

Neighbourhood Traffic Management Guidelines and Tools



May 2016

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Neighbourhood Traffic Management Guidelines and Tools

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	BACKGROUND.....	1
1.2	PURPOSE OF GUIDE.....	1
1.3	GUIDING PRINCIPLES.....	1
2	NEIGHBOURHOOD TRAFFIC MANAGEMENT GUIDELINES	4
2.1	OVERVIEW.....	4
2.2	BENEFITS OF NEIGHBOURHOOD TRAFFIC MANAGEMENT	5
3	REVIEW PROCESS	6
3.1	OVERVIEW OF STUDY PROCESS	6
3.2	PHASE 1 - RESPONDING TO ISSUES.....	6
3.3	PHASE 2 – NEIGHBOURHOOD SELECTION	7
3.4	PHASE 3 - PLAN AND DEVELOPMENT APPROVAL	8
3.5	PHASE 4 – PERMANENT IMPLEMENTATION PLAN	11
4	NEIGHBOURHOOD TRAFFIC MANAGEMENT MEASURES	12
4.1	SPEED MEASURES	12
4.1.1	<i>Speed Display Boards</i>	12
4.1.2	<i>Education</i>	13
4.2	COMMUNITY BASED INITIATIVES	15
4.3	COMMUNITY SPEED DISPLAY BOARD PROGRAM	15
4.4	ENFORCEMENT MEASURES	17
4.5	REGULATORY MEASURES.....	17
4.6	TRAFFIC CONTROL RETROFIT PROGRAM.....	17
4.7	PEDESTRIAN CROSSWALKS	18
4.8	THE SIDEWALK RETROFIT PROGRAM	18
4.9	THE RAMP ACCESSIBLY PROGRAM.....	18
4.10	TRAFFIC CALMING.....	19
4.11	OTHER PROGRAMS	19
5	TRAFFIC CALMING MEASURES	20
5.1.1	<i>Horizontal Deflections</i>	21
5.1.2	<i>Curb Extension (aka Bulb-out or bulbing)</i>	21
5.1.3	<i>Raised Median Island</i>	23
5.1.4	<i>Roundabout</i>	23
5.1.5	<i>Mini-Roundabout</i>	26
5.1.6	<i>Chokers (Pinch point)</i>	27
5.1.7	<i>On-street Parking</i>	28
5.1.8	<i>Curb Radius Reduction</i>	28
5.2	VERTICAL DEFLECTIONS.....	30
5.2.1	<i>Raised Crosswalks</i>	31
5.2.2	<i>Textured Crosswalk</i>	31
5.2.3	<i>Raised Intersection</i>	32
5.2.4	<i>Speed Hump</i>	33
5.2.5	<i>Speed Table</i>	34
5.2.6	<i>Speed Kidney</i>	34
5.2.7	<i>Speed Cushion</i>	35
5.3	OBSTRUCTIONS	38
5.3.1	<i>Diverter</i>	38
5.3.2	<i>Right in/Right out</i>	39
5.3.3	<i>Directional Closure</i>	39
5.3.4	<i>Full Closure</i>	40

Neighbourhood Traffic Management Guidelines and Tools

5.3.5	Intersection Channelization	40
5.3.6	Raised Median through Intersection	40
5.4	TRAFFIC CALMED NEIGHBOURHOOD SIGNAGE	43
5.5	OTHER ISSUES.....	44
5.6	TRAFFIC CALMING NOT USED BY THE CITY OF SASKATOON.....	45
5.6.1	Rumble Strips.....	45
5.6.2	Speed Bumps.....	45
6	TRAFFIC CALMING IN NEW NEIGHBOURHOODS.....	46
7	EFFECTS OF TRAFFIC CALMING MEASURES	47

LIST OF TABLES

Table 3-1:	Neighbourhood Traffic Review Process	9
Table 4-1:	Speed Display Boards Guidelines.....	16
Table 5-1:	Typical City of Saskatoon Roadway Classifications and Characteristics	20
Table 5-2:	Standard Drawing for Roundabout used by the City of Saskatoon	24
Table 5-3:	Horizontal Devices	29
Table 5-4:	Vertical Devices	36
Table 5-5:	Obstruction Devices	42
Table 6-1:	Standard Drawings for New Neighbourhood Streets.....	46
Table 7-1:	Effectiveness of Typical Traffic Calming Measures.....	47
Table 7-2:	Effectiveness of Measures not used as Traffic Calming Methods	48

LIST OF FIGURES

Exhibit 3-1:	Neighbourhood Traffic Review Process	6
Exhibit 4-1:	Speed Brochure Page 1	13
Exhibit 5-1:	7 th Avenue and Princess Street Curb Extension (City Park).....	22
Exhibit 5-2:	Saskatchewan Crescent Curb Extension (Nutana)	22
Exhibit 5-3:	Avenue P and 21 st Street Median Island (Pleasant Hill)	23
Exhibit 5-4:	3 rd Avenue and Spadina Crescent Roundabout (River Landing).....	25
Exhibit 5-5:	Stonebridge Boulevard and Cornish Road Roundabout (Stonebridge)	26
Exhibit 5-6:	23 rd Street Temporary Mini-Roundabout (Westmount).....	27
Exhibit 5-7:	Saskatchewan Crescent Pinch-Point (Nutana).....	28
Exhibit 5-8:	Meilicke Road between David Knight Crescent.....	31
Exhibit 5-9:	Textured Crosswalk using concrete in River Landing.....	32
Exhibit 5-10:	Textured Crosswalk using pavers at Stonebridge Boulevard and Wellman Crescent (Stonebridge)	32
Exhibit 5-11:	Speed Hump on Hughes Avenue (Dundonald)	33
Exhibit 5-12:	Avenue C and 38 th Street Temporary Device (Mayfair).....	39
Exhibit 5-13:	51 st Street and Millar Avenue (Hudson Bay Industrial).....	39
Exhibit 5-14:	Coppermine Crescent and Churchill Drive (River Heights).....	40

1 INTRODUCTION

1.1 Background

As the population of the City of Saskatoon continues to grow, residents are indicating an increasing concern regarding neighbourhood traffic issues. In particular, residents are concerned about the impacts of frequent occurrences of speeding and short-cutting traffic on the quality of life within the community.

The City has developed a neighbourhood traffic management document to address neighbourhood traffic concerns. The document will provide a guideline on how to address the concerns, a list of tools recommended for different concerns (speeding, short-cutting or pedestrian safety), and it will also identify proactive treatments for newly developed neighbourhoods.

The overall objectives of the ***City of Saskatoon Neighbourhood Traffic Management Guidelines and Tools*** are to maintain the livability and environmental quality of our neighbourhoods while ensuring the safe, efficient and economical movement of people and goods.

1.2 Purpose of Guide

The purpose of this guide is to provide the City of Saskatoon with a strategy to respond to a wide range of public concerns such as speeding, short-cutting, pedestrian safety, school safety and signage such as traffic controls, or parking restrictions and prohibitions. This guideline provides details on the following:

- The process for Neighbourhood Traffic Reviews
- Proposed measures to address traffic issues in existing neighbourhoods
- Tools that can be applied to the design of new neighbourhoods

1.3 Guiding Principles

The following guiding principles form the basis for neighbourhood traffic management and will be taken into consideration when investigating, selecting, and implementing appropriate measures. These principles provide overall direction and guidance in the application of neighbourhood traffic management measures and applying them will maximize the effectiveness of the Neighbourhood Traffic Management Plan and help build community support by ensuring their needs are met.

These principles include:

- **Identify the real problem.** Often, the perceived nature of a traffic problem is substantially different than the real problem. In some cases, the difference is so great that a solution intended to eliminate the perceived problem might make the real problem worse. For example, residents often mention “traffic volume” and “speeding” as concerns on their street, but in some cases the problem is one or the other. If the real problem is speeding, for example, a measure which significantly reduces the traffic volume on a street might encourage speeding if fewer cars remain on the street to slow traffic. Therefore, it is important to identify the real problem, so as to select the appropriate measure, or to help prioritize a number of selected measures.
- **Quantify the Problem.** Some problems are more significant than others. Some are all-day problems; others occur only at certain times of day or only in one direction. To select appropriate traffic measures, it is important to quantify the extent of the problem. This means gathering data, which includes: traffic counts, speed studies, parking surveys, collision statistics, or any other data as appropriate.
- **Involve the community.** Residents, business owners, property owners, community groups, and other local stakeholders in a community should be involved in developing Neighbourhood Traffic Management Plans. Their input is essential in identifying problems and in selecting traffic solutions. Involving the community builds support, and enhances credibility of a plan. Involving a broad cross-section of the community, as well as key stakeholders, minimizes the potential of special interest groups who might otherwise unduly influence the preparation of a plan. If the community is not adequately involved in preparing a Neighbourhood Traffic Management Plan, residents and others in a community might oppose the plan, regardless of its technical merit, because they feel they were not properly consulted, listened to, or the plan does not recognize the unique circumstances of their neighbourhood.
- **Consider improvements to the major road network first.** Most motorists will not shortcut through a neighbourhood unless there is a reason to and the reason is often related to congestion on adjacent major roads. There are a wide range of low-cost options available to improve operations on major roads, including adjusting traffic signal phasing and timing, adding turn bays, implementing turn prohibitions, and establishing parking restrictions. Improvements to the major road network should be considered first, as these might prevent or reduce the need for traffic measures on the neighbourhood streets, and enhance the effectiveness of a Neighbourhood Traffic Management Plan.
- **Access restrictions.** Neighbourhood traffic management measures that restrict access or egress should be carefully considered and should be accompanied by public consultation.
- **Do not impede non-motorized modes.** Neighbourhood traffic management measures should not impede the movement of cyclists and pedestrians.

Neighbourhood Traffic Management Guidelines and Tools

- **Consider all services.** Neighbourhood traffic management measures should not impede emergency, transit, and maintenance service access unless alternate measures are agreed upon.
- **Implementation of Neighbourhood Traffic Management Plans.** Neighbourhood Traffic Management Plans will be shared with the public and submitted to City Council for approval. All proposed measures, especially traffic calming devices, will be implemented temporary and monitored. Permanent installation of traffic calming devices will only be considered if temporary measures have proven effective.

2 NEIGHBOURHOOD TRAFFIC MANAGEMENT GUIDELINES

2.1 Overview

Neighbourhood traffic management is considered on local and collector streets. It involves the implementation of a broad range of measures that typically falls into two categories:

- **Isolated Studies.** This is used on a single problem street where it is not likely to displace traffic onto adjacent streets. School sites can be considered for a traffic management improvement (e.g. traffic calming) without being part of a bigger plan. If there is a request for traffic control, parking restriction, signage or pedestrian device at locations that are not part of a Neighbourhood Traffic Review for that year, the City of Saskatoon will review the request as an isolated study.
- **Area-wide issue.** In other areas, there will be a range of traffic issues on many streets within an area. For example, speeding and short-cutting traffic might be an issue on several streets, and pedestrian safety might be an issue at a number of locations throughout the area. In cases like this, traffic solutions must be developed on an area-wide basis, considering all issues within an area. For the purpose of neighbourhood traffic management, an area is typically defined by community boundaries. If desired, two or more adjacent areas can be combined to create a single larger area for the purposes of developing a Neighbourhood Traffic Management Plan.

Neighbourhood traffic management is undertaken for two key reasons: it improves the **safety** and **livability** within neighbourhoods. It helps make the streets safer for everyone and it includes all road users (pedestrians, cyclist, and motorists). It also helps to preserve and enhance the livability of the community by minimizing the negative impacts of traffic (noise and pollution). Many neighbourhood conflicts are the result of excessive speed and motorist's inattention. Successful neighbourhood traffic management measures effectively modify driver behavior and some are self-enforcing. Examples would be speed display boards or traffic calming devices.

