

# Traffic Calming In Canadian Urban Areas

## Overview

Over the last 10 to 15 years, traffic calming has become an accepted form of traffic management in Canadian communities. The 1998 publication of the *Canadian Guide to Neighbourhood Traffic Calming* was a major validating step.

Traffic calming is often advocated by community groups that are concerned with a range of issues related to excessive traffic speeds and volumes, and poor driver behaviour. It is sometimes perceived as a process rather than just a physical change, and extensive community participation in traffic calming projects is typical.

Dozens of Canadian municipalities now have significant traffic calming experience, and many of these have developed policies or guidelines to help ensure consistency, equity and effectiveness in their traffic calming endeavours.

Major traffic calming issues that have been explored through the experience of various Canadian communities include: impacts on road safety, emergency vehicles, cyclists, transit service and maintenance practices; preservation of neighbourhood equity; questions of applicability to major streets and new neighbourhoods; methods of achieving public consensus and approval; balancing costs and financing opportunities; managing liability; environmental approvals; and the use of temporary installations.

## Resources

- Canadian Institute of Transportation Engineers and Transportation Association of Canada, *Canadian Guide to Neighbourhood Traffic Calming*, 1998 (available from [www.tac-atc.ca](http://www.tac-atc.ca))
- Institute of Transportation Engineers and United States Federal Highway Administration, *Traffic Calming: State of the Practice*, 1999 (available online at [www.ite.org/traffic/tcstate.htm](http://www.ite.org/traffic/tcstate.htm))
- ITE Traffic calming library (available online at [www.ite.org/traffic](http://www.ite.org/traffic))

## Related case studies in this series

- Case Study #30 – St George Street Revitalization: “Road Diets” in Toronto TP 14415 E

## Definition and purpose of traffic calming

The practice of traffic calming is now four decades old, and has spread around the world from its roots in northern Europe. Although the definition and physical forms of traffic calming change from place to place, it is generally understood to involve the mitigation of traffic’s undesirable effects within communities. In Canada, the most accepted definition of traffic calming has been proposed by the Canadian Institute of Transportation Engineers (CITE) and the Transportation Association of Canada (TAC) in the *Canadian Guide to Neighbourhood Traffic Calming*:

- Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users.

The overriding purpose of traffic calming is to restore streets to their intended function by reducing speeds, discouraging excessive through traffic, and minimizing conflicts among road users. Traffic calming is often advocated by community groups that are concerned with a range of traffic-related issues:

- Safety threats due to speeding and aggressive driving
- Traffic noise, emissions and vibrations
- Low rates of walking, cycling and transit use
- Poor social cohesion due to a street environment that discourages neighbours from engaging each other
- Aesthetic problems including excessive pavement, lack of greenspace, and poor property maintenance

Traffic calming measures typically include vertical and horizontal deflections in the road surface, as well as road obstructions and traffic regulations. The roots of traffic calming lie in *woonerven* created by Dutch communities beginning in the 1960s — they eliminated the curbs that separated roads from sidewalks and play areas, and thus integrated roadways with adjacent outdoor spaces. This approach remains the ultimate form of traffic calming, and is only appropriate in limited circumstances. In contrast, traffic calmed roads in most western countries clearly remain vehicular zones, but ones that are respectful of

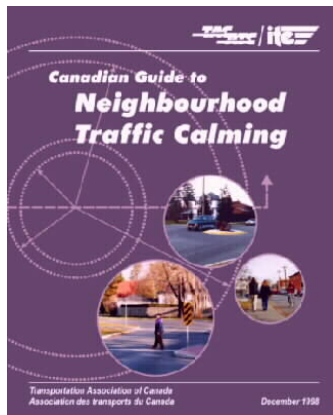
other activities in or near the right-of-way like cycling, walking, playing and socializing.

To some people, the phrase “traffic calming” implies more than physical changes — it represents a process of social change requiring extensive community participation. Traffic calming projects often involve area residents directly in collecting information, identifying problems, developing alternative solutions, and making recommendations. Where the problematic drivers include neighbourhood residents, outreach and communications activities like street sign or bumper sticker campaigns, block parties, newsletters and discussion groups can help to foster attitudinal change and a broader public awareness of behavioural problems and solutions.

### ***Canadian Guide to Neighbourhood Traffic Calming***

In 1998, the Canadian Institute of Transportation Engineers joined with the Transportation Association of Canada to publish the *Canadian Guide to Neighbourhood Traffic Calming*. The guide’s purpose is to help practitioners understand traffic calming principles and applications and achieve some level of standardization, while minimizing liability and maximizing public safety.

The guide focuses on traffic calming measures for local and collector streets in established residential areas. It mainly addresses retrofit situations (i.e. traffic calming on existing streets, rather than streets in new developments), and takes a flexible approach that recognizes the need for traffic calming to reflect local conditions. The guide documents the effectiveness and recommended applicability of a wide range of traffic calming measures, and proposes a step-by-step process for involving affected communities in the development of traffic calming plans.



