

# Urban Traffic Calming and Health Inequalities

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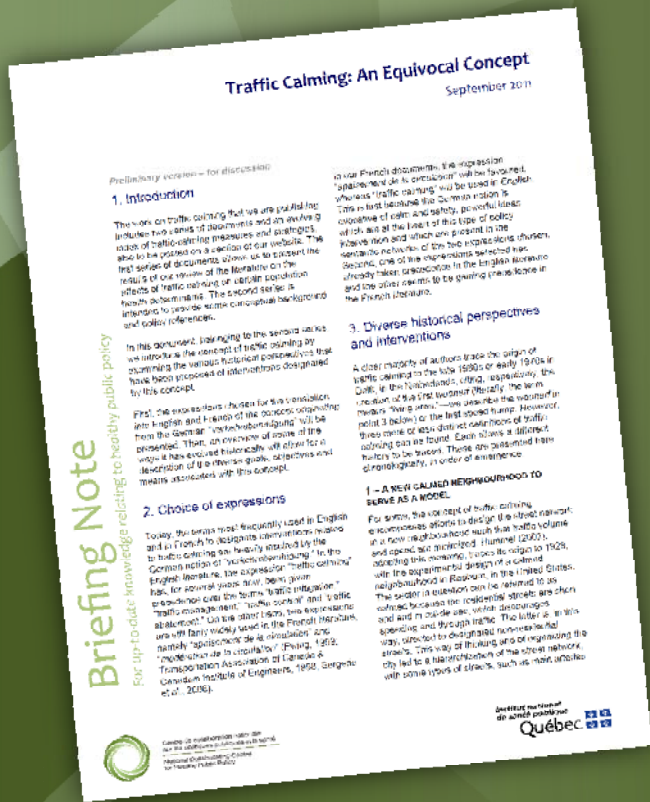
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Québec

# What is traffic calming?

A way of modifying the built environment which involves the installation of **traffic-calming measures** on the street network usually according to one of two broad approaches:

- The **black-spots** approach
- The **area-wide** approach



[http://www.nccpp.ca/175/Publications.ccnpps?id\\_article=648](http://www.nccpp.ca/175/Publications.ccnpps?id_article=648)



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# What is traffic calming?

**Traffic-calming measures** are designed by engineers primarily to reduce the speed and/or the volume of motorized traffic.



Source: [www.pedbikeimages.org](http://www.pedbikeimages.org).  
Photographer: Dan Burden.

Mini-roundabout



Source: [www.pedbikeimages.org](http://www.pedbikeimages.org).  
Photographer: Dan Burden.

Speed hump



Source: [www.pedbikeimages.org](http://www.pedbikeimages.org).  
Photographer: Dan Burden.

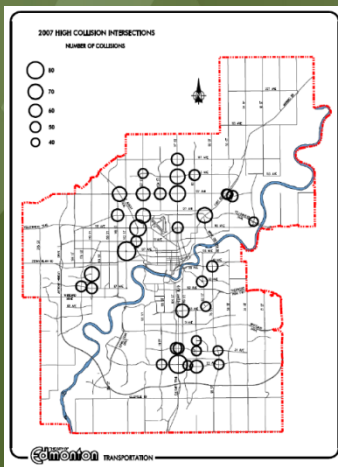
Full closure



# What is traffic calming?

## Black-spots approach:

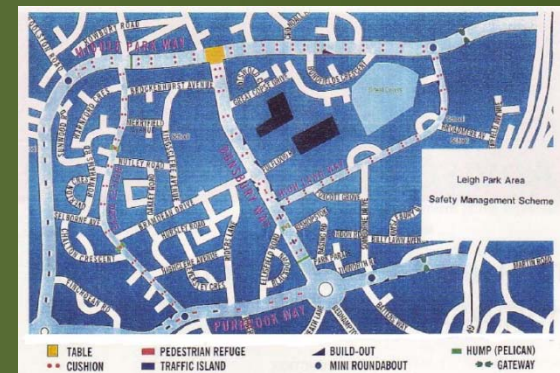
- Targeted interventions at high risk locations to improve safety, mostly by reducing traffic speed.



Source: City of Edmonton, 2008, p. 29.

## Area-wide approach:

- Systematic interventions on a street network to improve safety and living conditions, mostly by reducing traffic speed and volume.



Source: Department for Transport, 1999, p.2.