2.2 Benefits of Neighbourhood Traffic Management

The specific benefits of neighbourhood traffic management are:

- **Minimize conflicts.** Reducing conflicts between roads users reduces the likelihood of a collision occurring; therefore, improving safety, particularly for pedestrians, cyclists and other vulnerable road users.
- **Reduce vehicular speeds.** Speeds that are suitable for one type of road (such as major arterial) may be considered excessive on a residential collector or local street. Measures that decrease speeds help to reduce the likelihood of a collision occurring, as well as the severity of the collision. Reducing vehicular speeds also helps to improve the livability of a community by reducing noise and other negative impacts of traffic.
- **Discourage through traffic on local residential streets.** Local streets are primarily intended for access to properties rather than accommodating through traffic. Discouraging through traffic will improve safety by reducing potential conflicts.
- **Establish an ongoing process to address problems.** New roads, additional development and other changes may result in changes in traffic patterns and contribute to new traffic problems. Establishing proactive policies to consider neighbourhood traffic management measures in the design of new roads and neighbourhoods will help to ensure that problems are avoided in the first place.

3 REVIEW PROCESS

3.1 Overview of Study Process

To successfully implement an effective Neighbourhood Traffic Management Plan, there must be an established procedure documenting the process and the action to be taken. The City of Saskatoon’s process has been divided into four phases.

- Phase 1:** Responding to Issues
- Phase 2:** Neighbourhood Selection
- Phase 3:** Plan Development and Approval (Neighbourhood Traffic Review Process)
- Phase 4:** Permanent Implementation Plan

The study process is outlined in **Exhibit 3-1**.

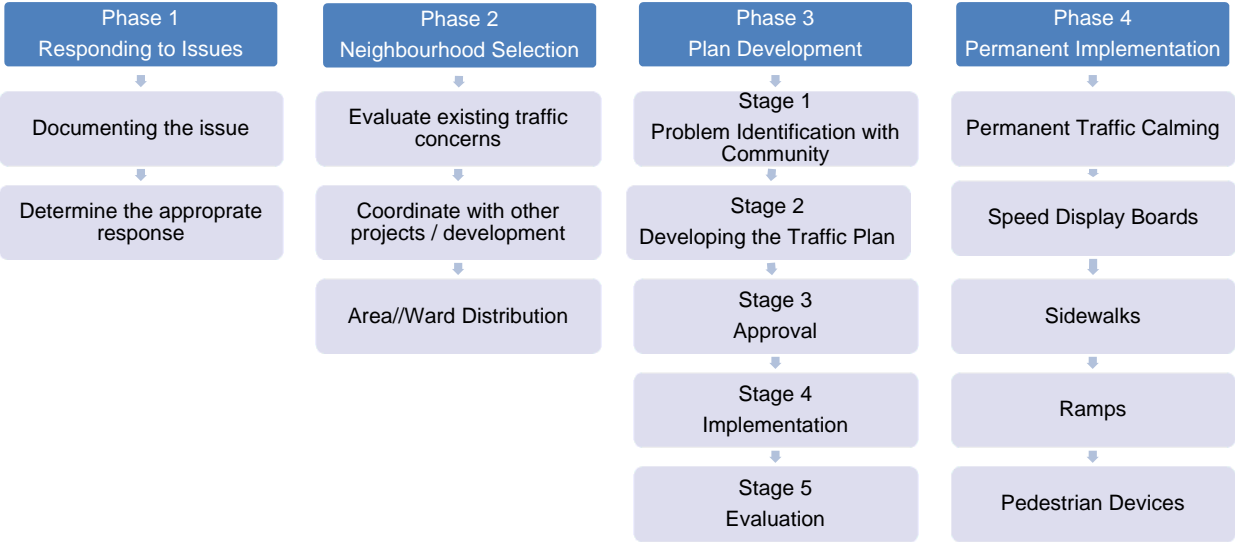


Exhibit 3-1: Neighbourhood Traffic Review Process

3.2 Phase 1 - Responding to Issues

This phase involves screening the traffic concern and determining whether the traffic concern be considered as part of Neighbourhood Traffic Management Review, or another course of action be taken.

This phase involves a two-step process:

Step 1 - Documenting the issue: The first activity is for residents to document their traffic issues. These issues can be documented by various methods: Council inquires, web-emails, letters, telephone calls, or submitting their concern on the new web application called “*Report a Traffic Issue*” at www.saskatoon.ca A link to the site is provided below:

<https://apps4.saskatoon.ca/app/aTrafficIssueReporting/>

Step 2 - Determine the appropriate response: The next step of this phase is for the Transportation division staff to determine which of the following responses is appropriate. In most cases, if there is neighbourhood traffic management review planned within the year, the traffic concern will be dealt with under that review. If there is no Neighbourhood Traffic Review planned for the year, the traffic issue can be reviewed under the appropriate policies and procedures. For example, Stop and Yield signs request will be reviewed under the Policy CO7-007 - *Traffic Control – Use of Stop and Yield Signs*.

3.3 Phase 2 – Neighbourhood Selection

This phase involves prioritizing the traffic concerns to determine which neighbourhood will receive a Neighbourhood Traffic Review. A formalized process was developed to prioritize and select neighbourhoods for each year. This phase has three steps:

Step 1 – Evaluate existing traffic concerns: This step is based on a point system and the number of criteria listed below.

1. Number of outstanding concerns: Includes all phone calls, emails, letters and additional correspondence documented since the beginning of the program in August 2013 (1 point per concern is added to the total score).
2. Councillor input: The Administration will work with each respective Councillor to select the highest priority neighbourhood in the Ward, considering all information available (3 points assigned to the highest priority neighbourhood).
3. Number of temporary traffic calming devices currently installed: There is currently a number of existing temporary traffic calming locations that must be maintained and assessed (1 point per device is added to the total score).
4. Number of collisions: Collision data provided by SGI will be reviewed each year. The criteria for collisions is as follows:
 - Low: The number of collisions appears to be lower relative to other neighbourhoods (0 points are added to the total score).
 - Medium: The number of collisions appears to be average relative to other neighbourhoods (1 point is added to the total score).
 - High: The number of collisions appears to be higher relative to other neighbourhoods (2 points are added to the total score).

Step 2 – Coordinate with other projects/consider areas under development: This step involves coordination with other projects, such as Local Area Plans (LAP) is required to achieve efficiencies such as combining public consultation efforts. Similarly, neighbourhoods under development where roads and infrastructure are not yet constructed may be delayed as traffic patterns will evolve. Both of these factors may result in an adjustment to the timing of reviews in certain neighbourhoods.

Step 3 – Area/Ward Distribution:

The final step of the neighbourhood selection process is to ensure reasonable distribution among the city. Since there are 10 Wards and only eight neighbourhoods reviews each year, not all Wards can be selected on an annual basis. The neighbourhoods that do not receive a review the year prior will have higher priority.

3.4 Phase 3 - Plan and Development Approval

This phase involves working with the community, City Council and City staff in developing a Neighbourhood Traffic Management Plan. This phase involves a five stage approach:

- Stage 1:** Problem Identification with Community
- Stage 2:** Developing the Traffic Plan
- Stage 3:** Approval
- Stage 4:** Implementation
- Stage 5:** Evaluation

Details on each stage are provided in **Table 3-1**.

Table 3-1: Neighbourhood Traffic Review Process

Stage	Details	Approximate Duration
Stage 1: Problem Identification with Community	<ul style="list-style-type: none"> • Host 1st community meeting to establish study goals, objectives and identify traffic concerns and possible solutions • Share results online at www.shapingsaskatoon.ca 	January - April
Stage 2: Developing the Traffic Plan	<ul style="list-style-type: none"> • Collect and analyze traffic and safety data to confirm the issues • Identify potential solutions • Develop proposed Traffic Plan • Circulate Traffic Plan to internal departments for feedback • Hold 2nd community meeting to determine the level of support for Traffic Plan • Review Traffic Plan and identify changes as appropriate • Determine if 3rd community meeting is required to address outstanding issues • Share community meeting results online at www.shapingsaskatoon.ca 	May - December
Stage 3: Approval	<ul style="list-style-type: none"> • Present Traffic Plan to Committee and Council for approval in principle • The community will be notified of the Traffic Plan by mail, the City's websites and the Community Association 	January - March (2 nd year)
Stage 4: Implementation	<ul style="list-style-type: none"> • Implement recommendations within the plan. Timeline for implementation may be short, medium or long term depending on the specific measure • Any measures that physically restrict traffic movements or significantly alter traffic patterns will be implemented temporarily to evaluate their effectiveness 	Time Frames Short term (1 - 2 years) Medium (3 - 5 years) Long Term (5 years' plus)
Stage 5: Evaluation ¹	<ul style="list-style-type: none"> • The overall plan will be evaluated and modified as required • Physical traffic movement restrictions will be formally evaluated after a minimum 1-year evaluation period • Traffic studies will be conducted and input sought from the impacted residents with the results shared on shapingsaskatoon.ca • Final approval from City Council will be sought prior to permanent construction • The community will be notified of any changes by mail, the City's websites and the Community Association • If required, Public Notice and any associated bylaws will be brought forward at this time. 	Minimum 1-year period following implementation

Note 1: Traffic calming measures that physically restrict traffic movements or significantly alter traffic patterns will be initially installed in a temporary manner to evaluate their effectiveness. The trial period will be a minimum of 1 year, with traffic studies being conducted to quantify the impacts.

Neighbourhood Traffic Management Guidelines and Tools

As part of the evaluation stage, if there are traffic measures that restrict traffic, further public consultation will be required. Some examples are indicated below:

- If a traffic restriction is being recommended that physically restricts a traffic movement, the evaluation process will include a flyer to impacted residents providing traffic data and seeking their opinion on the level of support for maintaining the traffic restriction permanently. If the majority of respondents are in support of maintaining the restriction, and it has not shifted the issue elsewhere in the area, the Administration will recommend to City Council that it be constructed permanently. The results of the trial and outcome of the community engagement will be reported to Council with the Administration's recommendation.
- In neighbourhoods where physical turning movement restrictions are not proposed, the Administration will monitor the effectiveness of the overall plan through discussions with the Community Association and the Councillor as well as through informal complaints from residents. Site observations will also be conducted to evaluate the design of traffic calming devices. An annual report will provide a status update on the implementation of each of the neighbourhood plans, identifying which devices will be made permanent.

3.5 Phase 4 – Permanent Implementation Plan

Phase 4 involves the implementation of permanent measures for traffic calming, sidewalks, ramps, speed display boards and pedestrian devices. The proposed time frame for these measures will be longer as most of them will be put on lists and prioritized based on the criteria for each measure. A summary of the criteria for each is as follows:

Traffic calming is installed temporary until there is funding for permanent installation. The traffic calming devices will be installed permanently based on the following criteria:

- Traffic calming devices temporarily installed prior to August 14, 2013
- Locations adjacent to schools or parks
- Locations addressing speed and short-cutting issues
- All other locations

A list will be established based on the above criteria and will be submitted to City Council in early spring for approval.

Sidewalk and **Ramps** recommendations are funded through the programs for Sidewalk Retrofit and Accessibly Ramp programs (see **Section 4.8** and **Section 4.9** for how sidewalk and ramps are prioritized).

Speed Display Boards when funding is available will be installed permanently.

Pedestrian devices such as a pedestrian actuated signal, active pedestrian corridor or pedestrian crossing will be added to a list generated for each type of pedestrian crossing device, and is prioritized based on warrant results.

4 NEIGHBOURHOOD TRAFFIC MANAGEMENT MEASURES

This section describes the neighbourhood traffic management measures used to address neighbourhood traffic concerns relating to speed, short-cutting, pedestrian safety, and signage.

4.1 Speed Measures

The intent of speed measures is to address speeding concerns in neighbourhoods by increasing driver and community awareness of the speed conditions on their streets. Tools such as speed display boards and education provides an opportunity for both the driver and community members to participate in speed reduction, creating safer and more livable streets.

4.1.1 Speed Display Boards

Speed Display Boards are pole-mounted devices equipped with radar speed detectors and an LED display. The boards are capable of detecting the speed of an approaching vehicle and displaying it back to the driver. When these signs are combined with a regulatory speed limit sign, a clear message is sent to the driver displaying their speed.

The objective of the speed display board is to improve road safety by making drivers aware of their speed, evoking voluntary speed compliance.

