



Toward Active Neighbourhoods

Analyzing Pedestrian Collisions And Socio-Economic
Status In Three Canadian Cities

Amrit Khakh, Dr. Victoria Fast, Celia Lee, Nikki Rogers, Francis Nasca & Mikael St.Pierre

CO-DESIGNING THE ACTIVE CITY



NEWS

Conference
April | 9 | 2018

[MOVING, IT'S ALSO STOPPING. HOW TO STUDY PUBLIC LIFE.](#)

During this conference in Quebec City, MUEC will present Gehl publication How to study public life.

Conference
March | 16 | 2018

[CONFERENCE - BUILDING THE ACTIVE CITY TOGETHER](#)

Longueuil, Québec - Odile Craig, MUEC, will present inspirational initiatives for active cities.

News
February | 28 | 2018

[JOB OPPORTUNITY: RESEARCH ASSISTANT](#)

Are you a graduate student interested in the interaction between health, urban design and

ACTIVE
NEIGHBOURHOODS
CANADA

WHAT IS AN ACTIVE NEIGHBOURHOOD? An active, green, and healthy neighbourhood is a neighbourhood redesigned to celebrate the use of shared public space, including streets and parks.



About Active
Neighbourhoods
Canada



Rationale:
Are we building
safe, healthy and
accessible places
for everyone?





Are pedestrian collisions linked to socio-economic status?



Mapping and Regression Analysis



```
R C:\Users\Amrit\Desktop\Sustainable Calgary\Regression_script.R - R Editor
wd = "C:/Users/Amrit/Desktop/Sustainable Calgary/Toronto analysis"
fn = "Tor_reg_inc_coll.csv"

setwd(wd)

df = read.csv(fn, header=TRUE)
attach(df)
head(df)

names(df)
summary(df)

correles = cor(df, method = "pearson")
round(correles, 2)

mod1 = lm(formula = COLL_COUNT~Median _aft_house,data = df)
summary(mod1)

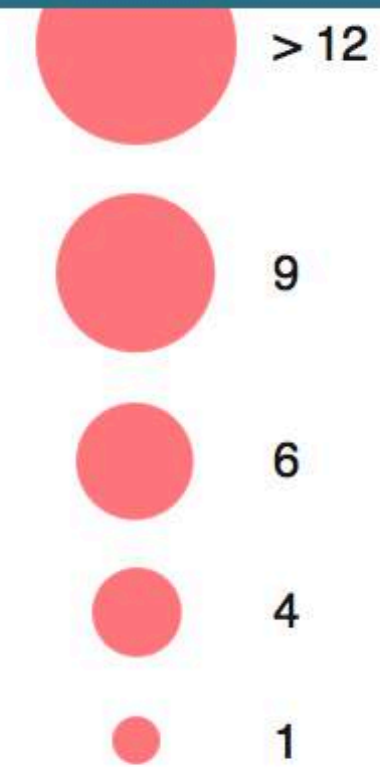
mod2 = glm(formula = COLL_COUNT~Median _aft_house, data = df,family=poisson)
summary(mod2)

install.packages("maps")
install.packages("mapproj")
install.packages("sp")
install.packages("spdep")
install.packages("gstat")
install.packages("splancs")
install.packages("spatstat")
install.packages("lattice")
install.packages("pgirmess")
install.packages("RColorBrewer")
install.packages("classInt")
install.packages("spgwr")
install.packages("lmtest")
install.packages("car")
```

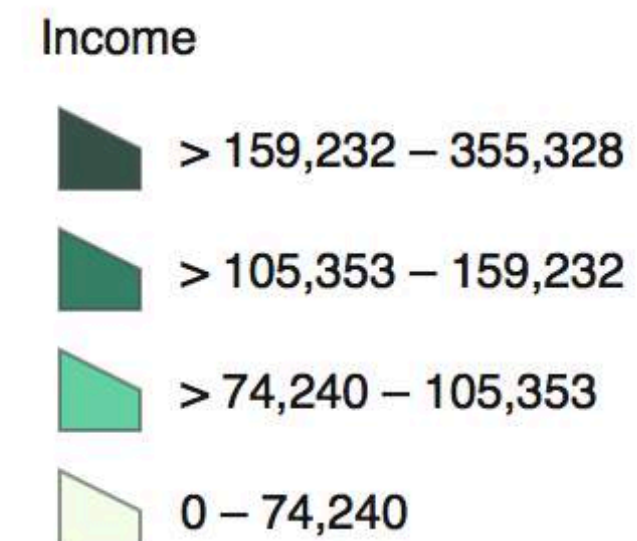

City of Calgary : Pedestrian Collisions 2016

Legend Overview map Details Share Print

Legend



Median After-tax Household Income (\$)



