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POLICY MANUAL

SECTION 1 – COUNCIL POLICIES	**POLICY NO: CCL – 051**
ESTABLISHED: SEPTEMBER 5, 2018	**LAST REVISED:**
TITLE: TRAFFIC CALMING POLICY & PROCEDURES	

All requests for traffic calming within the Town of Comox shall be considered in accordance with the attached document, titled “Traffic Calming Policy & Procedures” – dated November 2017.

TRAFFIC CALMING POLICY & PROCEDURES

November 2017

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1. Introduction

This document outlines the Town of Comox's Traffic Calming policy which utilizes the Transportation Association of Canada and Institute of Traffic Engineers' "*Canadian Guide to Neighbourhood Traffic Calming (1998)".*

1.1 Why a Policy?

The Town of Comox is receiving numerous requests within the community for traffic calming. As such there is a need to manage community traffic calming requests in an appropriate and equitable manner. The primary intent of the traffic calming policy is to establish the guidelines that would warrant traffic calming measures when requests are received. A traffic calming policy provides a transparent document for council, staff and the community on when and what will be reviewed in determining if traffic calming measures are warranted.

1.2 What is Traffic Calming?

Traffic calming can be described as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users". It aims to encourage safer, more responsible driving and inherently reduce traffic flow. When used effectively, traffic calming supports the livability and vitality of residential and commercial areas.

A traffic calming policy will allow the Town to determine what areas of the community needs traffic calming and how to prioritize the needs.

2 Goals of Traffic Calming

The basic function of a street is to provide both movement and access, but in differing combinations depending on location, adjacent land use, and road classification. Traffic calming is used to ensure a street or street network retains its intended function. Traffic calming measures are put in place to achieve at least one of the following objectives:

- **Reduce vehicle travel speeds:**
  Speeds and traffic volumes which are suitable for one type of road such as a major arterial road, may be considered excessive on a local road within a neighbourhood. Streets within the Town are classified to describe their role and functionality in the road network system.

  For vehicle speeds, the 85th percentile speed is considered the speed at which 85% of the total traffic volume on a road is travelling at or below. In considering the need for traffic calming, the 85th percentile speed must exceed the posted speed limit by 10 km/hr.

  Traffic calming measures which reduce vehicle speeds help to improve safety on neighbourhood streets for pedestrians, cyclists, motorists and other road users, and also help to improve the livability of a community by reducing noise and other negative impacts of traffic.

- **Discourage neighbourhood short-cutting:**
  Neighbourhood streets are primarily intended for access to properties. Reducing through/short-cutting traffic helps to improve safety by reducing the potential for conflicts and encourages traffic to use the surrounding arterial road network. Reducing through traffic also reduces delays for local traffic, pedestrians, cyclists and other road users. This helps to

improve livability for the residents by reducing noise, pollution, congestion, and other negative impacts of traffic.

- **Minimize conflicts between vehicles and other street users:**
  Local roads are intended to be shared between pedestrians, cyclists, motorists and other road users. Minimizing conflict points of road users, or enhance visibility or recognition between road users at existing conflict points. Reducing conflicts between road users helps to improve safety, as well as improve the livability of a community.

- **Improve the neighbourhood environment**
  Reducing vehicle speeds, traffic volumes and conflicts helps to enhance the livability of a community by reducing the apparent dominance of traffic. This makes for healthier neighbourhoods and more livable community.

Each road classification is intended to provide a different function as part of the overall network. Therefore it is important each traffic calming application is planned in consideration of the impact it may have on the overall road network.

Traffic calming uses physical design and other measures to improve safety for motorists, pedestrians and cyclists. It aims to encourage safer, more responsible driving and livability of a neighbourhood.

3 Traffic Calming Principles

There is no single “best” solution when implementing traffic calming that can be applied based solely on objective criteria. A number of principles are common to the application of all traffic calming measures, regardless of problem, type of road or mitigation measure.

A combination of local knowledge, technical expertise and experience must be applied to determine the best measure or combination of measures. The following five principles are relevant to all traffic calming projects. Following them will help to create an effective plan and build community acceptance.

- **Identify and quantify the real problem** - Ensure that any traffic calming plan is based on real problems and not simply perceptions. Conducting vehicle volume and classification counts, documenting speeds, undertaking license plate traces and parking surveys and collecting collision statistics may be required to determine the type and extent of traffic problems.

- **Consider area wide solutions** - Traffic problems on a particular street may have raised the need for a study but those problems may be caused by deficiencies on other roads, or other roads in the area may face similar problems. Applying traffic calming measures on only one road may simply shift the problem to neighbouring streets.

