In-Road Flexible Speed Signage Guidelines

Transportation Services

TORONTO

This document has been prepared by the
Policy & Innovation section under Transportation Services.
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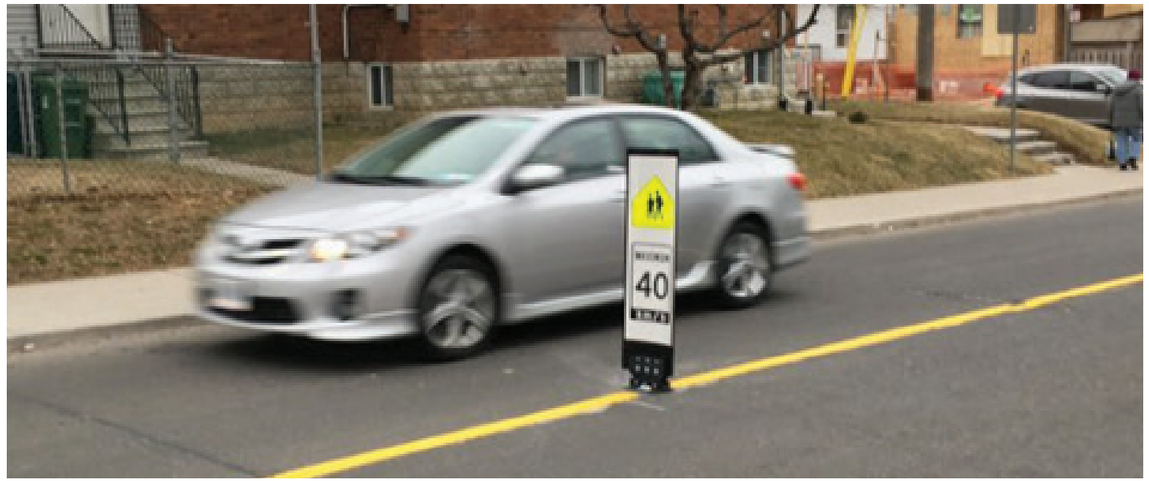
Introduction



As part of its role and mandate to build and maintain a safe and efficient road system for all road users, Transportation Services continues to make improvements that have proven to be effective in addressing road safety. One of the primary programs is through setting appropriate speed limits on our City streets. At times additional measures are required to encourage motorists to reduce their travel speeds or ensure compliance with posted speed limits either through physical traffic calming measures, 'Watch Your Speed' signs or as a last resort enforcement. Through targeted implementation of these various measures, and when applied appropriately, they can have a positive impact on travel speeds, traffic volumes, and road safety generally.

The purpose of this guide is to provide an overview on In-Road Flexible Speed Signs, an alternative traffic calming method, and when and where they can best be used to have the greatest success of influencing driver behaviour, with the goal of reducing driver speeds where they are travelling too fast.

This guide will be another effective tool in managing speeds on City of Toronto streets and making them safer for all road users.

In-Road Flexible Speed Signage Guidelines

What are In-Road Flexible Speed Signs?

In-Road Flexible Speed Signs are speed signs installed in the centre of the road, between opposing traffic lanes and are designed to withstand impacts from, and avert damage to, vehicles if struck by collapsing and rebounding.

Why Use In-Road Flexible Speed Signs?

In-Road Flexible Speed Signs have a narrowing effect on the lane or roadway which can give drivers the perception of the need to slow down. They also serve as supplemental signage to existing roadside speed limit signs to remind motorist to not exceed the posted speed limit. The signs do not represent a controlled crossing opportunity for pedestrians.

Where can In-Road Flexible Speed Signs be Installed?

The signs can be installed on roads classified as 'Local', 'Collector' and some 'Minor Arterial' streets with two-way traffic flow. The posted speed limit of those streets should not exceed 40 km/h.

Councillor Josh Colle and Mayor Tory on hand for the installation of first sign as part of a pilot on March 27, 2018.