Speed display boards are used as traffic calming devices in addition to or instead of physical devices such speed humps, speed cushions, or speed tables.

Speed Display Board Usages

- Used on collector roads where there are no trees or other vegetation that will restrict the operations of the speed display board.
- Used in conjunction with physical traffic calming devices.
- Typically installed where there is already an enforcement speed sign, e.g. entrance to neighbourhoods.

Advantages

- Provides awareness to driver.
- Encourages speed compliance.
- Portable mounting method allows for exposure at numerous locations citywide.

Disadvantages

- Not an enforcement tool.
- Less effective on multi-lane, high volume roadways.

4.1.2 Education

Sometimes speeding is a matter of perception, and enforcement. Educating the public is an option that is relatively inexpensive and effective. For example, many residents are simply unaware of the actual speed limit in their neighbourhood.

An informational brochure is available on the city website www.saskatoon.ca. The brochure provides information on:


- Why we speed?
- A list of measure that can be used to reduce speeding in your neighbourhood.
- Information on school zones, back alley and constructions zones speed limits.
- Speeding fines.
- Traffic Bylaw 7200.

A copy of the speed brochure is included in **Exhibit 4-1**.



Exhibit 4-1: Speed Brochure Page 1

TRAFFIC SPEED



Traffic Speed in neighbourhoods is often a common concern for residents, especially those with children.

Traffic speed can be critical to walkability and cycling. While pedestrians and cyclists may feel comfortable on streets that carry a lot of traffic at low speeds, higher speed traffic will discourage these activities.


WHY DO WE SPEED?

- ▶ People speed because they are behind schedule and are trying to make up for lost time.
- ▶ They are unaware of the speed limit.
- ▶ They are trying to keep up with other traffic.
- ▶ Out of habit.
- ▶ They are so familiar with their neighbourhood that they do not realize how fast they are driving.


Speeding is sometimes a matter of perception; Vehicle speeds can often seem high when you are close to the roadway, even when motorists are actually travelling under the legal speed limit. This is especially true on a quiet residential street.

MEASURES USED TO REDUCE SPEEDING IN YOUR NEIGHBOURHOOD

SET THE PACE
When you drive through your neighbourhood, stay at or below the speed limit. Set a safe pace and encourage your neighbours to do the same.





NARROW THE STREET
People drive faster on wide-open roads, and they slow down on narrower streets. By parking your car next to the curb, you can discourage speeding.



REPORT A TRAFFIC CONCERN
Go to saskatoon.ca and click on "N" for Neighbourhood Traffic Planning to report a concern and request a review.


REQUEST TRAFFIC ENFORCEMENT
Ask your local police to ticket neighbourhood speeders. Call Saskatoon Police at (306) 975-8300.

HOW MUCH ARE FINES FOR SPEEDING?

Speeding Tickets start at **\$120** and go up \$10 for every 10 km over the posted limit.

SCHOOL SPEED ZONES
Every year, thousands of children travel to and from schools in Saskatoon. Their safety is a high priority for the City of Saskatoon. As a motorist, you have a responsibility to obey posted limits and drive in a safe and courteous manner.



SPEEDING IN BACK ALLEYS
Traffic Bylaw 7200 states the speed limit in back alleys is 20 km/hr.

CONSTRUCTION ZONES
Construction zones use standard regulatory (black and white) sign with an orange tab indicating the maximum legal speed. These signs are enforceable and must be obeyed at all times.




Exhibit 4-1 continued: Speed Brochure Page 2

4.2 Community Based Initiatives

This section is intended to address numerous initiatives which individuals and community groups can undertake as a means of addressing traffic issues. The intent of these initiatives is to help communities help themselves. Together with any action undertaken by the City, these initiatives result in a balanced response to local traffic issues.

- **Community Newsletters:** Community Associations can publish information on traffic concerns in their newsletters to encourage more appropriate driving behavior among motorists or notify a neighbourhood of planned projects that will affect local traffic patterns (construction or permanent installations).
- **Community Events:** Public meetings and community open houses involving residents and stakeholders can be an effective means of identifying traffic issues and options available to deal with problems. These discussions can also bring awareness and education to help improve driver behavior. This will assist in the traffic study process.
- **Alternative Modes of Transportation:** A wide range of initiatives can be used to reduce vehicle trips and the amount of traffic on neighbourhood streets. Some examples include:
 - Car Pooling
 - Working from at home
 - Flex time – staggering work hours to avoid peak hour traffic volumes
 - Public Transit
 - Cycling
 - Walking

4.3 Community Speed Display Board Program

The purpose of this program is to allow communities to purchase their own speed display board. The following process will be followed:

1. Community Associations will need to submit a written application to the City of Saskatoon to initiate the process.
2. The City will provide the Community Association a cost estimate of the speed reader board, along with an agreement to be signed by the Community Association. The agreement will set out the expectations on maintenance, repairs, vandalism, etc. of the board.
3. The Community Association will provide payment to the City, as well as enter into the written agreement.
4. The City of Saskatoon will proceed to acquire the speed display board.
5. The speed display board is to be installed for one-year at one location.
6. Annually, the community can submit a written request to the City to have the speed display board relocated to another location.

The guidelines, and supporting reasons for developing these guidelines, that support the use of speed display boards is provided in **Table 4-1**.

Table 4-1: Speed Display Boards Guidelines

Guideline	Comments
The community will only be allowed to purchase one speed display board.	Doesn't conflict with recommendations for permanent speed display boards from the neighbourhood review plans.
The speed display board can only be installed at one location per year.	More effective if they remain in one place for a longer time period.
The speed display board cannot be used as enforcement purposes.	The police are the only entity that can enforce speeding.
The speed display boards are to be used only within the neighbourhood on local and collector streets.	To educate the drivers within the neighborhood.
The speed display boards can be used in school zone for education purposes only.	The police are the only entity that can enforce speeding.
The speed display boards shall not conflict with any SGI or police education enforcement programs.	These programs will take priority over the community speed display program
The speed boards should be installed in locations with clear site visibility to the board. No vegetation should be blocking the view of the board.	Speed display boards are solar powered will not be effective if they do not have sufficient sunlight. Drivers need clear site visibility to see the board.

Only the following type of Speed Display Boards are to be used.

- Radar Message signs (signs that display speed only)



Radar Speed Sign

- The speed display board should be battery operated or solar powered.

4.4 Enforcement Measures

Many neighborhood traffic management issues cannot be dealt with signage or traffic calming devices and may simply require enforcement.

When requested by City staff, Saskatoon Police Service will perform targeted enforcement on residential streets. The intent of the enforcement is to reduce vehicle speeds by acting as a visible deterrent. City staff may also provide the Police with speed data to assist in identifying potential locations and peak times for enforcement.

In addition, any requests by City staff for parking violations will be sent to Parking Services for enforcement. Parking enforcement will target the residential area in which parking complaints are a major issue or safety concern.

4.5 Regulatory Measures

Stop and Yield Signs: Stop and yield signs must follow policy *C07-007-Traffic Control – Use of Stop and Yield Signs*

Maximum Speed Limit Signs: Speed limit signs will be placed according to the classification of the roadway and will follow Traffic Bylaw No. 7200.

Turn prohibitions, through movement prohibitions and one-way signage

- Used where it is not desirable to implement physical devices to restrict certain movements.
- Use of signage without accompanying physical devices to restrict the movements can create an enforcement problem and can be costly in terms of enforcement.

Parking Restrictions and Prohibitions: Parking restrictions (parking at certain times of the day) and parking prohibitions (no parking) must meet the criteria in *Policy C07-010, Parking Restrictions and Parking Prohibitions*.

4.6 Traffic Control Retrofit Program

The primary objective of the traffic control retrofit infill system is to reduce the frequency and severity of collisions caused by confusion regarding the assignment of right-of-way. Because of the low traffic volumes and speeds, and in the absence of excessive collisions, it is the Administration's opinion that yield signs are adequate for identifying rights-of-way at the majority of currently uncontrolled intersections in neighbourhoods. Stop signs will be used at local-collector street intersections where it is required to stop minor traffic over priority traffic. Where appropriate, the proposed yield signs will be deliberately orientated in such a way as to provide alternating right-of-way priority to east-west traffic and north-south traffic, making it more inconvenient for non-residential traffic to shortcut through the residential streets.

4.7 Pedestrian Crosswalks

Pedestrian crosswalk requests must adhere to the policy *C07-018 Traffic Control at Pedestrian Crossing*. This policy provides the following hierarchy of typical pedestrian crossing applications:

- Standard Crosswalk
- Zebra Crosswalk
- Pedestrian Corridor
- Active Pedestrian Corridor
- Pedestrian Actuated Signal

4.8 The Sidewalk Retrofit Program

The Sidewalk Retrofit Program is an inventory of all missing sidewalks in the City. The locations are prioritized based on the following criteria:

- **Priority 1:** Locations primarily include outstanding resident requests, recommendations from neighbourhood reviews, and locations where no sidewalk exists on either side of the roadway.
- **Priority 2:** Locations around high pedestrian areas such as parks, schools and public facilities.
- **Priority 3:** Locations were areas that have sidewalk along one side of the roadway and do not lead to a park, school, and senior's complex or public facility.

4.9 The Ramp Accessibly program

The Ramp Accessibly Program is an inventory of all missing ramps within the City. The locations are prioritized based on the following criteria:

- **Priority 1:** Resident requests including neighbourhood traffic reviews.
- **Priority 2:** Locations identified by criteria taken from the implementation of the Accessibility Action Plan, (known areas where there is high population of disabled users, e.g. senior complexes).
- **Priority 3:** Other

4.10 Traffic Calming

There is no perfect solution to traffic calming. Every situation is unique, and there is no single “best” solution to a problem. The *Canadian Guide to Neighbourhood Traffic Calming* provides guidelines regarding the applicability, location and design of specific traffic calming measures.

Traffic calming devices are intended to slow speeding vehicles down, reduce collision frequency, enhance the safety and perception of safety for pedestrians and reduce shortcutting through residential neighbourhoods. Traffic calming as defined by the *Institute of Transportation Engineers (ITE)* “the combination of mainly physical measures that reduce the negative effects of motor vehicles use, alter driver behavior and improve conditions for non-motorized street users”.

There are a number of traffic calming techniques that are used to improve concerns relating to excessive speed, excessive volume and traffic conflicts. These techniques include vertical deflections, horizontal deflections and obstructions. The different types of traffic calming devices are outlined in **Chapter 5**.

4.11 Other Programs

The intent of this section is provide information on other City programs that are not a neighbourhood traffic management measure.

- **Intersection Improvement Program:** Issues regarding arterial streets will be reviewed under the Intersection Improvement Program. This program will select and prioritize the intersections requiring reviews for improvements based on traffic safety and traffic operations.
- **Corridor Study Program:** Issues that accumulate along corridors will be reviewed under the Corridor Study Program. This program selects and prioritizes corridors requiring study based on traffic safety and traffic operations.

5 TRAFFIC CALMING MEASURES

This section describes the tools that will be used by the City of Saskatoon as potential traffic calming solutions within the neighbourhood. Not all tools used will be applicable to each traffic concern. For example, obstructions are often used to reduce traffic volume and should not be used to reduce speed. Each section will outline the difference between the tools and the advantages and disadvantages of each.

This section will also include tools the City of Saskatoon will not consider as traffic calming solutions. Reasons are provided for each.

When developing a Traffic Management Plan with the community, data and statistical analysis will still continue to be an important tool to evaluate issues. Traffic calming will be considered on streets where the following guidelines are met:

- **Neighbourhood streets** are classified as a local or collector street.
- **Traffic volumes** on streets should meet the City of Saskatoon guidelines for local and collector streets (see table below).

