

**CITY OF SASKATOON
DESIGN AND DEVELOPMENT
STANDARDS MANUAL**

**SECTION EIGHT
TRANSPORTATION SYSTEM**

Version 11



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1 Objective

The transportation system shall provide residents with a range of travel options and support the long-term environmental, social, and economic sustainability of individual neighbourhoods and the City of Saskatoon as a whole.

The transportation network in neighbourhoods shall consist of a fully integrated combination of roadways, transit routes, bicycle routes, and pedestrian pathways.

2 Submissions and Approvals

The Proponent is responsible for being aware of the regulatory requirements governing the development of the transportation system, and for compliance with these requirements.

Regulatory and supporting documents that shall be referenced for the design and installation of the transportation system include the following:

- [Traffic Bylaw \(Bylaw No. 7200\)](#), City of Saskatoon;
- [Sidewalks – Private Crossings Over Bylaw \(Bylaw No. 4785\)](#), City of Saskatoon;
- [Street Design Policy \(Policy No. C07-030\)](#), City of Saskatoon;
- [Buffer Strips – Provision and Construction Criteria Policy \(Policy No. C09-017\)](#), City of Saskatoon;
- [Median Openings Policy \(Policy No. C07-012\)](#), City of Saskatoon;
- [Traffic Control at Pedestrian Crossings Policy \(Policy No. C07-018\)](#), City of Saskatoon;
- [Traffic Control – Use of Stop and Yield Signs Policy \(Policy No. C07-007\)](#), City of Saskatoon;
- [Landscape Guidelines](#), City of Saskatoon;
- [Standard Construction Specifications and Drawings, Roadways, Water, and Sewer](#), City of Saskatoon;
- [Active Transportation Plan Final Report](#), City of Saskatoon;
- [Transportation-System Impact Study \(TIS\) Guidelines](#), City of Saskatoon;
- [Complete Streets Design and Policy Guide](#), City of Saskatoon;
- [Curb and Sidewalk Crossing Information Package](#), City of Saskatoon;
- *Surfacing Manual*, Saskatchewan Highways and Transportation;
- *Transportation Impact Analysis for Site Development*, Institute of Transportation Engineers (ITE);
- *Promoting Sustainable Transportation Through Site Design*, ITE;
- *Geometric Design Guide for Canadian Roads*, Transportation Association of Canada (TAC);

- *Design Vehicle Dimensions for Use in Geometric Design*, TAC;
- *Metric Curve Tables*, TAC;
- *Canadian Guide to Neighbourhood Traffic Calming*, TAC;
- *Manual of Uniform Traffic Control Devices for Canada*, TAC;
- *Guidelines for Design of Bikeways*, TAC;
- *Bikeway Traffic Control Guidelines for Canada*, TAC;
- *Canadian Roundabout Design Guide*, TAC; and
- [Roundabouts: An Information Guide](#), Federal Highway Administration.

2.1 City of Saskatoon

The following documents are required for the design of the transportation system:

2.1.1 Transportation Plan

Proponents shall provide the City of Saskatoon (CoS) with a *Transportation Plan* that outlines the roadways, access points, transit routes, bicycle routes, and pedestrian pathways that are proposed for the development.

At the **neighbourhood concept stage**, a detailed layout of the overall development shall be submitted for approval. The *Transportation Plan* shall include the following:

- A figure illustrating the proposed post-development topography of the site.
- A general description and site plan of the proposed development.
- A description of the population densities that were used for design, together with an explanation of how these were calculated and assigned to the layout.
- The results of a noise analysis and a description of potential sound attenuation measures that meet the requirements of the CoS.
- The results of a traffic impact analysis, carried out in accordance with the ITE's *Transportation Impact Analyses for Site Development* and the City of Saskatoon's *Transportation-System Impact Study (TIS) Guidelines*.
- Figure(s) scaled to 1:200 that illustrate intersections for the following roadway types:
 - Freeway/freeway.
 - Freeway/arterial.
 - Arterial/arterial.
 - Arterial/collector.

