

TAC Sustainable Urban Transportation Award



TRAFFIC CALMING DESIGN GUIDELINES



City of Ottawa
Transportation Services Department
Area Traffic Management Branch

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INTRODUCTION

Ottawa's residents are increasingly looking to slow down traffic for safer walking and cycling environments in their neighbourhoods. With over 6,000 km of existing streets, the traditional approach to transform them through retrofit projects takes significant time, cost and inconvenience compared to getting the design right at the outset. Meanwhile, the Ottawa continues to grow at a rate of approximately 15,000 people annually¹, adding thousands of new trips to the transportation network and placing additional pressure on the existing system.

The City recognizes its role in providing transportation infrastructure that both responds to and influences mobility demands to help provide for the health and safety of our population and the environment, equitable access to education, employment, recreation and community. The City's [Transportation Master Plan](#) sets out a vision to address this through developing a safe multi-modal transportation system that makes sustainable travel modes attractive for users of all ages and abilities. Following direction in the TMP, Ottawa set out its [Complete Streets Framework](#) to ensure the needs for all road users are considered in the planning stages when reconstructing existing streets or building new ones.

Even with this policy framework, prevailing perspectives for street design along with limited guidance on how to materialize policy objectives into reality have often resulted in reverting to 'watered down' or more traditional car-centric street designs of the past once reaching implementation stages. Even residents in new neighbourhoods are demanding street improvements to slow down vehicle speeds and enhance walking and cycling environments because the new streets were constructed without integrated speed management. Until now, implementation of progressive street designs has been limited to stand-alone streets where resources, political support and technical perspectives aligned.

Additional guidance was needed to help planners and street designers bridge policy and practice, to more broadly realize the complete street framework and minimize the need for retrofits in the future. The City's Transportation Planning group developed two street design guidance documents in partnership with key stakeholders to ensure the implementation of progressive street designs are part of the basic design framework on any project, by any proponent.

This paper discusses the first of these two foundational sets of guidelines approved in 2019, the [Traffic Calming Design Guidelines](#).

¹ [Growth Projections for the New Official Plan: Methods and Assumptions for Population, Housing and Employment 2018 to 2046](#). Appendix 1 – Population Projection Scenario Summaries. Medium Scenario Population Projection.

PROJECT DESCRIPTION

In line with the City of Ottawa Complete Streets policy, many streets have recently been upgraded. But demand for safe, traffic calmed road designs that serve all users is high and resources are limited. As such, the City has established a set of Traffic Calming Design Guidelines to help streamline the consideration of these improvements as part of all street retrofits, renewal projects, and new construction – not just targeted traffic calming initiatives².

The design guidelines delve into specifics on common conundrums cities face when considering the integration of speed management design from the outset or retroactive traffic calming. How much can you narrow the road? What streets can you consider for speed humps? How do you balance emergency services and road maintenance needs? These are just some of the questions the guidelines help answer, making it easier to have traffic calming be a regular part of all street design discussions with or without the help of traffic calming specialists.

The guide includes two key parts:

Part 1 provides specific design guidance that applies to any traffic calming design and covers how to develop a Traffic Calming Plan (TCP). It includes information on universal design, active transportation, transit, street maintenance, and emergency response elements all in relation to traffic calming measures. It also provides details on “pinch points”, corner tightening dimensions, and outlines how to go about combined street-scaping and traffic calming elements in a winter city context. Lastly, it includes deviation procedures for unique installations.

Part 2 is a traffic calming “toolbox” that includes information on 35 different measures the City can consider in road designs in Ottawa. Information includes advantages, disadvantages, and key design considerations for successful implementation.

Context Elements	Design Considerations
Surface Materials	<p>Excerpts from the Traffic Calming Design Guidelines</p> <ul style="list-style-type: none"> Focus use of non-monolithic materials (e.g. interlock paver stones) in the City's "Design Priority Areas" only, where non-traditional materials and additional resources are needed to achieve broader design objectives Have City staff review the use of non-monolithic materials for traffic calming on a case-by-case basis
Clearance Width	<ul style="list-style-type: none"> Traffic calming designs should be implemented in locations where no additional maintenance resources are planned: <ul style="list-style-type: none"> a minimum 1.8m* wide clear widths for sidewalks, cycling facilities (where segregated from vehicle traffic), adjacent sidewalk-cycle track facilities, and multi-use pathways where present; a clear width for roadway surfaces that accommodates a typical width of a snow plow** used on the subject street plus 0.25m buffers on both sides (e.g. a 3.75m wide snow plow width would require 3.75m + 0.25m x 2 = 4.25m clear width). <p>*2.0m or greater is preferable – particularly for Traditional Mainstreets and other high-activity streets where levels of</p>

Raised intersections are intersections constructed at higher elevations than adjacent approach roads.