- **Avoid restricting access** - Closures, diverters and other barriers may eliminate cut-through traffic, but they will raise opposition from residents, emergency service providers, transit and others in the community. They can also generate difficulties for large vehicles such as snow plows, garbage trucks and delivery vehicles.

- **Consider all potential impacts** - Measures implemented may negatively affect emergency vehicles, transit, bicycles, people who are visually impaired, maintenance, local access,

parking, street sweeping, snow plowing and police enforcement. It may be impossible to completely eliminate all negative impacts but proper planning can reduce these concerns.

- **Monitor and follow-up** - It is important to perform follow-up evaluations to determine effectiveness of traffic calming measures and public acceptance after implementation. Some traffic calming devices may require maintenance that need be added to maintenance schedules.

4 Approaches to Traffic Calming Measures

Traffic calming measures are implemented to address issues with vehicles speeding, excessive traffic volumes and neighbourhood safety. All traffic calming measures help to reduce the speed and volume of traffic to improve the safety and quality of life for residents. These measures can be classified by the following:

a) Horizontal Deflection
   Creates a horizontal deflection of vehicles which generally discourages short-cutting of vehicles. Examples are Bulb-out/curb extensions and traffic circles.
b) Vertical Deflection
   Raising a portion of a road surface can create discomfort for drivers travelling at high speeds. Both the height and steepness affect the severity of vehicle displacement. Examples are speed hump and raised crosswalk.
c) Obstruction
   Obstructing specific vehicle movements which are usually applied to traffic intersections. They discourage or eliminate short cutting or through traffic. Examples are semi-diverter/directional closure, diverters and right-in/right-out islands.
d) Signing
   Installing signage such as stop signs, slow down or maximum speed signs are not an effective traffic calming measure.

5 Process

The following process will be instituted upon receiving a traffic calming request. This ensures a consistent approach.

5.1 Step 1 – Initial Request for Traffic Calming

Requests for traffic calming and concerns are most often related to the speed of and/or the traffic volumes on a particular street in a neighbourhood.

To begin the traffic calming process, the resident(s) concern must be made in writing to the Town of Comox, to the attention of Mayor and Council.

5.2 Step 2 – Collection of Data

Traffic data collection is a vital part of the process to gain an understanding of the concerns raised by the residents. This information is part of an analysis to determine the most appropriate traffic calming measure. The traffic data to be collected is as follows:

- Collision data – data for all roadway links and intersections are sourced from ICBC on request from the Town
- Average daily traffic - volumes are normally collected using standard traffic counters which are non-intrusive and deployed on the side of the roadway

- 85th percentile speed - can be picked up alone or in combination with the traffic volume information

5.3 Step 3 – Initial Screening process

The initial screening process will consider the classification of the street(s) under consideration, grade, collision history, average daily traffic volume and the defined threshold limits in the 85th percentile speed. The specific considerations include:

- Grade – if the grade of the roadway being considered exceeds 8%, then traffic calming will not be considered any further. Implementing traffic calming measures on roadways with steep grades could result in safety related issues especially under inclement weather conditions.
- Collision History – The collision history of the roadway within the past 3 years involving vulnerable road users such as cyclists and pedestrians which could have potentially been avoided with the implementation of traffic calming measures. This would be cause to advance the street through the initial screening process regardless of the volume and speed criteria. For local streets, this threshold is set at 3 collisions over a 3 year timeframe. For collectors, this threshold is set at 6 collisions over a 3 year timeframe.
- Volume on Roadway– The thresholds used for volumes upon which traffic calming could be considered are as follows:
    - local road average weekday traffic volume is greater than 1,000 vehicles per day
    - collector road average weekday traffic volume is greater than 5,000 vehicles per day
    - arterial road average weekday traffic volume is greater than 12,000 vehicles per day
- Speed on roads - The 85th percentile speed is the speed that 85 percent of the vehicles are travelling at or below. Another way of looking at this is that only 15 percent of vehicles are traveling faster than the 85th percentile speed. The threshold for consideration for traffic calming is the speed of traffic at the 85th percentile speed plus 10 km/h over the posted speed limit.

Table 1 traffic calming matrix is made up of recommended traffic calming measures and assigned threshold volumes and speeds relative to the road classification. If the data for the particular road exceeds the thresholds, then the complaint would trigger a traffic calming study.

Traffic calming should not be located on cul-de-sac roads since there can be no short cutting or volume issued due to lack of network connectivity. If speeding is an issue on cul-de-sac or long dead end roads an education program is required to inform neighbours of the street as the issues can only be created by that set of neighbours. This education could be in the form of a neighbourhood meeting and/or educational brochures identifying that speed is an issue being created by residents speeding in their own neighbourhood.