- Figure(s) scaled to 1:2000 that illustrate:
 - The proposed roadway/lane layout.
 - Proposed access points.
 - Existing and proposed utilities.
 - Rights of way, easement, and roadway widths.
 - Land use/zoning.
 - Buffers.
 - One metre contours.
- Figure(s) scaled to 1:2000 that illustrate:
 - Transit routes and stops.
 - All proposed pedestrian pathways and sidewalks, including key crossings of major roadways and walkways.
 - Bicycle lanes and pathways.
 - Connectivity of transit, pedestrian, and bicycle routes to adjacent neighbourhoods (existing and/or future).
 - Opportunities for traffic calming.

For **detailed design**, plans illustrating the staged installation of the transportation system shall be submitted.

- The plans shall be scaled to 1:200 and shall contain sufficient detail to allow all utility and transportation construction to proceed, including routes for transit, pedestrians, and bicycles.
 - Block numbering shall be shown.
- Proponents shall provide, in each stage of construction, infrastructure for cyclists, pedestrians, and transit services that provides opportunities for alternative transportation throughout the constructed portion of the development and that interconnects to existing adjacent neighbourhoods.
- This infrastructure shall include traffic controls and signage.
 - Signal planning and traffic control design shall be completed by the CoS.

The CoS reserves the right to require resubmission of the plan if there are changes to the proposed development that significantly affect the transportation system. Resubmission shall be required at the discretion of the CoS and shall typically relate to changes in the configuration of the system and/or changes to proposed land uses.

2.1.2 Functional Planning Study

A complete functional planning study shall be undertaken by the City of Saskatoon for all proposed freeways/expressways. The study shall be completed during the concept planning stage and shall include sufficiently detailed design of all facets of the roadway (including intersection and interchange construction) to allow final design to proceed expediently.

2.2 Other Authorities

The Proponent shall be responsible for obtaining approvals from the appropriate authorities in a timely manner.

3 Roadways

The road network is comprised of various road types, each of which performs a particular function in facilitating vehicular traffic. The road classification system used by the City of Saskatoon considers land service and traffic characteristics including vehicular mix and destination. The following hierarchical categories are used:

- Freeways and Expressways.
- Arterials.
- Collectors.
- Local Streets.
- Lanes.

Standard drawings that should be referenced for the design of roadways are listed in Appendix A.

3.1 Connectivity

The roadways within a proposed development shall reflect the normal progression of connectivity. That is, locals connect to collectors, collectors connect to arterials, and arterials connect to freeways. The following figure illustrates the acceptable connections between the various classes of roadways.

**Figure 3-1
Roadway Classification Access Chart**

Local	Collector	Arterial	Freeway	
No	No	Yes	Yes	Freeway
No	Yes	Yes	Yes	Arterial
Yes	Yes	Yes	No	Collector
Yes	Yes	No	No	Local

3.2 Classification

The Proponent is responsible for the designation of roadways in the development. Road classification should generally be established on the basis of the system detailed by TAC.

Roadways shall be designed to accommodate design traffic flows for the proposed development and, if applicable, to reasonably accommodate extensions to adjacent future development areas as described in the Sector Plan for each development area.

The daily traffic volumes and design speeds that are used by the City of Saskatoon to assist in establishing road classification can be found in the following table:

**Table 3-1
Daily Service Volumes and Design Speeds**

Roadway Type	Daily Service Volume (vehicles/day)	Design Speed	Posted Speed (Maximum)
Freeways and Expressways	>20,000	20 km/h above proposed posted speed limit	100 km/h
Arterials	5,000 to 30,000	10 km/h above proposed posted speed limit	70 km/h
Collectors	1,000 to 15,000	10 km/h above proposed posted speed limit	50 km/h
Local Streets	<1,000	50 km/h	50 km/h
Lanes	None specified	30-40 km/h	20 km/h

3.3 Emergency Vehicle Access

All roadways shall typically be designed to accommodate access by emergency vehicles as large as a fire truck.

3.4 Freeways and Expressways

Freeways and expressways are intended to accommodate heavy volumes of traffic moving at high speeds under free-flow conditions. The CoS shall be responsible for the design of freeways and expressways.

Freeways and expressways are subdivided into two categories dependent on service level.

- Urban.
- Rural.

3.4.1 Access

Access is provided only to other freeways/expressways or arterial streets at specifically designed interchanges or at-grade intersections.

