

TRAFFIC CALMING GUIDE FOR TORONTO



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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, the City of Toronto continuously makes improvements that have proven to be effective in addressing road safety. One of the primary programs through which this goal is to be accomplished is via the targeted implementation of traffic calming measures, which when applied appropriately can have a positive impact on travel speeds, traffic volumes, and road safety generally.

The purpose of this guide is to provide an overview of what traffic calming is, when and where it can best be used, and what the positive and negative impacts of applying traffic calming measures can be. It also contains a description of the different measures available in the City, their estimated costs, information on how to request traffic calming, and the process which must be followed.

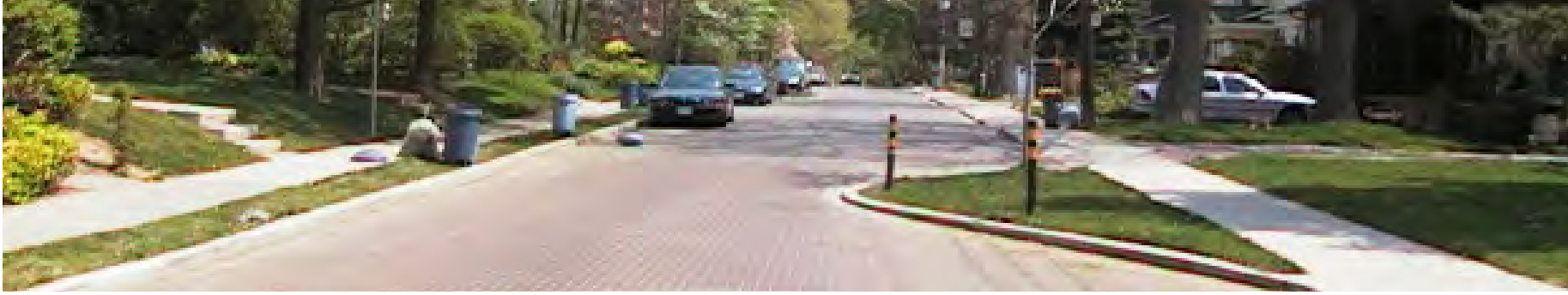
It is hoped that this guide will be an effective education tool, used to foster a greater understanding of traffic calming in Toronto, and how it can support the goal of making our streets safer for all road users.

WHAT IS TRAFFIC CALMING?

Traffic calming is a term commonly associated with physical features such as: speed humps, pinch-points, and chicanes. They are installed on a road to reduce the speeds at which vehicles travel, to discourage through traffic, to improve traffic safety, and to improve comfort levels for all road users.

WHY USE TRAFFIC CALMING MEASURES?

Traffic calming is intended to improve the quality of life for residents on traffic calmed streets, achieve slower speeds for motor vehicles, and increase the safety for non-motorized users of the street. Traffic calming solutions should be looked at as a community-wide strategy (as opposed to on a street by street basis) to ensure that volume and speed concerns are not transferred to adjacent streets.



WHERE TRAFFIC CALMING MEASURES CAN BE APPLIED

Physical traffic calming measures are considered only on roads classified as local or collector streets, as defined in the City of Toronto [Road Classification System](#), and conforming to established technical criteria in the Traffic Calming Policy. Local and collector roads can also be referred to as residential streets and they carry a maximum of 2,500 and 8,000 vehicle per day, respectively. Table 1 describes the main characteristics of the various classes of roads found in the City of Toronto.

Table 1: Road Classification

Road Classification	Characteristics	Volume (vehicle/day)	Typical Right-of-way Width (metres)	Speed (km/h)	Suitable for Traffic Calming
Local Roads	<ul style="list-style-type: none"> • Provide access to properties • Low traffic speed • Generally no bus routes • Truck restrictions preferred 	Less than 2,500	15 - 22	30 - 50	Yes
Collector Roads	<ul style="list-style-type: none"> • Provide access to properties and traffic movement • Signalized intersections at arterial roads • Truck restrictions permitted 	2,500 - 8000	20 - 27	30 - 50	Yes
Minor Arterial Roads	<ul style="list-style-type: none"> • Traffic movement is a primary function • Some property access control • No "Stop" signs • No Truck restrictions 	8,000 - 20,000	20 - 30	40 - 60	No
Major Arterial Roads	<ul style="list-style-type: none"> • Traffic movement is a primary function • Subject to property access control • Special cycling facilities preferred 	Greater than 20,000	20 - 45	50 - 60	No
Expressways	<ul style="list-style-type: none"> • Traffic movement is a primary function • No property access • Grade-separated intersections (no traffic signals) • Pedestrian and cyclist access prohibited 	Greater than 40,000	Greater than 45	80 - 100	No

TRAFFIC CALMING POLICY

In April 2002, City Council approved a new [Traffic Calming Policy](#) following the amalgamation of the former Municipalities of Toronto, North York, Etobicoke, Scarborough, York and East York to form the new City of Toronto. A [Traffic Calming Policy Summary](#) report is available on the City's website for more detailed information on the Policy.

WARRANTS

To comply with the Policy the following Warrants/Technical criteria should be met.

WARRANT 1 - PETITION		
1.1 PETITION	Consideration for physical traffic calming is initiated in one of three ways: i) by the local Councillor following a public meeting; ii) upon receipt of petition signed by at least 25% of affected households (or 10% in the case of multiple family rental dwellings); or iii) by a survey conducted by the Ward Councillor.	Yes / No
Impacts to Adjacent Streets	Should the District Traffic Operations Manager anticipate that the proposed traffic calming will have significant traffic impacts on adjacent streets, the review of the traffic calming proposal shall be modified to include the proposed street as well as adjacent streets where traffic is expected to divert.	
		WARRANT 1 MET?
		Yes / No
Warrants 2 and 3 will not be considered until Warrant 1 is satisfied.		

WARRANT 2 - SAFETY REQUIREMENTS		
ALL OF THE FOLLOWING CRITERIA MUST BE MET		
2.1 SIDEWALKS	On streets where traffic calming is proposed, there must be continuous sidewalks on at least one side of the street (both sides for collector). OR On streets where there are no sidewalks, the installation of sidewalk on at least one side of the street must have first been considered.	Yes / No
2.2 ROAD GRADE	Traffic calming measures may be considered at or near locations where the road grade is up to 5%. Traffic calming measures may be considered at or near locations where the road grade is between 5% and 8%.	Yes / No
2.3 EMERGENCY RESPONSE	On streets where traffic calming is proposed, impacts on Emergency Services will not be significant (as determined in consultation with Emergency Services (Fire, Ambulance, and Police) staff).	Yes / No
		WARRANT 2 MET?
		Yes / No

WARRANT 3 - TECHNICAL REQUIREMENTS

ALL OF THE FOLLOWING CRITERIA MUST BE MET

3.1 MINIMUM SPEED	<p>On streets where traffic calming is proposed, the 85th percentile speed must be a minimum of 10 km/h (but less than 15 km/h) over the warranted speed limit, and the traffic volume requirements of Warrant 3.2 must be fulfilled.</p> <p style="text-align: center;">OR</p> <p>On streets where the 85th percentile speed exceeds the warranted speed limit by a minimum of 15 km/h, there is no minimum volume required in Warrant 3.2.</p>	Yes / No
3.2 MINIMUM AND MAXIMUM TRAFFIC VOLUME	<p>Local Roads</p> <p>For streets where traffic calming is proposed, the traffic volume must be between 1,000 vehicles per day and 8,000 vehicles per day.</p>	Yes / No
3.3 MINIMUM BLOCK LENGTH	On streets where mid-block traffic calming measures are proposed, the block length must exceed 120 metres.	Yes / No
3.4 TRANSIT SERVICE	On streets where traffic calming is proposed, impacts on regularly scheduled Toronto Transit Commission (TTC) services will not be significant (as determined in consultation with TTC staff).	Yes / No
WARRANT 3 MET?		Yes / No

Traffic Calming measure is warranted:

WARRANT 1 AND 2 AND 3 MET? Yes / No

Physical traffic calming measures increase the response time for all emergency vehicles.