5.4 Step 4 – Initial Concepts Plan

If it is clear that the thresholds have been met, then the town will select potential traffic calming measures. Also considering safety, access, preliminary cost and traffic conditions. Depending on the extent, effect on overall traffic network and nature of the traffic calming mechanism, this will be the bases for determining if the potential traffic calming study can be done in house with staff expertise or if a traffic engineer should be hired.

Table 1 – Traffic Calming Matrix

Measures *	Arterial Rd Threshold to Trigger Traffic Calming Study:		Collector Rd Threshold to Trigger Traffic Calming Study:		Local Rd Threshold to Trigger Traffic Calming Study:		Cost*
	Volume >12,000 veh/day	Op. Speed 85th % ile > 10+ Km/h above posted	Volume >5,000 veh/day	Op. Speed 85th % ile > 10+ Km/h above posted	Volume > 1,000 veh/day	Op. Speed 85th % ile > 10+ Km/h above posted	
a)Traffic Circles					✓		2-50k
b) Intersection Channelization	✓		✓		✓		>3k
c) Diagonal Diverter					✓		50-100k
d) Raised Crosswalk					✓ (school & playground zones only)		20k
e) Speed Hump(s)					✓		1-5k
f) Speed Cushion			✓		✓		5k
g) Speed Table			✓		✓		5-7k
h) Curb Radius Reduction			✓		✓		>3k
i) Right in/Right out Island	✓		✓		✓		15-50k
j) Sidewalk Extension (at intersection)					✓		5-10k
k) Raised Median Island	✓		✓		✓		15–50k
l) Bulb-out/Curb Extension	✓		✓		✓		50-100k
m) Semi-diverter/Directional Closure					✓		15-50k
n) On Street Parking			✓		✓		1- 5k
o) Centreline Painting					✓		Varies
p) Street Closure					✓		50-100k

*Typically these measures require curb and gutter to be affective. On rural roads curb and gutter (and associated drainage upgrades) may be required when implementing traffic calming.
* Costs are based on a Class D estimates

5.5 Step 5 – Presentation to Stakeholders

In order for any traffic calming project to be successful, the community must support the process and be committed to the solution that is put in place to resolve the problems being experienced.

By way of a survey and letter or open house, staff will present the purpose, objectives and implementation process of traffic calming in general. Residents and stakeholders will have an opportunity to become involved in the process, learn more about the potential traffic calming measures and to provide feedback.

Surveys will contain:

- A brief description of traffic calming, including its advantages and disadvantages;
- A survey question asking if residents are in favour, opposed or neutral to the implementation of traffic calming measures in the identified location(s);
- The preferred traffic calming design; and
- A request for comments and feedback.

In order for the process to continue, staff requires the support of 75% of the residents and stakeholders who stand to be affected by the change. This reinforces that community support is vital for the ultimate success for traffic calming. Stakeholders shall include emergency services and transit.

5.6 Step 6 – Second Open House

Once the plan is completed a second open house may be held to present the plan. Residents and stakeholders will be asked if they support the plan presented. If necessary, consideration of modifying the plan to address additional problems or issues raised by the residents and stakeholders will be completed.

5.7 Step 7 – Council Approval

Based upon feedback from residents and stakeholders and in consideration of the evaluation exercise, staff will present the final plan to council for approval and funding.

The implementation of the plan is subject to budget approval and staff resources. Residents and stakeholders will be notified in writing of council decision and next steps.

5.8 Step 8 - Installation

The design of the various devices should be prepared according to the Transportation Association of Canada and Institute of Traffic Engineers' "*Canadian Guide to Neighbourhood Traffic Calming (1998)".*

A phased approach to installation may not be effectual, as traffic calming measures should be implemented all at once to ensure maximum safety, acceptance and compliance. Temporary or partially completed installations can create liability issues and/or maintenance problems. If funding is an issue, economical or more cost effective facilities can be utilised (e.g.: soft landscaping within the traffic circle) but the intention should be to install the measures as permanent fixtures rather than temporary.

The data that was collected on the subject area prior to initializing the traffic calming study represents the baseline information. Subsequent data results should be compared 6 months and 1 year respectively, after completion of the installation of the devices, to ensure the desired effect was achieved.