Table 5-1: Typical City of Saskatoon Roadway Classifications and Characteristics

Traffic Characteristics	Public Lanes		Locals		Collectors	
	Residential	Commercial	Residential	Commercial	Residential	Commercial
Traffic function	Access function only (traffic movement not a consideration)		Access primary function (traffic movement secondary consideration)		Traffic movement and land access of equal importance	
Traffic Volume	<500	<1000	<1000	<5000	<5000	8,000-10,000
Typical Speed Limits (km/h)	30		50		50	
Transit Service	Not permitted		Generally avoided		Permitted	
Cyclist	No restrictions or special facilities		No restrictions or special facilities		No restrictions or special facilities	
Pedestrians	Permitted, no special facilities		Sidewalks on one or both sides	Sidewalks provided where required	Typically, sidewalks provided both sides	Sidewalks provided where required
Parking	Some restrictions		No restrictions or restriction on one side only		Few restrictions other than peak hour	

- **Speed** on streets will be measured. If the 85th percentile speed is 5 kph above the posted speed limit, traffic calming will be considered if supported by the community.
- Neighbourhood traffic calming plans and studies will be developed for areas of concern where neighbourhood areas, or residents experience unnecessary traffic.

Unnecessary traffic is defined as:

- Traffic using a neighbourhood street as a shortcut;
- An excessive volume of traffic on a neighbourhood street that should normally be served by an arterial roadway;
- Traffic operating at excessive speed; and
- Vehicles with destinations outside of the neighborhood.

5.1.1 Horizontal Deflections

Horizontal deflection measures are those which require a motorist to steer around them. Examples include curb extensions and raised median islands.

Horizontal Deflections have the following benefits:

- Discourage short-cutting traffic or through traffic to a varying extent.
- Can achieve greater reductions in traffic volumes.
- May reduce vehicle speeds.
- Enhance pedestrian crossings and all-way stop signs locations.
- Relatively inexpensive.

Horizontal Deflections devices used by the City of Saskatoon include:

- Curb Extensions
- Raised Median Islands
- Roundabouts
- Chokers (Pinch Point)
- On-Street Parking

5.1.2 Curb Extension (aka Bulb-out or bulbing)

A curb extension is a horizontal intrusion of the curb into the roadway resulting in a narrower section of roadway. The curb is extended on one or both sides of the roadway to reduce the width to as little as 6 metres for two-way traffic and thereby have the potential to moderately reduce driver speed. They also allow a pedestrian to stand further out into the driver's line of sight so they are more visible at crossing locations.



Exhibit 5-1: 7th Avenue and Princess Street Curb Extension (City Park)

Curb extensions are often designed using concrete, paving stones or grass.

Curb extensions can be used on all roadways which have on-street parking. They are often used at midblock crossing locations, in front of schools and at major crosswalk locations.



Exhibit 5-2: Saskatchewan Crescent Curb Extension (Nutana)

5.1.3 Raised Median Island

A raised median island is a small-elevated median constructed on the centerline of the street, placed directly behind the crosswalk area. For example, in a marked crosswalk, it will be placed behind the standard painted markings. The purpose of the raised median island is to offer a place of refuge for pedestrian while crossing the street. It increases pedestrian visibility and may help to reduce speeds. Raised median islands are also placed to improve the visibility of four-way stop signs as well as pedestrian crosswalk signs.

Typical, raised median islands are designed using concrete and often have mountable median tip. They often are 1.5 metre in width.



Exhibit 5-3: Avenue P and 21st Street Median Island (Pleasant Hill)

5.1.4 Roundabout

A roundabout 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. The purpose of a roundabout is to help reduce vehicle speeds and vehicle-vehicle conflicts at intersections.

The City of Saskatoon has standard drawings as listed in **Table 5-2**.

Table 5-2: Standard Drawing for Roundabout used by the City of Saskatoon

Standard Drawing	Plan No.
Roundabout Functional Design Local Class 'A'	102-0029-017r001
Roundabout Detailed Design Local Class 'A'	102-0029-018r001
Roundabout Sight Lines Design Local Class 'A'	102-0029-019r001
Roundabout Operating Speed Design Local Class 'A'	102-0029-020r001
Roundabout Functional Collector Class 'A'/Local Class 'A'	102-0029-021r001
Roundabout Detailed Designs Collector Class 'A' and Local Class 'A'	102-0029-022r001
Roundabout Sight Lines Design Collector Class 'A' and Local Class 'A'	102-0029-023r001
Roundabout Operating Speed Design Collector Class 'A' and Local Class 'A'	102-0029-024r001

These drawings are found on the City of Saskatoon Web site; <http://www.saskatoon.ca> under Business and Development – Specifications.

Roundabouts reduce points of conflict between pedestrians and motor vehicles and are therefore considered to be safer. Additionally, most feature a safety island refuge where pedestrians may pause mid-crossing.

Roundabouts can reduce collisions. Studies have shown that roundabouts are safer than traditional stop sign or signal-controlled intersections. There are several reasons why roundabouts help reduce the likelihood and severity of collisions:

- **Low travel speeds:** Drivers must slow down and yield to traffic before entering a roundabout. Collisions that occur in roundabouts are typically minor and cause few injuries since they occur at such low speeds.
- **Continuous Traffic Flow:** Roundabouts are designed to promote a continuous, circular flow of traffic. Drivers need only yield to traffic before entering a roundabout; if there is no traffic in the roundabout; drivers are not required to stop. Because traffic is constantly flowing through the intersection, drivers don't have the incentive to speed up to try and "beat the light," like they might at a traditional intersection.
- **One-way travel** – Roads entering a roundabout are gently curved to direct drivers into the intersection and help them travel counterclockwise around the roundabout. The curved roads and one-way travel around the roundabout eliminate the possibility for T-bone and head-on collisions.

In addition to the safety benefits, roundabouts can reduce overall delay and improve traffic flow. Contrary to many peoples' perceptions, roundabouts actually move traffic through an intersection more quickly, and with less congestion on approaching roads. Roundabouts promote a continuous flow of traffic. Unlike intersections with traffic signals, drivers don't have to wait for a green light at a roundabout to get through the intersection.

Traffic is not required to stop, only yield, so the intersection can handle more traffic in the same amount of time.

Good locations for roundabouts

Roundabouts are safe and efficient, but they are not the ideal solution for every intersection. There are several factors when deciding to consider a roundabout for traffic control.

- **Collision history:** Data about the number of collisions, type of crash, speeds, and other contributing factors are analyzed.
- **Intersection operation:** The level of current and projected travel delay being experienced, and backups on each leg of the intersection.
- **Types of vehicles using the intersection:** Different kinds of vehicles that may use the intersection. This is especially important for intersections frequently used by large trucks
- **Cost:** This includes the societal cost of accidents, right-of-way (land purchase) requirements, and long-term maintenance needs.



Exhibit 5-4: 3rd Avenue and Spadina Crescent Roundabout (River Landing)

For assessing the appropriateness of roundabouts; for existing or forecast traffic volumes, the HCM (Highway Capacity Manual) 2010 Roundabout methodology is used. HCM Level of Service comparisons with stop-controlled and signalized intersections demonstrating superior performance over the alternatives is required for selecting a roundabout.



Exhibit 5-5: Stonebridge Boulevard and Cornish Road Roundabout (Stonebridge)

Improved pedestrian crossing and cycling safety must be demonstrated, compared to the alternatives.

5.1.5 Mini-Roundabout

A mini-roundabout 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. It is similar to large roundabout except it does not require pedestrian islands.

A mini roundabout eliminates speeding and the potential for the route to become a thoroughfare for motorists.

A mini roundabout would be recommended for local streets only.

It will not require the same amount of detail analysis as the roundabout indicated above.



Exhibit 5-6: 23rd Street Temporary Mini-Roundabout (Westmount)

5.1.6 Chokers (Pinch point)

A choker is a curb extension at midblock or intersection corners that narrow a street by extending the sidewalk or widening the planting strip. It can leave the cross section with two narrow lanes or with a single lane. Chokers are often referred to as parallel chokers, angled chokers, twisted chokers, angle points, pinch points, or midblock narrowing. When at intersections they are often referred to as neckdowns, bulbouts, knuckles, or corner bulges. If marked as a crosswalk, they are also called safe crossings.



Exhibit 5-7: Saskatchewan Crescent Pinch-Point (Nutana)

The exhibit above illustrates a pinch point on Saskatchewan Crescent indicating that traffic must yield to oncoming traffic.

5.1.7 On-street Parking

On-Street parking is often allowed on both sides of the roadway, or parking zones can be strategically being located on alternating sides. The presence of parked vehicles may contribute to a reduction in travel speed, and potentially volume. The City of Saskatoon allows on-street parking on all local and collector streets, unless otherwise signed.

5.1.8 Curb Radius Reduction

A curb radius reduction is the reconstruction of an intersection corner with a smaller radius usually in the 3.0 to 5.0 metre range.

The purpose of a reduced curb radius is to:

- Slow right-turning vehicles;
- Reduce crossing distance for pedestrians; and
- Improve pedestrian visibility.

A sample schematic drawing of curb radius reduction is included in **Appendix A**.

Applications, advantages and disadvantages for each horizontal device is provided in **Table 5-3**.

Table 5-3: Horizontal Devices

Device	Applications	Advantages	Disadvantages
Curb Extension	<ul style="list-style-type: none"> Local/collector streets. All traffic volumes. Use on roadways, which have on-street parking or other obstacles that cause visibility issues. Used in front of schools with school safety patrols officers. 	<ul style="list-style-type: none"> Narrows the street for pedestrians. Enhances the crosswalks. Moderately reduce speeds. No effect on snow plowing or street sweeping only if minimum width is maintained. 	<ul style="list-style-type: none"> Can affect turning radius for large vehicles such as buses or trucks. Not compatible with bicycle lanes. May require some removal of on-street parking.
Raised median island	<ul style="list-style-type: none"> Local/collector streets. All traffic volumes. 	<ul style="list-style-type: none"> Moderately slows down vehicles. Allows a place of refuge for pedestrians. Allows a place for additional signage to be placed. 	<ul style="list-style-type: none"> Can impact driveways access. May require removal of on-street parking. May effect maintenance such as snow removal. May effect transit route (narrowing turning radius narrow passing lane near bus stops).
Roundabout or Mini Roundabout	<ul style="list-style-type: none"> Used at intersections of two locals and local/collector streets with three or more approaches. 	<ul style="list-style-type: none"> Reduces severity of collisions. Slows down vehicles. Reduce conflict between pedestrians and motor vehicles. Reduce delay and improve traffic flow. 	<ul style="list-style-type: none"> Do not use on transit routes or primary emergency routes with high collision history. Do not use on intersections with high pedestrian volumes and high volume of left turns (particularly buses and trucks). Do not use on collector streets with significantly higher traffic volumes on the collector street than on the intersecting street.
Choker (pinch point)	<ul style="list-style-type: none"> Used on local and collector streets, pedestrian crossings. All traffic volumes. 	<ul style="list-style-type: none"> Can reduce speed and traffic volume. 	<ul style="list-style-type: none"> Can impact parking and driveway access. Can impact cycling abilities.

Table 5-3 Continued

Device	Applications	Advantages	Disadvantages
On-Street Parking	<ul style="list-style-type: none"> • Use on local and collector streets. • All traffic volumes. 	<ul style="list-style-type: none"> • Can reduce speed. • Provide a buffer between traffic and pedestrians. 	<ul style="list-style-type: none"> • Can reduce visibility of pedestrians crossing the roadway. • Obstruct street sweeping and snow clearing operations unless parking restrictions are implemented. • Can obstruct driveways and reduce visibility for motorist entering the roadway from driveways. • Suddenly-opened car doors may hit or create an obstacle for cyclists.
Curb Radius Reduction	<ul style="list-style-type: none"> • Used on local and collector streets • All traffic volumes. • Not suitable at intersections with significant volumes of turning trucks. • Avoid designated truck routes, right turn locations on bus routes with frequent service and primary emergency vehicle routes. 	<ul style="list-style-type: none"> • Can reduce speed for right-turning vehicles. • Reduce pedestrian crossing distance and improve visibility. 	<ul style="list-style-type: none"> • Long trucks, buses and other large vehicles may need to cross into adjacent (oncoming) travel lanes in order to negotiate turns at intersections with small curb radii.

5.2 Vertical Deflections

Vertical deflections measures are those which create vertical motion in a motor vehicle when it is driven over the device. Vertical deflections are not recommended on a street where there is a transit route or emergency access.