Rocky View County

Calgary

Chestermere

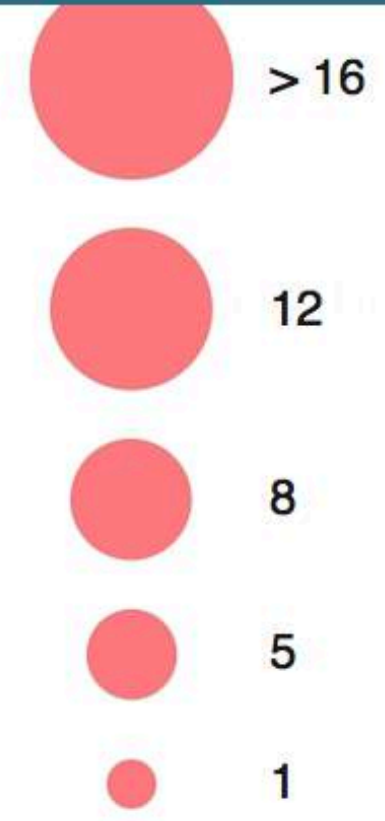
Langdon

Results: Calgary

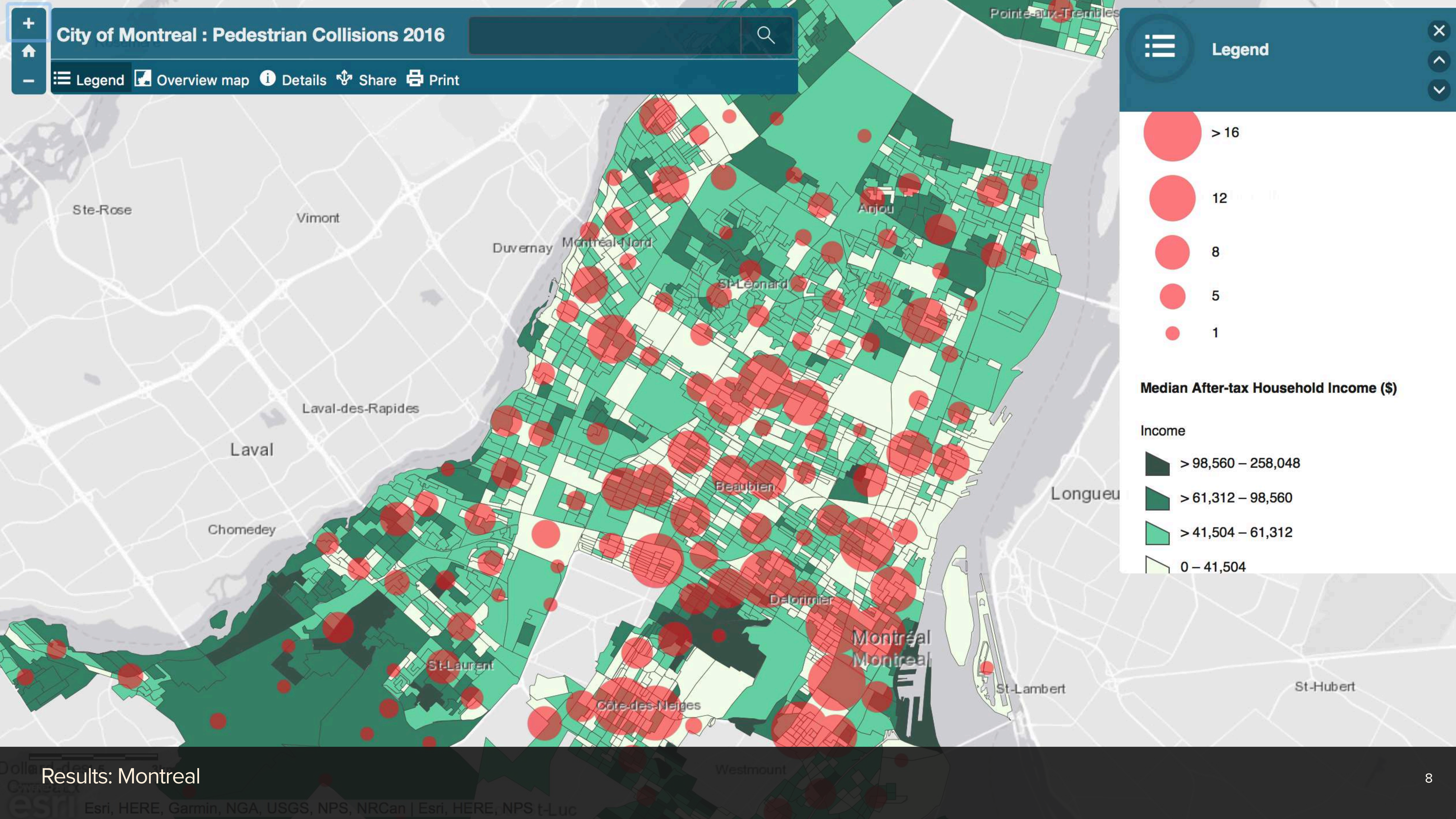
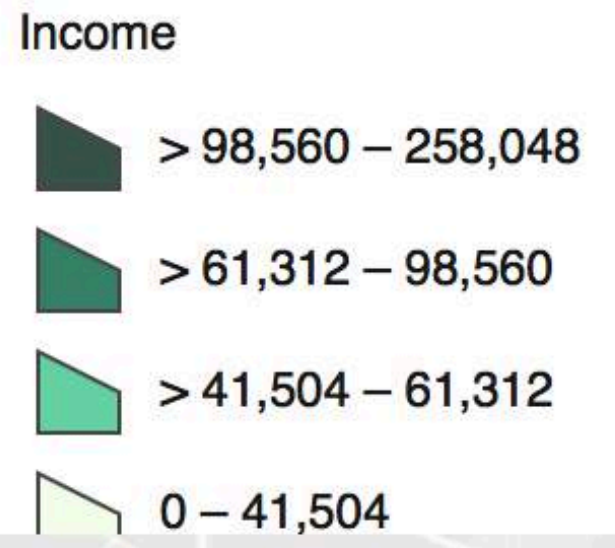
City of Montreal : Pedestrian Collisions 2016

Legend Overview map Details Share Print

Legend



Median After-tax Household Income (\$)