Warrants 1, 2 and 3 must all be satisfied in order to proceed with the installation of traffic calming measures.

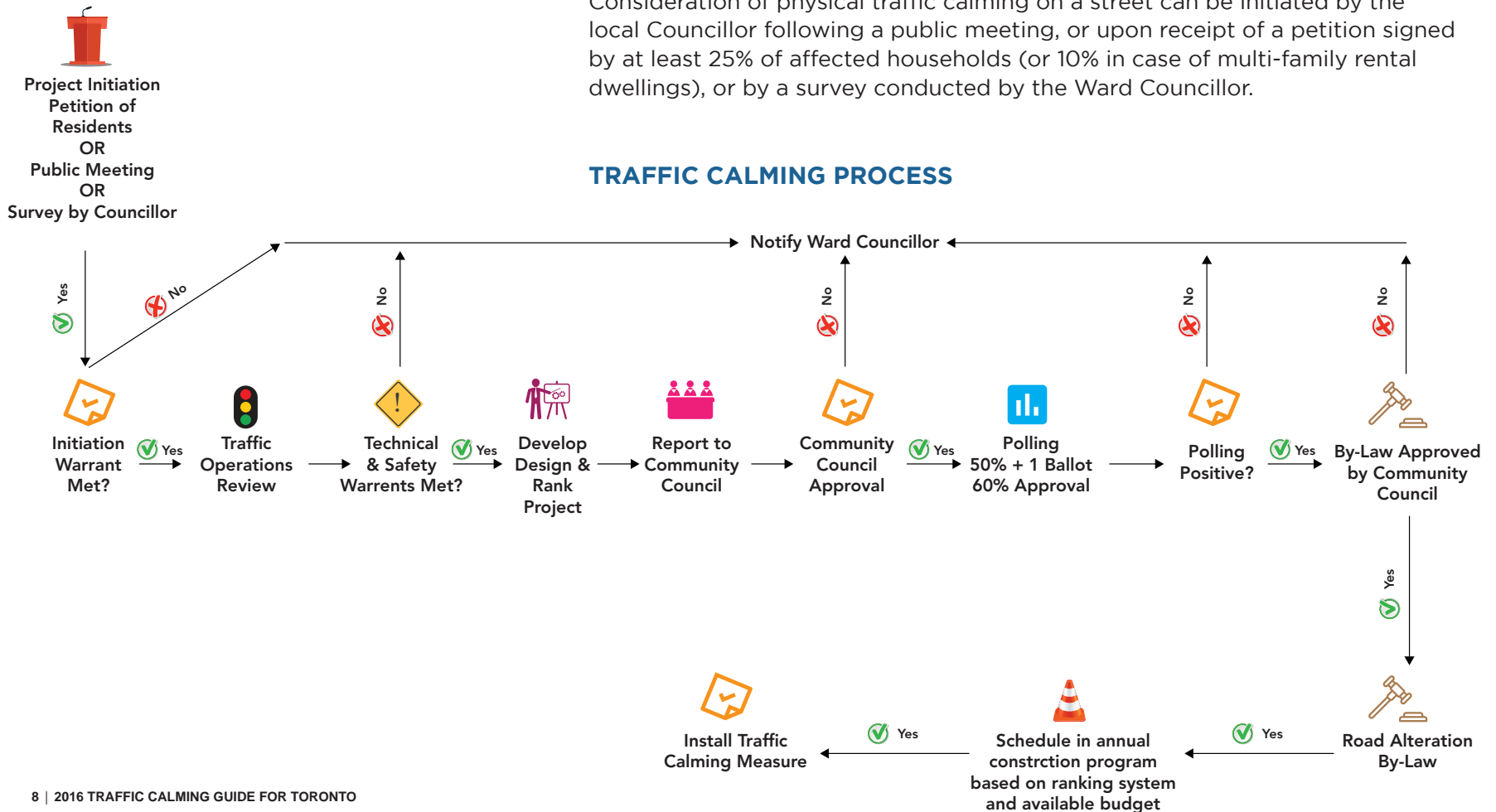
In conjunction with the installation of the traffic calming measure, the speed limit would be reduced to 30 km/h.



HOW TO REQUEST TRAFFIC CALMING MEASURES

Consideration of physical traffic calming on a street can be initiated by the local Councillor following a public meeting, or upon receipt of a petition signed by at least 25% of affected households (or 10% in case of multi-family rental dwellings), or by a survey conducted by the Ward Councillor.

TRAFFIC CALMING PROCESS





Council has the final decision on all traffic calming issues, regardless of the poll results.

PROCEDURE FOR TRAFFIC CALMING MEASURES INSTALLATION

Community Council approves the installation of traffic calming devices depending on a favourable poll of residents on the affected street(s). The City Clerk conducts a poll, which to be successful, requires half of the ballots plus one to be returned, of which at least 60% should be in favour of the installation of traffic calming devices.

If the poll is successful a Highway Alteration By-law is then submitted to Community Council for consideration. If approved, the project is then ranked with similar approved projects and prioritized for installation subject to funds being available in the Transportation Services' Annual Traffic Calming Budget.



TYPES OF TRAFFIC CALMING

There are **two types** of measures that can be used in the City of Toronto for traffic calming.