# What did we do?



[http://www.nccchpp.ca/175/Publications.ccnpps?id\\_article=686](http://www.nccchpp.ca/175/Publications.ccnpps?id_article=686)

A **literature review** designed to help anticipate the effects of the two approaches to urban traffic-calming on four determinants of health:

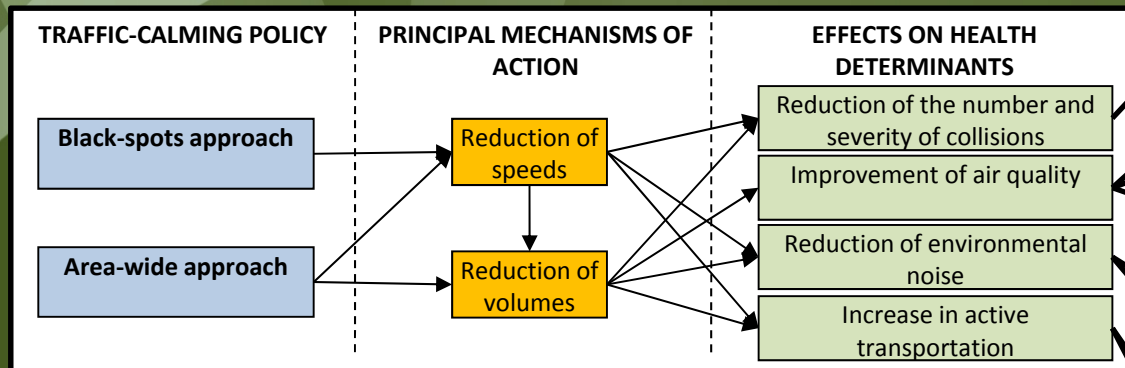
- The number and severity of collisions
- Air quality
- Environmental noise
- Active transportation




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# What did we find?




## Intervention logic:





## Evidence:

-  All street users



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-  Per vehicle emissions
-  Total emission, with traffic volume reductions
-  Little or no effect on air quality

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-  Cars
-  Trucks

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-  Perceived safety (most users)
-  # of active trips and physical activity

## Most promising intervention:

- Area wide
- Reduces speeds
- Reduces speed variations
- Reduces traffic volume
- Reduces health inequalities



# Transportation and inequalities?

## Inequalities between who and who?

- Socio-economic status (SES)
- Income
- Racial traits
- Place of residence
- Mode of transportation
- Age
- Gender
- ...

## Inequalities of what?

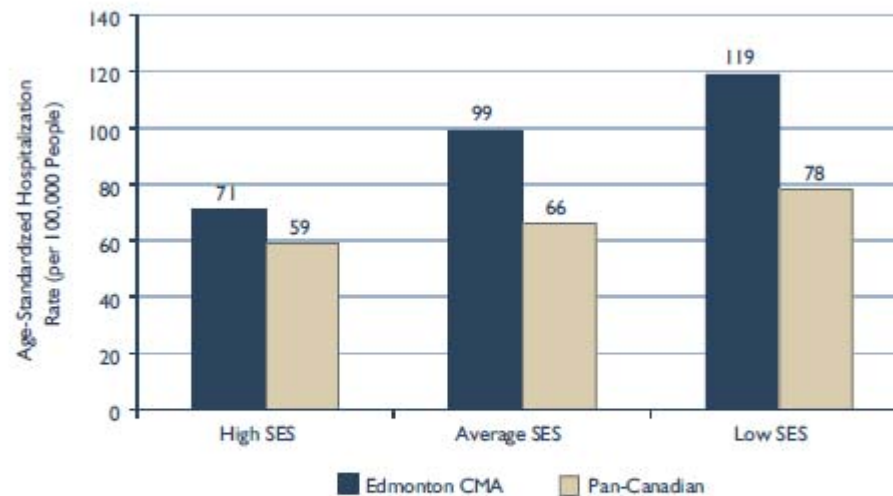
Distribution of the benefits and burdens of the transportation network:

- Accessibility
- Collisions, injuries, fatalities
- Air quality
- Noise
- Perceived safety (motorists, cyclists, children, etc.)
- ...



# E.g. Collision-related injuries by Socio-Economic Status group (SES)

Pan-Canadian and Edmonton CMA Age-Standardized Hospitalization Rates for Land Transport Accidents by Socio-Economic Status Group\*



**Note**

\* See detailed data tables (Appendix D) for significance testing.

