Urban Traffic Calming and Health: A Literature Review

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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.ncchpp.ca/175/Publications_conpps?id_article=648
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  
Speed hump  
Full closure
What is traffic calming?

**Black-spots approach:**
- Targeted interventions at high risk locations to improve safety, mostly by reducing traffic speed.

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

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

## Traffic calming and health?

### Intervention logic:

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1. A systematic search of peer-reviewed (n=19) and grey literature (n=10) for evaluative studies of urban traffic-calming interventions on four determinants of health:
   - The number and severity of collisions
   - Air quality
   - Environmental noise
   - Active transportation
What did we do?

2. A broader search for peer reviewed (n=36) and grey literature (n=38) to identify:
   - research gaps
   - methodological issues
   - mechanisms of action

3. A comparison of the black-spots and the area-wide approaches

E.g., The relation between speed and noise
What did we find?

Collisions:

- Black-spots and area-wide interventions substantially reduce the number and severity of collisions for all users of the streets (drivers, cyclists, pedestrians, children, etc.).

399 20-mph (32-km/h) zones in London:
-42% injury collisions
(-49% children)

Single-lane roundabout:
-77% injury collisions

Source: Grundy et al., 2009, p. 2.
What did we find?

Air quality:

- Most interventions increase per vehicle emissions (CO$_2$, VOC, CO, NO$_X$, PM), except those reducing speed variations (e.g., mini-roundabouts replacing stop signs).

- Area-wide interventions can reduce overall emissions in an area if they reduce the volume of traffic.

- Little or no effect on ambient air quality.
What did we find?

Noise:

• Most interventions reduce the noise generated by cars as a result of speed reduction.

• Most interventions increase the noise generated by heavy vehicles (trucks, buses, etc.), by causing speed variations or introducing vertical deflections.

Source: www.pedbikeimages.org.
Photographer: Dan Burden.
What did we find?

Active transportation:

- Traffic calming increases perceived road safety of pedestrians, parents, and drivers.

- Cyclists are concerned about horizontal deflections and narrowings that force them closer to moving vehicles.

- Traffic calming has uncertain effects on the number of active trips.

- Traffic calming has uncertain effects on physical activity.
Conclusion

Intervention logic:

**TRAFFIC-CALMING POLICY**

- Black-spots approach
- Area-wide approach

**PRINCIPAL MECHANISMS OF ACTION**

- Reduction of speeds
- Reduction of volumes

**EFFECTS ON HEALTH DETERMINANTS**

- Reduction of the number and severity of collisions
- Improvement of air quality
- Reduction of environmental noise
- Increase in active transportation

**Evidence:**

- All street users
- Per vehicle emissions
- Total emission, with traffic volume reductions
- Little or no effect on air quality
- Cars
- Trucks

*Most promising intervention:*

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

Tomorrow’s presentation!
References


Thanks!

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Our documents are available in French and English online at www.ncchpp.ca