Enhancing equity and road safety in Guelph

Starting in 2021, the City of Guelph will use data from a research partnership with the University of Guelph to proactively target road safety and traffic calming measures in specific areas across the city.

Guelph's Community Plan imagines a city where everyone in the community can "move around freely" and "people feel safe walking, jogging, wheeling and riding their bikes through all of our city." To support this vision, a partnership between the City of Guelph's Engineering and Transportation Services department, the Guelph Lab[1], and the Department of Geography, Environment and Geomatics at the University of Guelph conducted research on the relationship between inequality and road safety in Guelph.

Summary

- The City will proactively target road safety improvements in areas of the City that have a history of collisions but have not had many traffic studies in the past.
- The most marginalized areas of Guelph see more pedestrians and cyclists involved in collisions with a driver.
- The most marginalized areas of Guelph have fewer traffic studies. Traffic studies are usually conducted in response to residents' concerns, so this suggests that a history of collisions doesn't always predict where people will request traffic calming measures.
- The most marginalized areas of Guelph tend to have fewer local roads. Local roads often have lower posted speeds, which is associated with fewer collisions and less severe collisions.

[1] The Guelph Lab is a joint initiative of the City of Guelph and University of Guelph.

University of Guelph
College of Social and Applied Human Sciences
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Making a Difference

What is road safety?

Collisions are a leading cause of death and injury in Canada[2] and the City of Guelph uses road safety and traffic calming measures to make roads safer for all road users. These measures include narrowing roads, speed limit reductions, education campaigns (e.g., "Don't Rush the Red"), and automated enforcement cameras. These interventions are often initiated in response to community concerns, so residents also play an important role in planning traffic calming and road safety measures.



How does inequality influence road safety?

Existing research shows that collisions are not evenly distributed in Canadian cities. For example, neighbourhoods with lower average incomes tend to see more pedestrians and cyclists injured in collisions compared to neighbourhoods with higher average incomes.[3] Some of the factors that influence collisions also reflect social and economic inequality. For example, neighbourhoods with lower average incomes tend to have fewer traffic calming and road safety measures like speed cushions and reduced speed limits.[4] One reason for these differences is that inequality also affects rates of civic participation. For example, neighbourhoods with more recent immigrants, a younger population, or lower average incomes may be less likely to request services (like road safety measures) because these residents can face barriers to participation in local politics and local policy-making.[5]

As part of the Community Road Safety Strategy (CRSS), the City is trying to address these issues through research about where collisions happen in Guelph. Incorporating equity into the CRSS is part of the City's commitments to diversity, inclusion and anti-racism, including the Community Plan and membership in the Coalition of Inclusive Municipalities.

[2] Parachute. (2021, August 27). *Road safety*.
[3] Pedestrian collisions are an issue of equity: Streets in lower-income areas more dangerous for pedestrians. (2019, April 25). *Active Neighbourhoods Canada*.
[4] Rothman, L., Cloutier, M.-S., Manaugh, K., Howard, A. W., Macpherson, A. K., & Macarthur, C. (2019). Spatial distribution of roadway environment features related to child pedestrian safety by census tract income in Toronto, Canada. *Injury Prevention, 26*(3), 229–233.
[5] John, P. (2009). Can citizen governance redress the representative bias of political participation? *Public Administration Review, 69*(3), 494–503.

Research methods

This research examined the relationship between pedestrian and cyclist collisions, the location of traffic studies, and inequality (measured through the Ontario Marginalization Index). The research used the following data sets:

- **Collision reports.** All police-reported collisions in Guelph from 2015-2019.
- **Location of traffic studies.** Traffic studies give an indication of where residents have requested road safety measures in the past. Not all requests lead to a traffic study however, so this is a good estimate rather than an exact measure of residents' requests.
- **Ontario Marginalization Index.** This index combines 18 indicators that help researchers to understand different aspects of inequality. It includes indicators related to residential instability, material deprivation, ethnicity, and dependency (people who do not have income from employment e.g., seniors, children and adults whose work is not compensated).
- **Walkability Scores.** Areas of the city that are highly walkable are more likely to have pedestrians and cyclists using the sidewalks, trails, and roads. Walkability Scores were taken from the "Canadian Active Living Environments" datasets.

Statistics Canada divides Guelph into 200 different areas, known as Dissemination Areas. This research compared the number of collisions and traffic studies in 37 of the highly walkable areas of the city. 16 of the 37 were amongst the most marginalized areas of the city according to data from the Ontario Marginalization Index. 21 were amongst the least marginalized areas of the city. The results for each area were calculated based on the number of collisions and traffic counts per 10KM of road in that area.

How does equity influence road safety in Guelph?

The most marginalized areas of Guelph saw more pedestrians and cyclists involved in collisions with drivers. Between 2015 and 2019, 381 pedestrians and cyclists were involved in collisions with drivers on Guelph's roads.[6] Most of these pedestrians and cyclists (359 out of 381) sustained injuries and 29 sustained major injuries or died.[7] On average, the most marginalized areas of the city saw twice as many pedestrians and cyclists involved in collisions compared to the least marginalized areas of the City.

The most marginalized areas of Guelph have had fewer traffic studies. The City conducts traffic studies in response to residents' concerns and the results of these studies help to determine what kind of road safety intervention is most appropriate. On average there were half

[6] City of Guelph. (2020). *2015 - 2019 collision report*.
[7] City of Guelph. (2020). *2015 - 2019 collision report*.

as many traffic studies (per 10 km of road) in the most marginalized areas of Guelph compared to the least marginalized areas of the city.

The most marginalized areas of Guelph have a higher proportion of arterial and collector roads. Local roads tend to have lower posted speeds than arterials and collectors, and existing research shows that lower speeds are associated with fewer collisions and less severe collisions. On average, 57% of the roads in the most marginalized areas of Guelph are local roads. In the least marginalized areas of Guelph an average of 73% of the roads are local roads



How will equity considerations change how the City makes decisions about road safety?

This research shows that historical evidence of collisions doesn't always predict where people will request traffic calming measures. Some road safety requests come from areas without historical evidence of collisions and some areas of the city aren't making road safety requests, even though there is a history of collisions in the area.

Through this research the City has identified areas of Guelph that have been marginalized, and have a demonstrated history of collisions but very few traffic studies. These areas of the City are likely to benefit from a road safety improvement (such as traffic calming, speed reduction, etc.) and the City will now work proactively to target traffic studies and road safety improvements in these areas.

Residents' road safety requests will continue to play an important role in road safety, and they will now be complemented by this data about collisions and equity. See the below map of collisions and traffic studies in Guelph.

Map of collisions and traffic studies in Guelph

A history of collisions does not always predict where people will request traffic studies in Guelph

About this report

Map of collisions and traffic studies

The map in this report contains information about collisions and traffic studies conducted in Guelph. It shows the location of all collisions involving pedestrians and cyclists between 2015 and 2019. The collisions are represented by red circles. The larger the circle, the more collisions at that location. The map also shows the location of traffic studies, which are represented by blue squares. The map area comprises the boundaries of the city of Guelph. All major roads and some minor roads are included in the map to help orient the viewer. The maps suggests that traffic studies have been conducted in many areas that have no history of collisions. Likewise, some areas of the city had few (or even no) traffic studies despite multiple collisions.

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The Guelph Lab is a joint initiative of the City of Guelph and University of Guelph.

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