

**City of Saskatoon**  
**Design and Development Standards Manual**

**Section Eight**  
**Transportation System**

**Version 17**



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## 1 Objective

The transportation system shall provide residents with a range of safe and accessible travel options, such as walking, cycling, public transit use, and driving while supporting the long-term environmental, social, and economic sustainability of individual neighbourhoods and the City of Saskatoon (City) as a whole. The design of the transportation network should reflect the *Street Design Policy* and *Active Transportation Plan* goals and objectives, and align with the *Official Community Plan*, as well as incorporate industry best practices and applicable City of Saskatoon regulations and supporting documents.

Streets should be planned and designed to effectively support the movement of people of all ages and levels of mobility by providing appropriate and accessible facilities that support pedestrians, cyclists, transit users, and motor vehicles while integrating the street environment with existing and future land uses.

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

## 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:

- [Official Community Plan Bylaw](#), City of Saskatoon
- [Traffic Bylaw](#), City of Saskatoon;
- [Street Design Policy](#), City of Saskatoon
- [Sidewalks – Private Crossings Over Bylaw](#), City of Saskatoon;
- [Traffic Calming Policy](#), 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](#), 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, Sidewalk, and Ditch Crossing Information Package](#), City of Saskatoon;
- Surfacing Manual, Saskatchewan Ministry of Highways and Infrastructure;
- 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 2017 (GDG);
- Traffic Calming Guide, City of Saskatoon
- Canadian Guide to Neighbourhood Traffic Calming, Transportation Association of Canada (TAC);
- Manual of Uniform Traffic Control Devices for Canada, (MUTCD) TAC;
- Guidelines for Design of Bikeways, TAC;
- Bikeway Traffic Control Guidelines for Canada, TAC;
- Canadian Roundabout Design Guide, TAC;
- [Roundabouts: An Information Guide](#), Federal Highway Administration;
- [Traffic Noise Sound Attenuation Policy](#), City of Saskatoon; and
- Guide for the Design of Roadway Lighting, TAC.

## 2.1 City of Saskatoon

The following documents are required for the design of the transportation system: Transportation Plan and Functional Planning Study.

### 2.1.1 Transportation Plan

Proponents shall provide the Transportation and Construction Division (TC Division) with a *Transportation Plan* that outlines the pedestrian pathways, bicycle routes, transit routes, streets, and access points that are proposed for the development.

At the Concept Plan 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 TC Division.

- 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*.
  - Existing traffic volumes, illustrated for each design hour;
  - Site-generated traffic volumes, illustrated for each design hour;
  - Forecast background traffic volumes, illustrated for each design hour;
  - Total forecast traffic volumes, illustrated for each design hour; and
  - Signal timing plans for each signalized intersection, for each design period; as well as the Intersection Capacity Utilization (ICU) analysis if Synchro was used for the Level of Service (LOS) analysis.
- For staged or phased developments:
  - Staging plan (should include year);
  - Triggers for changes; and
  - Ultimate or full build-out plan.
- Figure(s) scaled to a typical identified engineering scale that illustrate intersections, including widenings to accommodate channelization and roundabouts, for the following street types:
  - Freeway/expressway-freeway/expressway;
  - Freeway/expressway-arterial;
  - Arterial-arterial; and
  - Arterial-collector.
- Figure(s) scaled to a typical identified engineering scale that illustrate:
  - The proposed street/lane layout;
  - Proposed access points;
  - Existing and proposed utilities;
  - Rights of way, easement, and street widths;
  - Land use/zoning;
  - Buffers/berms; and
  - One metre contours.
- Figure(s) scaled to a typical identified engineering scale that illustrate:
  - Operational, geometric modifications or land use changes required to maintain the system at LOS D or better, under total traffic conditions for the horizon years;
  - Transit routes and stops;
  - All proposed pedestrian pathways and sidewalks, including key crossings of major streets and walkways;
  - Bicycle facilities and pathways;
  - Traffic signals and pedestrian crossing devices;

- Connectivity of transit, pedestrian, and bicycle routes to adjacent neighbourhoods (existing and/or future);
- Traffic calming plan showing City approved traffic calming devices, school zones, and marked crosswalks; and
- Street classification, posted speed limit, daily traffic volumes, and right-of-way.

For detailed design, a design memo and supporting plans shall be submitted to the City for approval. The template for the design memo can be found in Appendix B: Street Design Memo. Plans illustrating the staged installation of the transportation system shall be submitted.

- The plans shall be scaled to a typical identified engineering scale and shall contain sufficient detail to allow all utility and transportation construction to proceed, including routes for pedestrians, bicycles, and transit.
  - Block numbering shall be shown.
- Proponents shall provide, in each stage of construction, infrastructure for pedestrians, cyclists, 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, pavement markings, and signage.
  - Signal planning and traffic control design shall be completed by the TC Division.