**Source**

CPIH analysis of 2003-2004 to 2005-2006 National Trauma Registry data, Canadian Institute for Health Information.

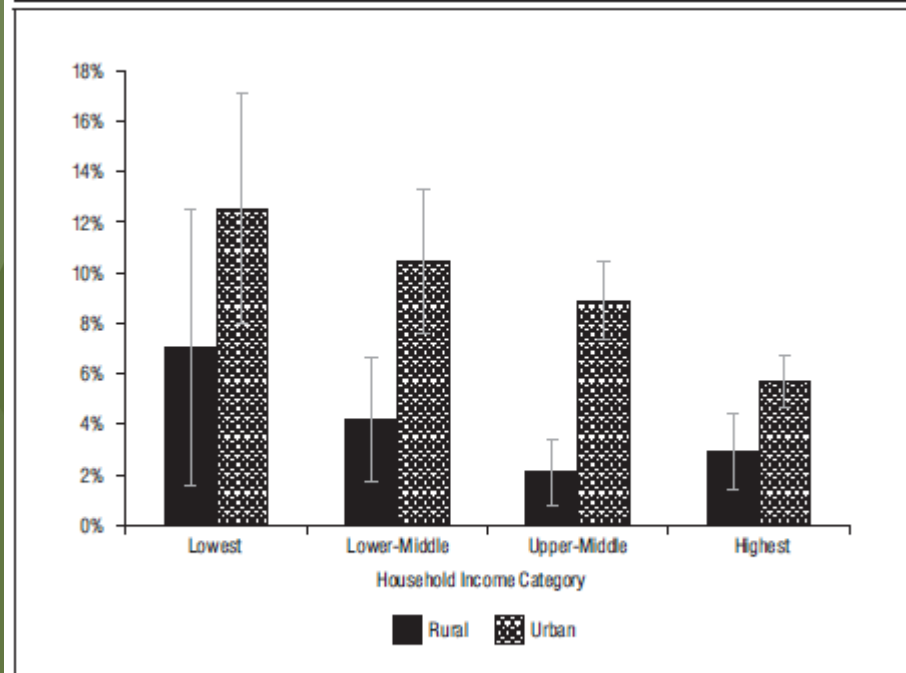
CIHI, 2008, p.46.





# E.g. Noisy or polluted neighbourhoods by income

Figure 1: Percentage of Urban and Rural Adults Who Reported That Their Neighbourhoods Were Too Noisy or Polluted, by Household Income Category, 2006–2007



**Note**  
Error bars indicate 95% confidence intervals.

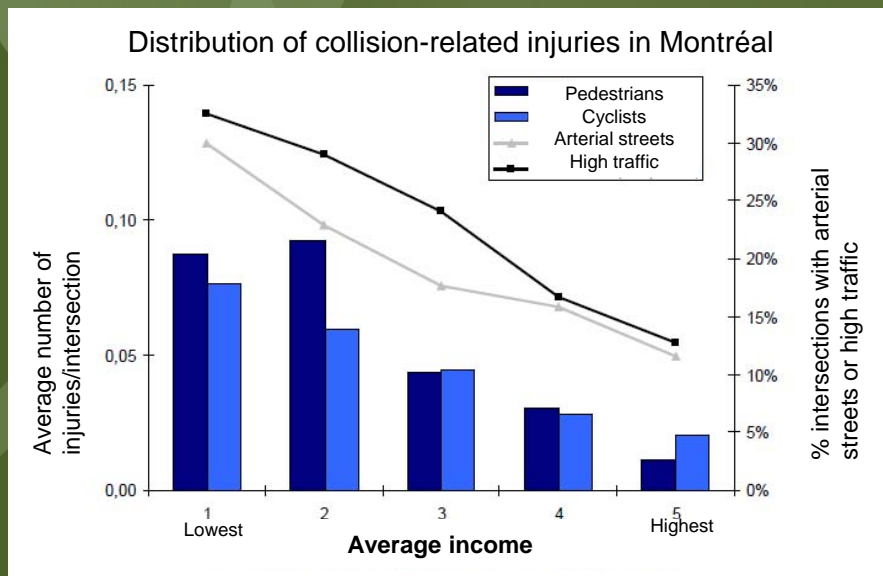
**Source**  
National Population Health Survey, 2006–2007, Statistics Canada.

CIHI, 2011, p.11.



# How can traffic calming reduce inequalities?

- **Black-spots approach:** usually targets locations at high risk for collisions
  - In urban settings, most are usually in low SES neighborhood.