6 Conclusion

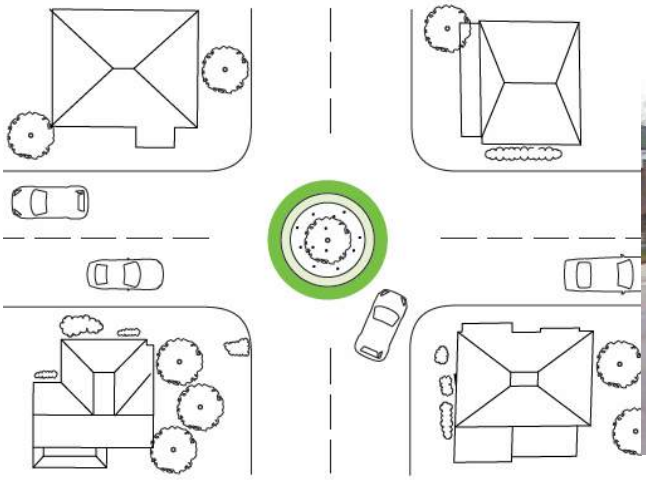
In order to streamline the decision making process for the Town of Comox, the aforementioned traffic calming steps should be followed when determining the necessity for enhanced safety measures. In order to maintain consistent and efficient process, these steps will ensure that the Town has the tools to implement a traffic calming measure where and when appropriate. As many individuals have their own perceptions regarding the need for traffic calming measure on a street, the previous steps will allow for the study to be based on the reality, as well as consider all potential impacts that these measures will have on all the road users.

Appendix A: Types of Traffic Calming

1 Traffic Calming Measures Considered

a) Traffic Circle

Traffic circle is a raised island located in center of intersection which requires vehicles to travel through the intersection in a counter clock wise direction.



Advantages	Disadvantages
• Can reduce vehicle speed by 6-10 km/h in vicinity of circles (most effective in reducing speed when several are used in a series) • Reduces vehicle volume slightly (some jurisdictions have reported reductions of 10-20%) • Reduces number of conflict points at intersection by 82% • Enhances aesthetics with landscaping	• Maybe inappropriate on major emergency response routes as delays emergency vehicles 5 to 8 sec. • Difficult for emergency vehicles and trucks to turn left • May require removal of some on-street parking (prohibiting parking for 9 m from intersection recommended) • Requires ongoing maintenance of landscaping

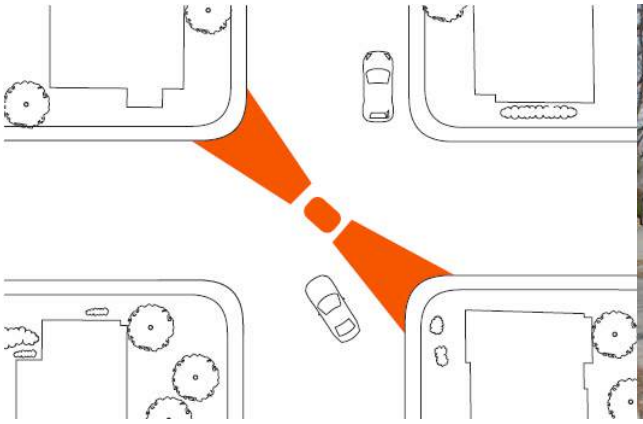
b) Intersection Channelization

Intersection channelization is raised islands located at an intersection, which is designed to obstruct specific movements and direct traffic through an intersection. Must involve an assessment by a Traffic Engineer regarding effect to overall traffic network.

Advantages	Disadvantages
• Creates pedestrian refuge which could increase pedestrian safety and shorten distance exposed vehicles • Treatment that is intended to reduce short-cutting	• Restrictive for larger vehicles and emergency vehicles • Adversely affects snow removal and other maintenance programs • Good illumination levels are required

c) Diagonal Diverter

A divider is a physical raised barrier placed diagonally across 4-way intersection to create 2 unconnected intersections. The barrier forces traffic to turn and prevents traffic from proceeding straight through the intersection. Gaps can be incorporated in the design for pedestrians, wheelchairs and bicycles and can be mounted by emergency vehicles. Must involve an assessment by a Traffic Engineer regarding effect to overall traffic network.



Advantages	Disadvantages
• Can reduce vehicle speed slightly within immediate vicinity of measure (approximately 61-91 m) • Can reduce vehicle volume by 20-70% (typically 35%) • Reduces crash potential by eliminating conflicting traffic movement • Lesser impact on traffic circulation in comparison to street closure • Enhances aesthetics with landscaping	• Traffic may be diverted to surrounding neighborhood roadways • May inconvenience local residents in accessing their homes • Delays emergency service vehicles • Drainage and icing may prove a problem • Good illumination levels are required