The TC Division reserves the right to require resubmission of the plan and accompanying analyses if there are changes to the proposed development that significantly affect the transportation system. Resubmission shall be required at the discretion of the TC Division 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 freeway/expressway and arterial streets. The study shall be completed during the concept planning stage and shall include sufficient detailed design of all facets of the street (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 Streets**

The street network is comprised of various street types, each of which performs a particular function in facilitating the way people and goods move through and within the City. The current street classification system used by the City of Saskatoon considers many principles and factors including land use, land service function, typical traffic volume, traffic flow characteristics, posted speed, vehicle type, network connections, and design user groups and modes with the goal of providing a connected street network balanced for all types of transportation. In Saskatoon, the following hierarchical categories are used:

- Freeway/Expressway;
- Arterial;
- Collector;
- Local; and
- Lane.

Each of these street types has unique features that should be considered in their design. These features are described in the sections below and each classification more thoroughly defined in Section 4, Street Design. Throughout this section of the Manual, the *Geometric Design Guide for Canadian Roads (GDG)* should be referenced for further background and discussion.

### **3.1 Connectivity**

Streets shall reflect the normal progression of connectivity. In an ideal system, lanes connect with locals, locals with collectors, collectors with arterials, and arterials with freeways/expressways. This allows for street users to adjust to gradual changes in street cross-section features. Other connections should be minimized. Table 1 summarizes connections by classification.



*Table 1: Street Connectivity*

Groups	Normally connects with				
	Freeway/Expressway	Arterial	Collector	Local	Lane
<b>Freeway/Expressway</b>	Y	Y			
<b>Arterial</b>	Y	Y	Y		
<b>Collector</b>		Y	Y	Y	
<b>Local</b>			Y	Y	Y
<b>Lane</b>				Y	Y

\*Blank cells indicate connection not permitted.

### 3.2 Classification

The Proponent is responsible for the designation of streets in the development. Street classification should generally be established on the basis of the system detailed in Section 4, Street Design.

Streets 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 street classification can be found in Table 2. The speeds listed are maximums, and may not be chosen as the posted speed for some streets.

*Table 2: Daily Service Volumes and Design Speeds*

Street Classification	Typical Daily Service Volume (veh/day)	Posted Speed (Maximum)	Design Speed (above posted speed)
<b>Freeway/Expressway</b>	>10,000 / >20,000	90 kph	+20 kph
<b>Arterial</b>	5,000 – 25,000	70 kph	+10 kph
<b>Collector</b>	5,000 – 10,000	50 kph	+10 kph
<b>Local</b>	1,000 – 5,000	50 kph	+10 kph
<b>Lane</b>	500 – 1,000	20 kph	+10 kph

More detailed information about each of the street classification can be found in Section 4, Street Design.

### 3.3 Emergency Vehicle Access

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

### 3.4 Travel Lanes

Lane widths should be carefully considered in conjunction with other street elements. Table 3 identifies appropriate lane widths for consideration on urban streets.

*Table 3: Travel Lane Widths*

Design Speed (kph)	Design Domain			
	Practical Lower Limit *	Recommended Range		Practical Upper Limit *
		Recommended Lower Limit *	Recommended Upper Limit *	
60 and less	2.7 m	3.0 m	3.7 m	4.0 m
70 to 100	3.0 m	3.3 m	3.7 m	4.0 m
110 and higher	3.5 m	3.7 m	3.7 m	4.0 m

\* Independent of gutter width

Where buses and larger trucks are expected to regularly use a lane, a minimum lane width of 3.3 meters is recommended regardless of the design speed or traffic volume.

Lane widths described in Table 3 are independent of gutter width and do not account for the presence of parked cars, snow storage, or accommodation of cyclists. These additional needs should be considered when determining lane widths.

Auxiliary lanes, acceleration lanes, merge lanes, and lanes on ramps and loops should be designed using the GDG.

### 3.5 Parking Lanes

Parking lanes should be considered on local, collector, and arterial streets depending on land use and access conditions, as well as street function. A summary of parking lanes in relation to street classification is provided in Table 4: Parking Lanes.

*Table 4: Parking Lanes*

<b>Street Classification</b>	<b>Parking Permitted</b>	<b>Width (m)</b>	<b>Considerations</b>
<b>Freeway/Expressway</b>	No	-	Never considered
<b>Arterial</b>	Sometimes	2.5*	May be considered
<b>Collector</b>	Yes	2.2-2.5*	Always present on both sides of street
<b>Local</b>	Yes	2.2*	Always present on both sides of street
<b>Lane</b>	No	-	May provide access to parking lots

\* Independent of gutter width

### **3.6 Medians**

A median is defined as the portion of a street which physically separates the travelled lanes of traffic travelling in opposing directions. A median is a safety device which provides some measure of freedom from interference of opposing traffic and can provide a recovery area for errant vehicles, speed change lanes for left-turn and U-turn traffic, and reduce headlight glare. Other uses may include location for utilities or street lighting, snow storage, access control, and a pedestrian crossing refuge area.