Vertical Measures

- Speed humps;
- Raised intersections – for two-way stop control;

Horizontal Measures

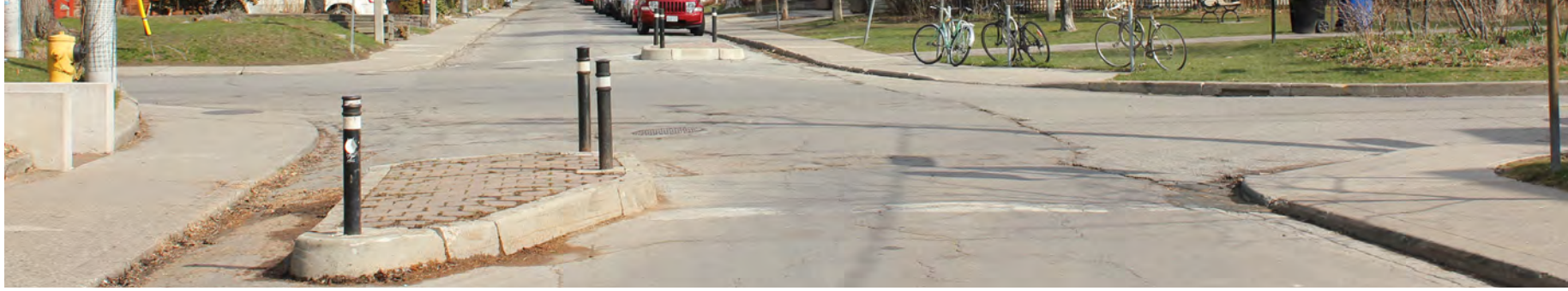
- Chicanes;
- Curb extensions (Mid-block pinch Point);
- Traffic islands;
- Traffic circles.

The most common traffic calming measure used in the City of Toronto is the speed hump because of its effectiveness and low cost. However, there are a number of other traffic calming measures that can be successful at:

- Speed reduction;
- Volume reduction;
- Safety – reducing vehicle-vehicle, vehicle-pedestrian, and vehicle-cyclist conflicts.

The following pages detail the various traffic calming measures, including a visual illustration, description, purpose, effectiveness, cost range, and advantages/disadvantages.

While cost range estimates are provided for each measure, these can vary on a project-to-project basis depending on the quantity, materials used, and the amount of construction effort required. In addition, there would be cost associated with undertaking data collection (e.g., speed studies, traffic volume data) and polling of residents.



TRAFFIC CALMING MEASURE OPTIONS

Table 2 summarizes the different measures that can be installed through the traffic calming process, their effectiveness, and estimated cost.

Table 2: Traffic Calming Measures

Measures	EFFECTIVENESS			ROAD CLASSIFICATION		Cost Per Measure	Page
	Speed Reduction	Road Volume Reduction	Safety	Local	Collector		
Vertical Measures							
Speed Humps	●	●	●	✓	✓	\$1,000 - \$5,000	12
Raised Intersections - Two-way Stop Control	◐	○	◐	✓	✓	\$50,000 - \$100,000	13
Horizontal Measures							
Chicanes - One-Lane	●	●	●	✓	✓	\$15,000 - \$50,000	14
Chicanes - Two-Lane	◐	○	◐	✓	✓	\$15,000 - \$50,000	14
Curb Extensions - Mid-block pinch-point	◐	○	◐	✓	✓	\$50,000 - \$100,000	15
Traffic Islands	◐	○	◐	✓	✓	\$5,000 - \$15,000	16
Traffic Circles	●	◐	○	✓	✓	\$15,000 - \$50,000	17

SPEED HUMPS

MEASURE

Vertical Measure

PRIMARY PURPOSE

Speed Reduction

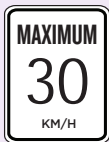
TRAFFIC CALMING SIGNS



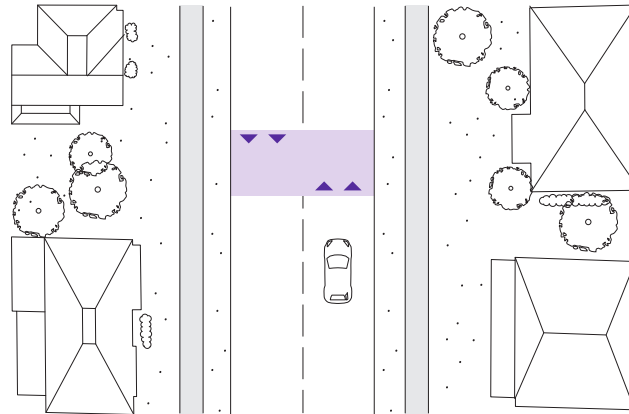
SPEED HUMPS



TRAFFIC CALMING



SPEED LIMIT



SPEED HUMPS

Speed humps are raised sections of the roadway designed to discourage motor vehicle drivers from travelling at excessive speeds.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	●
Safety	●



COST PER MEASURE

\$1,000—\$5,000

(Physical speed hump, signage, pavement markings, polling)



ADVANTAGES

- Speed reduction
- Minimal impact on cyclists
- Minimal impact on snow clearing
- Self enforcing



DISADVANTAGES

- Negative impact on Emergency Services (i.e., Ambulance, Fire, and Police), by slowing down response time and impacting the comfort of patients being transported

RAISED INTERSECTIONS - TWO-WAY STOP CONTROL

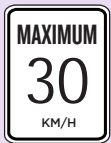
MEASURE

Vertical Measure

PRIMARY PURPOSE

Speed Reduction

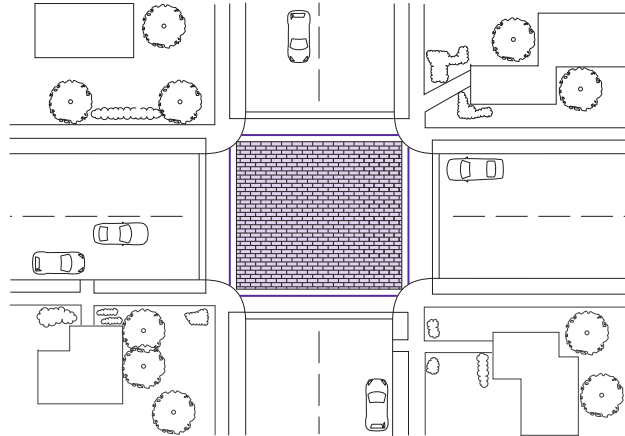
TRAFFIC CALMING SIGNS



SPEED LIMIT



TRAFFIC CALMING



RAISED INTERSECTIONS - TWO-WAY STOP CONTROL

A raised intersection is defined as an intersection constructed at a higher elevation than the adjacent roadway.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	○
Safety	●



COST PER MEASURE

\$50,000—\$100,000

(Cost varies due to size of intersection, pavement material, relocation of catch basins)



ADVANTAGES

- Speed reduction
- Better definition of pedestrian areas
- Self-enforcing
- Reduce pedestrian-vehicle conflict



DISADVANTAGES

- Negative impact on Emergency Services (i.e., Ambulance, Fire, and Police), by slowing down response time and impacting the comfort of patients being transported