Most Beneficial Context

- Local, collector, and Traditional / Village Mainstreet context; urban cross-sections; school priority zones
- Signalized intersections

General Considerations

- Consider if heightened need to highlight presence of vulnerable street users
- Can be costly if not constructed as part of larger roadway reconstruction



² These Guidelines are intended to supplement the Canadian Guide to Traffic Calming and Geometric Design Guide for Canadian Roads (Transportation Association of Canada and Institute of Transportation Engineers) with Ottawa-specific considerations.

CONTRIBUTION TO DEVELOPMENT AND ENHANCEMENT OF SUSTAINABLE TRANSPORTATION

Social Perspective

The Traffic Calming Design Guidelines support the design of low-speed street environments more comfortable for walking and cycling. They will help ensure street designs cater not just to the average road user, but that people of all ages and abilities feel comfortable using streets.



The guidelines support the equitable distribution of traffic calming benefits because they are available to all street designers, whether City staff or private developers. This will help with more rapid implementation of low-speed streets across the network, benefiting walking and cycling, by leveraging opportunities for economies of scale through other city-building projects. This includes street renewal and transportation network improvements as part of development applications. On the planning side, the guidelines would be considered as part of the design of every street, not only those locations where there is significant political or community interest. This will allow the City to be proactive in addressing traffic concerns that residents have while also accelerating the deployment of streets designed with all users in mind to foster healthy travel habits in the community from a young age. For the public, the guidelines will be available to help inform their interest in traffic calming and may help residents to participate in the planning process in a very informed way.



Economic Perspective

The guidelines provide some key advantages from an economic perspective by accelerating progress through:

Economies of Scale – The guidelines imply that any project that implicates streets are opportunities to improve conditions for vulnerable road users. This includes projects of varying scale and proponents such as integrated road-water-sewer renewal activities, the development of new communities, the implementation of a new crosswalk, etc. A key benefit with the two primary examples is that they pro-actively deploy solutions to improve conditions for vulnerable road users which can contribute to significantly lower capital costs in comparison to reactive retrofits.



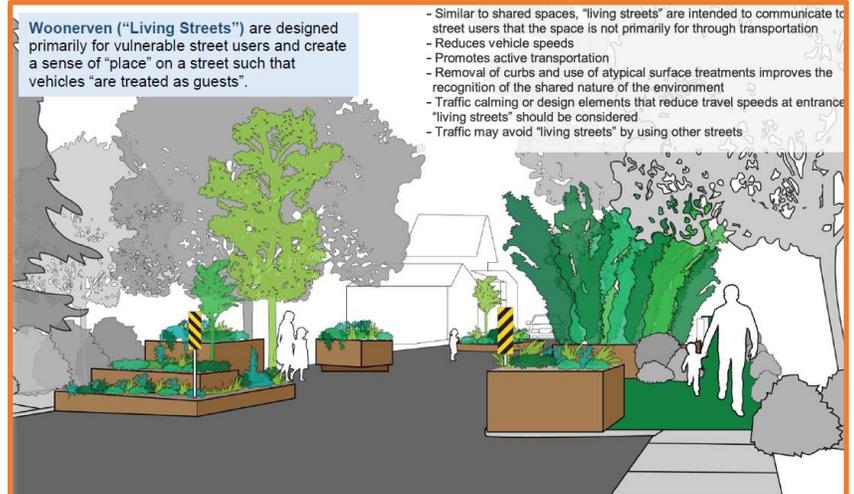
More Efficient Use of Existing Resources – The guidelines ultimately reduce the amount of time required for planning and design efforts given many of the more onerous agreements have been negotiated and documented as part of the development and approval of the guidelines. This has a significant positive effect by maximizing use of existing design resource capacities, providing clear and concise guidance particularly for those undertaking detailed designs who may not have expertise with integrated speed management street design. Furthermore, it allows these designers flexibility to review integrated speed management design options quickly in situations where tight turn-around times would have previously made this consideration unlikely.

Limiting Need for Future Retrofit Investments - Over time, the transportation infrastructure deficit with respect to streets with integrated speed management / traffic calming will be reduced as streets are rebuilt through proactive implantation from larger scale integrated road-water-sewer renewal activities. More importantly, the guidelines will imply new communities be built with integrated speed management from the outset and help the city avoid the need for costly retrofit projects downstream. The knock-on effect is that it will reduce the proliferation of problematic street designs, thus allowing retrofit programs to focus investment to the high volume of older, existing streets with long-standing issues already in queue for upgrades.