- Direct access to adjacent land is prohibited.
- Bicyclists and pedestrians are prohibited on the roadway.

3.4.2 Cross-Section

The choice between rural or urban cross-section shall be dependent upon right-of-way and drainage constraints.

- In the case of reconstruction where the right-of-way width is less than 100 m, an urban cross-section should be considered.
- The desired minimum cross-slope is 2.5%.

Interchange cross-sections shall be designed with the following criteria:

	<u>Ramp</u>	<u>Loop</u>	
			To be confirmed by design vehicle dimensions and vehicle off-tracking simulation and the appropriate provision for passing stopped vehicles.
• Lane (minimum)	4.0 m	5.0 m	
• Inside Shoulder	1.0 m	1.0 m	
• Outside Shoulder	2.5 m	2.5 m	

3.4.3 Right-of-Way Width

The minimum right-of-way width is 100 m.

3.4.4 Traveled and Parking Lanes

A minimum of four traveled lanes shall be provided.

- A raised or depressed center median shall divide opposing traffic flows.
- Parking is prohibited, therefore, parking lanes shall not be provided.

3.4.5 Medians

If the median width of a rural cross section is less than 20 m, appropriate barriers shall be used to separate opposing traffic flows.

3.4.6 Horizontal Alignment

- The minimum centreline radius of curves shall be 670 m.
 - This minimum value shall only be used in extremely difficult design circumstances.
- Transition spirals shall be used on all curves with the length of spiral based on TAC design criteria.
 - The minimum length of the spiral shall be 50 m.
- Broken back curves (two curves in the same direction) shall have a minimum tangent length between curves of 250 m.

3.4.7 Guide Signage

Signing for freeways/expressways shall be primarily directed to drivers who are not familiar with the route and shall provide clear instructions for orderly progress to their destination. As such, guide signs form an integral part of any expressway/freeway and shall be designed concurrently with the roadway's geometric design.

The operational requirements of expressways/freeways are such that overhead signs have an advantage over side ground-mounted signs at many locations. Their use is preferred where particularly complex or unusual movements are required.

- All ground-mounted signs shall incorporate a breakaway I-beam support system.

3.5 Arterials

Arterial roadways are intended to carry large volumes of all types of traffic moving at medium speeds. They expedite movement of through traffic to major traffic generators and from subdivision to subdivision.

Arterial roadways are subdivided into three categories dependent on service level.

- Class A: 6 lanes, divided.
- Class B: 4 lanes, divided.
- Class C: 4 lanes, undivided.

3.5.1 Access

Land access shall be prohibited or strictly controlled to minimize impact to the roadway. Access to arterials will be subject to the approval of the CoS and will be determined at the concept stage.

- Where access is allowed, buffer strips shall be employed to control access to private property.
- Median openings on divided arterials shall only be considered if sufficient adjacent land access demand is established. Refer to the City of Saskatoon *Median Openings Policy*.

3.5.2 Cross-Section

An urban cross-section with a combined straight face curb and gutter is the only acceptable cross-section.

- If the arterial is to be used as a bus route with bus stops, bus turnout bays shall be provided.
- The desired minimum cross-slope is 2.5%.

3.5.3 Right-of-Way Width

The minimum right-of-way width is:

- 38 m for Class A arterials.
- 32 m for Class B arterials.
- 30 m for Class C arterials.

3.5.4 Traveled and Parking Lanes

A minimum of four traveled lanes shall be provided.

- Staged construction is acceptable where two lanes are constructed initially and additional lanes are constructed as development proceeds.
 - For staged construction on a divided arterial, the initial two lane undivided roadway shall have 4.0 metre lane widths for undivided opposing traffic flows.
- Parking is prohibited on any arterial.

3.5.5 Medians

- Depressed medians are not acceptable.
- Portions of medians in excess of 2.0 m width shall be landscaped to the requirements of the Parks Division.
- Medians 2.0 m in width, or less, shall be hard surfaced throughout.