CHICANES

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction

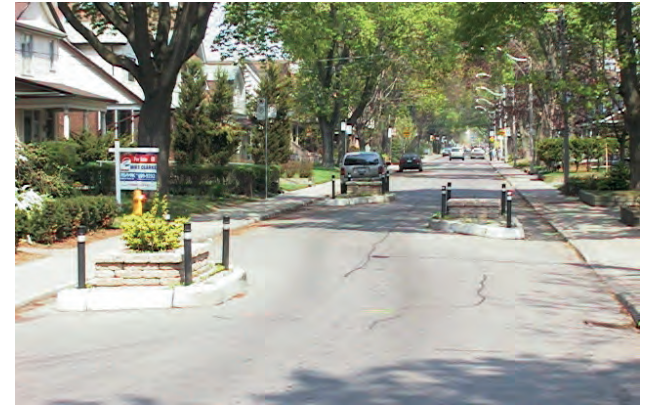
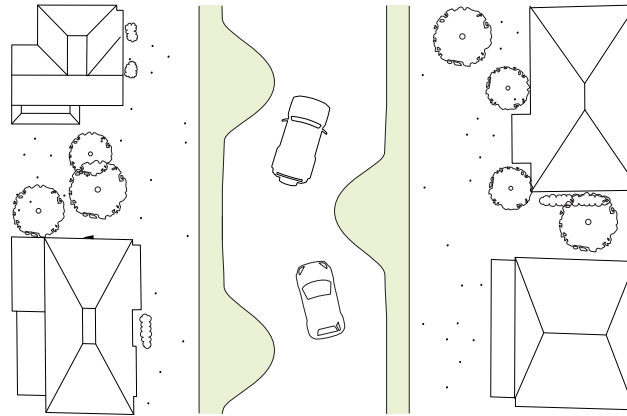
TRAFFIC CALMING SIGNS



SPEED LIMIT



TRAFFIC CALMING



CHICANES

A chicane is a series of curb extensions on alternate sides of a roadway which narrow the roadway and requires drivers to steer from one side to the other to travel through the chicane.



EFFECTIVENESS

	One-lane	Two-lane
Speed Reduction	●	◐
Road Volume Reduction	●	○
Safety	●	◐



ADVANTAGES

- Speed reduction
- Discourage shortcutting and through traffic
- Opportunity for landscaping



COST PER MEASURE

\$15,000—\$50,000

(Cost varies due to size and number of chicanes, installation of bollards and reflective signs, relocation of catch basins)



DISADVANTAGES

- Not recommended on bike routes
- Ineffective on low volume roads. There are safety concerns when installing on high volume roads. Therefore, suggested for mid-range traffic volumes.

CURB EXTENSIONS

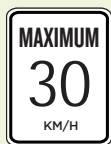
MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction

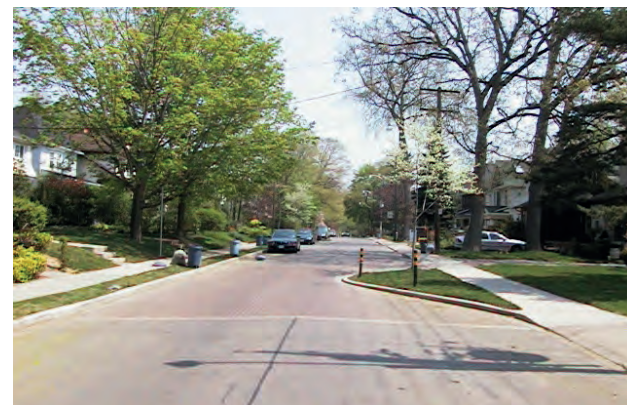
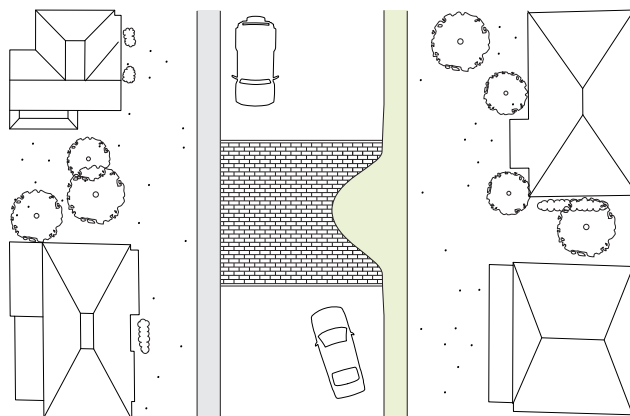
TRAFFIC CALMING SIGNS



SPEED LIMIT



TRAFFIC CALMING



CURB EXTENSIONS - MID-BLOCK PINCH POINT

A curb extension is a horizontal intrusion of the curb into the roadway, resulting in a narrower section. Curb extensions installed mid-block must follow the traffic calming process.



EFFECTIVENESS

Speed Reduction	
Road Volume Reduction	
Safety	



ADVANTAGES

- Speed reduction
- Increase pedestrian visibility
- Opportunity for landscaping



COST PER MEASURE

\$50,000—\$100,000

(Cost varies due to size and number of curb extensions, type of boulevard material, relocation of catch basins, installation of bollards)



DISADVANTAGES

- May not be compatible with bike lanes
- May require removal of on-street parking spaces

TRAFFIC ISLANDS

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction

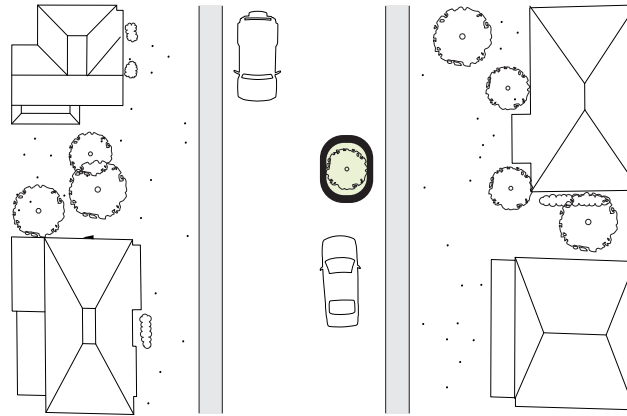
TRAFFIC CALMING SIGNS



SPEED LIMIT



TRAFFIC CALMING



TRAFFIC ISLANDS

Traffic Islands have the effect of narrowing the road and reducing the speed of passing traffic. They are not intended for pedestrians, as they have no dropped curbs and tactile paving.



EFFECTIVENESS

Speed Reduction	
Road Volume Reduction	
Safety	



ADVANTAGES

- Speed reduction
- Prevents over-taking
- Opportunity for landscaping



COST PER MEASURE

\$5,000—\$15,000

(Costs varies due to modular or in-place construction, type of material, installation of bollards)



DISADVANTAGES

- Maintenance cost
- May require the removal of some on-street parking

TRAFFIC CIRCLES

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction

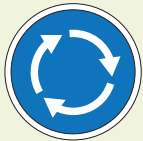
TRAFFIC CALMING SIGNS



SPEED LIMIT



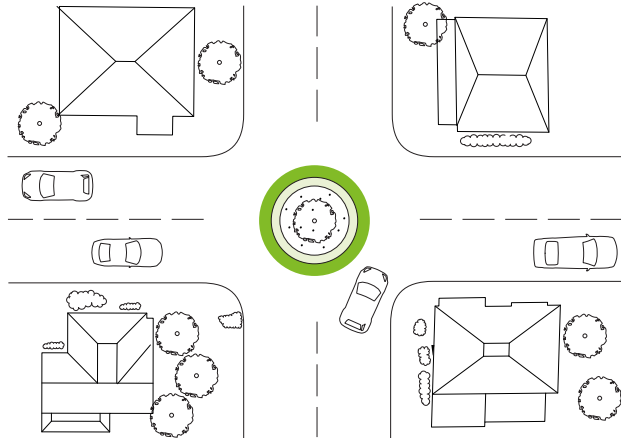
TRAFFIC CALMING



ROTARY



ROTARY AHEAD



TRAFFIC CIRCLES

A traffic circle is a raised island located in the centre of an intersection which requires vehicles to travel through the intersection in a counter-clockwise direction around the island. Used to calm roads with relatively low volumes of traffic.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	◐
Safety	○