In-Road Flexible Speed Signage Guidelines

Candidacy Evaluation

Feasibility Assessment

Assessment, Prioritization and Implementation Process

GUIDELINES: Candidacy Evaluation Criteria				
Item	**Operational Considerations**	**WARRANTS**	YES	NO
1	**Road Classification**	i. Local or Collector Road **OR** ii. Minor Arterial Road (justified and approved by Traffic Operations) *If a TTC route consult with TTC staff If **YES** proceed, otherwise this is not a candidate location.		
2	**Road Operations**	i. Is it a 2-way road? **AND** ii. Two (2) lane road and not exceeding 3 lanes. **AND** iii. Posted speed limit is no greater than 40km/hr If warrants (i) to (iii) are all **YES** then proceed, otherwise this is not a candidate location.		
3	**School Safety Zone**	Is it within a Designated School Safety Zone? If **YES**, skip the next warrant and proceed to 'Implementation Evaluation' below. Otherwise, continue through remaining warrants.		
4	**Location**	In the vicinity of or adjacent to facilities such as, but not limited to, community centres, seniors centres, libraries, parks/trail connection, churches, public institutions and other appropriate community locations with high pedestrian/cyclist movement. If **YES** then proceed to 'Guidelines: Feasibility Assessment'.		

In-Road Flexible Speed Sign installation will be prioritized to ensure the most deserving streets receive attention first, especially if installations are limited due to availability and distribution of resources.

Factors such as, but not limited to, 85th percentile speed, presence of other traffic calming measures, history of collisions and equitable geographic distribution of traffic calming tools will be considered when prioritizing programming of candidate locations.

GUIDELINES: Feasibility Assessment			
Item	**Operational Considerations**	**CRITERIA**	NOTES
1	**Road / Lane Widths**	i. For roads where on-street parking is not permitted, the minimum lane width should not be less than 3.3 metres. For lane widths greater than 4.5 metres the application may not achieve the desired motorist response and may want to consider other traffic calming measures; such as edge lines, chicanes, speed humps, etc. ii. For roads where on-street parking is permitted or bike lanes exist, the minimum lane width should not be less than 5.5 metres (3.5m through lane and typically 2.0m for parking or bike lane). Consider using pavement markings to denote parking areas adjacent to the signage installation. iii. If the road lacks sidewalks, a 1.7 metre pedestrian clearway, within the paved portion of the roadway, must be available in both directions and still meet the minimum lane width requirements as set out in items (i) and (ii) above. Consider using pavement markings or flexible bollards to denote the pedestrian clearway adjacent to the signage installation. iv. Installation does not impact any other near-term planned work on the street in which lane widths may be affected (e.g., new parking, new sidewalk/bike lane, etc.) **Refer to Figures 1 to 4 on page 14 for various scenarios discussed above.**	