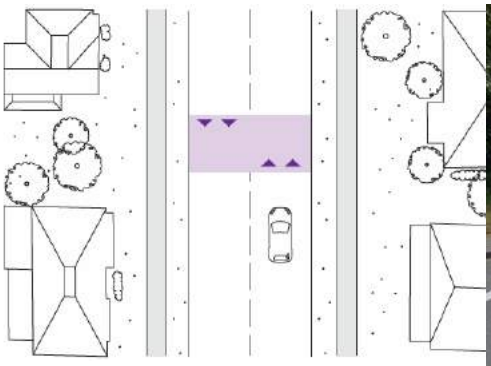
d) Raised Crosswalk

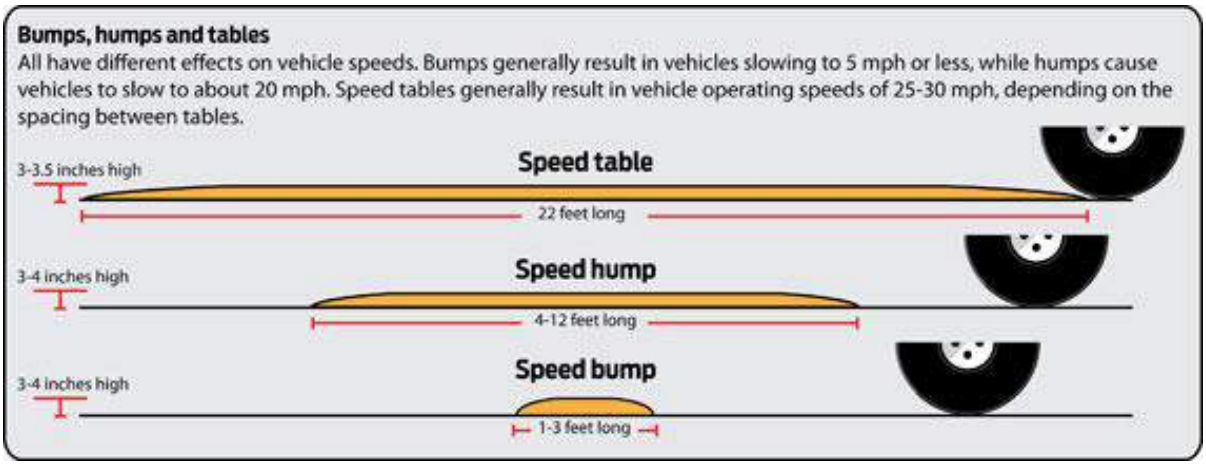
Marked pedestrian crossings elevated 7.6 to 15.2 cm above street grade at intersections or mid-block and can be at level with curb (about 15.2 cm above street). Raised crosswalks often have same profile as speed tables. Most effective with curb extensions

Advantages	Disadvantages
• Can reduce vehicle speed by about 10 km/h • Can reduce vehicle volume by about 12% • Improves visibility for pedestrians • Provides enhanced safety for pedestrians	• Negative impact on emergency response services • Traffic may divert to surrounding neighborhood roadways • Requires more maintenance • Increased time and cost necessary for snow removal • Drainage may be a concern (catch basin should be installed on uphill side of raised crosswalk • May produce noise concerns from adjacent residents due to braking and acceleration

e) Speed Hump:

Speed humps are rounded raised areas placed on the roadway. They are designed to discourage motor vehicle drivers from travelling at excessive speeds. The profile of a speed hump can be circular, parabolic, or sinusoidal. They typically are 7.6-10.2 cm high and 1.2-3.7 m long (speed bumps in contrast are 0.3-0.9 m long)





Advantages	Disadvantages
• Speed humps are relatively inexpensive • Relatively easy for bicycles to cross • Very effective in slowing travel speeds • Tapered at the curb on each end to allow for unimpeded drainage • Available in pre-constructed form	• They cause a 'rough ride' for all drivers including cyclist • Negative impact on emergency response services • May cause increase noise

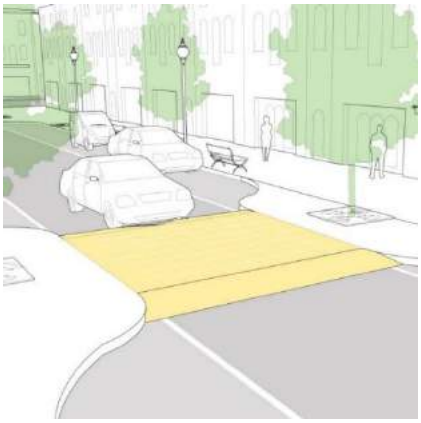
f) Speed Cushion:

A cushion is a series of 3-4 "humps" spaced across roadway that permits wide axle emergency vehicles to pass without slowing (typically 7.6 cm high, 1.82 m wide, and 2.1-4.3 m in length)

Advantages	Disadvantages
• Reduce vehicle speed • Can reduce vehicle volumes • No restrictions on on-street parking • Requires minimum maintenance • Does not restrict access to residents • Minimal impact to emergency response times	• May divert traffic to parallel streets that do not have traffic calming measures • Increase in noise in the vicinity of the cushions

g) Speed Table:

A table is a raised hump in roadway with flat top and ramps on either end, typically 6.7m long. Are typically long enough for the entire wheelbase of a passenger car to rest on the flat section. Their long flat fields, plus ramps that are sometimes more gently sloped than speed humps, give speed tables higher design speeds than speed humps. Speed tables are easier to construct than speed humps and generally have higher neighborhood acceptance.