Vertical deflections have the following benefits:

- Reduce vehicle speeds which can reduce traffic volumes.
- Relatively inexpensive.

Vertical deflections devices used by the City of Saskatoon include:

- Raised crosswalk
- Textured Crosswalk
- Raised Intersection
- Speed Hump
- Speed Table
- Speed Kidney
- Speed Cushion

5.2.1 Raised Crosswalks

A raised crosswalk is a marked pedestrian crosswalk at an intersection or mid-block location constructed at a higher elevation than the adjacent roadway. Raised crosswalks may help reduce vehicle speeds and improve pedestrian visibility, thereby reducing pedestrian-vehicle conflicts.



Exhibit 5-8: Mellicke Road between David Knight Crescent and Stechishin Crescent (Silverwood Heights)

5.2.2 Textured Crosswalk

A crosswalk enhanced with patterned brick or stone pavers instead of traditional paint road markings.



Exhibit 5-9: Textured Crosswalk using concrete in River Landing



Exhibit 5-10: Textured Crosswalk using pavers at Stonebridge Boulevard and Wellman Crescent (Stonebridge)

5.2.3 Raised Intersection

A raised intersection includes crosswalks which are constructed at a higher elevation than the adjacent roadways. It consists of a flat raised area covering the entire intersection, with ramps on all approaches and often brick or other textured materials on the flat section.

A raised intersection is not readily noticeable to motorists and other roadway users. The effect of a raised intersection on vehicle speed and volume is minor.

The purpose of a raised intersection is to better define crosswalk areas; and the potential for reduce pedestrian-vehicle conflicts.

A schematic drawing of a raised intersection is included in **Appendix A**.

5.2.4 Speed Hump

A speed hump is a raised area of roadway that deflects both the wheels and frame of a traversing vehicle. Speed humps should only be considered if other traffic calming measures are not applicable or if there is excessive speed on a street.



Exhibit 5-11: Speed Hump on Hughes Avenue (Dundonald)

Speed humps are designed in series and may reduce the volume of traffic on a street by diverting traffic to other streets.

Speed humps can increase safety as slower drivers and less traffic can reduce collision rates.

Speed humps should be avoided on roadways that are considered an emergency route or transit route.

Speed humps will only be considered if the speeds are 30% higher than the posted speed limit (e.g. on a roadway with a posted speed limit of 50 kph the 85th percentile speed must be 66.5 kph or higher) and supported by community, City Council, Transit, emergency services (Fire, Police, and Ambulance) and Public Works.

The standard drawing for speed hump – Plan 102-008-002r001 is found on the City of Saskatoon Web site; www.saskatoon.ca under Business and Development – Specifications.

Speed humps are different than a speed bump. Speed humps are less aggressive than speed bumps at low speeds and are used on actual streets, as opposed to speed bumps which are narrow devices primarily placed in parking lots.

While speed bumps generally slow cars to 15 kph, speed humps slow cars to (15 – 30 kph). The narrow nature of speed bumps often allows vehicles to pass over them at high speed while only perturbing the wheels and suspension, hardly affecting the vehicle cab and its occupants. The relatively long slopes of speed humps gradually accelerate the entire vehicle in the vertical direction, causing the perturbation of the cab to become progressively more severe at higher speeds.

5.2.5 Speed Table

A speed table (or flat top hump) is a traffic calming device designed as a long speed hump with a flat section in the middle.

Speed tables are generally long enough for the entire wheelbase of a passenger car to rest on top. The long, flat design allows cars to pass without slowing as significantly as with speed humps or cushions.

Speed tables are good for locations where low speeds are desired but a somewhat smooth ride is needed for larger vehicles.

Speed tables are smoother on large vehicles (such as fire trucks) than speed humps.

Speed tables are effective in reducing speeds, though not to the extent of speed humps

Speed tables are typically preferred by fire departments over speed humps as they are smoother to travel over.

Speed tables can be designed using asphalt, paver stones or can be temporary.

Speed tables will only be considered if the speeds are 30% higher than the posted speed limit and supported by community, City Council and transit, emergency services (Fire, Police, and Ambulance) and public works.

A sample schematic drawing of a speed tables is included in **Appendix A**.

5.2.6 Speed Kidney

A speed kidney is a traffic calming device composed of a main speed hump and a complementary speed hump disposed on the same cross-section. If passenger car drivers adopt a straight path they would ride the speed kidney with one or two wheels over the main speed hump, the same as a usual speed cushion or speed table. A speed kidney can reduce speed because of vertical discomfort.

The shape of the main speed hump is different, it is curved. Moreover, it does not occupy the entire street cross-section because it is located on the center of the lane. Drivers could modify their path, adapting it to the curvature of the main speed hump to avoid both vertical discomfort and mechanical damage. The main speed humps effective width is narrow enough so wider vehicles, such as emergency vehicles, trucks, or buses, could follow a straight path straddling the main speed hump, as with speed cushions, but passenger cars will pass over with at least one of their wheels. Cyclists can traverse the device without deflection by driving through the gaps between either the main speed hump or the complementary speed hump.

Speed kidney will only be considered if the speeds are 30% higher than the posted speed limit and supported by community, City Council, Transit, emergency services (Fire, Police, and Ambulance) and Public Works.

A sample schematic drawing of a speed kidney is included in **Appendix A**.

5.2.7 Speed Cushion

Speed cushions are traffic calming devices designed as several small speed humps installed across the width of the road with spaces between them. They are generally installed in a series across a roadway resembling a split speed hump.

The design of a speed cushion forces cars to slow down as they ride with one or both wheels on the humps. However, the wider axle of emergency vehicles such as fire trucks and ambulances allows them to straddle the cushions without slowing down or increasing response times.

Speed cushions will only be considered if the speeds are 30% higher than the posted speed limit and supported by community, City Council, Transit, emergency services (Fire, Police, and Ambulance) and Public Works.

A sample schematic drawing of a speed cushion is included in **Appendix A**.

Applications, advantages and disadvantages for each vertical device is provided in **Table 5-4**.

Table 5-4: Vertical Devices

Device	Applications	Advantages	Disadvantages
<p>Raised Crosswalk</p>	<ul style="list-style-type: none"> • Used on local and collector streets. • Used at marked and unsignalized crosswalks. • Used at intersections and mid-block. • Avoid- designated emergency access routes, unless acceptable to emergency services. • All traffic volumes. 	<ul style="list-style-type: none"> • Reduce vehicle speeds and volumes. • Enhance pedestrian crossing. 	<ul style="list-style-type: none"> • Traffic may be diverted to parallel streets. • Unless vehicular traffic is stopped, the measure may result in a false sense of pedestrian security. • Impacts and delays on emergency services. • Some cyclists may experience loss of control at speeds over 40 kph. • Visually-impaired pedestrians may have difficulty differentiating between the curb and travelled portion of the street. • Maintenance, as catch basins will be required to provide drainage on uphill side of raised crosswalk. • Snow clearing time may be increased.
<p>Textured Crosswalk</p>		<ul style="list-style-type: none"> • Enhance pedestrian crossing. 	<ul style="list-style-type: none"> • Maintenance issues such as repair and increase street sweeping time if texturing incorporates deep grooves. • Texturing can cause traction or stability problems for seniors, disabled, wheelchairs if rough or pronounced grooves parallel to the direction of travel.
<p>Raised Intersection</p>		<ul style="list-style-type: none"> • Reduce speed. • Enhance pedestrian crossing. 	<ul style="list-style-type: none"> • Impacts and delays on emergency services. • Snow clearing time may be increased. • Some cyclists may experience loss of control at speeds over 40 kph.

Table 5-4 Vertical Devices Continued

Device	Applications	Advantages	Disadvantages
Speed Hump	<ul style="list-style-type: none"> Local/collector streets. Avoid emergency routes, unless acceptable to emergency services. Significant volume of speeds at least 30% greater than the posted speed limit. Not to be used on truck or transit routes. Need to be at least 25 metres from intersecting street or alley. Maximum 5 percent grade. Street must have appropriate sight distance. 	<ul style="list-style-type: none"> Reduce speed and may reduce traffic volume. 	<ul style="list-style-type: none"> Traffic may be diverted to parallel streets that do not have traffic calming measures. Some cyclists may experience loss of control at speeds over 40 kph. Maintenance snow clearing. Road repairs – interfere with pavement overlays.
Speed Table		<ul style="list-style-type: none"> Reduce speed and may reduce traffic volume. Less delay to emergency services. 	
Speed Cushion		<ul style="list-style-type: none"> Reduce speed and volume. Allow larger vehicles to straddle the cushion without slowing down. Less delay to emergency services. 	
Speed Kidney	<ul style="list-style-type: none"> Can be installed in local or collector streets. Can be used on bus routes and emergency response routes. Maximum 5 percent grade. Should not be installed at intersections or horizontal or vertical curves. Require sufficient stopping sight distance and should be located at a minimum distance to decision points of 20 metres. Not be used as pedestrian crossing. Spacing should be 90 to 110 metres apart. 	<ul style="list-style-type: none"> Reduce speed and may reduce volume. Allow larger vehicles to straddle the cushion without slowing down. Less delay to emergency services. 	<ul style="list-style-type: none"> Loss of parking spaces on outer sides of the road. Maintenance snow clearing. Road repairs – interfere with pavement overlays.

5.3 Obstructions

Obstruction measures physically restrict certain vehicle movements and should only be used on local streets and on low-volume collectors where there is not a likelihood that traffic would be diverted to nearby local streets.

Obstruction measures are typically deployed at intersections, but may also be applied in mid-block positions. The nature and number of movements obstructed, as well as the presence of other traffic calming measures in the neighbourhoods, combines to discourage shortcutting and through traffic to varying extents.

Obstructions should be avoided and should only be used where horizontal or vertical deflection measures will not adequately address a traffic problem.

Obstructions devices used by the City of Saskatoon include:

- Diverter
- Right in/Right out
- Directional Closure or Full Closure
- Intersection Channelization
- Raised Median Through Intersection

5.3.1 Diverter

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.

Diverter can incorporate gaps for pedestrians, wheelchairs and bicycles and may allow passage of emergency vehicles in some cases. The purpose of a diverter is to obstruct shortcutting or through traffic.



Exhibit 5-12: Avenue C and 38th Street Temporary Device (Mayfair)

5.3.2 Right in/Right out

A right-in/right-out island is a raised triangular island at an intersection approach.

A right in/right-out island restricts left turns, and through movements to and from the intersecting street or driveway.

The purpose of right-in/right-out island is to restrict shortcutting or through traffic.



Exhibit 5-13: 51st Street and Millar Avenue (Hudson Bay Industrial)

5.3.3 Directional Closure

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.

The purpose of a directional closure is to restrict shortcutting or through traffic.

A sample schematic drawing of a directional closure for entrance and exits from a neighbourhood street is included in **Appendix A**.

5.3.4 Full Closure

Full closure is a barrier extending across the entire width of a roadway that restricts all motor vehicle traffic movement from continuing along the roadway.

The purpose of a full closure is to eliminate shortcutting or through traffic. It can be designed to allow pedestrian and cyclist access.



Exhibit 5-14: Coppermine Crescent and Churchill Drive (River Heights)

5.3.5 Intersection Channelization

Intersection channelization is a treatment that is intended to discourage specific movements.

The purpose of intersection channelization is to reduce short-cutting.

A sample schematic drawing of intersection channelization is include in **Appendix A**.

5.3.6 Raised Median through Intersection

A raised median through an intersection is an island that eliminates left turns to and from a local street and obstructs straight through movements. The median must extend a sufficient distance beyond the intersection to discourage drivers from attempting to get around it and continue through the intersection.

A raised median through an intersection should be sufficiently wide to offer a pedestrian refuge area. The sidewalk crossing should include a depressed section in the median. This depressed section should be narrow enough to discourage general usage but not preclude emergency access. Separate openings may also be required for cyclists.

This measure should not be used across primary emergency access routes.

A sample schematic drawing of a raised median through an intersection is included in **Appendix A**.