Promising strategy to reduce collision-related injuries (correlation to inequalities), but not evaluated



# How can traffic calming reduce inequalities?

- **Area-wide approach:** by targeting low SES neighbourhood to reduce inequalities:

- Collision-related injuries → 2 positive evaluations

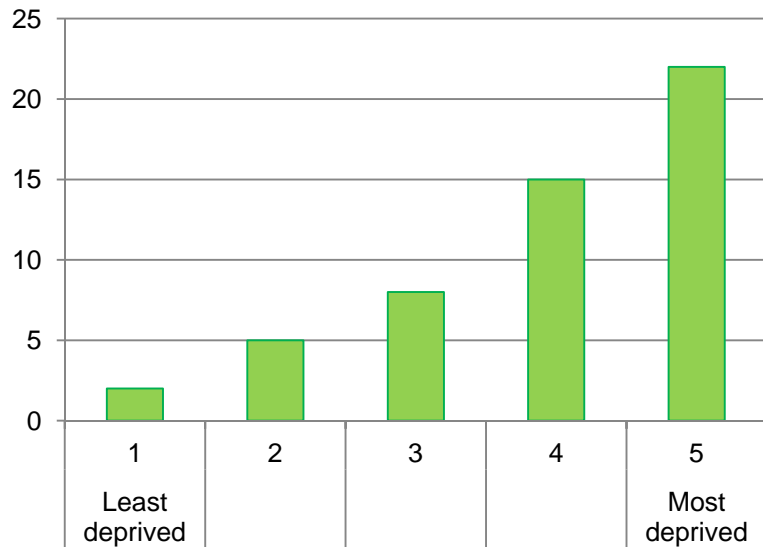
- Pollution (air & noise)
- Perceived safety

Promising, but not evaluated



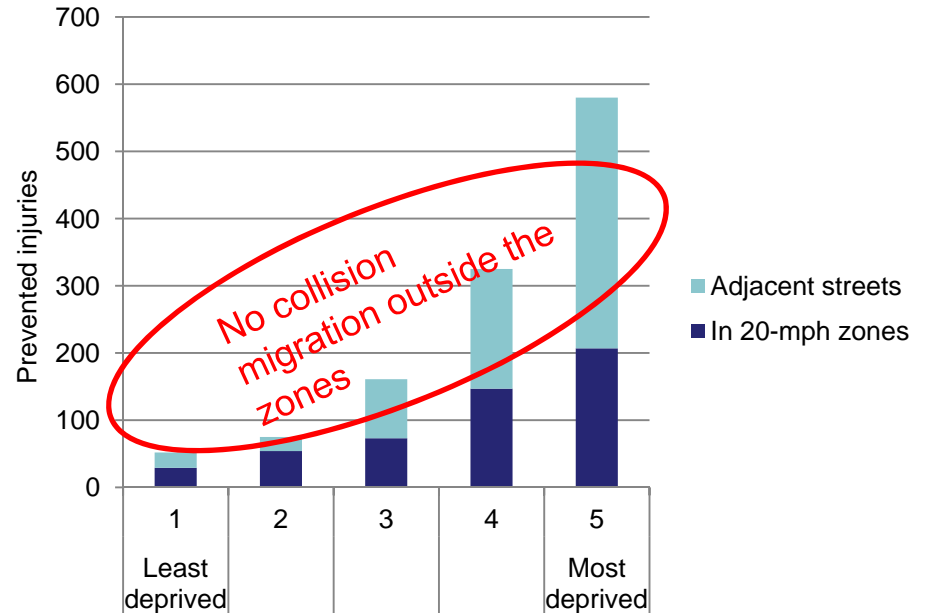
# E.g. 399 20-mph zones in London, U.K.

**% of km of street by deprivation  
quintile covered by  
20-mph zones in 2006**



Source of data:  
Grundy et al., 2008, p.39.