Environmental Perspective

Implementation of the guidelines will result in an increased proportion of trips done by sustainable transportation modes which will contribute to lower per-capita greenhouse gas emissions from private automobile transportation. Because this is a foundational design document, it should also contribute to accelerating progress in this regard as discussed previously. Furthermore, it supports the trend of declining driver licensing among young adults in Ottawa³ by allowing sustainable trips to be fostered from a young age when travel mode choice habits can take root. Some specific examples of how the guidelines help in this regard include:

- better definition of how to integrate trees and landscaping into street designs within traffic calming / speed management features as well as how to consider opportunities for innovations like stormwater bio-swales;
- identification of appropriate street types where hard surfaces / pavement widths can be reduced significantly to make space for landscaping and create street environments comfortable for vulnerable road users;
- toolbox measures such as “cycle-friendly” bulb-outs that calm traffic while creating safe space for cyclists; and
- significant expansion of the number of streets considered acceptable for vertical deflection considerations.



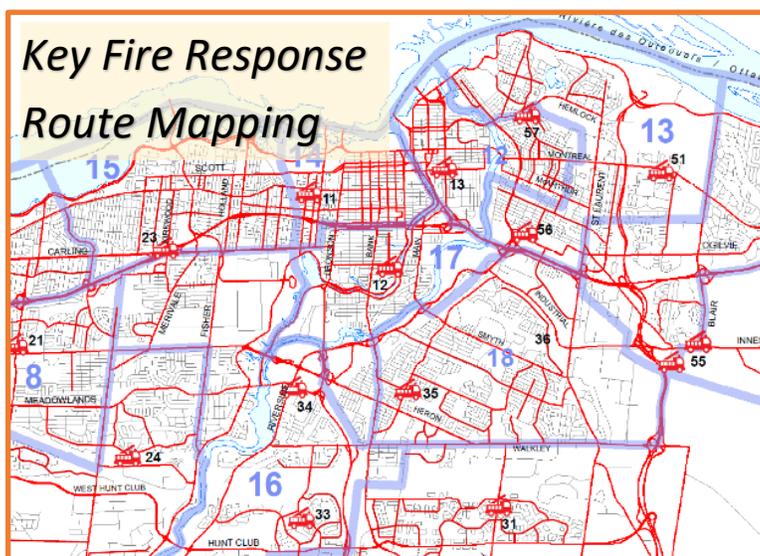
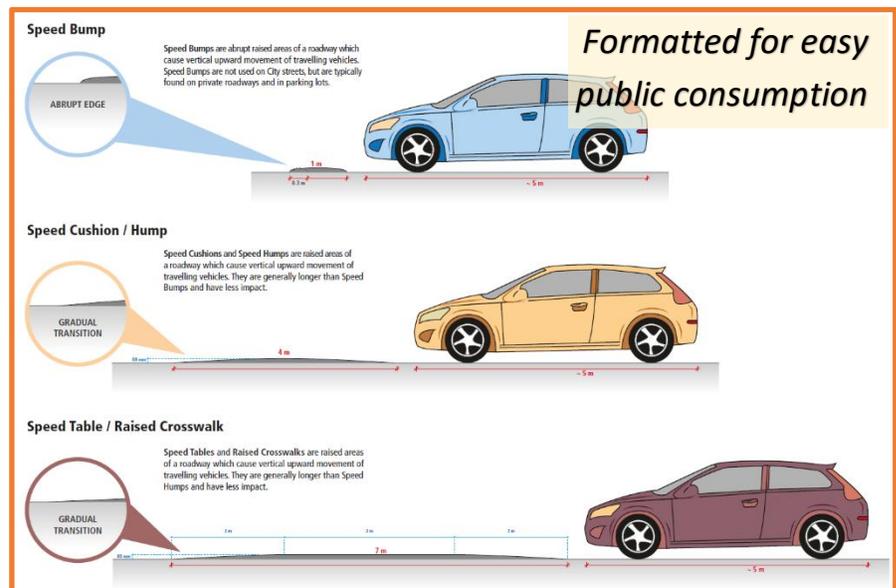
³ City of Ottawa [Transportation Master Plan](#). 2013. “Exhibit 2.2 – Residents Holding a Driver’s Licence (% by age)”.
January 24, 2020 | City of Ottawa Transportation Planning

PROCESS INNOVATION

The innovation in the guidelines comes from the hybrid approach of including technical depth at the level of a design manual or standards document while using a format and writing style that is consumable to a general public audience. For example, Sections 1 and 2 talk about where, when, and how traffic calming is considered in Ottawa including descriptions of how to make a request for traffic calming on an existing street, how to develop a traffic calming plan, consider strategic objectives, and engage the public. The

descriptions are concise, yet enough for professional staff to understand the scale of scoping. Section 3 provides a set of Ottawa-specific design considerations which provide specifics answering questions such as:

- “how narrow can you pinch a roadway for short and extended segments considering different levels of winter maintenance class standards?”;
- “what constraints are there to consider on streets with varying levels of bus transit activity?”;
- “how tight can we design intersection corners depending on the role of each street in the overall transportation system?”
- “what flexibility is there in terms of traffic calming measures that can be contemplated on streets considering varying levels of emergency response activities?”



