

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

**SECTION EIGHT  
TRANSPORTATION SYSTEM**

**2018**



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# SECTION EIGHT – TRANSPORTATION SYSTEM

## 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:

- [Traffic Bylaw](#), City of Saskatoon;
- [Sidewalks – Private Crossings Over Bylaw](#), City of Saskatoon;
- [Buffer Strips – Provision and Construction Criteria Policy](#), City of Saskatoon;
- [Median Openings Policy](#), City of Saskatoon;
- [Traffic Control at Pedestrian Crossings Policy](#), City of Saskatoon;
- [Traffic Control – Use of Stop and Yield Signs Policy](#), City of Saskatoon;
- [Landscape Guidelines](#), City of Saskatoon;
- [Standard Construction Specifications and Drawings, Roadways, Water, and Sewer](#), Transportation & Utilities Department, 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 TU Department 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 TU Department.
- 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 TU Department.

The TU Department 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 TU Department 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**

<b>Local</b>	<b>Collector</b>	<b>Arterial</b>	<b>Freeway</b>	
<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>Freeway</b>
<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Arterial</b>
<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>Collector</b>
<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Local</b>

### 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**

<b>Roadway Type</b>	<b>Daily Service Volume (vehicles/day)</b>	<b>Design Speed</b>	<b>Posted Speed (Maximum)</b>
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 TU Department 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
• Lane (minimum)	4.0 m	5.0 m	and vehicle off-tracking simulation and the
• Inside Shoulder	1.0 m	1.0 m	appropriate provision for passing stopped
• Outside Shoulder	2.5 m	2.5 m	vehicles.

### **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 TU Department 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 of the Community Services Department.
- 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 m<sup>2</sup> shall apply.
- Where pedestrian traffic is anticipated, the minimum lane island size shall be 10 m<sup>2</sup>.
  - 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**

<b>Roadway Type</b>	<b>Sag and Crest Curves</b>
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**

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

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:

Drawing Number	Title
<b>Channelization/Geometrics</b>	
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
102-0029-005	Arterial, Class B
102-0029-006	Arterial Class C
102-0029-007	Industrial Roadway
102-0029-008	Collector, Class A
102-0029-009	Collector, Class B
102-0029-010	Collector, Class C
102-0029-011	Local, Class A
102-0029-012	Local, Class B
102-0029-016	Local, Class C, Cul-de-sac
102-0005-002	Lane, Paved Typical Lane Cross Section
102-0005-007	Lane, Paved – 2 Stage Construction
102-0029-013	Bikeways, Class A, B, C
102-0029-014	Bus Turnout Bay
102-0029-035	Cul-De-Sac – Residential, Commercial and Industrial Roadways
102-0029-025	Alternative Median Barrier Treatment Semi-Urban Cross Section Without Drainage Layer
102-0029-043	Alternative Median Barrier Treatment Semi-Urban Cross Section With Drainage Layer
102-0029-001	Channelized Intersection 3 Centered Curve Details Turning Bays

102-0029-027	Standard Neighbourhood Entrances, New Neighbourhoods Only
102-0029-026	Design Vehicles Arterials, Expressways, Freeways & Highway Geometric Design
102-0029-031	Design Vehicle for Collectors and Roundabouts
102-0029-032	Class B Arterial Staging Options
102-0029-045	Typical Road and Back Lane Subdrainage Details
<b>Boulevards</b>	
102-0001-001	Standard Ditch Crossing Requirements
102-0001-002	Cross Section VCG & Separate Sidewalk Construction Details
102-0001-003	Typical Tree & Utility Placement in Boulevards
<b>Curbs and Walks</b>	
102-0002-001	Full Heights Curbs and Gutters
102-0002-002	Curb on Asphalt
102-0002-003	Separate Dropped Curb Crossings
102-0002-004	810 mm Concrete Barrier Curb
102-0002-005	Separate Vertical Curb
102-0002-067	150mm Vertical Curb and Gutter with Paver Lip
102-0002-069	Concrete Swale
102-0002-071	Walk, Reversed Rolled Curb and Gutter
102-0002-006	Crossing – Walk, 150mm Vertical Curb and Gutter
102-0002-007	Crossing – Walk, 200mm Vertical Curb and Gutter
102-0002-008	Crossing – Walk & 150mm Vertical Curb
102-0002-009	Crossing – Walk & 200mm Vertical Curb
102-0002-010	Crossing – Separate Walk & Vertical Curb and Gutter
102-0002-011	Dropped Curb Crossing – Separate Walk, Vertical Curb
102-0002-012	Crossing – Rolled Curb, Gutter & Walk
102-0002-013	Curb Return Crossing – Separate Walk, Vertical Curb
102-0002-014	Directional Crossing, Walk and Vertical Curb
102-0002-015	Direction Crossing, Separate Curb & Walk
102-0002-016	Location of Corner Directional Crossings
102-0002-017	Typical Driveway Curb Detail – Isometric View
102-0002-018	Grade Construction for Curb and Gutter
102-0002-019	Grade Construction for Sidewalk, Curb and Gutter
102-0002-020	Grade Construction for Walkway and Sidewalk
102-0002-021	Control Joints
102-0002-022	Dowel/Control Joint Location and Spacing