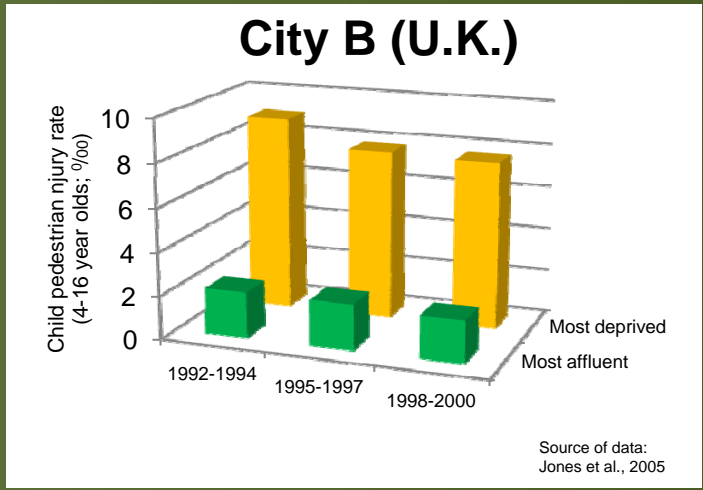
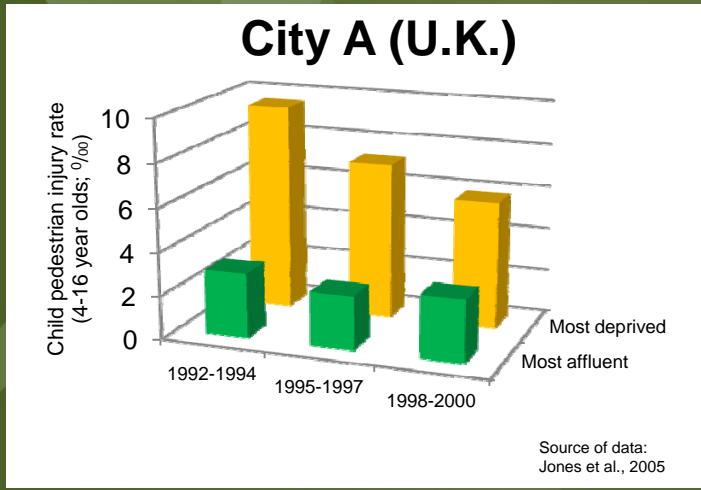
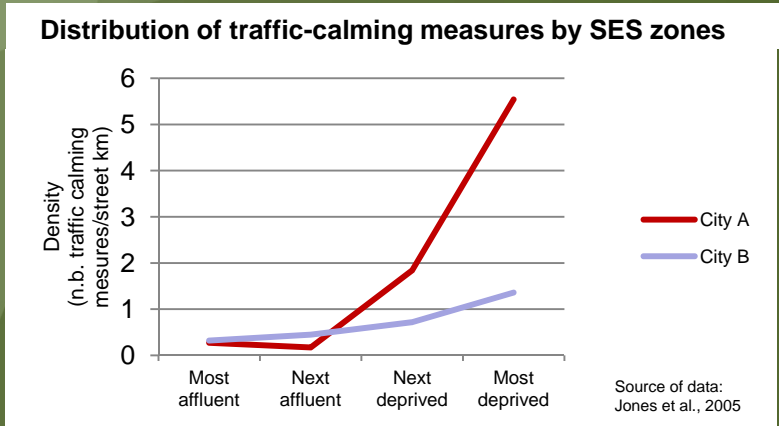
**Prevented injuries in 2006**



Source of data:  
Grundy et al., 2008, p.40.



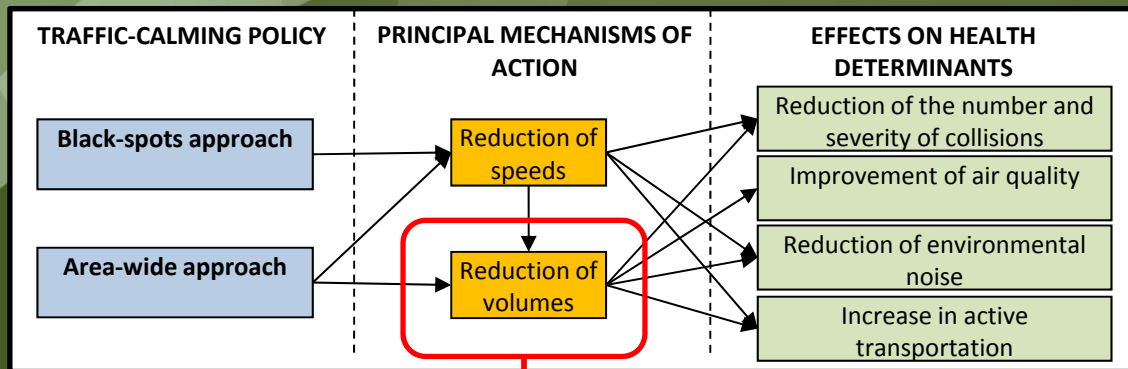
# E.g. Two similar cities, U.K.