Given this level of detail, this document is also being used to inform land use development design decisions to guide the inclusion of integrated speed management during plan of subdivision processes. Traditionally, the city has used legacy designs as a starting point, which applied by “rolling-out” standard cross-sections such that there is no physical or visual variation to help manage speeds effectively. The guidelines will interject into that process until such time that standard street cross-section designs are updated.

The process also involved the development of mapping that identified key emergency response streets. This was done by the City's Fire and Paramedic Service groups in support of the guidelines' development. Previously, all streets were considered priority emergency response routes where traffic calming considerations needed to be developed from scratch in consultation with emergency response input. Now, the agreements on details of how to approach different priority levels of streets are included in the guidelines – thus giving a significant head-start for proponents.

TRANSFERABILITY TO OTHER CANADIAN COMMUNITIES

The guidelines have a significant amount of transferable value to other communities given it addresses many unresolved competing interests that are common in communities across Canada. Winter maintenance regimes vary across the country, but a significant proportion of municipalities have similar routine salting, clearing, and removal activities that make use of motorized plows, blowers, and other ubiquitous equipment. Furthermore, many jurisdictions must meet provincial road maintenance quality standards. The design details in the document were developed in consultation with the City's Road Operations and Maintenance department to understand the key operational constraints and opportunities with respect to traffic calming such as scenarios where vertical deflection or pinch-points widths become problematic. Furthermore, these consultations were useful in building mutual understanding of the purpose of managing speeds, and the need to integrate consensus-driven design guidance into the document.

A similar process was followed with other key stakeholders as well. Emergency response performance for example, is measured based on metrics such as response time. Historically, traffic calming has been opposed by Fire Services on any street. Through the consultation process for the guidelines, the project team educated the Fire and Paramedic Services teams on the common public safety goals with respect to traffic calming and empowered those groups to develop mapping of key emergency response routes across the city.



Sensitive to winter, transit, and emergency response considerations

After learning about the details of emergency response operational considerations, the project team, in consultation with fire and paramedic response groups, developed traffic calming design guidelines for the identified key streets as well as those that were not identified. This is one of the most significant elements of the guidelines development as it opens numerous possibilities for the majority of city streets not tagged as key emergency response routes and provides a starting-point framework for those that are. For example, certain types of vertical deflection measures are not permitted on key emergency response routes.

The guidelines also resolve competing interests between bus transit operations and traffic calming. A similar process was followed with OC Transpo (City of Ottawa Transit Services) to ensure mutual understanding of interests and develop a tiered approach to traffic calming considerations depending on the frequency of bus service provided. For example, on streets where frequent bus service is provided (15 minute or less wait times), focus for traffic calming design considerations should be on measures such as narrowings, signage, pavement markings, corner radii tightening, etc. – only considering vertical deflection measures when all other possibilities have been exhausted.

In summary, the consultation approach used for developing the Traffic Calming Design Guidelines can be applied in any jurisdiction. It consists of two key elements:

1. Developing mutual understanding of goals, operating constraints and opportunities, and conflicting and common interests; and
2. Empowering stakeholder groups to develop design guidance solutions from a lead position.

ADDED VALUE

The development of these guidelines formally had taken place over the past 2 years. However, the issues discussed and resolved in the document have been on-going for decades. In this regard, the document is a key milestone in the progression of resolving long-standing issues but has also added value by acting as a launching point for further works that have been initiated since.

Many of the detailed guidelines in the document are foundational works for the development of local, collector, and arterial street design standard updates to ensure that low-speed street design becomes integrated into these keystone drawings. For example, the guidelines have informed the recent update to the City of Ottawa’s collector street designs which were approved late in 2019 – five months following the approval of the Traffic Calming Design Guidelines. There is now discussion as well to update the local street design standards, to which these guidelines will play a significant role.

In addition, the agreements developed with emergency response groups have helped lead to better relationships and mutual understanding. As part of furthering understanding of detailed street design considerations for emergency response activities, the Transportation Planning and Fire Services group used these guidelines to conduct joint technical testing on fire truck fleet models to provide further information for detailed design processes for new and reconstructed streets.

Finally, as stated previously, the project team paid considerable attention to the format and language within the document to ensure it was not only useful for practitioners, but consumable for interested members of the public. This effort is intended to help allow for more meaningful public engagement when planning for integration of speed management / traffic calming on city streets.