Medians may be flush with, raised above, or depressed below adjacent travel lanes. Additional information about medians can be found in the GDG. The City of Saskatoon only allows depressed medians on freeways/expressways. Landscaping in medians should not obstruct visibility of intersections, pedestrian crossings, or street signs. Obstructions may negatively affect a driver's ability to safely react to approaching traffic of all modes.

Typically, medians are found on higher order streets such as freeways/expressways, arterials, and some collectors. Clear zone calculations must be presented to determine if barriers are required to separate opposing traffic flows safely. An explanation of clear zone can be found in the GDG.

A list of the standard drawings that should be referenced for the design of medians can be found in Appendix A: Standard Drawings (list). Typically, the minimum width of medians shall be 1.5 metres. The maximum width of medians can vary depending on the detailed design of left turn bays.

### 3.7 Curb & Gutter

Curbs are raised, vertical elements located at the edge of the roadway, adjacent to travel lanes, parking lanes, or shoulders. They are implemented on urban streets for several reasons including drainage control, delineation of the pavement edge, right-of-way reduction, access control or provision, and aesthetics.

The City of Saskatoon uses several different curb types, as listed in Table 5.

*Table 5: Curb Selection*

Curb Type	Implementation Criteria
Rolled Curb	<ul style="list-style-type: none"> <li>• Full access to property allowed</li> <li>• On-street parking permitted</li> <li>• Local street with residential development and no back lane access</li> <li>• Adjacent to one and two-unit residential dwellings only</li> </ul>
150 mm Vertical Curb	<ul style="list-style-type: none"> <li>• Controlled access to property</li> <li>• On-street parking permitted</li> <li>• Adjacent to parks and schools</li> <li>• Local, collector, and arterial street applications</li> </ul>
200 mm Vertical Curb	<ul style="list-style-type: none"> <li>• Controlled access to property</li> <li>• On-street parking prohibited</li> <li>• Collector and arterial street applications</li> </ul>
Mountable Curb	<ul style="list-style-type: none"> <li>• May be used in conjunction with semi-rigid, or rigid roadside safety systems</li> <li>• Arterial and freeway/expressway applications</li> </ul>

### 3.8 Amenity Strip

Amenity strip refers to the area between the back of curb and the active transportation facility. Amenity strips are implemented on urban streets for several reasons, including safety and comfort of active transportation modes, location for surface and underground utilities, **trees**, snow storage area, and location for street amenities like transit waiting areas, bike racks, benches, street signs, traffic control, street illumination, and landscaping. Additional information regarding amenity strips can be found in the GDG.

Amenity strips shall be implemented on arterial and collector streets and should be considered on local streets. **When determining widths, the function of the amenity strip should be considered.** A minimum width of **2.0** meters is **required** for amenity strips **to accommodate tree planting. If any utilities including street lighting are planned to be placed in the amenity strip, the amenity strip must be widened to allow for both tree planting and utilities with appropriate setbacks or utilities should be placed in an alternate location.** Landscaping in the amenity strip should not obstruct the visibility of intersections, pedestrian crossings, or street signs. Obstructions may negatively affect a driver's ability to safely react to approaching traffic of all modes.

### **3.9 Universal Accessibility**

Streets should be designed so that they can be accessed, understood, and used to the greatest extent possible by all people regardless of their age, ability or disability, in the most independent and natural manner possible without the need for adaptation, modification, assistance, or specialized devices. A barrier free and interconnected network of accessible facilities should be provided to ensure mobility for all residents of Saskatoon.

Slopes should be designed as follows for accessibility:

- Sidewalk cross-slope shall be no steeper than 3% and should ideally be designed at 2% to accommodate accessibility and drainage needs.
- Road cross-slope shall be no steeper than 3%.
- Longitudinal grades used for the design of grade separations shall be no steeper than 5%.

The proponent shall be responsible for ensuring that streets are designed to be safe and accessible for all users. City standards and specifications shall be followed.

### **3.10 Active Transportation Facilities**

Active transportation encompasses any form of human powered transportation, such as walking, jogging, cycling, skateboarding, and use of mobility aids. In this document, walking and cycling facilities are specifically acknowledged since other forms of active transportation can also use walking and cycling facilities.

The proponent shall be responsible for identifying the active transportation network in a neighbourhood, as well as the design and installation of all active transportation facilities

within the neighbourhood. These may include sidewalks, cycling facilities, multi-use pathways, crosswalks, etc.

A list of the standard drawings that should be referenced for the design of active transportation facilities can be found in Appendix A: Standard Drawings (list).

### **3.10.1 Sidewalks**

Sidewalks encourage and facilitate people of all ages and abilities to move around the city. Sidewalks must be designed to be universally accessible, provide all weather access, and provide public realm opportunities where possible. A connected network of sidewalks can help support community vibrancy and public health while providing an equitable form of transportation for all citizens.