Based on the Canadian guide and on American experiences with traffic calming, the Institute of Transportation Engineers and the United States Federal Highway Administration published *Traffic Calming: State of the Practice* in 1999. That document offers a synthesis of North American traffic calming experience in residential neighbourhoods and rural communities subjected to entering highway traffic.

The Canadian and American documents are available from [www.tac-atc.ca](http://www.tac-atc.ca) and [www.ite.org/traffic/tcstate.htm](http://www.ite.org/traffic/tcstate.htm), respectively.

## **Summary of Canadian experiences**

Since the 1970s, cities like Toronto, Vancouver and Ottawa have tested innovative solutions to traffic-related neighbourhood problems. Their downtown residential areas have long suffered from cut-through traffic, as commuters take advantage of local street grids to escape congestion on parallel arterial roads. Early approaches to traffic calming often included attempts to deter non-resident drivers from entering neighbourhoods by closing access points and creating maze-like street patterns through turning prohibitions and one-way designations.

However, in the last 10 to 15 years Canadian municipalities of all sizes have experienced a substantial growth in traffic-related complaints from residents in recent suburban developments as well as inner cities. Conventional suburban streets tend to have wide paved surfaces, gentle curves, little on-street parking activity, and long block lengths — a combination that virtually invites drivers to travel at speeds well above posted limits.

In the face of these public concerns and supported by a growing body of international literature, traffic engineering professionals in cities across Canada have tested and evaluated different traffic calming measures. Not only does a northern climate present some unique constraints on road modifications, but every community has its own culture that helps to define the “art of the possible.” Traffic management can also be a highly charged and controversial topic — typically, both “winners” and “losers” want to express opinions about potential changes. For these reasons, and due to a lack of national guidance on technical issues, progress was relatively slow until the *Canadian Guide to Neighbourhood Traffic Calming* was published in 1998 and improved traffic calming’s standing as an accepted traffic management tool. Since that time, dozens of Canadian cities have moved forward proactively in applying traffic calming solutions.

Figure 1 shows a selection of 30 Canadian municipalities that have significant traffic calming experience. For each community, the figure identifies whether local traffic calming applications have been planned and implemented with a focus on individual streets or entire neighbourhoods, and whether the community has developed a detailed policy or guidelines as a framework for traffic calming measures.

Many municipalities have found fixed policies or guidelines to be helpful in prioritizing numerous public requests for help, conducting studies that are thorough and equitable, and consistently implementing measures to achieve predictable results. Some municipal traffic calming policies also address other issues such as cost-sharing between local

government and benefiting residents, limits on traffic calming to respect the needs of emergency and transit vehicles, and approaches to gaining neighbourhood consensus and approval.

**Figure 1 Canadian municipalities with significant traffic calming experience**

Municipality	Detailed policy or guidelines	Project focus	
		Street	Area
<b>British Columbia</b>			
City of Burnaby			■
City of Coquitlam	■		■
Corporation of Delta	■		■
City of Kelowna	■*		■
City of Langley	■		■
City of North Vancouver	■		■
City of Port Moody	■	■	
District of Saanich	■		■
City of Surrey	■		■
City of Vancouver	■		■
City of Victoria			■
District of West Vancouver	■	■	
<b>Alberta</b>			
City of Calgary	■		■
City of Edmonton			■
<b>Saskatchewan</b>			
City of Saskatoon			■
<b>Manitoba</b>			
City of Winnipeg	■+	■	
<b>Ontario</b>			
City of Toronto	■	■	
City of Ottawa	■*		■
City of Waterloo	■	■	
Town of Oakville	■		
Town of Markham	■*		■
City of Pickering	■		■
City of Vaughan	■		■
City of Windsor	■		■
<b>Quebec</b>			
Gatineau	■		■
Montreal			■
Sherbrooke		■	
Quebec			■
<b>New Brunswick</b>			
City of Fredericton	■		■
<b>Nova Scotia</b>			
Halifax Regional Municipality	■*		■

\* Component of broader policies or guidelines for traffic management or road safety

+ Limited to the use of speed humps

## Major issues

The following paragraphs touch on some of the major issues that have been explored through traffic calming experiences in communities across Canada.

**Road safety impacts.** Traffic calming measures can have significant road safety benefits. The Insurance Corporation of British Columbia (which has funded traffic calming projects to reduce insurance claims) commissioned a study in the mid-1990s to examine the impact of different traffic calming schemes in four Greater Vancouver neighbourhoods. The study found that annual collision frequencies and insurance claims both decreased by about 40%. Combining this research with information from Europe led to the finding that measures like speed humps, road narrowings, chicanes (lateral “zigzag” deflections) and traffic circles can all reduce site-specific collisions by 75% to more than 80% (Source: S. Zein et al., “Safety Benefits of Traffic Calming” in *Transportation Research Record 1578*, Transportation Research Board, 1997).