Applications, advantages and disadvantages for each vertical device is provided in **Table 5-5**.

Table 5-5: Obstruction Devices

Device	Applications	Advantages	Disadvantages
Diverter	<ul style="list-style-type: none"> Local/collector street. All traffic volumes. Not recommended on designated emergency access routes. Aid in traffic volume reduction as a result of shortcutting. 	<ul style="list-style-type: none"> Reduce volumes. Reduce pedestrian crossing distances and may reduce vehicle and pedestrian conflicts. No effect on bicycle or pedestrian access nor on-street parking. No effect on police enforcement. 	<ul style="list-style-type: none"> Restricts resident access. May divert significant volume of traffic to parallel streets without traffic calming measures. Maintenance such as sweeping, snow removal and garbage collection route. Some motorists may deliberately circumvent devices, by driving over it.
Directional Closure			
Full Closure			
Right in /Right out	<ul style="list-style-type: none"> Local/collector streets. All traffic volumes. 	<ul style="list-style-type: none"> Reduce volumes. No effect on bicycle or pedestrian access. No effect on on-street parking. 	<ul style="list-style-type: none"> Restricts resident access. May divert significant volume of traffic to parallel streets without traffic calming measures. Maintenance such as sweeping, snow removal and garbage collection route. Some motorist's may deliberately circumvent device by driving over it.

Table 5-5 Continued

Device	Applications	Advantages	Disadvantages
<p>Raised Median Through Intersection</p>	<ul style="list-style-type: none"> • Collector or arterial streets at intersections with local streets or residential collector streets. • Avoid local street intersections with other local streets, as motorists are likely to deliberately circumvent raised median in low-volume locations. • All traffic volumes. 	<ul style="list-style-type: none"> • Reduce volume. • No effect on bicycle or pedestrian access. 	<ul style="list-style-type: none"> • Restricts resident access. • May divert significant volume of traffic to parallel streets without traffic calming measures. • Maintenance such as sweeping, snow removal and garbage collection route. • Some motorist's may deliberately circumvent device by driving over it. • May require removal of on-street parking in order to provide sufficient lane width. • May obstruct emergency vehicle in locations where median cannot be easily circumvented.

5.4 Traffic Calmed Neighbourhood Signage

The purpose of the Traffic-Calmed Neighbourhood sign may be used to advise drivers that traffic calming measure are in place within a neighbourhood.

This sign may be installed at entrances to the neighbourhood.



5.5 Other Issues

Traffic calming measures will be implemented on local and collector streets only. There may be a desire to implement traffic calming measures in other areas. This section describes other approaches to implementing traffic calming measures in the City.

Lanes: It is the standard policy of the Transportation division that traffic calming measures are not appropriate in lanes. Lanes are meant for backyard access for the residents living in that area or for garbage pickup, access to utilities and should not be used as a short-cut. If short-cutting is deemed an issue in lanes, other measures will be considered.

Major Roads (arterials and expressways): A different approach should be used in implementing measures on major roads. It is recommended major roads encompasses a corridor study which would consider other transportation options, such as changes to traffic signals and roadway lanes, improved pedestrian facilities and crossings, space for bicycles and parking, and streetscape enhancement.

Road Construction Projects: Where traffic is diverted or delayed as a result of a construction project on a major road, there is the potential for traffic to divert to adjacent neighbourhood streets. As part of construction plans, temporary traffic calming measures may be identified on adjacent local and collector roads as needed to mitigate any effects of diverted traffic. The intent would be to remove the temporary measures when the road construction project is completed.

Special Events - As with road construction projects, delays and diversions to traffic as a result of special events can divert traffic to nearby neighbourhood streets and create traffic concerns on these streets. Transportation plans for special events should include temporary traffic calming measures on adjacent local/collector roads as needed to mitigate any effects of the diverted traffic. Where possible, preparation of a temporary traffic calming plan should be required as part of the planning process for a special event. In all cases, the costs of temporary traffic calming measures associated with a special event should be paid entirely by the organization hosting the event, or the Provision of Civic Services project where applicable.

New Development - Traffic calming measures are now often incorporated in the design of new residential neighborhoods and are included in the initial construction. Any devices should conform to the design standards as identified in **Chapter 6**.

5.6 Traffic Calming not used by the City of Saskatoon

The City of Saskatoon currently does not use the following measures as they are not effective for traffic calming purposes.

5.6.1 Rumble Strips

Rumble strips are a series of indented or raised short strips that are perpendicular to the roadway on the paved surface adjacent to the travel lane or at an important intersection. A driver, whose vehicle comes into contact with the rumble strips, generates vibration and sound cues to alert the driver. Rumble strips are more common for highway use as a shoulder lane rumble strip or centre line rumble strips.

5.6.2 Speed Bumps

Speed bumps are raised area of roadway used in areas where speed is reduced sufficiently. The City of Saskatoon will not consider using speed bumps for the following reasons:

- The vibrations of the vehicle when driving over the speed bump causes noise that may affect the peacefulness of the surrounding neighbourhood. Also, vehicles can be damaged if they drive too fast over the speed bumps.
- Speed bumps reduce speeds to 15 kph, which is too slow for collector and local streets.
- Difficulty in maintaining them during the winter months.
- Speed bumps are different than speed humps. See **Section 5.2.4** for an explanation.

6 TRAFFIC CALMING IN NEW NEIGHBOURHOODS

It should be noted that traffic calming measures are now often incorporated in the design of new residential neighbourhoods and included in the initial construction.

Standards drawings are available to developers to incorporate into the new design. These drawings are found on the City of Saskatoon Web site; www.saskatoon.ca under Business and Development – Specifications.

The typical standard drawings are included in **Table 6-1**.

Table 6-1: Standard Drawings for New Neighbourhood Streets

Standard Drawing	Plan No	Intersection
Highly used intersection by Pedestrians	102-0002-065r001	Collector/local
Neighbourhood Entrances – Centre Median Island	102-0002-066r001	Collector/local
T-Intersection- School/Commercial Crossing	102-0002-062r001	Collector local
Midblock crossing- Walkway to walkway	102-0002-064r001	Collector
Calming on a curve- center median island	102-0002-063r001	Collector/local

7 EFFECTS OF TRAFFIC CALMING MEASURES

Information on effectiveness of the traffic calming measures in addressing problems involving volume, speed, traffic conflicts, and emergency services is included in **Table 7-1**. The purpose of this table is to assist with screening and selecting appropriate traffic calming measures to address specific problems and conditions.

Table 7-1: Effectiveness of Typical Traffic Calming Measures

Traffic Calming Measures		Volume Reductions	Speed Reductions	Conflict Reduction	Emergency Response
Horizontal Deflections	Curb Extension	N	M	M	N
	Raised Median Island	N	M	M	N
	Roundabout	M	M	S	S
	Chokers (pinch point)	N	M	M	M
	On-street Parking	N	M	M	M
Vertical Deflection	Raised Crosswalk	M	S	M	S
	Textured Crosswalk	N	N	M	N
	Raised Intersection	N	M	M	M
	Speed Hump	M	S	M	S
	Speed Table	N	M	N	M
	Speed Cushion	N	M	N	M
	Speed Kidney	N	M	N	M
Obstructions	Diverter	S	M	M	M
	Right in/Right Out Island	M	N	M	M
	Full Closure	S	M	S	S
	Directional Closure	S	N	M	S
	Intersection Channelization	M	N	M	M
	Raised median through island	N	M	M	M

N= Minimal or no effect, M= Moderate effect, S= Significant effect

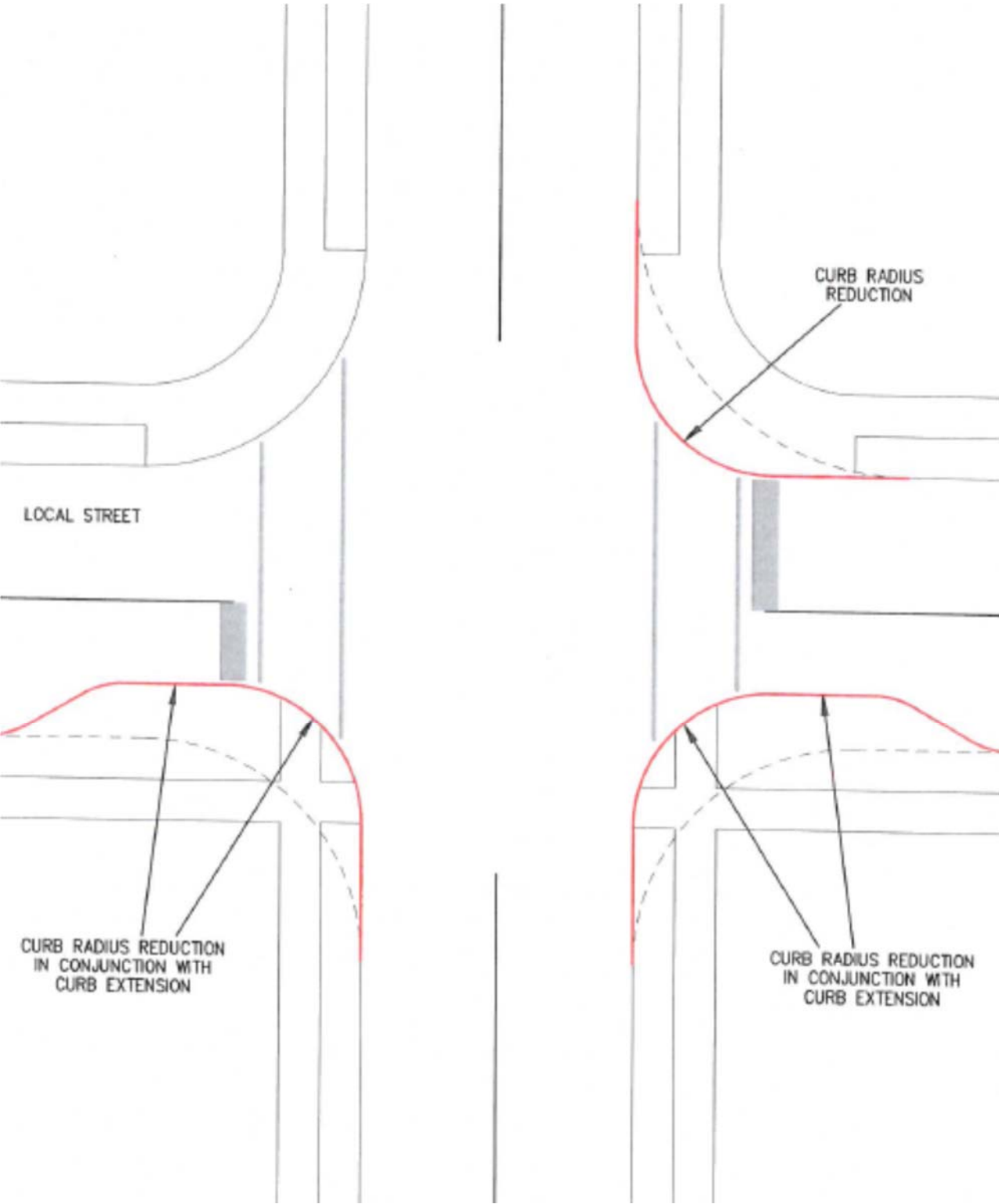
The effectiveness of some of the measures that are not used as traffic calming methods is summarized in **Table 7-2**.