Pedestrians come in many forms. For example, a person using a mobility aid typically has an operating envelope of 0.9 meters and requires 1.8 meters to pass another mobility aid user. A single adult walking has an operating envelope of approximately 0.5 meters, but studies show that two adults passing each other or walking side by side have an operating envelope of 1.8 meters due to cultural norms. An adult walking with a child or a service animal typically operates in a 1.2 meter wide envelope. All of these factors come into consideration when choosing the appropriate sidewalk width for a street.

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

It is preferred to provide separation between sidewalks and the property line as per Section 3.11, Boulevard.

In general, pedestrian movement shall be provided along the various street types as specified in Table 6. These widths are minimum requirements and should be increased depending on the intensity of the adjacent development. Appropriate widths can be determined by referencing the GDG.

*Table 6: Minimum Sidewalk Requirements*

<b>Street Classification</b>	<b>Location</b>	<b>Minimum Walking Surface Clear Width (m)</b>	<b>Material</b>	<b>Offset from Back of Curb</b>
<b>Freeway/ Expressway</b>	As per the <i>Active Transportation Plan</i>	3.0*	Asphalt	Separate (outside of clear zone)
<b>Arterial</b>	Both Sides	2.5*	Concrete	Separate (1.5 m)
<b>Collector</b>	Both Sides	1.8*	Concrete	Combined or Separate (1.5 m)
<b>Local</b>	Both Sides	1.5*	Concrete	Combined or Separate (1.5 m)
<b>Lane</b>	N/A	N/A	N/A	N/A

\*Or wider in high pedestrian traffic areas.

### **3.10.2 Cycling Facilities**

Cycling facilities encourage and facilitate people of all ages and abilities to move around the city. The cycling network is an integral part of the transportation system and cyclists shall be accommodated on all streets, except freeway/expressways, in all weather conditions. Providing a complete and interconnected network of bicycle facilities throughout Saskatoon is critical to supporting and encouraging people to choose cycling.

At a minimum, a neighbourhood shall accommodate one east-west and one north-south *All Ages and Abilities* (AAA) route that connects with the adjacent existing and future neighbourhoods to support a city-wide AAA cycling network. The network of cycling facilities shall be connected, safe and secure, convenient, and accessible.

The operating envelope of a typical bicycle is 1.5 meters wide and 1.8 meters long. Bicycles can be up to 3.0 meters in length. The vertical operating envelope is approximately 2.5 meters for most cyclists. It is important to ensure that tree branches or other overhead obstacle clearances are higher than a cyclist's head.

Cycling facilities can be provided in two basic forms: exclusive facilities where street space is designated for cyclists; and shared use facilities where street space is integrated. Land-use and built form may also influence the cycling facility chosen and

should be given careful consideration. Table 7 provides guidance on cycling facility design options.

*Table 7: Cycling Facility Design*

<b>Street Classification</b>	<b>Location</b>	<b>Minimum Clear Width (m)</b>	<b>Facility Type</b>
<b>Freeway/ Expressway</b>	As per the <i>Active Transportation Plan</i>	3.0	Prohibited, May be considered beyond the clear zone.
<b>Arterial</b>	Both Sides	2.0	Exclusive, protected facility
<b>Collector</b>	Both Sides	1.8	Exclusive facility may be considered
<b>Local</b>	N/A	N/A	Shared on-street
<b>Lane</b>	N/A	N/A	Shared on-street

### **3.10.3 Multi-use Paths**

Multi-use pathways are an integral part of the City's planned AAA cycling network intended to encourage a broad cross-section of people to cycle. Typically, multi-use paths can be found parallel to major arterials with limited driveway access, adjacent to freeway/expressway, or within parks. Multi-use pathways may be implemented as an alternative to sidewalks and AAA cycling facilities where the volumes of pedestrians and cyclists are low enough that mixing uses will not create a safety issue, and where adjacent land use supports the implementation of a multi-use path.

The width of multi-use paths may vary depending on the volume of pedestrians and cyclists. The minimum width of a multi-use path is 3.0 meters. Multi-use paths are typically built with asphalt and offset from the back of curb with the same requirements as sidewalks.

### **3.10.4 Walkways**

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

- Minimum right-of-way width shall be 3.0 meters.
- Concrete walking surface shall be 3.0 meters in width.



- No sharp bends or steep gradients that may create blind spots or hiding places.
- Fencing and full illumination shall be installed.
- Vehicular access shall be prevented.
- The Proponent is responsible for the design and installation of fencing and illumination.

### **3.10.5 Active Transportation Grade Separations**

Active transportation grade separations may be required to provide adequate connectivity and to avoid hazards or barriers to pedestrian and cyclist movement (e.g. freeway/expressways, arterials, railways).

### **3.10.6 Crosswalks**

Crosswalks are a designated area for pedestrians to cross a street, either at intersections or midblock. Crosswalks exist at all intersections, except where otherwise posted, and at marked midblock locations throughout the City.