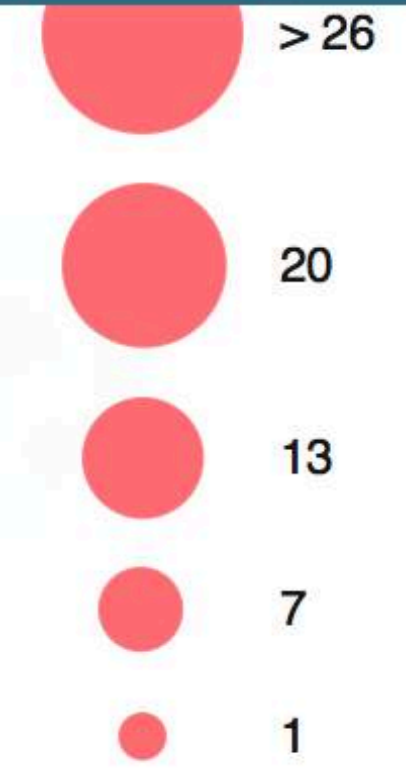


Results: Montreal

City of Toronto : Pedestrian Collisions 2016

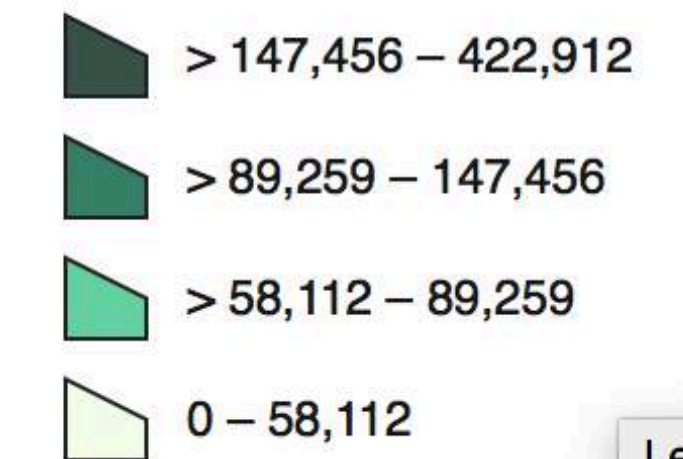
Legend Overview map Details Share Print

Legend

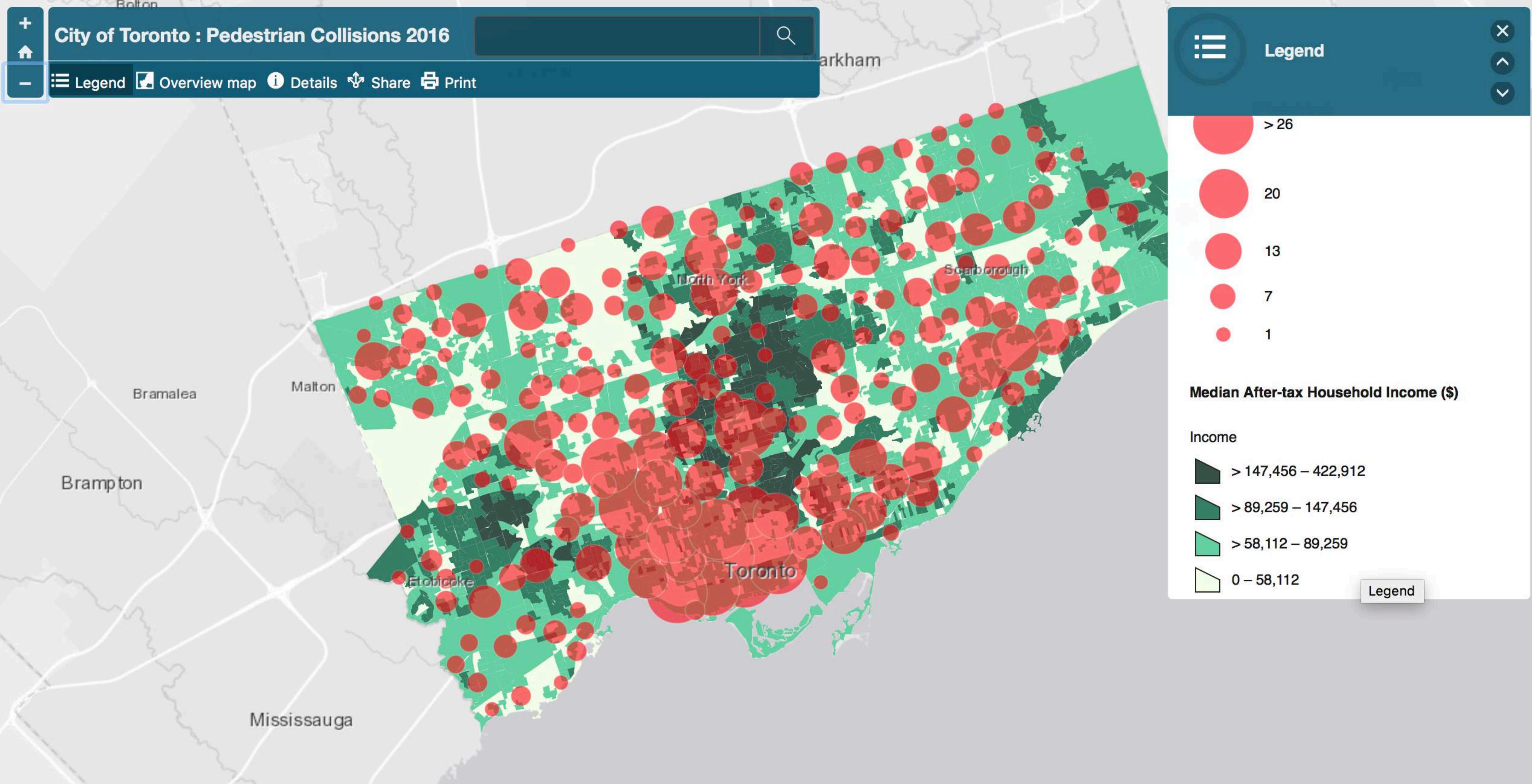


Median After-tax Household Income (\$)