COST PER MEASURE

\$15,000—\$50,000

(Physical traffic circle depends on size of intersection, material and signage)



ADVANTAGES

- Speed reduction
- Reduce vehicle-vehicle conflicts at intersections
- Opportunity for landscaping



DISADVANTAGES

- Restricts turning movements by large vehicles
- May increase Emergency Services response time



TRAFFIC CALMING MEASURES IN LANEWAYS

Residents may experience speeding in some laneways. To address this issue, Transportation Services can install speed bumps to slow down traffic. For a speed bump to be installed the lane must satisfy one or more of the following conditions:

1. The average speed is greater than 20 km/h;
2. The traffic volume is more than 100 vehicles per day; or
3. The lane is used as a frequent pedestrian passageway

In addition, the lane must be paved and have surface drainage that will not be impeded by the speed bump.

Speed bumps in laneways can be requested through resident's Ward Councillor.

Following the initiation of a request and an investigation by Transportation Services' staff, a Staff Report is submitted to Community Council for approval.

SPEED BUMPS IN LANEWAYS

MEASURE

Vertical Measure

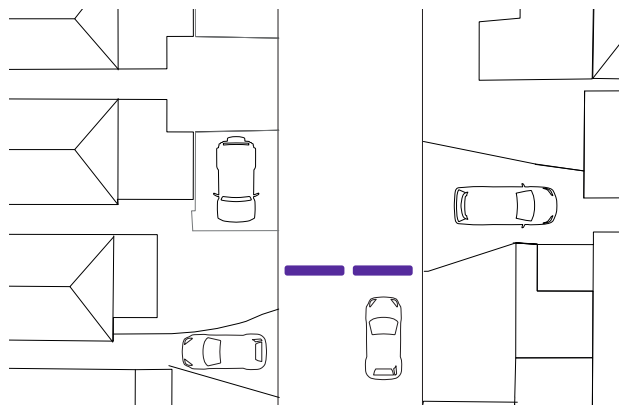
PRIMARY PURPOSE

Speed Reduction

TRAFFIC CALMING SIGNS



LANEWAY SIGNS



SPEED BUMPS IN LANEWAYS

Speed bumps are raised sections of the roadway designed to discourage motor vehicle drivers from travelling at excessive speeds. They are considerably shorter than humps. Speed bumps encourage drivers to cross at no more than 10 km/h.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	◐
Safety	●



COST PER MEASURE

\$1,000—\$5,000

(Physical speed bump and signage)



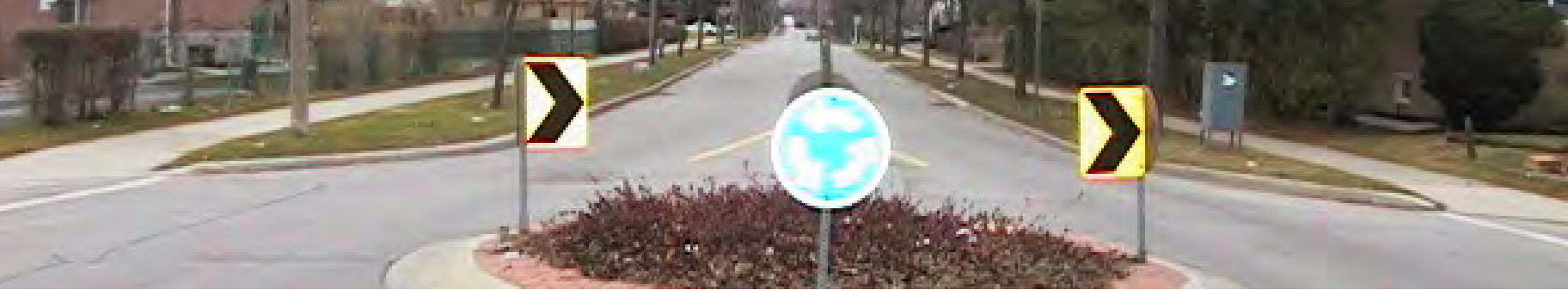
ADVANTAGES

- Speed reduction
- Minimal impact on cyclists
- Self enforcing



DISADVANTAGES

- Negative impact on Emergency Service (i.e., Ambulance, Fire, and Police) by slowing down response time and impacting the comfort of patients being transported



ALTERNATIVE OPTIONS TO TRAFFIC CALMING

In addition to traffic calming measures that follow the Traffic Calming Process, there are a number of other options that can be used to influence driver behaviour and discourage through traffic. Some of the options listed below may be applied to roads other than locals and collectors. These options can be assessed through Transportation Services' Traffic Operations staff at the relevant district office in consultation with the Councillor's office.

Stop signs and traffic signals are often requested; however, are not intended for use as speed control devices, as they are not the most effective way to manage speed. Therefore, are not included as options in this Guide.

POSTED SPEED LIMIT REDUCTION

The City of Toronto has two policies, a 40 km/h speed limit policy and a 30 km/h speed limit policy, that allow the posted speed limit to be reduced. Both of these policies contain a number of criteria that must be met for a reduction in the posted speed limit to be warranted.

40 km/h Speed Limit Warrant

The City's [40 km/h Maximum Speed Limit Warrant](#) was adopted in 2002. The warrant was developed with the primary emphasis on the safety of pedestrian and cyclists. The 40 km/h Warrant applies to local, collector, and minor arterial roads.

A 40 km/h maximum speed limit may be implemented on any of the applicable classes of road where one or more of the following Warrants B or C is met. In the case of streets 10.5 metres or more in width, Warrant A must also be satisfied.

If all the required Warrants are met, a report is submitted by Transportation Services staff to the appropriate Community Council for the approval of the speed limit reduction and required By-law change.