3.5.6 Horizontal Alignment

- The minimum centreline radius of curves shall be 250 m.
 - This minimum value shall only be used in extremely difficult design circumstances.
 - The preferred centreline radius of curves shall be within the range of 400 to 5,000 m.
- Transition spirals shall be used on all curves with the length of the spiral based on TAC design criteria.
 - The minimum length of the spiral shall be 50 m.
- Broken back curves (two curves in the same direction) shall have a minimum tangent length between curves of 250 m.

3.5.7 Intersections

The preferred intersection spacing shall be 450 m with a minimum acceptable spacing of 250 m. Increased spacing shall be provided if warranted by higher traffic volumes.

- Full channelization of arterial intersections with freeways/expressways, arterials, and collectors shall be provided.
- The preferred width of left turn bays shall be 3.75 m (including the gutter).
 - The minimum width shall be 3.55 m (including the gutter).

- A left turn bay shall have sufficient length to accommodate anticipated traffic volumes.
 - A minimum 37 m taper shall be provided in addition to the bay length.

3.5.8 Spacing

Arterials shall have a minimum spacing of 800 m.

3.6 Collectors

Collector roadways shall provide both traffic movement and land access. They carry traffic between local and arterial streets.

Collectors are subdivided into three categories dependent on service level.

- Class A: two lanes, undivided, parking lane on both sides.
- Class B: two lanes, undivided, parking lane on one side.
- Class C: two lanes, undivided, no parking lanes.

3.6.1 Access

Full access to adjacent land is generally provided.

- No direct access to a collector shall be allowed within 60 m of its intersection with an arterial roadway.

3.6.2 Cross-Sections

An urban cross-section with a combined straight face curb and gutter is the preferred cross-section.

- Where access to one and two unit dwellings is provided, rolled curb and gutter shall be used.
- The desired minimum cross-slope is 2.5%.

3.6.3 Right-of-Way Width

Minimum right-of-way width is:

- 22 m for a Class A collector.
 - A 12.2 m roadway width is allowable only if a separate walk is provided on both sides of the collector.
- 22 m for a Class B collector.
- 20 m for a Class C collector.

3.6.4 Traveled and Parking Lanes

- If there is a frontage along a collector, parking lanes must be provided along the same side of the roadway.
- Bus routes can be accommodated only where a parking lane is available for bus turnout.
 - Class A collectors can accommodate bus routes in both directions.
 - Class B collectors can accommodate bus routes in one direction.
- Parking is not permitted on either side of a Class C collector.

3.6.5 Horizontal Alignment

- The minimum centreline radius of curves shall conform to TAC standards to ensure that adequate stopping sight distances are available.
 - Consideration shall be given to obstructions adjacent to the roadway.
- Transition spirals are preferable on all curves but their use is not mandatory.

3.6.6 Intersections

- Intersection treatments shall be reviewed on an individual basis.
- In general, collector/collector intersections shall not require channelization.
- The minimum spacing of intersections shall be 60 m.

3.7 Locals

The main function of local streets is to provide land access. Local streets are not intended to carry large volumes of traffic, but primarily traffic with an origin or destination along its length.

Locals are subdivided into three main categories, dependent on service level.

- Classes A & B: preferred.
- Class C: serving cul-de-sacs.
 - This class of roadway may be permitted in other locations based on land use. Designs shall be reviewed on an individual basis.

3.7.1 Access

Full access to abutting properties shall be provided. This is most frequently done with rolled curb and gutter.

3.7.2 Cross Section

- Where back lanes are provided, straight face curb and gutter shall be used.
- Where back lanes are not provided, rolled curb and gutter shall be used.
- The desired minimum cross-slope is 2.5%.

3.7.3 Right-of-Way Width

Minimum right-of-way width is:

- 18 m for a Class A local.
- 16 m for a Class B local that is less than 500 m in length and is not a cul-de-sac.
- 15 m for a Class C local that is a cul-de-sac.
 - This class of roadway will only be permitted in cul-de-sacs.

Note: In areas where there are back lanes, the road width shall be 10 m and a separate walk shall be provided on both sides. There shall be clear access to the boulevard for snow storage.

3.7.4 Parking

- Parking shall be provided on one side of the local roadway at a minimum.
- If parking is provided only on one side:
 - A reduced street width shall be considered.
 - Street lighting shall be provided on the side with restricted parking.