Income

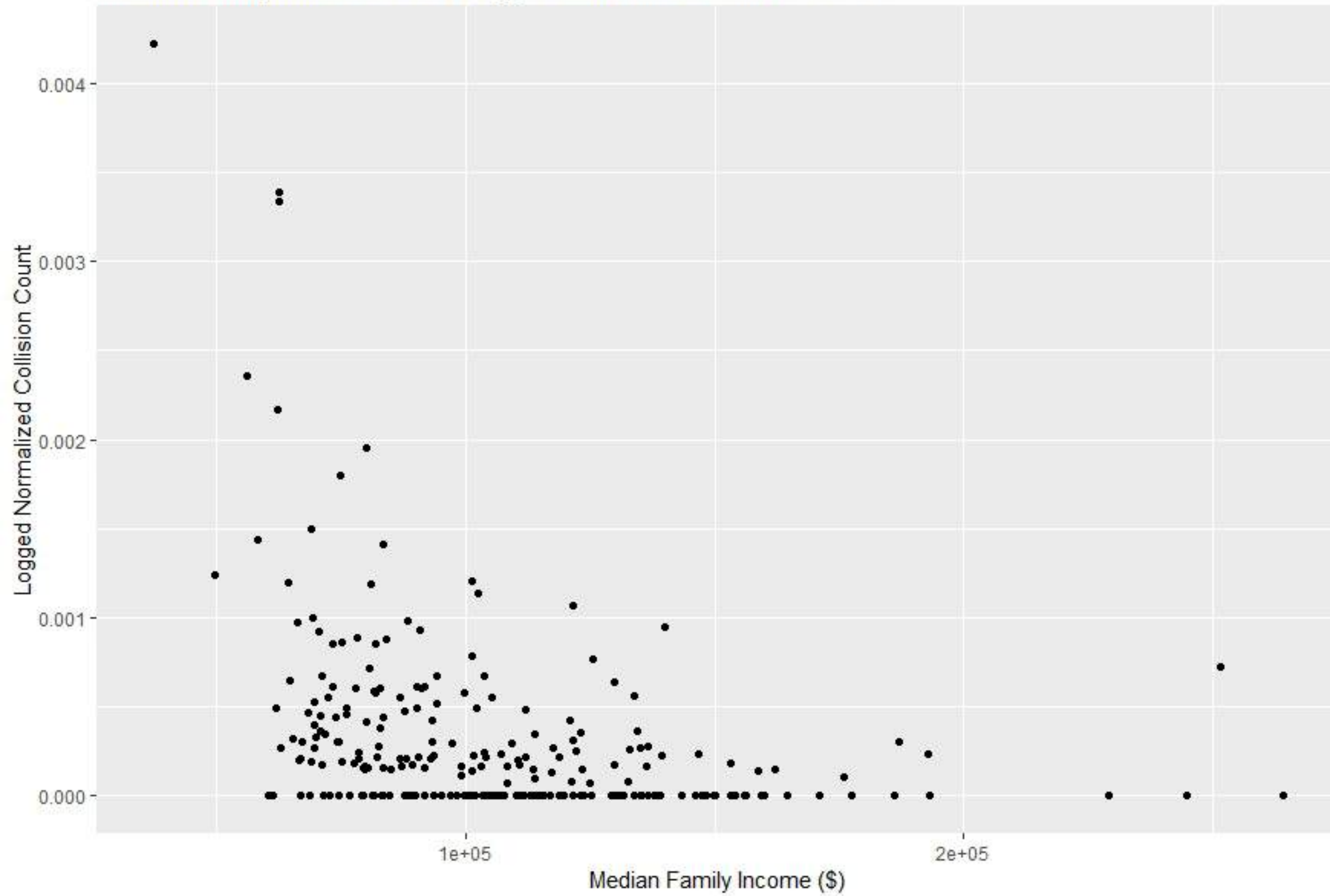


Legend

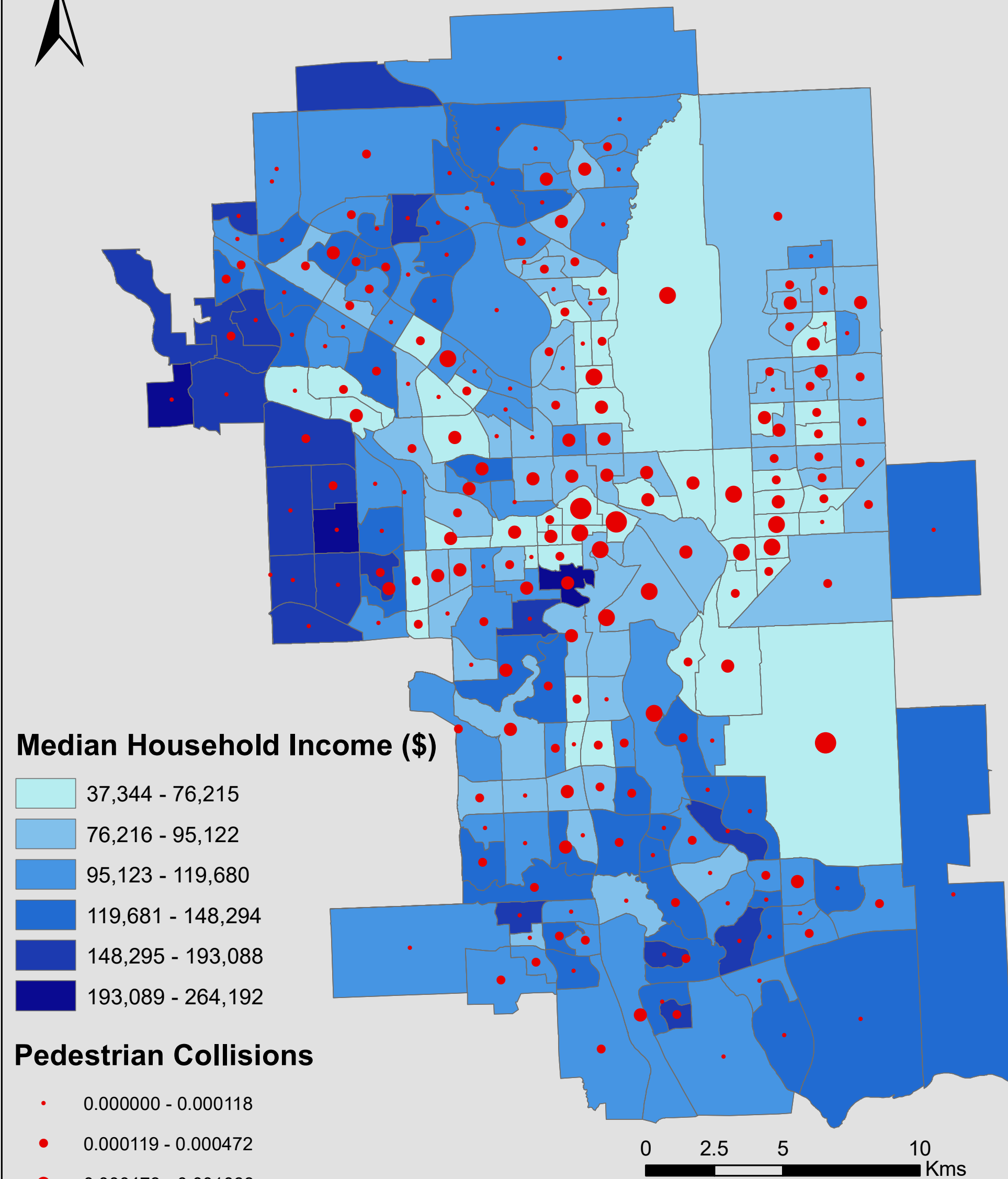


Results: Toronto

Median Family Income versus Logged Normalized Collision Count



Pedestrian Collisions from 2016 and Median Household Income