Warrant A - WIDE ROADS

1	Pavement width equal to or more than 10.5 metres, where the operating speed 85 percentile is equal to or less than 50km/h.	Yes / No
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Warrant B - PEDESTRIAN ENVIRONMENT

ONE OF THE FOLLOWING

1 (i)	Elementary or junior high school abuts the road.	Yes / No
(ii)	Parkland abuts the road which is contiguous to and used to gain access to an elementary or junior high school.	
(iii)	No sidewalk on either side of the road or a major portion of the road.	
OR		
2	The sidewalk is immediately adjacent to and not separated from the flow of motor vehicles by long-term parking (>3 hours) or bike lanes, where the travelled portion of the road width is less than 5.7 metres for two-way operation, or less than 4.0 metres for one-way operation.	Yes / No
WARRANT B1 or B2 MET?		Yes / No

Warrant C - ROAD AND TRAFFIC ENVIRONMENT

ONE OF THE FOLLOWING

1 (i)	Two or more locations of concern where: - Grades are greater than 5%; and/or - Safe speed on curves is less than 50 km/h.	Yes / No
(ii)	Lack of sufficient distance to stop safely at two or more locations when travelling at 50 km/h	
(iii)	Pattern of collisions where vehicle speed was identified as a factor: - Local streets - 3 or more over 3 years. - Other streets - 5 or more over 3 years.	
OR		
2	Where long-term parking (>3 hours) is permitted on one or both sides, and the remaining travelled portion of the road is less than 5.7 metres for two-way operation, or 4.0 metres for one-way operation	Yes / No
WARRANT C1 or C2 MET?		Yes / No

40 km/h Maximum Speed Limit Is Warranted:

WARRANT B or C MET?		Yes / No
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ALTERNATIVE OPTIONS TO TRAFFIC CALMING cont.

30 km/h Speed Limit Policy

City Council approved in 2015 the [30 km/h Speed Limit Policy](#). The purpose of this policy was to recommend a set of criteria under which the implementation of a 30 km/h speed limit could be recommended on local and collector streets in the absence of traffic calming measures.

A 30 km/h maximum speed limit may be implemented when Warrants A, B, C, and D are met.

If all the required Warrants are met, a report is submitted by Transportation Services staff to the appropriate Community Council for the approval of the speed limit reduction and required By-law change.

Warrant A - PETITION

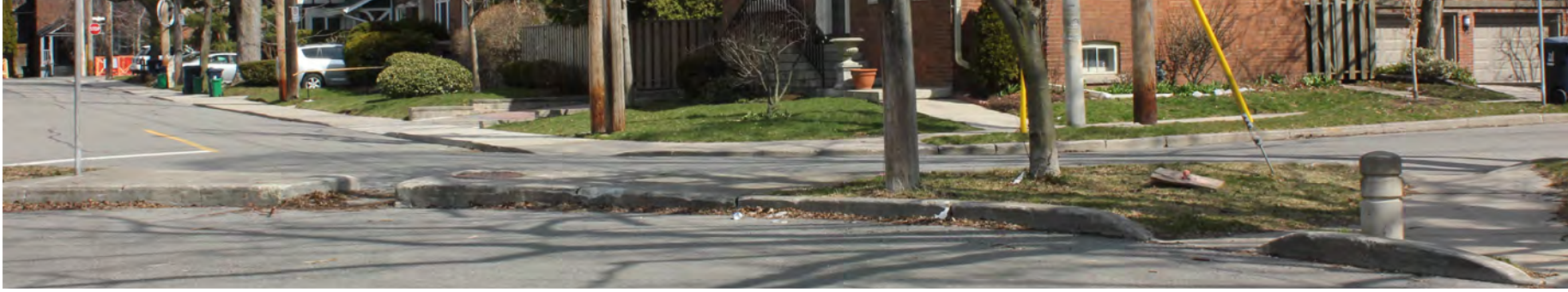
Consideration of 30km/h speed limit on a street upon receipt of a petition signed by at least 25% of affected households (or 10% in the case of multiple family rental dwellings).

Warrants “B”, “C” and “D” will not be considered until Warrant “A” is satisfied.

Warrant B - ROAD ENVIRONMENT

ALL OF THE FOLLOWING CRITERIA MUST BE MET

1	Local or Collector road	Yes / No
AND		
2	Pavement width less or equal to 8.5 metres	Yes / No
AND		
3	Operating speed 85th percentile no greater than 50 km/h	Yes / No
AND		
4	Maximum traffic volume Local & Collector – less than 8,000 vehicles/day	Yes / No



Warrant C - SCHOOL AND CYCLING ENVIRONMENT

At least ONE of the following criteria must be met

1	Elementary or junior high school abuts the road - (The 30 km/h maximum speed limit must extend at a minimum 150 metres beyond the boundary of school property and can be extended to include full road section)	Yes / No
AND		
2	Improved parkland abuts the road that is contiguous to and used to gain access to an elementary or junior high school - (The 30 km/h maximum speed limit must extend at a minimum 150 metres beyond the boundary of the parkland and can be extended to include full road section)	Yes / No
AND		
3	Presence of cycling facilities identified by means of a contra-flow bicycle lane, mid-block sharrows or signed bicycle route	Yes / No

Warrant D - PEDESTRIAN AND TRAFFIC ENVIRONMENT

At least ONE of the following criteria must be met

1	Absence of continuous sidewalk on both sides of the road or major portion of the road	Yes / No
OR		
2	'Significant parking activity' that results in cars being parked most of the time on both sides of the road or parked on one side, and the pavement width is less than 6.5 metres	Yes / No
OR		
3	2 or more curves in short distance from each other (< 200 metres) with a safe operating speed less than 30 km/h	Yes / No
OR		
4	Lack of sufficient safe stopping distance (65 metres) based on the operating speed of 40 km/h at two or more locations	Yes / No

30 km/h Maximum Speed Limit is Warranted:

WARRANTS "B" and "C" met OR "B" and "D" met Yes / No



SAFETY AND OPERATIONAL IMPROVEMENT MEASURES

POLICE ENFORCEMENT

Where measures implemented (i.e., traffic calming measures, posted speed limit reduction, etc.) are not sufficient in changing driver behaviour, police enforcement may be an option. Toronto Police Service has a [Traffic Safety Program](#) that focuses on education, awareness, and enforcement.

There are other measures that can be installed to address safety and operational issues. These are typically identified by Transportation Services staff in consultation with the Councillor's office. They can be based on specific problems or opportunities for improvement based on scheduled resurfacing or reconstruction or part of a wider safety program. Transportation staff will evaluate these options depending on area needs, necessary approvals, available resources, and budget. Table 3 lists some of these measures.



Table 3: Safety and Operational Improvement Measures

Measures	EFFECTIVENESS			ROAD CLASSIFICATION			Cost Per Measure	Page
	Speed Reduction	Road Volume Reduction	Safety	Local	Collector	Arterial		
Vertical Measures								
Raised Intersections - All-way stop control							\$50,000 - \$100,000	26
Horizontal Measures								
Curb Extensions - at intersection							\$50,000 - \$100,000	27
Curb Radius Reductions							\$50,000 - \$100,000	28
On-Street Parking							\$1,000 - \$5,000	29
Raised Median Islands / Textured Median							\$15,000 - \$50,000	30
Obstruction Measures								
Directional Closures							\$15,000 - \$50,000	31
Diverter							\$50,000 - \$100,000	32
Full Closures							\$50,000 - \$100,000	33
Raised Median Through Intersections							\$15,000 - \$50,000	34

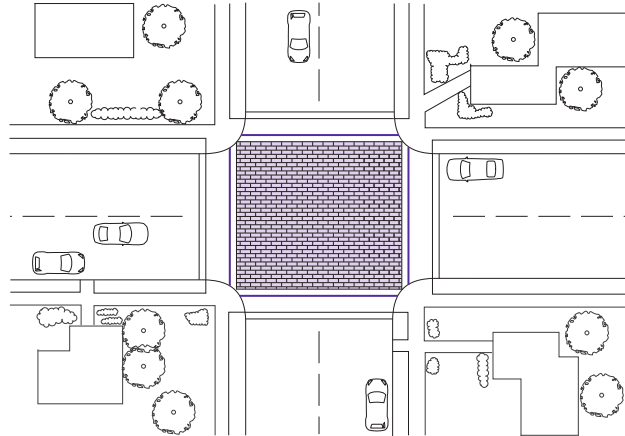
RAISED INTERSECTIONS - ALL-WAY STOP CONTROL

MEASURE

Vertical Measure

PRIMARY PURPOSE

Speed Reduction



RAISED INTERSECTIONS - ALL-WAY STOP CONTROL

A raised intersection is defined as an intersection constructed at a higher elevation than the adjacent roadway. All-way stop control intersections do not follow the traffic calming process.