**Applicability to different types of streets.** Traffic calming measures typically are found on minor streets within residential neighbourhoods. Some municipalities have used them on busier collector roads, and a few have even experimented with arterial streets. Such attempts generally have mixed results, and lead to significant public reaction. In Ottawa, speed humps on a busy multi-lane one-way street through a downtown neighbourhood have been the subject of great public debate, but have also substantially reduced the number of traffic collisions along the road. However, road narrowings along pedestrian-heavy commercial streets that only intrude into reserved parking lanes are quite common and generally work well.

**Impacts on transit and emergency vehicles.** Most communities do not permit vertical traffic calming measures like speed humps or raised crosswalks on streets that serve transit routes or are used frequently by emergency vehicles. Each such measure can delay fire trucks, ambulances and buses by up to 10 seconds, with a group of measures threatening an unacceptable cumulative delay. However, on local streets within neighbourhoods the acknowledged benefits of traffic calming usually outweigh the possible impacts on emergency response.

**Neighbourhood equity.** Fairness is always a significant issue in traffic calming schemes. Measures that slow traffic on one street can simply displace vehicles onto adjacent streets. And measures that prohibit short-cutting drivers from entering a neighbourhood also make it more difficult for neighbourhood residents to reach their homes, or for visitors to reach local businesses and institutions.

**Walking and cycling.** While pedestrians take a generally favourable view of traffic calming, cyclists have a more mixed perspective. Vertical measures like speed humps are well accepted, but horizontal measures can cause problems for cyclists unless they are carefully designed. Cyclists can be put at risk by road narrowings or lateral diversions that require them to change their travel path relative to the path of adjacent motor vehicles. For example, lanes shared by bikes and cars should have a constant width as they pass through narrowings or chicanes.

**Community consensus.** Given that most traffic calming schemes generate mixed reaction within affected communities, municipalities face the difficult task of saying how much support is needed to warrant moving ahead. In some cases, city staff will let elected officials weigh opposing arguments and make a judgement call — but in others, supportive signatures of 70% or more of area residents must be collected before a plan or measure can be approved.

**Costs.** Traffic calming measures range from relatively affordable to very expensive. Retrofit designs that affect drainage patterns, utility pole locations or underground services can be very costly, and add up to more than \$100,000 for a minor intersection. Simple and effective speed humps, however, generally cost only a few thousand dollars each.

**Funding.** To preserve equity and avoid giving effective priority to wealthier neighbourhoods, many municipalities prohibit residents from paying directly for traffic calming measures. Others welcome this approach, however — Coquitlam, B.C. uses general revenues to fund just 10% of a traffic calming measure's costs, while the remaining 90% comes from a levy on the benefiting residents.

**Liability.** Early in the development of North American traffic calming practice, liability was a major concern of municipal engineers who had little solid evidence with which to establish confidence in traffic calming's safety impacts. However, repeated investigations have found very few problematic legal issues arising from traffic calming measures. One major U.S. study reviewed records from 50 cities and counties with traffic calming programs, and found just one successful lawsuit related to traffic calming (Source: R. Ewing, "Traffic Calming Liability Issues," 2000 *Annual Meeting Compendium*, Institute of Transportation Engineers). The growing use of traffic calming policies and guidelines springs partly from their usefulness as tools to minimize liability.

**Maintenance impacts.** As with liability, the impacts of traffic calming on snow clearing, road sweeping and other maintenance practices are no longer a widespread concern. Some early traffic calming measures did cause undue delays to snowplows and other maintenance vehicles, but design modifications have minimized such issues. Nevertheless, traffic calming measures can have tangible impacts on

maintenance needs and costs — and when some municipalities now approve traffic calming measures they account for not only capital costs but also future incremental costs for snow clearing and other maintenance.

**Applicability to old and new neighbourhoods.** Traffic calming experiences have led some municipalities to change the way that new neighbourhoods are designed, in order to minimize the need to retrofit them with traffic calming measures in the future. Some communities even build traffic calming measures into new streets when an eventual need is anticipated.

**Environmental approvals.** In Ontario, regulations have been enacted that require an Environmental Assessment process to be followed before traffic calming measures can be installed or removed. While this requirement has not significantly changed the way that large traffic calming studies are conducted, it has made it much more difficult and costly to implement traffic calming as a "spot" solution.

**Temporary installations.** Some communities encourage or require the use of temporary traffic calming installations (i.e. before taking permanent steps) to measure the effects and test public acceptance. Other communities refuse to do so, citing the poor aesthetics of most temporary measures and the resulting negative effect on public opinion.

## Future directions

The practice of traffic calming on local streets has matured significantly in the last decade, and future progress will likely spring from municipalities' efforts to find out what works best in their particular climatic, geographic and cultural circumstances.

One challenge will be to extend the objectives of traffic calming to arterial roads, where safety concerns have led to the emergence of "speed management" as an important engineering research topic. One offshoot of the traffic calming movement that has already spread to major streets is the use of roundabouts to replace signalized intersections on collector and arterial roads. Their ability to reduce delay and emissions and improve safety has been demonstrated in cities across the continent.