Urban Traffic Calming and Health Inequalities

Olivier Bellefleur CDPAC, Ottawa February 9th, 2012



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What is traffic calming?

Traffic Calming: An Equivocal Concept

Prelimbary version - for discussion

1. Introduction

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Diverse historical perspectives and interventions

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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



What is traffic calming?

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



Mini-roundabout



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Speed hump



Full closure



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What is traffic calming?

Black-spots approach:

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



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Area-wide approach:

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



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What did we do?

National Collaborating Center for Healthy Public Policy www.ncchpp.ca

> URBAN TRAFFIC CALMING AND HEALTH: A LITERATURE REVIEW PRELIMINARY VERSION | NOVEMBER 2011

http://www.ncchpp.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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Data

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What did we find?



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Transportation and inequalities?

Inequalities between who and who?

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

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.)
- ...



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- Age
- Gender

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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

CPHI analysis of 2003–2004 to 2005–2006 National Trauma Registry data, Canadian Institute for Health Information. CIHI, 2008, p.46.



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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 18% 16% 14% 12% 10% 8% 6% 4% 2% 0% Lower-Middle Lowest Upper-Middle Highest Household Income Category Rural 🔛 Urban Note Error bars indicate 95% confidence intervals. Source

National Population Health Survey, 2006-2007, Statistics Canada.



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CIHI, 2011, p.11.

How can traffic calming reduce inequalities?

Black-spots approch: usually targets locations at high risk for collisions

In urban settings, most are usually in low SES neighborhood.



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



How can traffic calming reduce inequalities?

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

 $\frac{\text{Collision-related injuries}}{\text{Pollution (air & noise)}} \rightarrow 2 \text{ positive evaluations}$

Perceived safety _____



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

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



700 600 500 No collision outside the migration Prevented injuries 400 300 Adjacent streets In 20-mph zones 200 zones 100 0 3 5 2 4 Least Most deprived deprived

Prevented injuries in 2006

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



Centre de collaboration nationale sur les politiques publiques et la santé national Collaborating Centre for Healthy Public Policy Grundy et al., 2008, p.39.

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



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Source of data: Jones et al., 2005



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Unintended effects on inequalities?

Intervention logic:



Modal transfer (to cycling, ...)



<u>Traffic diversion</u> (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



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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		Traffic diversion: Yes/No?
	Positive effects:	Positive effects:
	Negative effects:	Negative effects:
Who lives, works, studies, etc.,		Traffic diversion: Yes/No?
	Who benefits?	Who benefits?
	Who bears the burden?	Who bears the burden?
Who travels by what mode (car, cycling, walking, etc.)		Traffic diversion: Yes/No?
	Who benefits?	Who benefits?
	Who bears the burden?	Who bears the burden?



References

Bellefleur, O. & Gagnon, F. (2011). Urban Traffic Calming and Health: A Literature Review. Montréal: National Collaborating Centre for Healthy Public Policy. Retrieved from: <u>http://www.ncchpp.ca/175/Publications.ccnpps?id_article=686</u>

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

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

- Edmonton, the City of. (2008). *Motor Vehicle Collisions 2007*. Edmonton. Retrieved from: 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.ncchpp.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.



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Thanks!

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