Crosswalks may be enhanced by providing additional measures to increase visibility or decrease crossing distance such as signs, pavement markings, median islands, curb extensions, raised crosswalk, or pedestrian crossing devices. These measures should be considered in accordance with relevant City policies.

Crosswalks may be installed with corresponding cross-ride markings for bike crossings where a multi-use pathway or dedicated cycling facility crosses a street. Cross-rides help a cyclist position themselves when cycling through an intersection, and increase the visibility of the cyclist crossing for drivers.

Proponents shall provide pedestrian and cyclist crossing measures as appropriate to encourage the use of active transportation modes through neighbourhoods.

### **3.10.7 Accessibility Ramps**

Accessibility ramps provide a graded transition between the sidewalk and the street, linking the sidewalk and the pedestrian crossing it serves.

Generally, accessibility ramps should:

- Be provided for each individual crosswalk where practicable, and always for intersections with arterial streets;
- Include tactile walking surface indicators as per City of Saskatoon specifications;
- Be centered in the crosswalk; and

- Be provided on all corners of an intersection for all crossing directions, except where crossings are prohibited.

No pedestrian facilities are permitted on freeway/expressways; accessibility ramps are not required for these intersections.

### **3.11 Boulevard**

The area between the back of the sidewalk and the edge of right-of-way is referred to as the boulevard. Boulevards are typically one meter wide, but may vary depending on adjacent land use or future street expansion needs. Boulevards can be used to accommodate utilities, provide for future grade adjustment needs, and provide for a comfortable buffer between sidewalks and adjacent fences or structures. Additional information about boulevards can be found in the GDG.

Boulevards should be designed in consideration of adjacent land use. They may be grass or hardscaped to continue the aesthetic qualities of the adjacent development where feasible. Landscaping in boulevards should not obstruct visibility of intersections, pedestrian crossings, or street signs. Obstructions may negatively affect a driver's ability to safely react to approaching traffic of all modes.

A list of the standard drawings that should be referenced for the design of boulevards can be found in Appendix A: Standard Drawings (list).

### **3.12 Access and Driveways**

All construction and modification of City of Saskatoon sidewalks, curbs, and ditches require approval by the City of Saskatoon and must conform to standard drawings. Prior approval is required before construction of a driveway. In general, access to private property is only considered as shown in Table 8. Safety and operational factors are the main considerations when determining access.

*Table 8: Land Access by Classification*

<b>Street Classification</b>	<b>Land Service/Access</b>
<b>Freeway/ Expressway</b>	No Access
<b>Arterial</b>	Some/Rigid Access Control depending on anticipated traffic volumes and operation
<b>Collector</b>	Traffic movement and land access of equal importance
<b>Local</b>	Land access primary function
<b>Lane</b>	Land access only function

A Transportation-System Impact Study (TIS) may be required for developments once the Concept Plan analysis has been completed and more is known about the density of development, or 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 driveways are listed in Appendix A: Standard Drawings (list). Wherever possible, the grade change through a driveway should occur through the amenity strip so as not to effect sidewalk cross slope grades.

### **3.13 Buffer Strips**

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

Buffer strips are implemented to improve the physical and/or sound qualities between adjacent land uses. Buffer strips shall be provided along restricted access sections of Provincial Highways, adjacent to interchanges, along the rights-of-way of freeways and controlled access arterials, and where a residential subdivision abuts a railway right-of-way or station grounds, airport, or major industrial area.

### **3.14 Ancillary Structures**

Ancillary structures include sound attenuation, fencing, roadside safety systems, 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: Standard Drawings (list).

#### **3.14.1 Sound Attenuation**

Sound attenuation measures should be implemented in accordance with City of Saskatoon *Council Policy C07-028 – Traffic Noise Sound Attenuation*. The proponent is responsible for traffic noise mitigation in new developments.

Noise barriers can be earth berms, sound walls, or a combination of the two. Standard drawings that should be referenced for the design of sound attenuation measures are listed in Appendix A: Standard Drawings (list).

#### **3.14.2 Fencing**

Fencing shall be provided along each street type as described in Table 9. Fencing is typically chain link or a suitable alternative.

*Table 9: Fencing Requirements*

<b>Street Classification</b>	<b>Fencing Requirement</b>
<b>Freeway/Expressway</b>	Fencing or other barrier shall be provided along the entire right-of-way; the minimum height shall be 1.8 meters
<b>Arterial</b>	Fencing required along the right-of-way where pedestrian access is not allowed from private property; the minimum height shall be 1.8 meters
<b>Collector</b>	No fencing required
<b>Local</b>	No fencing required
<b>Lane</b>	No fencing required

### **3.14.3 Roadside Safety Systems**

Roadside safety systems shall be designed in accordance with the GDG.