102-0002-023	Sidewalk Ramp Details
102-0002-024	Ramp Locations at a T - Intersection
102-0002-025	Sidewalk Ramps in High Pedestrian Areas, Texture Details
102-0002-026	Sidewalk Ramps – Texture Details
102-0002-027	Sidewalk Ramp Section, Rolled Curb
102-0002-028	Transition, Typical Sidewalk
102-0002-029	Combined Walk, Vertical Curb & Gutter
102-0002-030	Walk, Rolled Curb & Gutter
102-0002-031	Separate Walk
102-0002-032	Concrete Walkway
102-0002-033	Combined Walk & Vertical Curb
102-0002-034	Asphalt Pathway
102-0002-035	Precast Concrete Curb
102-0002-036	Reversed Curb and Gutter Detail
102-0002-037	Reversed Curb and Gutter Detail
102-0002-038	Concrete Placement Rate of Moisture Loss Chart
102-0002-039	Separate Sidewalk Irrigation Sleeve
102-0002-040	Separate Sidewalk Bus Stop Detail
102-0002-041	Perpendicular Separate Sidewalk Ramp Details
102-0002-043	Pre-Cast Concrete Barriers Bullnose Male, Bullnose Female, Low Barrier
102-0002-044	Pre-Cast Concrete Barriers Transition Barrier
102-0002-045	Pre-Cast Concrete Barriers Median Barrier Male
102-0002-046	Pre-Cast Concrete Barriers Median Barrier Female
102-0002-047	Cast Concrete Barriers Pier Barrier Male, Pier Barrier Female
102-0002-052	3.0 m Multi-Use Pathway Ramp Configurations
102-0002-054	2500 Separate Walkway Concrete
102-0002-055	3000 Multi-Use Pathway Asphalt
102-0002-057	Roadway Sideslope Ramp – Pedestrian Access Wheelchair Accessible
102-0002-070	Cut-Through Median Detail, Pedestrian/Cyclist Crossing
102-0002-062	Traffic Calming at a T-Intersection – School/Commercial Crossing
102-0002-063	Traffic Calming on Curve – Center Median Islands
102-0002-064	Traffic Calming at a Mid-Block Crossing – Walkway to Walkway
102-0002-065	Traffic Calming at a Highly Used Intersection – by Pedestrians
102-0002-066	Traffic Calming at a Neighbourhood Entrance – Center Median Island

<b>Landscape</b>	
102-0004-001	Chain Link Fence Details – 1.8m Fence
102-0004-002	Chain Link Fence Details – 1.2m Fence
102-0004-003	Chain Link Fence Details – Gate Detail
102-0004-005	Chain Link Fence Type A
102-0004-006	Chain Link Fence Type A
<b>Medians</b>	
102-0006-001	Splash Apron
102-0006-002	Mountable Median Tip
102-0006-003	Median Ramp
102-0006-005	830 Median Barrier Slip-Formed Concrete
<b>Shallow Buried Utilities</b>	
102-0007-001	Utilities Placement Standards
102-0007-002	Utilities Placement Standards
102-0007-003	Utilities Placement Standards
102-0007-005	Utilities Placement Standards
102-0007-006	Typical Roadway Crossing Electrical Sleeve
102-0007-007	Typical Roadway Crossing Irrigation Sleeve
102-0007-008	Base/Ducting Installation – Typical Median Cross Section
<b>Parking Meter</b>	
102-0015-001	Type 1 Parking Meter Installation
102-0015-002	Type 2 Parking Meter Installation
102-0015-003	Type 3 Parking Meter Installation
<b>Traffic Signals</b>	
102-0016-019	Traffic Signal Conduit Junction Box Installation
102-0016-020	Specifications for Pre-Cast Traffic Signal Pole Base
102-0016-021	Specifications for Traffic Signal Corridor Pole
102-0016-022	Combination Street Light and Traffic Signal Pole
102-0016-023	Specifications for Traffic Signal Arms
102-0016-025	Specifications for Hand Hole Assembly
102-0016-029	Pre-Cast Pole Base Installation Details
102-0016-032	Trenching Installation Details
102-0016-033	Cast-In-Place Cabinet Base in Natural Ground Details
102-0016-034	Service Pedestal Installation Details
102-0016-039	Cast-In-Place Cabinet Base in Sidewalk Details

<b>Signage</b>	
102-0017-010	Adapter Plate for Roadside Guidesign
102-0017-011	Concrete Base for Roadside Guidesign
102-0017-012	I-Beam for Roadside Guidesign
102-0017-013	Bolt Assembly I-Beam to Adapter Plate for Ground Mounted Signs
102-0017-015	I-Beam for Median Guidesign
102-0017-016	Pavement Marking Test Section Sign Details
102-0017-017	Advance Warning Flasher Structure Pile and Anchor Bolt
102-0017-021	Standard W-Beam Guardrail Standard Post and Rail Details
102-0017-022	Standard W-Beam Guardrail Collapsible Terminal End
102-0017-023	Standard W-Beam Guardrail Standard End Treatment
102-0017-024	Standard W-Beam Guardrail Wood Post Material and Specifications
102-0017-027	Standard W-Beam Guardrail Rail Section & End Details
102-0017-031	Temporary Sign Base
<b>Crosswalks</b>	
102-0028-001	Crosswalk Pavement Markings
102-0028-008	Required Pavement Markings at Intersections
102-0028-009	Required Pavement Markings at Chevrons
<b>Berms</b>	
102-0021-001	Typical Berm Requirements
<b>Roundabouts</b>	
102-0029-017	Roundabout Functional Design, Road Classification Local Class A
102-0029-018	Roundabout Detailed Design, Road Classification Local Class A
102-0029-019	Roundabout Sight Lines Design, Road Classification Local Class A
102-0029-020	Roundabout Operating Speeds Design, Road Classification Local Class A
102-0029-021	Roundabout Functional Design, Road Classification Collector Class A / Local Class A
102-0029-022	Roundabout Detailed Design, Road Classification Collector Class A / Local Class A
102-0029-023	Roundabout Sight Lines Design, Road Classification Collector Class A / Local Class A
102-0029-024	Roundabout Operating Speeds Design, Road Classification Collector Class A / Local Class A

Source:

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