EFFECTIVENESS

Speed Reduction	◐
Road Volume Reduction	○
Safety	◐



ADVANTAGES

- Speed reduction
- Pedestrian area is better defined
- Self-enforcing
- Reduce pedestrian-vehicle conflict



COST PER MEASURE

\$50,000—\$100,000

(Cost varies due to size of intersection, pavement material, relocation of catch basins)



DISADVANTAGES

- Negative impact on Emergency Services (i.e., Ambulance, Fire, and Police) by slowing down response time and impacting the comfort of patients being transported

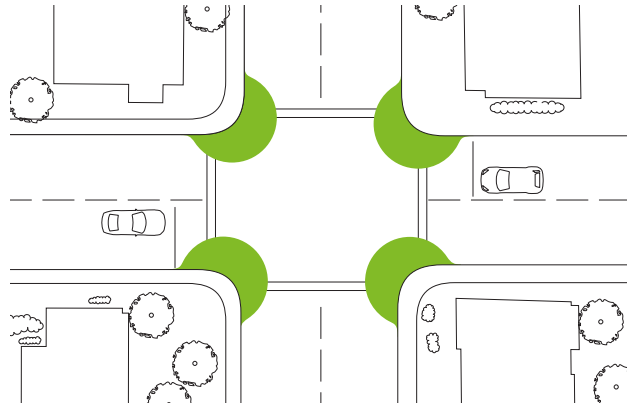
CURB EXTENSIONS

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction



CURB EXTENSION S - AT INTERSECTIONS

A curb extension is a horizontal intrusion of the curb into the roadway resulting in a narrower section of the roadway. It can be installed mid-block or near an intersection.

EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	○
Safety	○

ADVANTAGES

- Speed reduction
- Reduce crossing distance for pedestrians at intersections
- Increase pedestrian visibility
- Prevent parking close to an intersection

COST PER MEASURE

\$50,000—\$100,000

(Cost varies due to size and number of curb extensions, type of boulevard material, relocation of catch basins, installation of bollards)

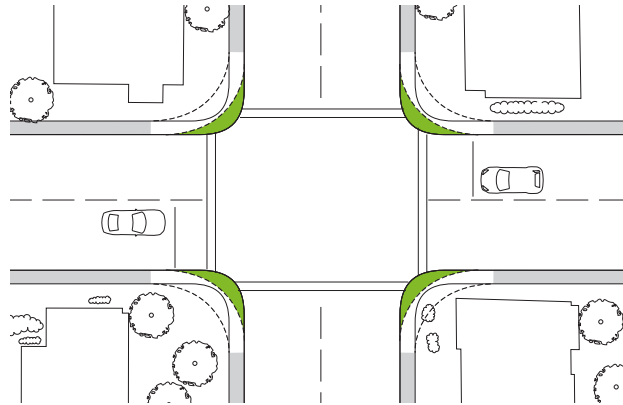
CURB RADIUS REDUCTIONS

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction



CURB RADIUS REDUCTIONS

A curb radius reduction is the reconstruction of an intersection corner with a smaller radius. Often installed as part of an intersection improvement. More detailed information can be found in the City's Curb Radii Guidelines.



EFFECTIVENESS

Speed Reduction	
Road Volume Reduction	
Safety	



ADVANTAGES

- Slow right-turning vehicles
- Reduce crossing distance for pedestrian
- Improve pedestrian visibility



COST PER MEASURE

\$50,000—\$100,000

(Reconstruction of curb and sidewalk, installation of tactile strips, relocation of catch basins, repair of pavement)

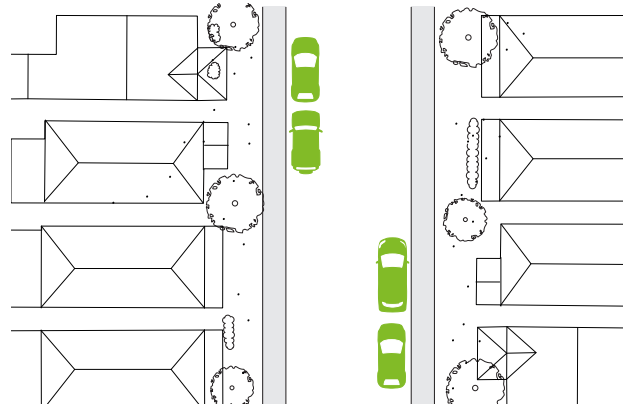
ON-STREET PARKING

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction



ON-STREET PARKING (ALTERNATING SIDES/CHICANE EFFECT)

On-street parking is the reduction of the roadway width available for vehicle movement by allowing motor vehicles to park adjacent and parallel to the curb.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	●
Safety	○



ADVANTAGES

- Speed reduction
- Possible reduction in short-cutting traffic or through traffic



COST PER MEASURE

\$1,000—\$5,000

(Pavement line markings and signage)



DISADVANTAGES

- Potential impact on cyclists

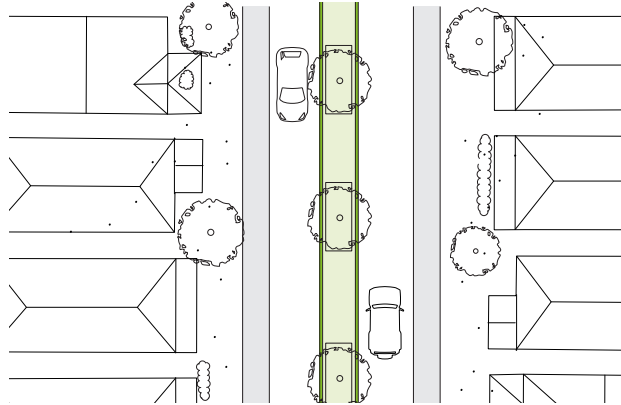
RAISED MEDIAN ISLANDS

MEASURE

Horizontal Measure

PRIMARY PURPOSE

Speed Reduction



RAISED MEDIAN ISLANDS / TEXTURED MEDIAN

A raised median is an elevated median constructed on the centerline of a two-way roadway to reduce the overall width of the adjacent travel lanes. If required, bike lanes can be included to prevent motorists from intruding into path of cyclist.