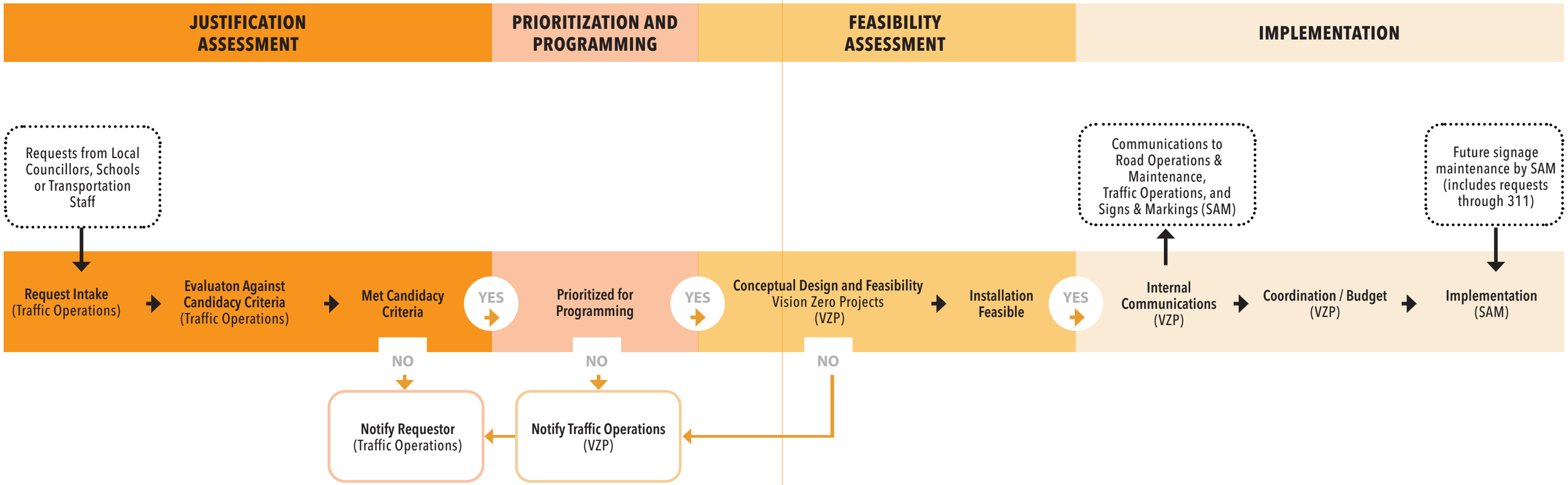
GUIDELINES: Feasibility Assessment

Item	Operational Considerations	CRITERIA	NOTES
2	**Clearance from Obstructions/ Driveways (Sightline Clearance)**	i. Minimum clearance distance from a residential driveway assumes a passenger vehicle turning at 5km/h onto a roadway with a minimum 3.3 metre lane width. Minimum clearance distances from intersections considers turning movements by a medium single unit truck and/or TTC buses. (SEE CHART BELOW FOR RECOMMENDED MINIMUMS) ii. At locations near intersections, an appropriate setback distance from intersection needs to be confirmed by AutoTurn analysis. When selecting design vehicles for AutoTurn analysis, consideration should be given to the types of vehicles and services that typically operate on that particular roadway or at adjacent driveways (e.g., school buses, solid waste trucks, delivery trucks, etc.). Design speed should be a range between 5 to 15km/hr, with 5km/hr used for the majority of scenarios and 15km/hr speed being applied for turning movements and other maneuvers by TTC vehicles. Consult with TTC staff to identify AutoTurn requirements for special cases (e.g., signage upstream or downstream of transit stops, or elsewhere where there is a change in a transit vehicle's horizontal alignment). iii. Avoid installation where there may be sightline issues (e.g. grades greater than 8%, or on a curve). iv. Where there is an existing PXO crossing, the signage should not be placed within 36m from this crossing. **Recommended Minimum Clearance Distance** a) 10 metres from residential driveways b) 22 metres from intersections with no expected truck volume, and no regular TTC turns expected c) 33 metres from intersections with no expected truck volume and where TTC makes regular turns d) **XX** metres from intersections with expected truck turning volume (**XX** to be confirmed with Autoturn on a case by case basis) **Autoturn analysis can be used to support a shorter clearance distance if available lane width is wider than 3.3 metres and recommended clearance distance from the intersection is not available. School buses should be accommodated at school driveways.** **Refer to Figure 5 on page 15 for measuring driveway / intersection minimum distances.**	

GUIDELINES: Feasibility Assessment

Item	Operational Considerations	CRITERIA	NOTES
3	**Site Specific Sign Placement**	i. Signs primarily to be installed on the street fronting the facility – however in some instances (especially with no facility) this should be reviewed during site assessment. ii. Signs should be placed at a minimum 60m to a maximum 90m from the front of facility/site in either direction. For all other streets without a facility, the spacing of the signs should be a maximum of 120m. iii. Yellow centreline will be installed on either side of the flexible sign if one doesn't currently exist (see Note 5 below) Notes: 1. Appropriate sign locations may not match spacing identified and in some cases should be determined through site assessment. 2. If candidate location is not site/facility specific, sign placement may be impacted by; length of blocks, stop controls, speed signage, etc. and should be assessed onsite to determine the best placement. 3. In school zones the flexible sign combines both the school zone sign (Wc-1) and the speed limit sign (Rb-1). Within a school zone, one sign should be placed at either end of the zone.  4. For applications outside of school zones, the Rb-1 sign is combined with the hazard marker sign (OM3-L)   5. A yellow centreline should be painted, if one does not already exist (3 metres in length on either side of the sign).	