Advantages	Disadvantages
• Relatively inexpensive to install and maintain (cost increases with size, therefore speed table is most expensive) • Reduces vehicle speed and volume	• Increased time and cost necessary for snow removal • Noise from acceleration and deceleration • Traffic may divert to surrounding neighborhood roadways • Avoid on major transit routes • Drainage may be a concern • Should not be installed on grade exceeding 8% or curves unless radius is greater than approximately 91 m • Should not be placed within 76 m of a signalized intersection • Negative impact on emergency response services, snow and road maintenance

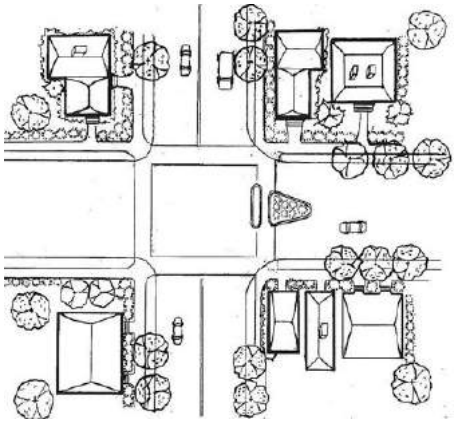
h) Curb Radius Reduction

The reduction of the radii of street corners, typically 3.0 m to 5.0 m range. The radius of street corners affects traffic turning speeds as a tighter radius forces drivers to reduce speed.

Advantages	Disadvantages
• Expand the intersection corner to reduce the crossing distance for pedestrians • Improve motorist visibility of pedestrians • Reduce the speeds of turning vehicles, which can reduce the likelihood and consequences of a collision with a pedestrian	• Not recommended for primary emergency vehicles, truck or transit routes

i) Right-in/Right-out Island

A right-in/right-out island is a raised triangular island at an intersection approach which obstructs left turns and through movements to and from the intersection, street or driveway. They are usually used to direct traffic to the nearest collector of arterial instead of cutting through the neighbourhood. It can also create refuge for pedestrians using the crosswalks in these locations. Prior to implementation a Traffic Engineer is required to review the intersection to ensure there is no adverse effect on adjacent traffic patterns and road network.



Advantages	Disadvantages
• Reduces through traffic on local street • Can improve pedestrian safety by reducing crossing distances and providing refuge areas	• Little or no impact on vehicle speed • Does not reduce vehicle volume on major street • Restricts resident access • Traffic may be diverted to surrounding neighborhood roadways • Negative impact on emergency response services

j) Sidewalk Extension (at intersection)

A sidewalk extension is the continuation of the sidewalk across a local street intersection. A “raised” sidewalk extension continues at its original elevation, with the local roadway raised to the level of the sidewalk at the intersection. For an “un-raised” sidewalk extension the sidewalk is adjusted to the level of the road.

Advantages	Disadvantages
• Favorable for intersections with substantial pedestrian activity	• Can create surface drainage concerns • Maintenance issues for snow plowing • May hamper turning movements causing traffic “back-ups” and possible collisions