EFFECTIVENESS

Speed Reduction	●
Road Volume Reduction	○
Safety	●



ADVANTAGES

- Speed reduction
- Reduce pedestrian-vehicle conflict
- Safer pedestrian crossing



COST PER MEASURE

\$15,000—\$50,000

(Length and width of median, material, removal and repair of pavement)



DISADVANTAGES

- Potential driveway access restriction
- Potential loss of parking

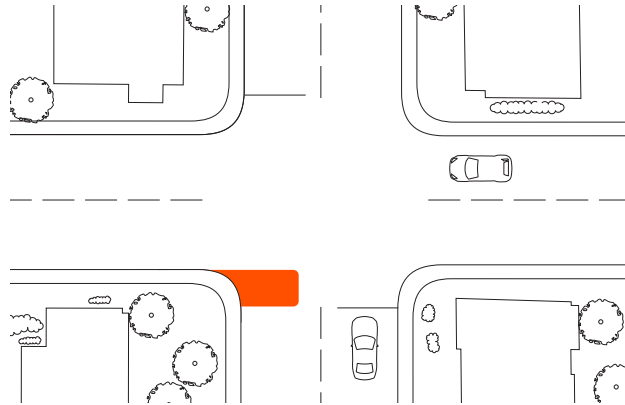
DIRECTIONAL CLOSURES

MEASURE

Obstruction Measure

PRIMARY PURPOSE

Volume Reduction



DIRECTIONAL CLOSURES

A directional closure is a curb extension or vertical barrier extending to approximately the centerline of a roadway, effectively obstructing (prohibiting) one direction of traffic.



EFFECTIVENESS

Speed Reduction	○
Road Volume Reduction	●
Safety	◐



ADVANTAGES

- Obstruct short-cutting or through traffic



COST PER MEASURE

\$15,000—\$50,000

(reconstruction of curb and sidewalk, installation of tactile strips, relocation of catch basins, installation of bollards)



DISADVANTAGES

- May increase traffic on adjacent streets
- May increase trip length for some residents

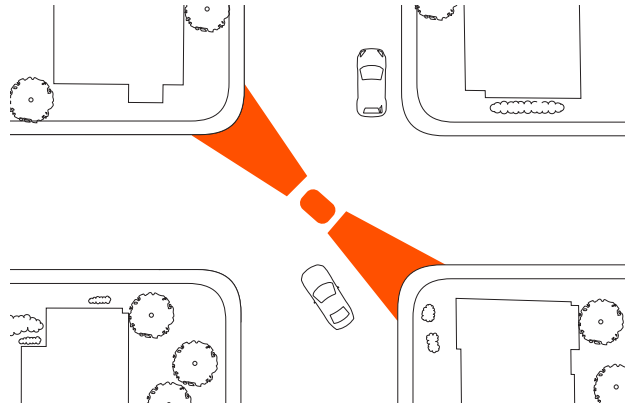
DIVERTERS

MEASURE

Obstruction Measure

PRIMARY PURPOSE

Volume Reduction



DIVERTERS

A diverter is a raised barrier placed diagonally across an intersection that forces traffic to turn and prevents traffic from proceeding straight through the intersection. Diverters can incorporate gaps for pedestrians, wheelchairs and bicycles, and can be mounted by emergency vehicles.



EFFECTIVENESS

Speed Reduction	○
Road Volume Reduction	●
Safety	◐



ADVANTAGES

- Obstruct short-cutting or through traffic



COST PER MEASURE

\$50,000—\$100,000

(Cost of physical measure depends on size of intersection, material and signage)



DISADVANTAGES

- May increase traffic on adjacent streets
- May increase trip length for some residents

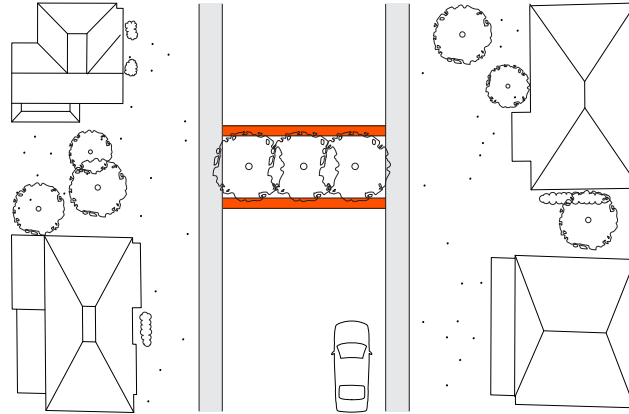
FULL CLOSURES

MEASURE

Obstruction Measure

PRIMARY PURPOSE

Volume Reduction



FULL CLOSURES

A full closure is a barrier extending the entire width of a roadway, which obstructs all motor vehicle traffic movement from continuing along the roadway. Gaps can be provided for cyclists and they are typically passable by emergency vehicles.



EFFECTIVENESS

Speed Reduction	○
Road Volume Reduction	◐
Safety	◐



ADVANTAGES

- Speed reduction
- Reduce pedestrian-vehicle conflict
- Obstruct short cutting or through traffic



COST PER MEASURE

\$50,000—\$100,000

(cost of physical measure depends on width of the road, material and signage)



DISADVANTAGES

- May increase traffic on adjacent streets
- May increase trip length for some residents

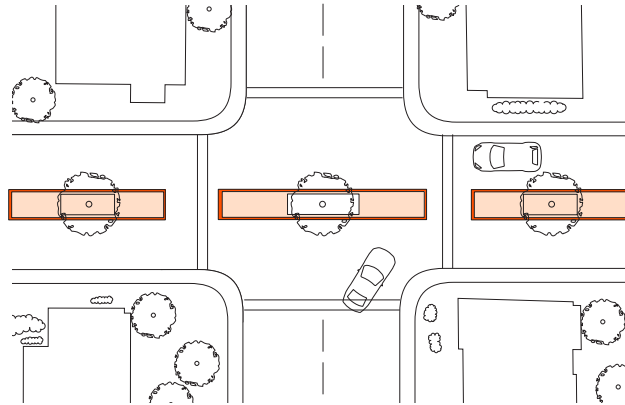
RAISED MEDIAN THROUGH INTERSECTIONS

MEASURE

Obstruction Measure

PRIMARY PURPOSE

Volume Reduction



RAISED MEDIAN THROUGH INTERSECTIONS

A raised median through an intersection is an elevated median located on the centerline of a two-way roadway through an intersection, which prevents left turns and through movements on one of the roadways.



EFFECTIVENESS

Speed Reduction	○
Road Volume Reduction	●
Safety	◐



ADVANTAGES

- Obstruct short-cutting or through traffic
- Reduce crossing distance for pedestrians
- Provide refuge for pedestrians
- Maintain access for cyclists and pedestrians



COST PER MEASURE

\$15,000—\$50,000

(Length and width of median, material, removal and repair of pavement)






DISADVANTAGES

- May increase traffic on adjacent streets
- May increase trip length for some residents

REFERENCES

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