### **3.14.4 Illumination**

Full illumination shall be provided on all freeways/expressways, arterials, collectors, and local streets. Lanes do not require lighting. Sidewalks, cycling facilities, and intersections shall require illumination to increase pedestrian, cyclist, and intersection safety. The level of illumination for streets, sidewalks, and intersections shall be in accordance with the *Illumination Engineering Society of North America, RP-8, Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting*. Saskatoon Light and Power shall review all street lighting designs prior to approval.

Temporary roadways, and/or roadways used to support development, shall be assessed, at a minimum, once per year by the proponent to determine if illumination is required in accordance with the illumination warrants in the *TAC Guide for the Design of Roadway Lighting*. Important intersections shall be illuminated at the start of occupation of the development. The proponent is responsible for illumination of temporary roadways and intersections.

### **3.14.5 Traffic Control Devices**

Traffic control devices include all pavement markings, traffic signs, and traffic signals required to operate the transportation system in a safe and efficient manner. The City of Saskatoon shall follow, as closely as practical, the guidelines established by the *Manual for Uniform Traffic Control Devices for Canada* (MUTCDC).

The City of Saskatoon shall be responsible for the identification, design, manufacture, and installation of all traffic control devices. Proponents are responsible for the cost of design, manufacture, and installation of all traffic control devices. Controls shall be provided as described in Table 10 for each street classification.

*Table 10: Traffic Control Device Requirements*

<b>Street Classification</b>	<b>Traffic Control Devices</b>
<b>Freeway/Expressway</b>	<ul style="list-style-type: none"> <li>• Longitudinal lane pavement markings are required</li> <li>• Durable pavement markings shall be used</li> </ul>
<b>Arterial</b>	<ul style="list-style-type: none"> <li>• Longitudinal lane pavement markings required</li> <li>• Pedestrian crossing markings and signs are required</li> <li>• Traffic signals and pedestrian crossing devices are required as warranted and should be installed prior to street opening</li> </ul>
<b>Collector</b>	<ul style="list-style-type: none"> <li>• Longitudinal lane pavement markings may be required</li> <li>• Pedestrian crossing markings and signs may be required at significant intersections</li> <li>• All traffic control devices and pavement markings shall be installed prior to street opening</li> </ul>
<b>Local</b>	<ul style="list-style-type: none"> <li>• No longitudinal lane pavement markings required</li> <li>• Pedestrian markings may be required at significant intersections</li> <li>• All traffic control devices and pavement markings shall be installed prior to street opening</li> </ul>
<b>Lane</b>	<ul style="list-style-type: none"> <li>• No traffic control devices required</li> </ul>

### **3.14.6 Guide Signage and Street Name Signs**

Guide signage shall be provided on the freeway/expressway network and shall be primarily directed to drivers who are not familiar with the route. Signing shall provide clear instructions for orderly progress to their destination. As such, guide signs form an integral part of any freeway/expressway and shall be designed concurrently with the roadways geometric design and roadside safety system design. Guide signs shall be installed prior to street opening.

Neighbourhood street name signs shall be installed as streets are opened and shall be designed in accordance with City of Saskatoon standards.

### 3.14.7 Underground Utilities

**When placing utilities, consideration should be given to the location of other infrastructure including but not limited to water and sewer mains, water and sewer service connections, hydrants, catch basins, valves, manholes, trees, sidewalks, cycling facilities, curbs and other shallow buried utilities.**

The locations of underground utilities should be designed to not impede accessibility of the transportation network. Catch basins, maintenance covers, and utility boxes should not be located within the accessible route, including crosswalks, accessibility ramps, refuge areas, and other pedestrian pathways. Consideration should also be made in regards to locating utilities within cycling facilities. If utilities must be located within a cycling facility, appropriate grate type and direction must be installed.

**All street classifications should, wherever possible, preserve areas for tree planting free of utilities. Utilities within the boulevard or amenity strips should have adequate setbacks from areas reserved for tree planting.**

### 3.15 Intersections

An intersection is a location where two or more streets join or cross at-grade. An intersection shall provide for the movement of pedestrians, cyclists, and motor vehicles. An at-grade intersection differs from a grade-separated interchange in terms of capacity, operation, cost of construction and maintenance, safety, complexities of design features, signing, and traffic signals.

Intersections should be spaced based on function, traffic volumes, and relative presence of various street user modes. Typical intersection spacing is outlined in Table 11.

*Table 11: Minimum Intersection Spacing*

Groups	Typical Minimum Spacing (m)				
	Freeway/ Expressway	Arterial	Collector	Local	Lane
<b>Freeway/Expressway</b>	800-1600	800			
<b>Arterial</b>	800	200-400	200		
<b>Collector</b>		200	60	60	
<b>Local</b>			60	60	N/A
<b>Lane</b>				N/A	N/A

\*Blank cells indicate connection not permitted.

The City shall be responsible for the design of any intersection that involves an arterial street or freeway/expressway.