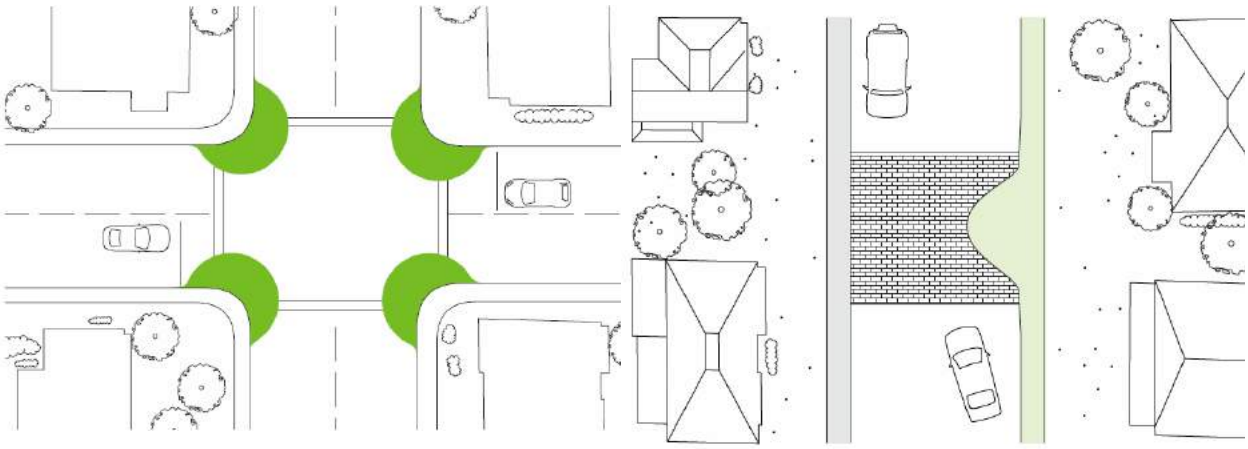
k) Raised Median Island (Pedestrian Refuge)

Narrow islands at mid-block or intersection between travel lanes with breaks in curbing/landscaping for pedestrians. Median islands should be 1.8-2.4 m wide to comfortably accommodate pedestrians, and at least about 3.7 m long (preferably about 6.1 m)

Advantages	Disadvantages
• Can reduce vehicle speed by 2-8 km/h (typically 3-5 km/h), especially when median islands result in roadway narrowing • Separate opposing vehicle travel lanes and prevent passing movements • Provide a safe in-between refuge for pedestrians as they make their way across the street, split up a lengthy curb-to- curb distance. • Can be used on curves to prevent vehicles from swinging wide at excessive speeds	• May require removal of on-street parking to create room for median • May restrict access to driveways from one direction • May require curbing at road edges to confine vehicles to narrowed traffic lanes • Snow removal within pedestrian refuge areas may prove difficult and experience delays

l) Bulb-out/Curb Extension

A curb extension is a horizontal intrusion of expanded area of curbing that extend across parking lane and may narrow at travel lane (at intersection of mid-block) with the primary purpose of speed reduction.

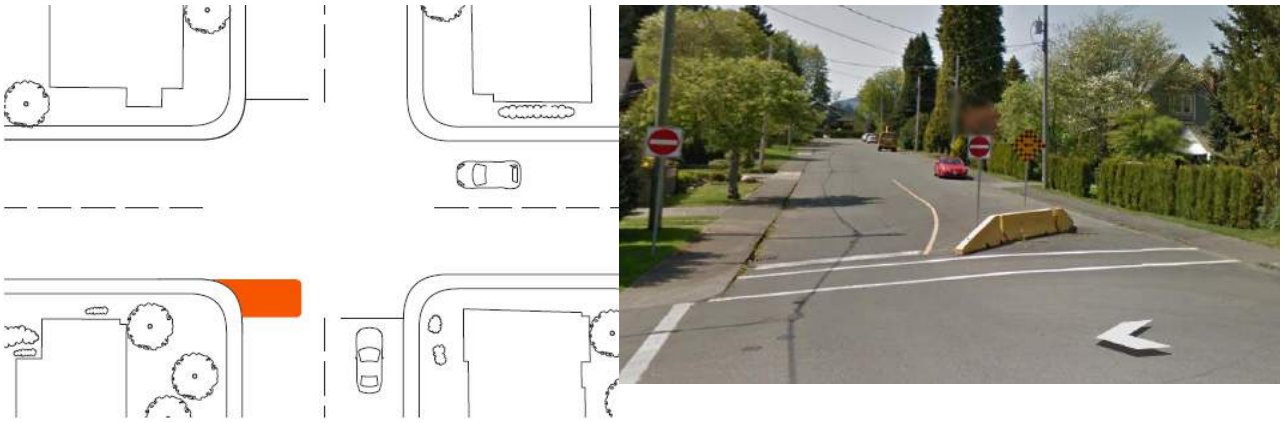


Intersection *Mid-block*

Advantages	Disadvantages
• Can reduce vehicle speed up to 2-3 km/h (and even up to 8 km/h when travel lanes are significantly reduced) • Improves pedestrian safety (reduces crossing distance) • prevents illegal parking close to intersections	• Reduces on-street parking • May be difficult to accommodate full bicycle lanes • Drainage may be a concern • Negative impact on emergency response services

