inflammation, Stress)
 - Disease(Physical, Mental)

- Dietary Intake
- **Physical Activity**
- Social Interaction

Safety review

Built Environment variables

- Vehicle speed
- Land use
- Living near school or park
- Traffic volume
- Sidewalk condition
- Traffic light density
- Type of street
- Intersection density
- Population density
- Traffic calming

Health Outcome

- **Fatalities**
- **Physical injuries**
- **Mental changes**
- **Sleep disturbances**
- **Depressed mood**
- **Fear**

GIS Tools

Visualizing, mapping and identifying topological relationship

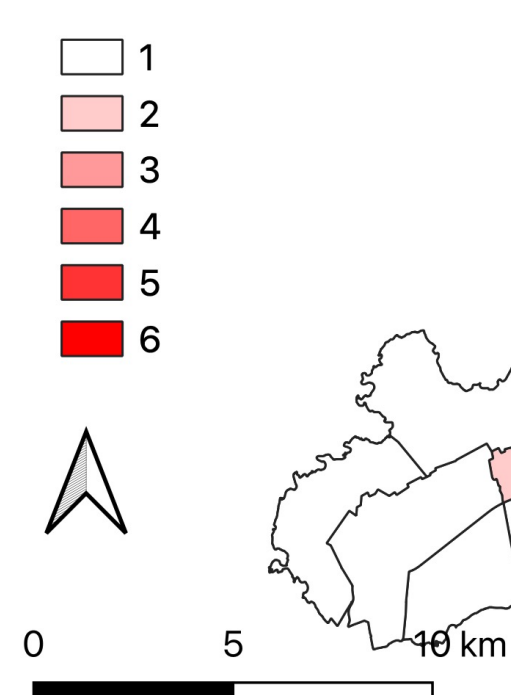
Identifying clustering patterns of traffic collisions (global or local pattern)

Analysing effects of contributory variables

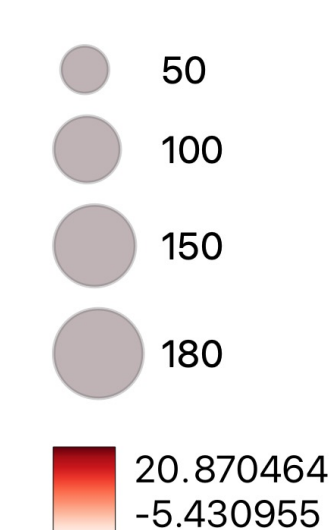
Handling large databases in a multidisciplinary framework

Examples

Example of traffic danger index



Pedestrian injury count - traffic danger index.



Methodology