3.7.5 Horizontal Alignment

- The minimum curb return radius at intersections shall be 8.0 m.
- Cut-off corners from property shall be provided where needed.

3.8 Industrial Roadways

Industrial roadways provide both traffic movement and land access within industrial zoned areas. These roadways may be classified as arterials, collectors, or locals.

3.8.1 Access

Full access to adjacent lands is generally provided.

3.8.2 Cross-Section

Industrial roadways shall be undivided urban cross-sections with straight face curb and gutter.

- The desired minimum cross-slope is 2.5%.

3.8.3 Right-of-Way Width

The minimum right-of-way width is 20 m.

3.8.4 Traveled and Parking Lanes

A minimum of two traveled lanes and two parking lanes shall be provided.

- All industrial roads shall be undivided.
- Parking shall generally be provided on both sides.
- Parking restrictions may be implemented when analysis indicates that restrictions are warranted.

3.8.5 Horizontal Alignment

- Channelization shall only be provided at intersections with arterial roadways.
- Cut-off corners shall be provided at all intersections to allow for a minimum 12.5 m curb return radius.
- If truck volumes are high and a larger turning radius is desirable, the curb return radius shall be increased to 15 m.

3.9 Lanes

If lanes are provided, they shall be constructed as an asphalt concrete on granular base roadway covering the entire 6.0 metre right-of-way.

- Lanes shall not intersect other lanes.
- Lanes shall not be designed with right angle turns.

3.10 Traffic Islands

The sizing of traffic islands shall be dependent upon the anticipated volume of pedestrian traffic.

- Where pedestrian traffic is not anticipated, the minimum TAC standard of 6 m² shall apply.

- Where pedestrian traffic is anticipated, the minimum lane island size shall be 10 m².
 - The design of the island must consider anticipated pedestrian traffic and must accommodate wheelchair ramps. A level platform for a standard wheelchair shall be provided.

3.11 Roundabouts

The planning, traffic operation, and design of roundabouts shall be governed by the guidelines presented in the Federal Highway Administration Roundabouts: *An Information Guide*.

3.12 Private Roads

Private roads may be developed at the local or the industrial level. Proponents and/or the property owner are fully responsible for the construction and maintenance of these roads.

4 Vertical Design

Factors impacting the design of gradients include the slope of the surrounding landscape, safety in vehicle operation, and efficient removal of runoff. The design of gradients, vertical alignment and roadway structures is based on criteria outlined by TAC. Adjustments are provided for some of these standards to accommodate the lower traffic volumes, design speeds, and other design factors associated with the various classifications of Saskatoon’s roadways.

4.1 Longitudinal Gradients

The preferred maximum longitudinal gradient is 5%.

- Special consideration shall be given to approach gradients at major structures and intersections.

Longitudinal gradients shall be:

- A minimum of 1% on graded areas.
- A desirable minimum of 0.5% on curbed roadways where surface drainage is critical.
- A desirable minimum of 0.5% on earth areas such as utility easements.
- Low enough to avoid erosion of grassed bottoms in open ditches.
 - Failing this, the ditch bottom shall be paved or otherwise treated so as to convey the design volume of runoff without erosion.

4.2 Vertical Curves

Factors impacting the design of vertical curves include stopping sight distance, headlight control (not critical in an urban environment where street lighting is provided), riding comfort, positive drainage on curbed roadways, algebraic difference between intersecting tangents, and design speed. All of these factors are considered and incorporated in vertical curve design according to TAC standards on streets with rural cross section only.

The City of Saskatoon has adopted standards that lend priority to positive drainage and riding comfort for the design of vertical curves on curbed roadways. K values for the design of vertical curves are presented in the following table:

**Table 4-1
K Value of Vertical Curve**

Roadway Type	Sag and Crest Curves
Freeways and Expressways	None specified
Arterials	As per Engineer's design
Collectors	20
Industrial Roadways	20
Local Streets	10
Lanes	None specified

4.3 Superelevations

Superelevation design is impacted by street classification, design speed, curve radius, curb lane parking, direct access from fronting residences, and positive drainage on curbed roadways.