Nikki Rogers and Zach Lamoureux, April 4, 2019
Data sources: Statistics Canada, University of Calgary, City of Calgary
PCS: MAD 1983 UTM Zone 11N

Discussion



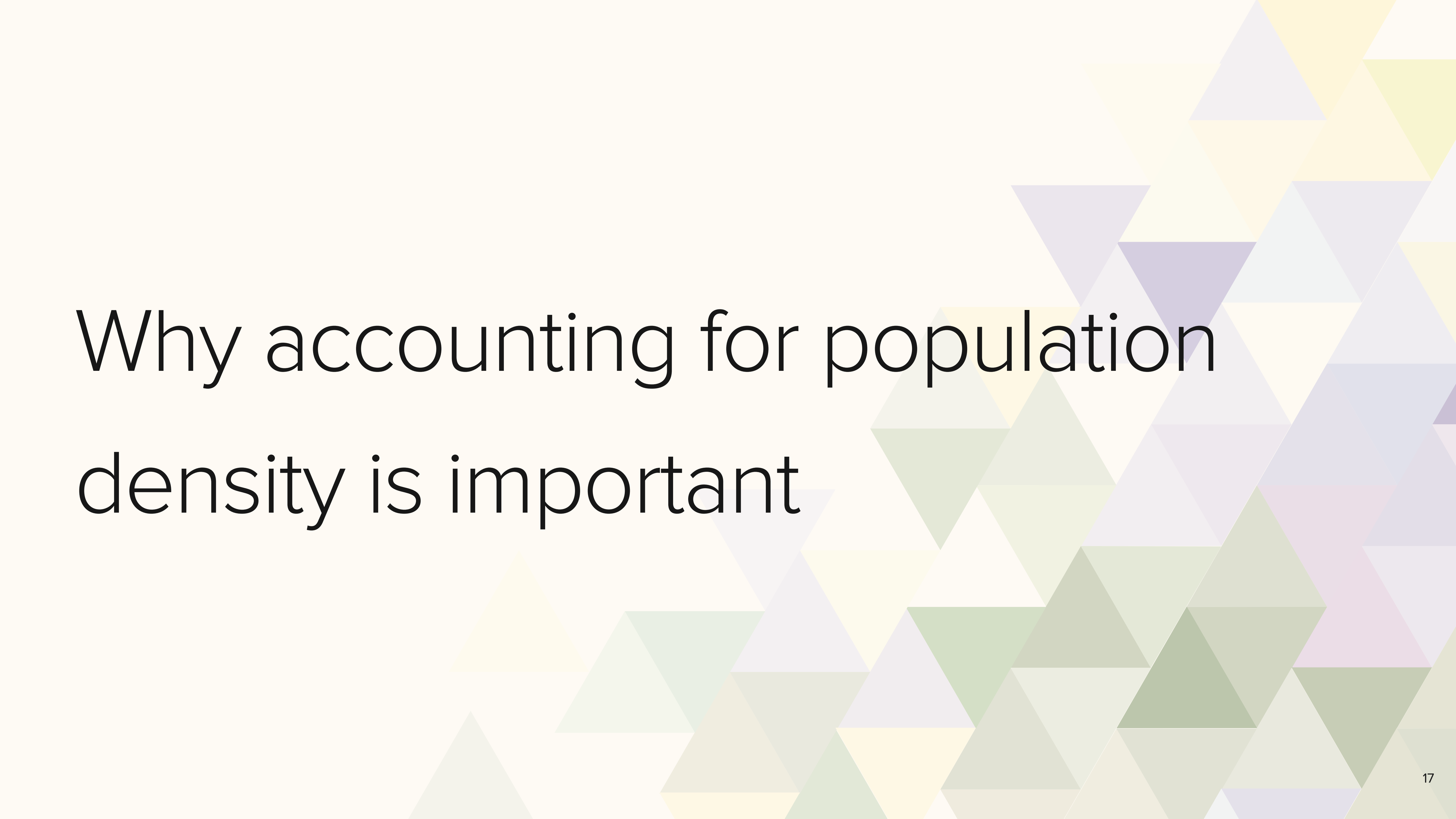


Why would we expect a low
correlation?