Assessment, Prioritization and Implementation Process



In-Road Flexible Speed Signage Guidelines

Figures 1-5

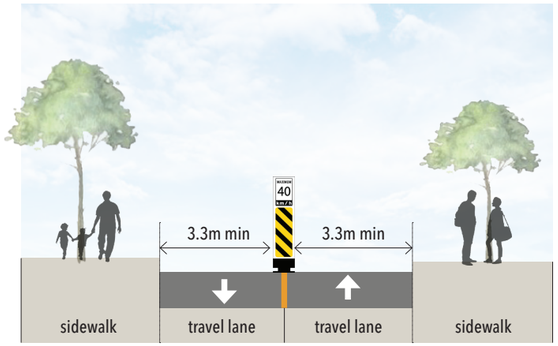


Figure 1: No Parking – With Sidewalks

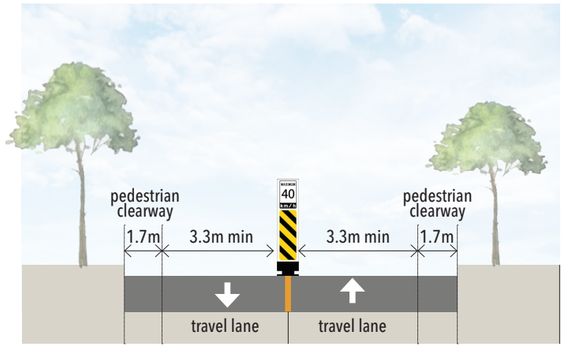


Figure 2: No Parking – Without Sidewalks

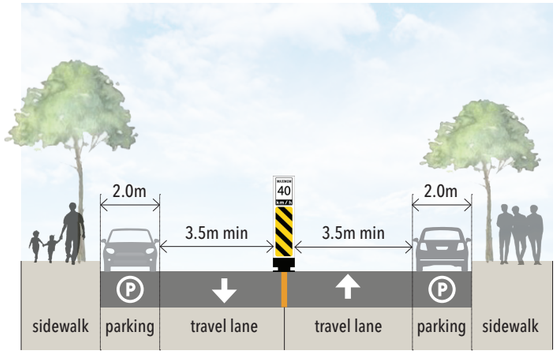


Figure 3: With Parking and Sidewalks

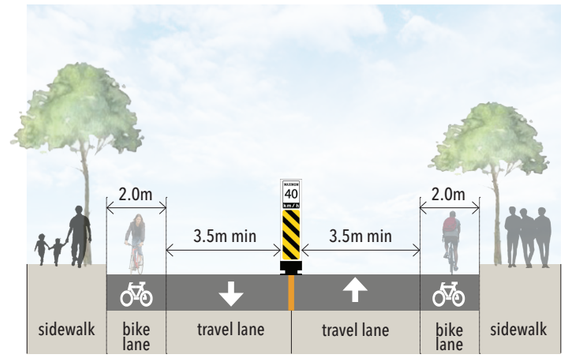


Figure 4: With Bike Lanes

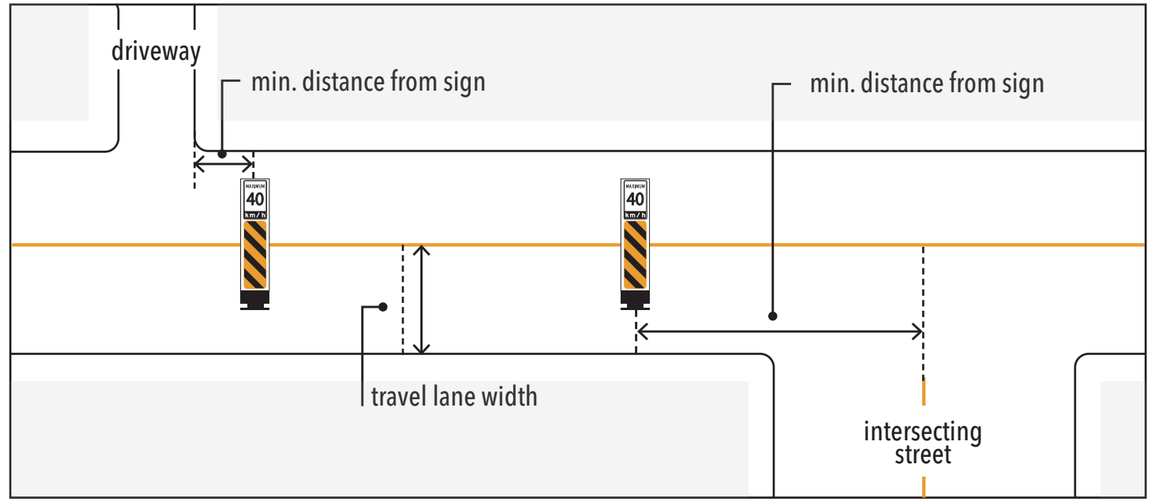


Figure 5: Minimum Distance from Driveways and Intersections (image not to scale)

Recommended Minimum Clearance Distance
a) 10 metres from residential driveways
b) 22 metres from intersections with no expected truck volume, and no regular TTC turns expected
c) 33 metres from intersections with no expected truck volume and where TTC makes regular turns
d) **XX** metres from intersections with expected truck turning volume (**XX** to be confirmed with Autoturn on a case by case basis)
Autoturn analysis can be used to support a shorter clearance distance if available lane width is wider than 3.3 metres and recommended clearance distance from the intersection is not available. School buses should be accommodated at school driveways.