- For design of superelevated curves on freeways and expressways of rural cross-section, the City of Saskatoon has adopted the TAC standards using a rate of superelevation of $e = 0.06$ m/m.
 - The Engineer shall determine maximum superelevation.
- For design of superelevated curves on arterials, or freeways and expressways with an urban cross-section:
 - Maximum cross-slope shall be twice the normal crown height divided by the road width; in effect a fully superelevated cross-section shall be an extension of the slope of the crown in a normal cross-section.
 - Transition lengths are variable, but the longitudinal gradient shall never be less than 0.5%.

- Superelevations on curbed arterial roadways shall be individually designed according to the criteria as determined by the Engineer.
- Collector, local streets, and lanes are not required to be superelevated.

5 Boulevards

A list of the standard drawings that should be referenced for the design of boulevards can be found in Appendix A.

6 Buffer Strips

Proponents shall reference the City of Saskatoon *Buffer Strips – Provision and Construction Criteria Policy* for guidance on the design of buffer strips.

7 Bikeways

Bikeways are an integral part of the transportation system and cyclists shall be accommodated on all roadways. Basic considerations for establishing bikeways are safety, aesthetics, destination, system continuity, and cost.

Bikeways are subdivided into three classes based on location and separation of the pathway.

- Class A: shared pedestrian and bicycle use.
 - Cross-flows by motorists are minimized.
 - Typically found in parks.
 - Minimum width is 3.0 m.
- Class B: restricted lane on a traveled roadway, exclusive bicycle use.
 - Through travel by motor vehicles or pedestrians is not allowed.
 - Vehicle parking is not allowed in this lane.
 - Cross-flows by motorists to gain access to parking facilities or associated land use is allowed.
 - Minimum width is 1.5 m.
- Class C: shared lane on a traveled roadway, bicycle use designated by signs.
 - These routes do not permit bicycles exclusive use of a road surface since the bicycles are in the general vehicular traffic flow.
 - Minimum width of vehicle lane is 4.5 m.

7.1 Location

Bikeways shall be located to accommodate bicycle traffic for the proposed development and, if applicable, to reasonably accommodate extensions to adjacent future development areas as described in the Sector Plan for each development area.

In general, cyclists shall be accommodated along the various roadway types as follows:

- Freeway/Expressway: As per the City of Saskatoon Active Transportation Plan Final Report
- Arterial: Class A, B, or shared use pedestrian sidewalk
- Collector: Class B or C
- Local: On roadway, no special separation

7.2 Design Criteria

Design of bikeways should, as closely as practical, follow the criteria as established by TAC and the City of Saskatoon *Active Transportation Plan Final Report*.

Standard drawings that should be referenced for the design of bikeways are listed in Appendix A.

8 Pedestrian Sidewalks

There are four classes of sidewalks:

- Class A: concrete sidewalk, combined.
- Class B: concrete sidewalk, separate.
- Class C: concrete, shared use path, separate.
- Class D: asphalt, shared use path.

8.1 Location

Sidewalks shall be located to accommodate pedestrian traffic for the proposed development, and if applicable, to reasonably accommodate extensions to adjacent future development areas as described in the Sector Plan for each development area.

It is acceptable for both combined and separate sidewalks to be placed at the property line.

In general, pedestrians shall be accommodated along the various roadway types as specified in the following table:

**Table 8-1
Sidewalk Placement**

Road Type	Sidewalk Type	Location	Walking Surface Width (m)	Material	Offset from Back of Curb
Expressway/ Freeway	D	As per the <i>Transportation Plan</i>	3.0	Asphalt	Separate
Arterial	C	One Side	2.5	Concrete	Separate (1.5 m)
Collector	A or B	Both Sides	1.5	Concrete	Combined or Separate (1.5 m)
Local	A or B	One or Both Sides	1.5	Concrete	Combined or Separate (1.5 m)

8.2 Design Criteria

Standard drawings that should be referenced for the design of pedestrian walkways are listed in Appendix A.

8.3 Walkways

Walkways provide pedestrian access between culs-de-sac and between streets and parks. Design shall conform to the following standards:

- Minimum right-of-way width shall be 3.0 m.
- Concrete walking surface shall be 3.0 m in width.
- No sharp bends or steep gradients that may create blind spots or hiding places.
- Masonry fencing and full illumination shall be installed.
- The Proponent is responsible for the design and installation of fencing and illumination.