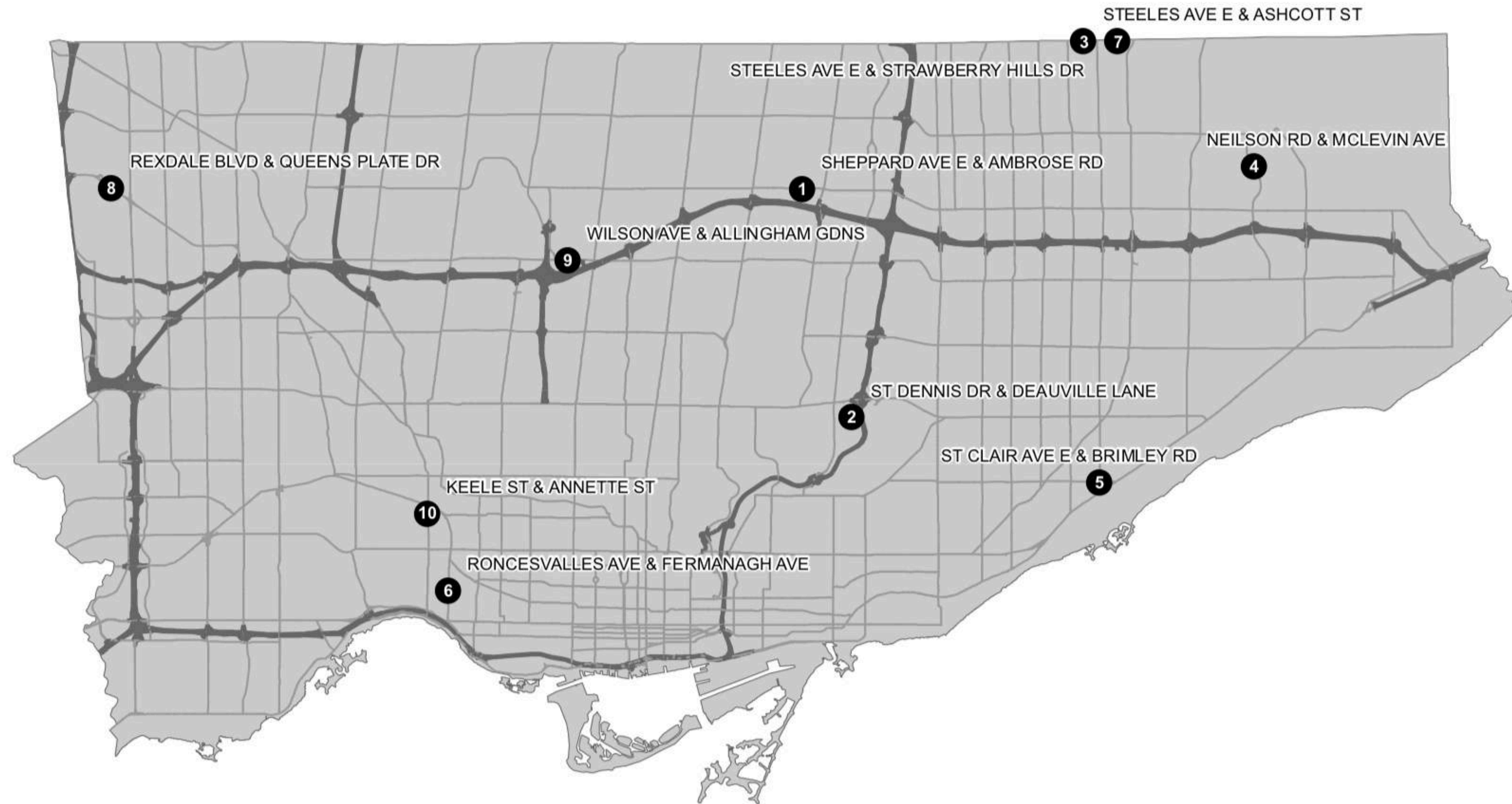


Discussion: Why Might We See a Low Correlation? Social Factors.



Why accounting for population
density is important

Top Priority Intersections for Pedestrian Safety



0 1.5 3 6 9 12 Kilometers

Intersection Ranking



The question of Open Data

Policy Context

Who are we hearing from?



Who are we
building for?