### 3.15.1 Corners, Curb Radius, and Sight Triangles

Intersection corners should be designed to safely accommodate the movement of all expected street users, including pedestrians, cyclists, transit vehicles, personal vehicles, and commercial vehicles.

The selection of corner radius shall be completed by analyzing the turning templates of varying anticipated vehicles. These include:

- Design vehicle, which is the largest typical vehicle that will frequently use the street;
- Control vehicle, which is the largest vehicle that will infrequently use the street; and,
- Managed vehicle, which is the most common vehicle to use the street.

By analyzing each of these vehicles, a radius can be selected that accommodates all anticipated vehicles while minimizing the higher, more dangerous speeds that can be reached by the managed vehicle. Vehicle turning speeds should be minimized through an intersection, typically less than 20 km/h, to improve pedestrian safety. Typical vehicles that should be analyzed for each street classification are listed in Table 12:

*Table 12: Typical Design, Control, and Managed Vehicles*

<b>Street Classification</b>	<b>Design Vehicle</b>	<b>Control Vehicle</b>	<b>Managed Vehicle</b>
<b>Freeway/Expressway</b>	WB-20	As per TC - Division	Personal Vehicle
<b>Arterial</b>	Heavy Single Unit (HSU)	WB-20	Personal Vehicle
<b>Collector</b>	City Bus/ Medium Single Unit (MSU)	HSU	Personal Vehicle
<b>Local</b>	Garbage Truck	MSU	Personal Vehicle
<b>Lane</b>	Garbage Truck	Fire Truck	Personal Vehicle

\* There may be locations where alternate vehicles must be analyzed.

The corner radius and effective turning radius should also be considered when determining the appropriate corner radius. The effective turning radius of a vehicle is the space needed for the vehicle to make a right-turn from one lane to another that may cross parking and bicycle lanes. The corner radius should be minimized to lessen



pedestrian crossing times and provide greater comfort and safety for pedestrians. The actual corner radius should be defined after considering the effective turning radius. A list of the standard drawings that should be referenced for the design of corner radii can be found in Appendix A: Standard Drawings (list).

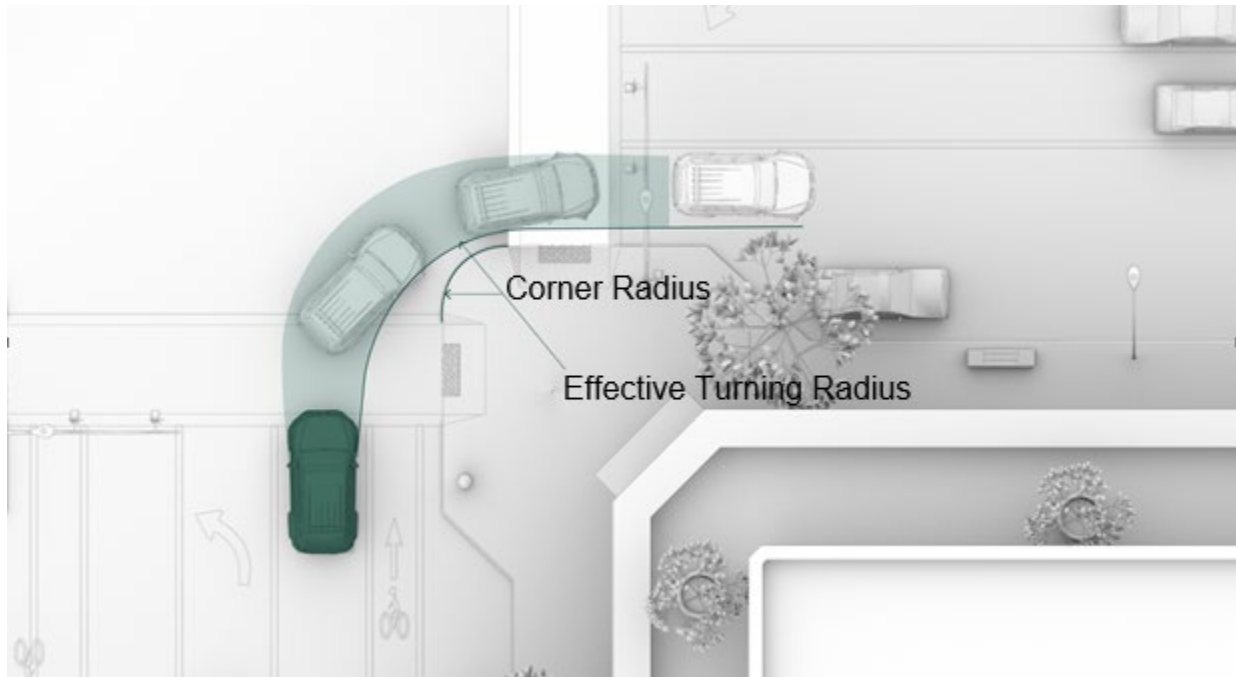


Figure 1: Corner Radius and Effective Turning Radius

Providing adequate sight lines and sight triangles is important for providing safe intersection operations. Corner visibility triangles shall be set aside as per City of Saskatoon specifications and the zoning bylaw.