Table 7-2 Effectiveness of Measures not used as Traffic Calming Methods

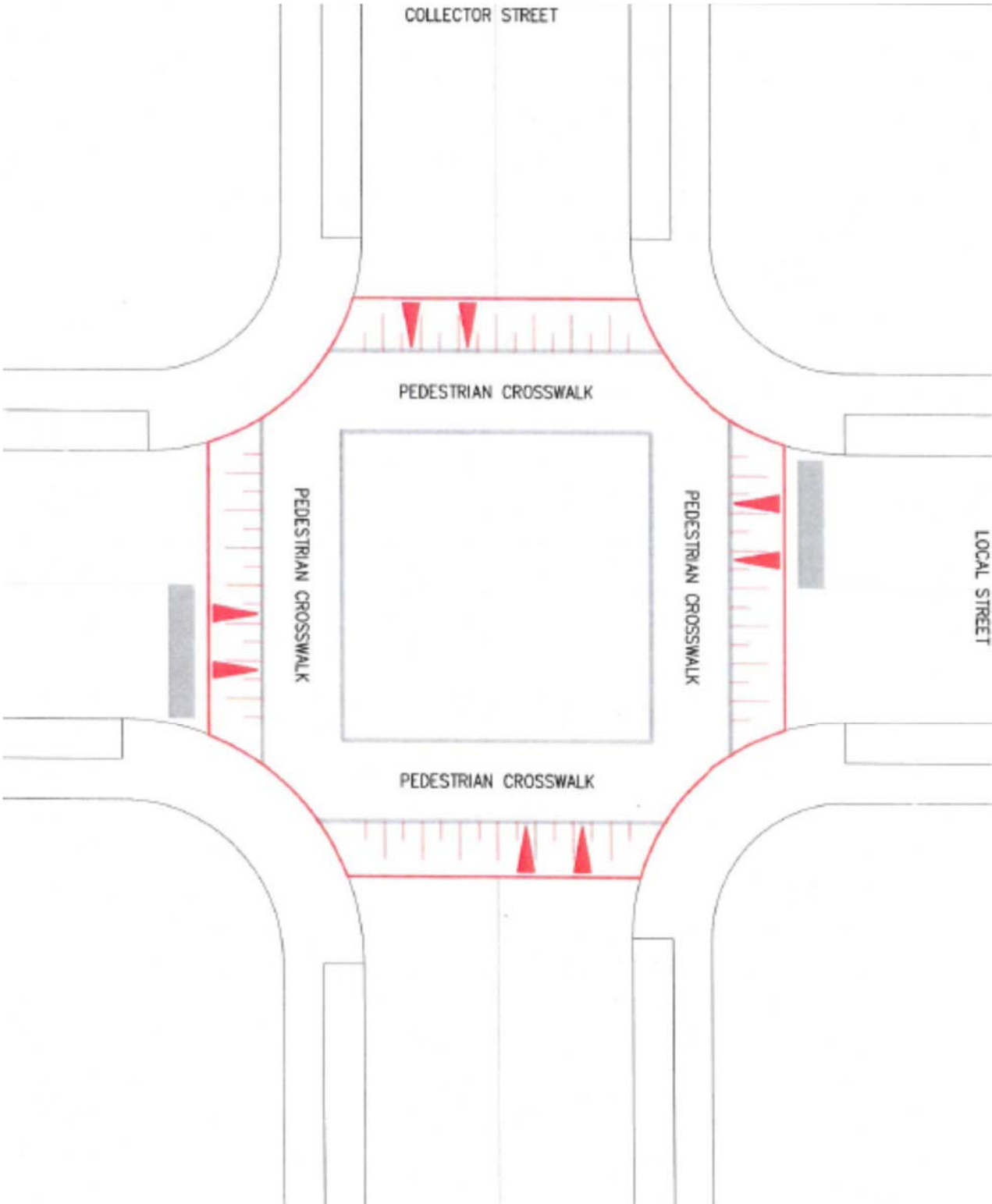
Traffic Calming Measures	Volume Reductions	Speed Reductions	Conflict Reduction	Emergency Response
Rumble Strip	N	M	N	M
Speed Bump	M	S	M	S