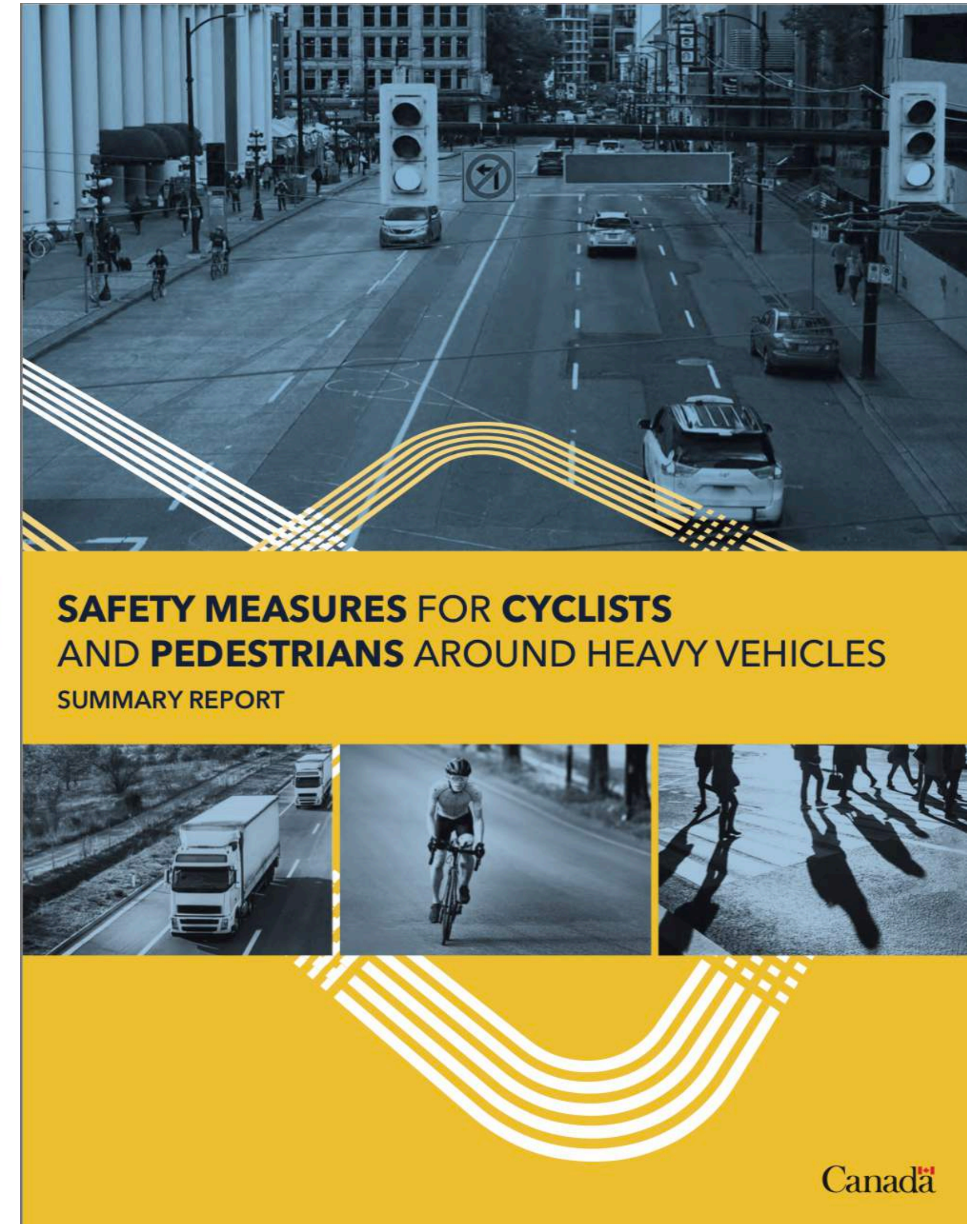
Complete Street Transformations

in the Greater Golden Horseshoe Region

Urban Street Design Guide

National Association of City Transportation Officials





Scaling Up — Our policy recommendations

We want to start a conversation about healthy places in Alberta with a set of provincial policy recommendations that emerged from what we heard from community conversations, subject matter experts, and from our explorations in co-design.

Health

The Province supports and grows the role of Alberta Health Services' public health professionals, such as public health inspectors, health promoters and medical officers of health, who already work collaboratively in local communities providing expertise on healthy built environments. They and public health academics are engaged in developing inter-ministerial policy guidelines and tools for designing and evaluating healthy built environments.

Infrastructure

New healthcare facilities, schools, roads, bridges, and seniors' and affordable housing investments demonstrate how they support a healthy and equitable built environment.

Tourism

The Province invests in regional active transportation infrastructure that meet the needs of local communities and tourists alike. Clusters of communities have expressed the benefits of investing in regional active transportation for tourism and economic development, as well as mobility and accessibility for local residents.

Education

(a) The Province invests in walking school buses and bike-to-school programs, and

(b) Incorporates healthy place-making into curriculum. Curriculum helps children evaluate the built environment around their schools and propose changes. We know from experience that kids are observant, perceptive, and empathetic. They come up with the best ideas!

(c) The Ministries of Education and Transportation collaborate with municipalities and towns to create active transportation infrastructure around schools, and contribute to healthy behaviour and successful learning environments.

All new provincial infrastructure projects demonstrate how they support healthy and equitable built environments, as determined by new guidelines. Guidelines for healthy built environments are developed through a collaborative, inter-ministerial process that builds on best practices. Assessment tools for healthy built environments are identified and adapted.

Guidelines for multi-stakeholder collaboration are developed, to help major infrastructure projects respond to the needs of the local community, and best leverage the roles, responsibilities and strengths of stakeholders.

Environment

The Province demonstrates how Land Use Frameworks support public health using identified assessment tools, and enhances support for brownfield re-development.

Transportation

(a) Roads and bridge projects demonstrate how they support healthy and equitable built environments. Attention is paid to the role of highways in rural and indigenous communities: how they are used by vulnerable users and how they impact local mobility. Projects respond to community needs, regional tourism strategies, especially those focused on walking and cycling, and use a Vision Zero lens.

(b) An Active Transportation group is created to advise the Ministry of Transportation and local communities on infrastructure projects, and liaise with other ministries.

(c) A fund for active transportation projects is created in partnership with the Ministry of Environment. The Alberta Traffic Safety Fund continues to provide learning and prototyping opportunities for communities.

Affordable Housing

New affordable housing projects funded by the province are sited in healthy and affordable places. Projects must demonstrate how their design and site selection support healthy, affordable and equitable built environments. Affordable housing locations are often based on land costs, which does not always coincide with overall suitability. The surrounding built environment can play a big role in determining household expenses, particularly transportation. It can also affect which economic opportunities and social supports are accessible. Affordable housing should emphasize affordable and healthy neighbourhoods, which incorporate: accessible transportation options, amenities, schools, services, food, jobs and affordable recreation options.

Seniors' Housing

New seniors' housing projects are in healthy and age-friendly places. Projects funded by the Province demonstrate how their design and site selection support healthy and age-friendly built environments. As our population ages, we need to consider not just housing, but the suitability of neighbourhoods for seniors; create age-friendly places that provide social connection, transportation options, safety, and access to services, amenities and recreation.

Next steps



- **SES index and collisions**
- **10 most dangerous intersections**



THANK YOU!

Amrit Khakh, B.Sc., M.GIS

Celia Lee, M.E.Des

Sustainable Calgary

<http://www.sustainablecalgary.org>



CO-DESIGNING THE ACTIVE CITY



NEWS

Conference
April | 9 | 2018

MOVING, IT'S ALSO STOPPING. HOW TO STUDY PUBLIC LIFE.

During this conference in Quebec City, MUEC will present Gehl publication How to study public life.

Conference
March | 16 | 2018

CONFERENCE - BUILDING THE ACTIVE CITY TOGETHER

Longueuil, Québec - Odile Craig, MUEC, will present inspirational initiatives for active cities.

News
February | 28 | 2018

JOB OPPORTUNITY: RESEARCH ASSISTANT

Are you a graduate student interested in the interaction between health, urban design and

ACTIVE
NEIGHBOURHOODS
CANADA

WHAT IS AN ACTIVE NEIGHBOURHOOD? An active, green, and healthy neighbourhood is a neighbourhood redesigned to celebrate the use of shared public space, including streets and parks.