8.4 Pedestrian Grade Separations

Pedestrian grade separations may be required to provide adequate connectivity and to avoid hazards or barriers to pedestrian movement (e.g. expressways, arterials).

9 Curb Crossings

All construction of City sidewalks and curbs require approval by the City of Saskatoon and must conform to standard drawings. Approval is obtained when a sidewalk crossing permit has been issued.

A Traffic Impact Study (TIS) may be required when a development will introduce additional traffic or change traffic patterns.

A TIS is generally required under any of the following conditions:

- The development will generate over 100 vehicles per hour in the peak direction of travel (i.e. a fast-food restaurant with a drive-through or service station); and/or
- The development may result in safety, operational or design issues that require mitigation through study; and/or
- The development is a result of a change in land use designation or is an infill into an existing neighbourhood. For traffic mitigation, this includes commercial retail development that is not consistent with a typical light industrial land use mix of manufacturing, service, office and warehouse facilities; and/or
- The development is within existing, or adjacent to existing neighbourhoods, where downstream impacts of the additional traffic requires mitigation (i.e. “shortcutting”).

To determine if a development would require a TIS, please submit a site plan showing the location of driveways, building size and anticipated land use to the City of Saskatoon.

Standard drawings that should be referenced for the design of curb crossings are listed in Appendix A.

10 Ancillary Structures

Ancillary structures include fencing, guard rails, lighting, and traffic control devices. A list of the standard drawings that should be referenced for the design of ancillary structures can be found in Appendix A.

10.1 Fencing

Fencing shall be provided as follows, for each roadway type:

- Freeways/Expressways: Chain link fencing, or other barrier, shall be provided along the entire right-of-way

- Arterials: Chain link fencing, or a suitable alternative, shall be provided along the right-of-way where pedestrian access is not allowed. The minimum height of fencing shall be 1.8 m.
- Collectors: No fencing requirements.
- Locals: No fencing requirements.
- Lanes: No fencing requirements.

10.2 Guard Rails

Guard rails shall be designed in accordance with TAC guidelines.

10.3 Lighting

Full roadway lighting shall be provided on all freeways/expressways, arterials, collectors, and local streets. Lanes do not require lighting.

- The level of illumination shall be in accordance with TAC guidelines. Saskatoon Light & Power shall review all street lighting designs prior to approval.

10.4 Traffic Control Devices

The City of Saskatoon shall be responsible for identification, design, manufacture, and installation of all traffic control devices. Controls shall be provided as follows for each roadway type.

- Freeways/Expressways:
 - The City of Saskatoon shall follow, as closely as practical, the guidelines established by the *Manual of Uniform Traffic Control Devices for Canada*.
 - Permanent pavement markings shall be used on all freeway/expressway roadways.
- Arterial and Collectors:
 - Proponents are responsible for cost of design, manufacture, and installation.
 - Permanent pavement markings shall be used on all arterial roadways.
- Locals:
 - Proponents are responsible for cost of design, manufacture, and installation.
 - Crosswalk markings shall be used.
 - No longitudinal lane pavement markings.

Appendix A Standard Drawings

Proponents shall be responsible for referencing standard drawings that are applicable to their development. Drawings are available from the [City website](#).

Drawings are subject to revision, addition, or deletion. Revised drawings shall be renamed using the date of latest revision. Proponents are responsible for ensuring that they are referencing the latest version of any standard drawing.

Drawings that are applicable to the Transportation System include the following:

Drawing Number	Title
Geometrics/Channelization	
102-0029-002	Freeway/Expressway Urban Cross-Section
102-0029-003	Freeway/Expressway Rural Cross Section Without Drainage Layer
102-0029-044	Freeway/Expressway Rural Cross Section With Drainage Layer
102-0029-004	Arterial, Class A
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102-0005-007	Lane, Paved – 2 Stage Construction
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102-0029-025	Alternative Median Barrier Treatment Semi-Urban Cross Section Without Drainage Layer
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Source:

<http://www.saskatoon.ca/business-development/development-regulation/specifications-standards>