N= Minimal or no effect, M= Moderate effect, S= Significant effect

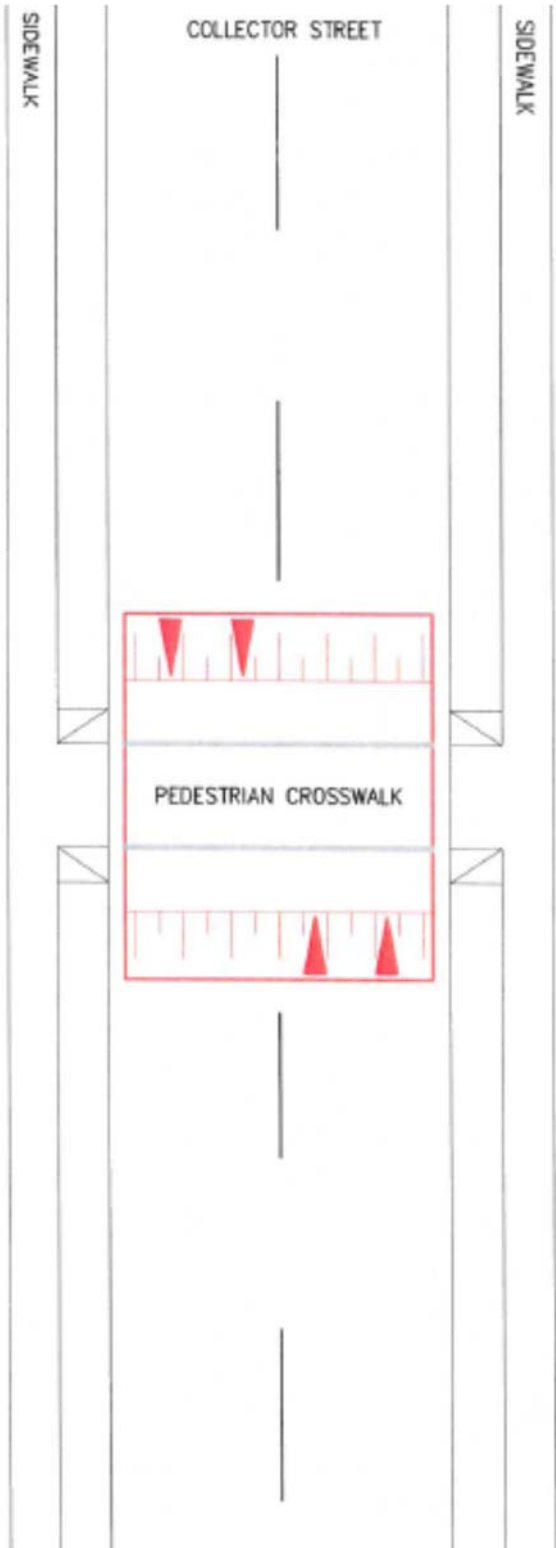
Appendix A
Sample Schematic Drawings



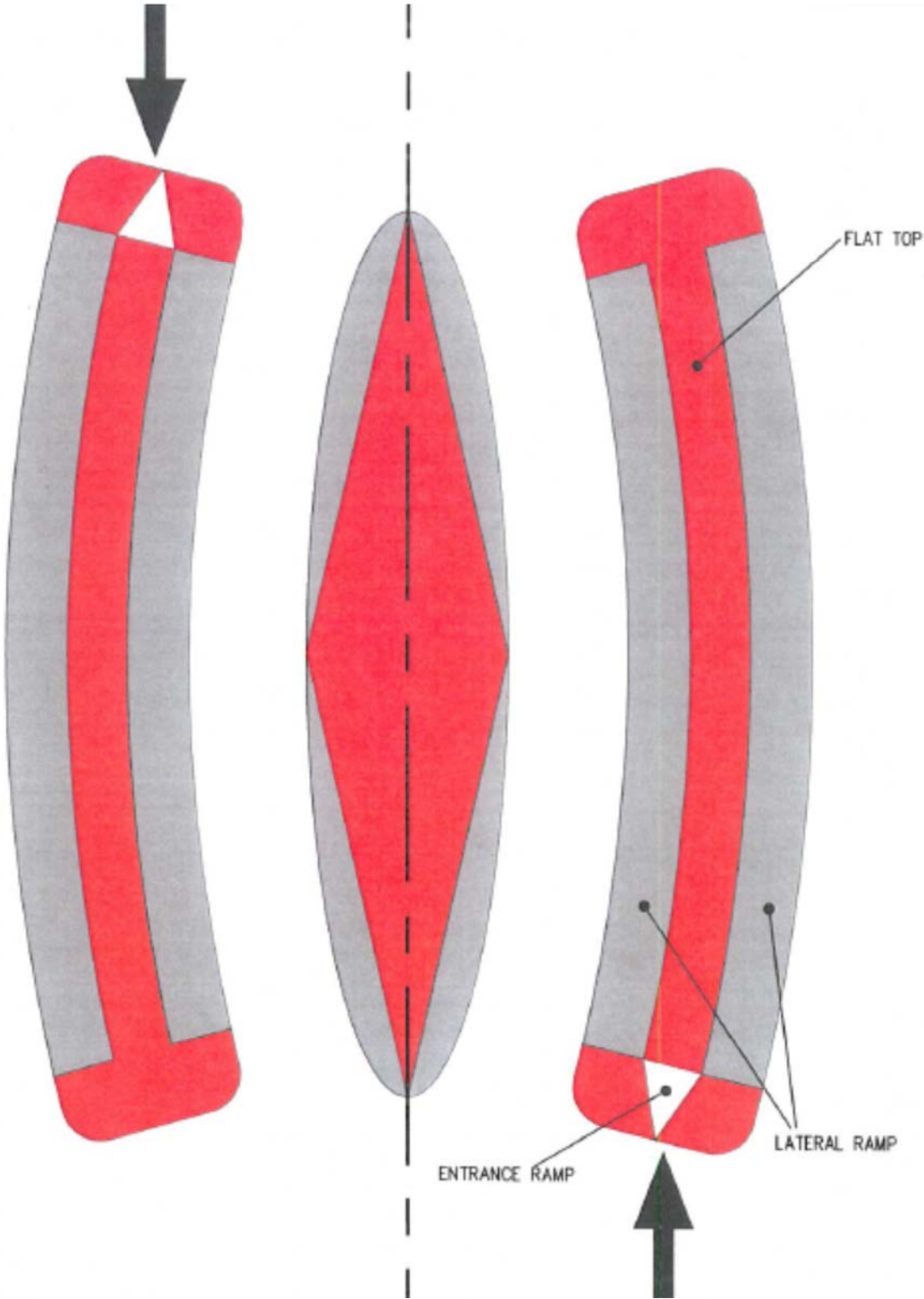
Curb radius extension



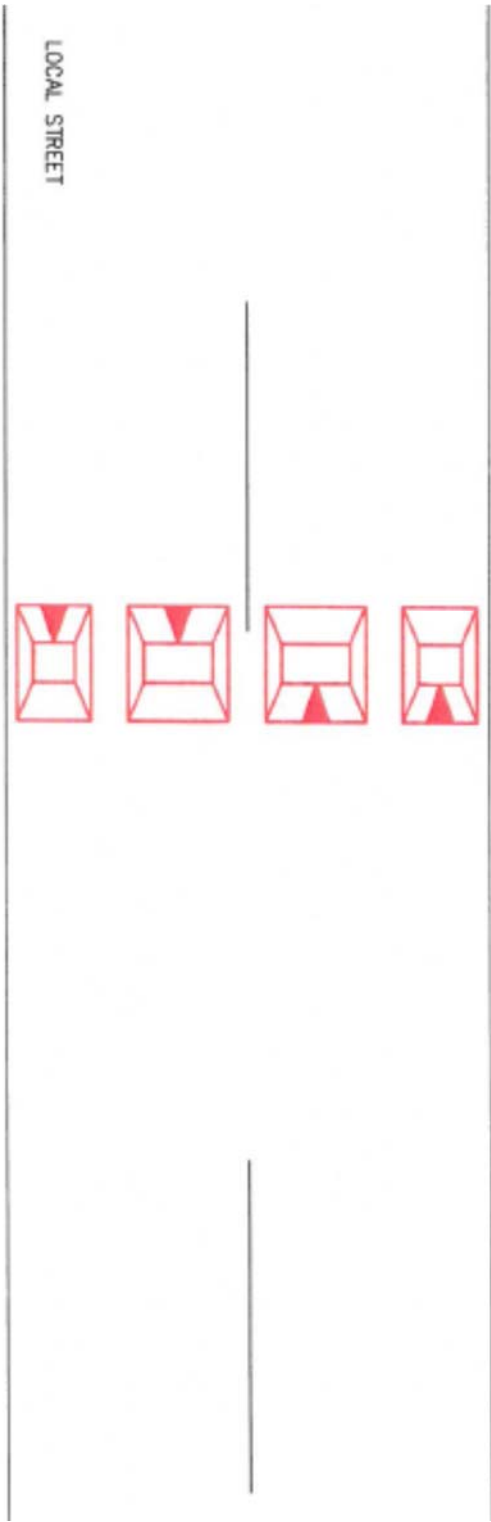
Raised Intersection



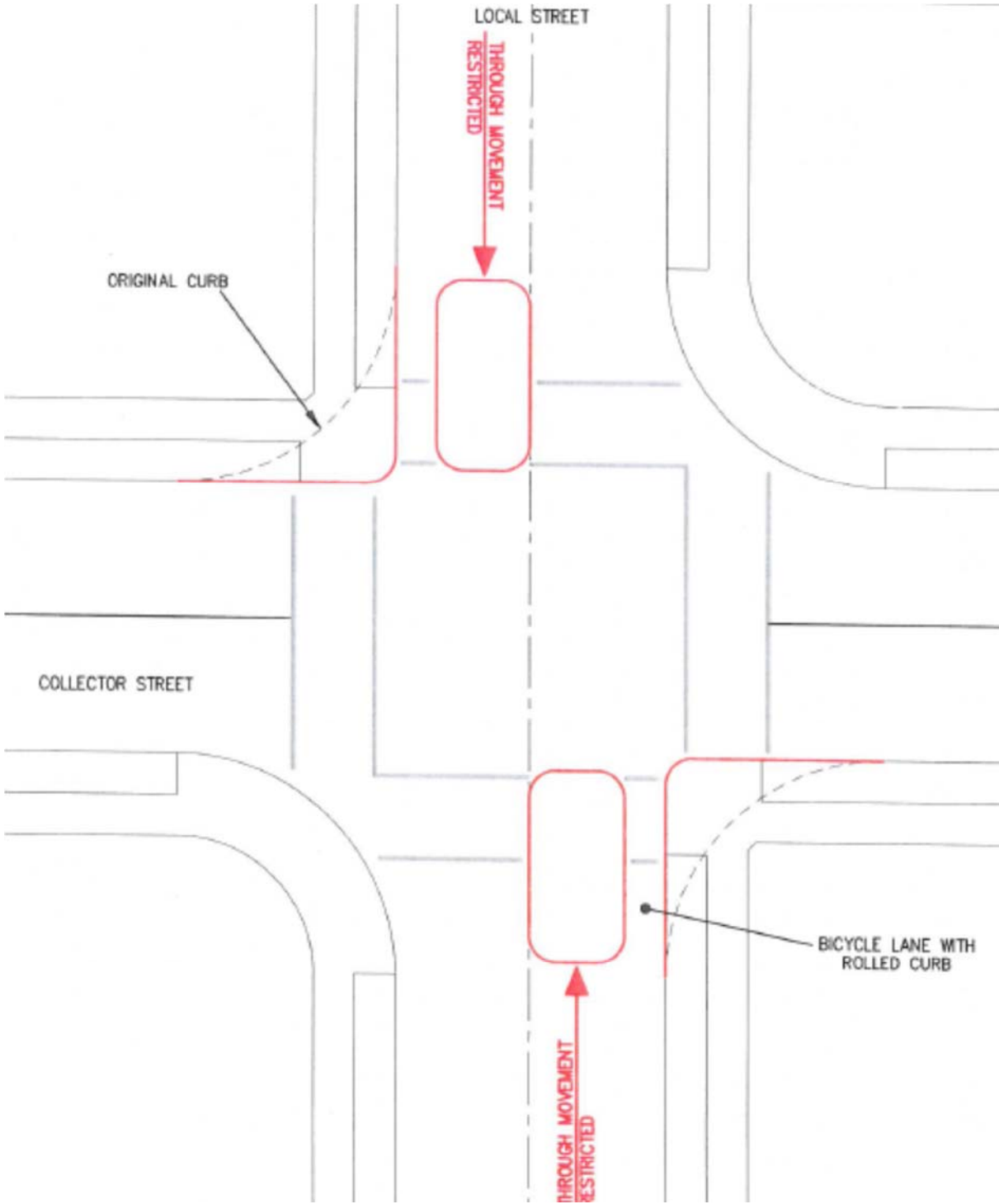
Speed Table



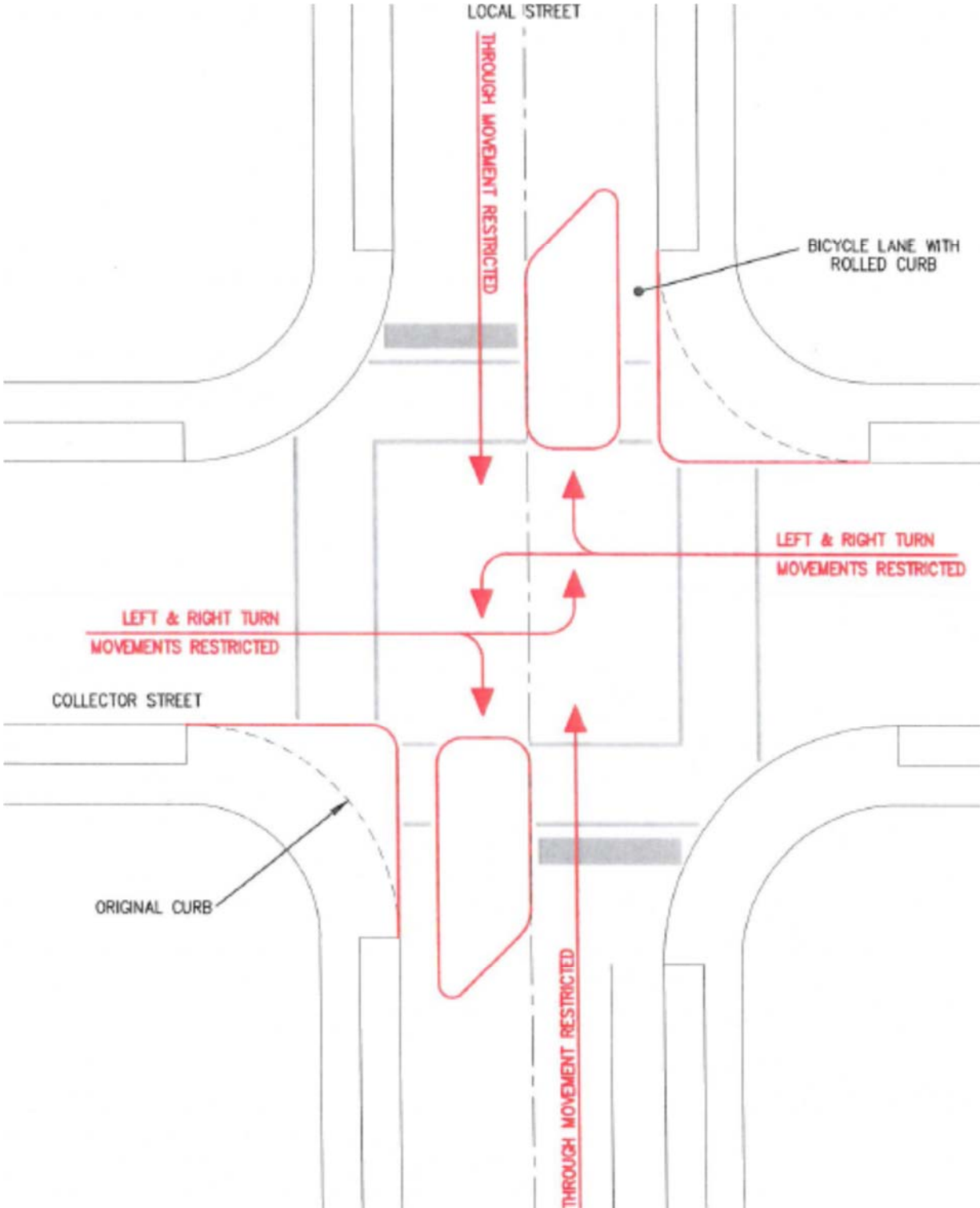
Speed Kidney



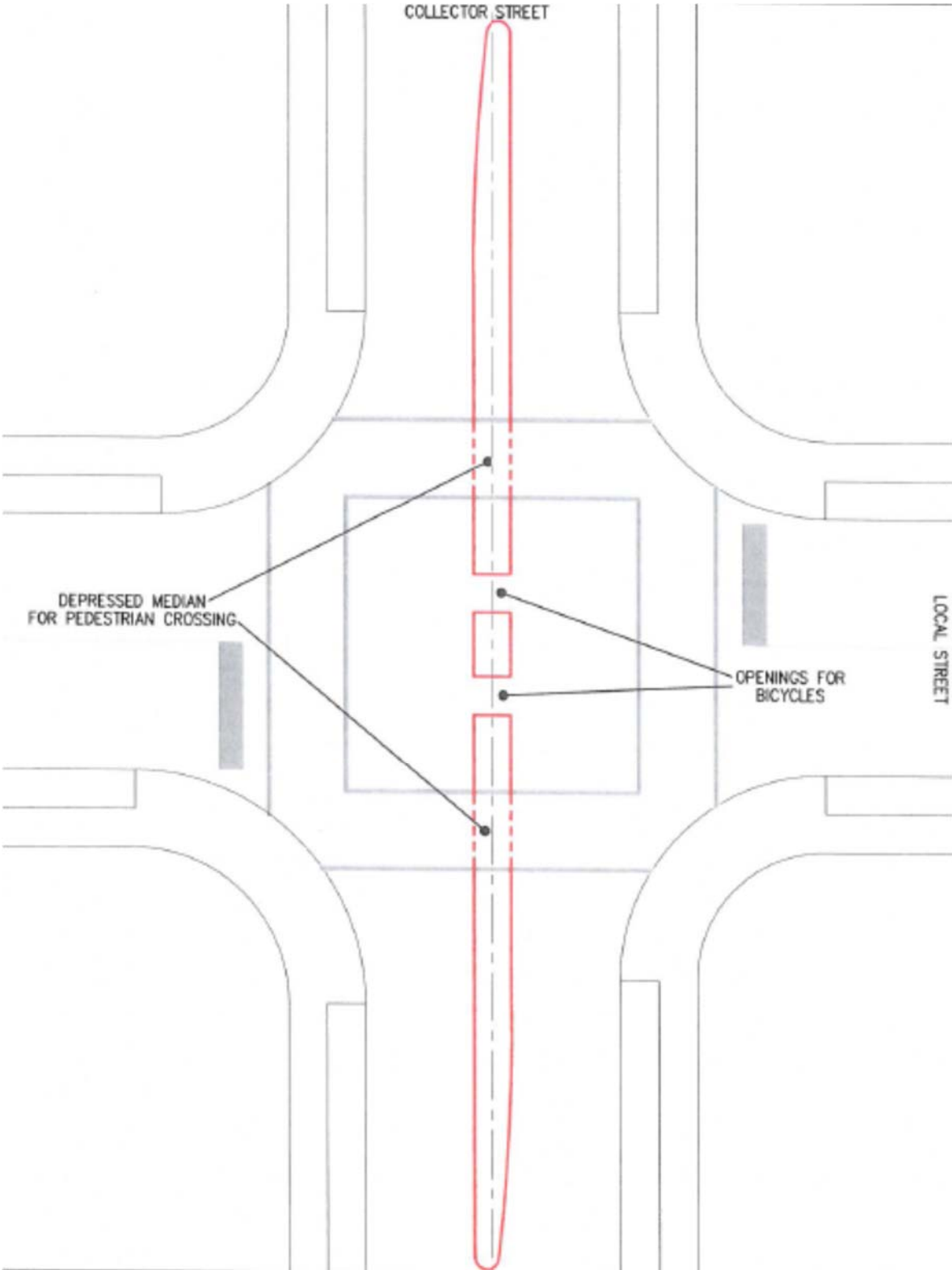
Speed Cushion



Directional Closure (Entrance Only)



Directional Closure (Exit Only)



Raised Median Through Intersection