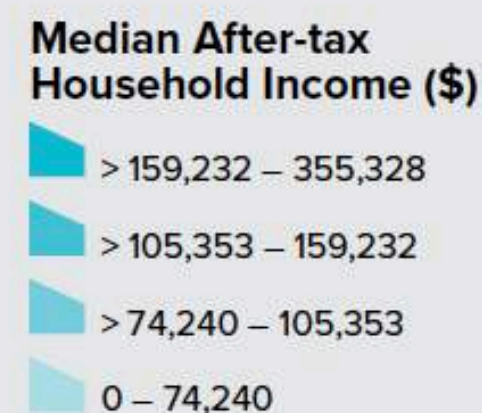
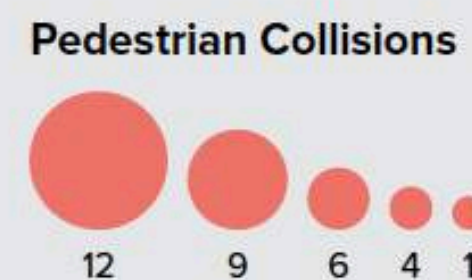


Health Inequity — Pedestrian collisions tied to neighbourhoods experiencing low incomes

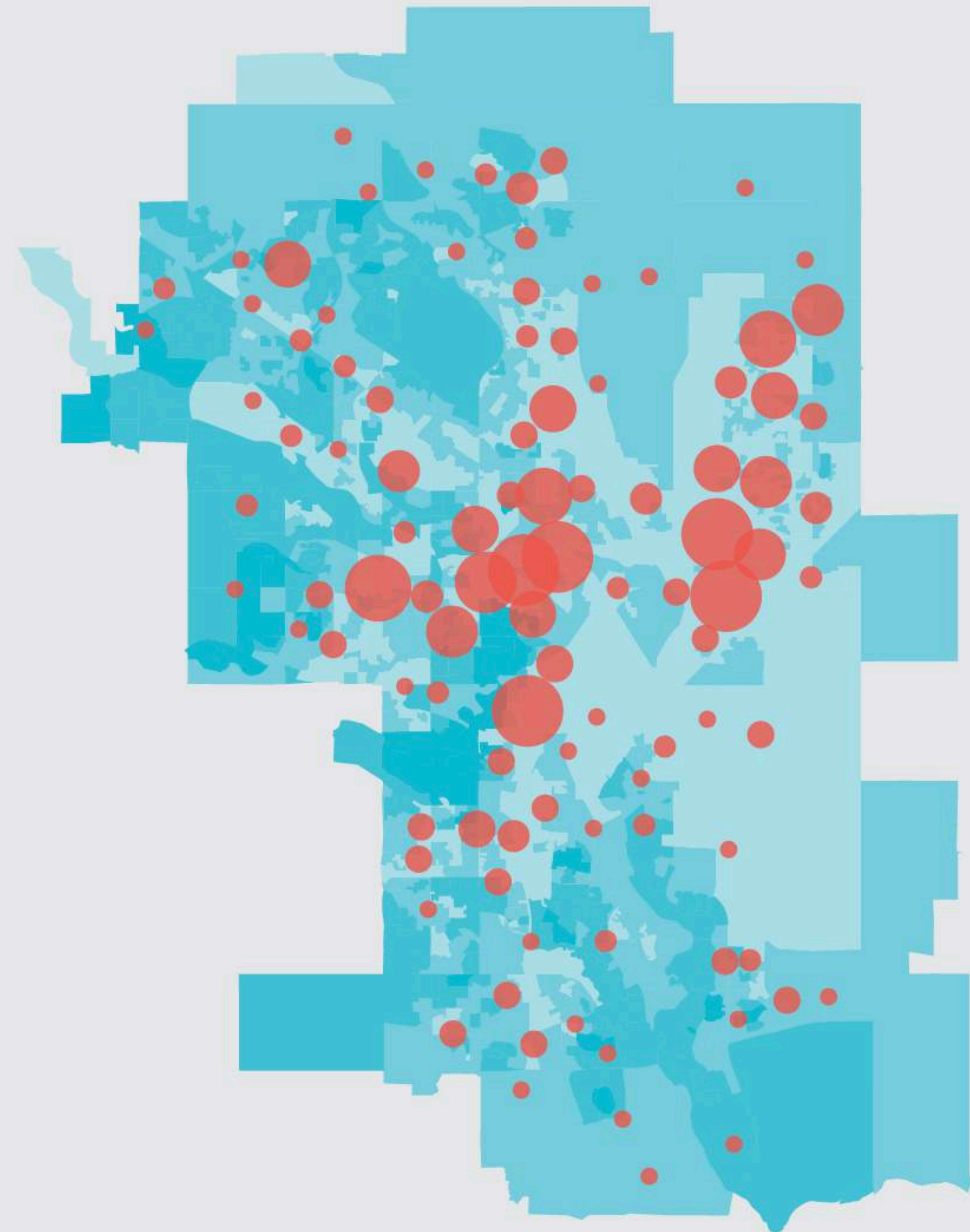
Are we designing our cities for health equity?

In 2016, 1691 pedestrians and cyclists were injured in collisions in Alberta, 3 of which were fatalities. Several North American cities have correlated pedestrian collisions with socio-economic factors such as income, age, gender and ethnicity, as well as with the quality of the built environment. We wanted to know if the same held true in Calgary, and commissioned new research to explore this. Preliminary results tell us there is a correlation between collision frequency and nearby household incomes. Research is underway to explore additional contributing factors. Of particular interest is analysis of collisions as a rate of total pedestrians or of local population density. Research in other cities suggests that serious pedestrian collisions are more likely in areas that experience both lower incomes and lower pedestrian flows.

City of Calgary : Pedestrian Collisions 2016



SOURCE: KHAKH, 2019



See this interactive map
for yourself at:
<https://bit.ly/2ufFaIX>