m) Semi-diverter/Directional Closure

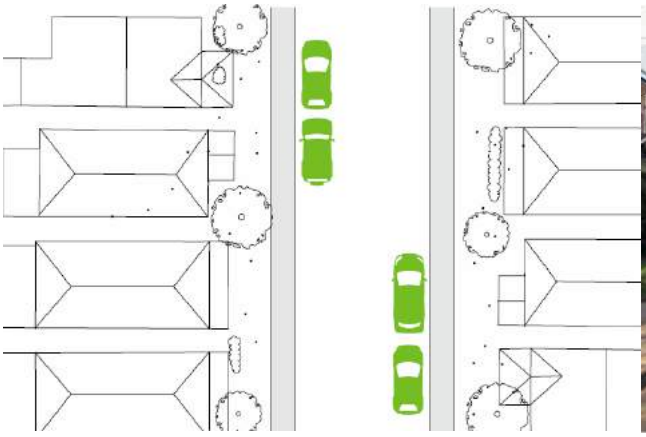
A physical barrier can be curb extension or vertical barrier that extends to proximately the centreline of a street, effectively obstructing one direction of traffic.



Advantages	Disadvantages
• Can reduce vehicle speed by 3-8 km/h • Can reduce vehicle volume by 40-60% • Reduce cut-through traffic without restricting bicycle and pedestrian access • Enhances aesthetics with landscaping	• Traffic may be diverted to surrounding roadways • Could be violated especially in late evening and on low-volume streets • Negative impact on emergency response services • Not on transit streets • Reduces access for residents

n) On-Street Parking

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



Advantages	Disadvantages
• Reduces vehicle speed if roadway is less than 9.0 m and effective width of roadway is reduced. If one half or more of block face is not parked out, on-street parking is unlikely to reduce speed • Parked vehicles provide buffer between traffic and pedestrians on sidewalks	• May reduce visibility of pedestrians and vehicles to each other • Negative impact on emergency response services • Not to be applied to roads with ≤ 6.0 m paved width

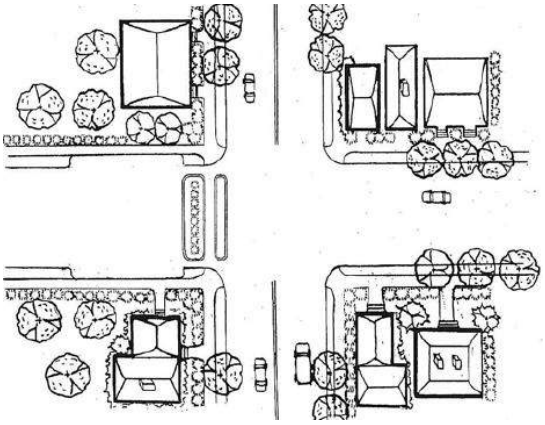
o) Centreline Painting

Painting a centreline can reduce the width of the travel portion of a lane. Usually used on roads 9.0 metre wide or less. Narrow lanes provide a feeling of constraint and encourage drivers to reduce their speed. Lanes can either be visually narrowed by adding a painted median, but these may be less effective than centre islands with raised curbs and landscaping, since vehicles can traverse a painted island.

Advantages	Disadvantages
• Encourages drivers to slow down due to perception of the road narrowing • Delineates the traffic • Traffic lines do not slow emergency vehicles • Painted lines is relatively easy and low-cost to install and modify.	• Painted lines are easy for drivers to cross and disobey • Roads without paint lines allow drivers to assume they can use the entire road, which results in higher speeds • Removal of pre-existing traffic lines in order to change the configuration may leave unsightly scars on the pavement surface

p) Street Closure

A closed roadway is a barrier extending the entire width, 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.



Advantages	Disadvantages
• Eliminates all cut-through traffic • May reduce vehicle speeds (especially if dead-end street is less than 122 m in length) • May reduce vehicle volume • Enhances aesthetics with landscaping	• Obstruct emergency service access • Restrict resident access • Adversely affects snow and road maintenance program • Creates issues regarding turn-around and may result in complaints due to repetitive use of private driveways for this purpose

2 Traffic Calming Measures Not Considered

a) Raised intersections

Raised intersections are not readily visible to motorists and other roadway users. Consequently, their effect on vehicle speeds and traffic volumes are minor. Expensive to retrofit raised intersections on existing roadways.

b) Rumble Strips

Rumble strips are effective when used to alert motorists to the presence of a stop sign, crosswalk, reduce speed zone or potentially hazardous situation. It is not a common traffic calming measure and creates additional noise for nearby residents.

c) Chicanes

Chicane is a series of curb extensions on alternating side of the roadway, which is to narrow the road and require drivers to steer in an “S” pattern from one side of the road to the other. One lane chicanes have been successful at reducing vehicle volumes and speeds. They have a higher operational and maintenance costs especially for snow clearing and street sweeping.

Appendix B – OCP Map 5 – Road Network Classifications