# Unintended effects on inequalities?

## Intervention logic:



- Modal transfer (to cycling, ...)
- Traffic diversion (from one local street to another or from local streets to major roads)



People of low SES tend to be overrepresented near major roads

+

Burdens from transportation are already high



# A simple framework:

	...near the intervention?	...where some of the motorized traffic might be diverted?
What are the anticipated effects of an intervention on the main determinants of health...	<p>Positive effects:</p> <p>Negative effects:</p>	<p>Traffic diversion: Yes/No?</p> <p>Positive effects:</p> <p>Negative effects:</p>
Who lives, works, studies, etc.,...	<p>Who benefits?</p> <p>Who bears the burden?</p>	<p>Traffic diversion: Yes/No?</p> <p>Who benefits?</p> <p>Who bears the burden?</p>
Who travels by what mode (car, cycling, walking, etc.)...	<p>Who benefits?</p> <p>Who bears the burden?</p>	<p>Traffic diversion: Yes/No?</p> <p>Who benefits?</p> <p>Who bears the burden?</p>



# References

- Bellefleur, O. & Gagnon, F. (2011). *Urban Traffic Calming and Health: A Literature Review*. Montréal: National Collaborating Centre for Healthy Public Policy. Retrieved from: [http://www.nccchpp.ca/175/Publications.ccnpps?id\\_article=686](http://www.nccchpp.ca/175/Publications.ccnpps?id_article=686)
- Canadian Institute for Health Information. (2008). *Reducing Gaps in Health: A Focus on Socio-Economic Status in Urban Canada*. Ottawa: CIHI. Retrieved from: [http://secure.cihi.ca/cihiweb/products/Reducing\\_Gaps\\_in\\_Health\\_Report\\_EN\\_081009.pdf](http://secure.cihi.ca/cihiweb/products/Reducing_Gaps_in_Health_Report_EN_081009.pdf)
- Canadian Institute for Health Information. (2011). *Urban Physical Environments and Health Inequalities*. Ottawa: CIHI. Retrieved from: [http://secure.cihi.ca/cihiweb/products/cphi\\_urban\\_physical\\_environments\\_en.pdf](http://secure.cihi.ca/cihiweb/products/cphi_urban_physical_environments_en.pdf)
- Department for Transport. (1999). *Leigh Park Area Safety Scheme, Havant, Hampshire* (Report No. Traffic Advisory Leaflet 2/99). London: TSO. Retrieved from: <http://www.ukroads.org/webfiles/TAL%202-99%20Leigh%20Park%20Area%20Safety%20Scheme%20-%20Havant%20-%20Hampshire.pdf>
- Edmonton, the City of. (2008). *Motor Vehicle Collisions 2007*. Edmonton. Retrieved from: [http://www.edmonton.ca/transportation/RoadsTraffic/2007\\_Annual\\_Collision\\_Report\\_FINAL.pdf](http://www.edmonton.ca/transportation/RoadsTraffic/2007_Annual_Collision_Report_FINAL.pdf)
- Gagnon, F. & Bellefleur, O. (2011). *Traffic calming: An Equivocal Concept*. Montréal: National Collaborating Centre for Healthy Public Policy. Retrieved from: [http://www.nccchpp.ca/docs/ConceptTrafficCalming\\_EN.pdf](http://www.nccchpp.ca/docs/ConceptTrafficCalming_EN.pdf)
- Grundy, C., Steinbach, R., Edwards, P., Wilkinson, P., & Green, J. (2008). *The Effect of 20 mph zones on Inequalities in Road Casualties in London: A report to the London Road Safety Unit*. London: London School of Hygiene and Tropical Medicine. Retrieved from: <http://www.tfl.gov.uk/assets/downloads/the-effect-of-20-mph-zones-on-inequalities-in-road-casualties-in-london.pdf>
- Jones, S. J., Lyons, R. A., John, A., & Palmer, S. R. (2005). Traffic calming policy can reduce inequalities in child pedestrian injuries: database study. *Injury Prevention*, 11, 152-156. doi: 10.1136/ip.2004.007252
- Morency, P. (2009). Blessés de la route, des inégalités qui s'expliquent. *Développement social*, 10(2), 31.



# Thanks!

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