### 3.15.2 Channelization

Channelization at an intersection may be implemented for a variety of reasons. Some of these reasons include:

- Provision of protected storage areas for turning vehicles;
- Segregate traffic movements into left-turning, right-turning, and through traffic streams;
- Separate and reduce areas of potential conflict and dilemma to ensure the driver is required to make only one decision at a time;
- Control the angle of merging traffic streams; and
- Provide a safe refuge area for pedestrians between the various traffic streams; etc.

Channelization should be considered as indicated in Table 13.

*Table 13: Channelization of Intersections*

	<b>Freeway/ Expressway</b>	<b>Arterial</b>	<b>Collector</b>	<b>Local</b>	<b>Lane</b>
<b>Freeway/ Expressway</b>	Always	Always	N/A	N/A	N/A
<b>Arterial</b>	Always	Considered	Considered	Never	Never
<b>Collector</b>	N/A	Considered	Never	Never	Never
<b>Local</b>	N/A	Never	Never	Never	Never
<b>Lane</b>	N/A	Never	Never	Never	Never

Turn bays shall have sufficient length to accommodate anticipated traffic queue lengths.

Traffic islands define the area between traffic lanes for control of vehicle movements in intersection areas or for pedestrian refuge. Traffic islands may be considered on all street types, excluding freeways/expressways and lanes.

Design of channelization shall ensure the accessibility of the intersection is maintained. Traffic islands shall incorporate accessibility ramps for all movements and maintain clear areas at the top of each ramp to provide an acceptable landing area for refuge. A list of standard drawings for reference in the design of channelization is provided in Appendix A: Standard Drawings (list).

### **3.15.3 Anticipated Traffic Operations**

Anticipated traffic operations should be considered during the design of an intersection. These traffic operations decisions affect the geometric design of an intersection in many ways including lane assignment, turn bay lengths, style of turn bays, inclusion of channelization, and intersection size. Simultaneous left turns of the design vehicle must be accommodated in the design of the intersection.

### **3.15.4 Traffic Calming**

Traffic calming is used to enhance the safety and functionality of the City's streets, while ensuring access to properties and accommodating all modes of travel in a safe and appropriately designed environment.

Traffic calming should be considered in accordance with the City of Saskatoon *C07-029 – Traffic Calming Policy*. Additionally, traffic calming considerations should be considered when development occurs that could affect adjacent streets in a manner that could be mitigated by installation of traffic calming. The developer shall be responsible

for identifying locations and installing appropriate traffic calming measures in these circumstances.

### **3.15.5 Roundabouts**

The planning, traffic operation, and design of roundabouts shall be governed by the guidelines presented in the Transportation Association of Canada (TAC) *Canadian Roundabout Design Guide*.

### **3.15.6 Interchanges**

Interchanges may be an appropriate intersection design choice for some locations since they permit high traffic volumes to operate safely and unimpeded on the intersecting streets. Crossing conflicts are eliminated by grade separation and turning conflicts are minimized depending on the configuration of the interchange. Interchanges shall accommodate pedestrian and cyclist movements where they are permitted.

All interchange designs shall be designed in compliance with the GDG. Generally, interchange cross-sections shall be designed with the criteria listed in Table 14.

*Table 14: Interchange Design*

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

### **3.16 Private Streets**

Private streets may be developed at the local level or through industrial development. Proponents and/or the property owner are fully responsible for the construction and maintenance of these streets. Intersections of public streets and private streets will be considered as driveways and subject to the guidance provided in Access and Driveways.

### **3.17 Horizontal Alignment**

Horizontal alignment refers to the configuration of the streets as seen in plan view, consisting of tangent sections, circular curves, and spiral transitions. All horizontal alignments shall be designed following the GDG with the following provisions:

- The minimum centerline radius of curves shall be 660 meters.
  - On low speed local urban streets, lower radii may be considered as per the methods in the GDG.
    - The absolute minimum centerline radius of curves shall be 105 meters for short lengths of curve;
    - These minimum values shall only be used in extremely difficult design circumstances for low speed urban streets and account for normal crown and ideal conditions.
- Transition spirals shall be used on all curves with the length of spiral based on GDG design criteria.
  - The minimum length of the spiral shall be 50 meters.
- Broken back curves (two curves in the same direction) shall have a minimum tangent length between curves of 250 meters.

### **3.17.1      Superelevation**

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. Maximum rates of superelevation can also be controlled by factors such as climatic conditions, terrain, type of environment, frequency of slow-moving vehicles, and maintenance.

The City of Saskatoon has adopted the GDG standards for superelevation, and streets shall be designed in accordance with the GDG.

- Lanes, local streets, and collector streets shall not be superelevated.
- Arterials may only be superelevated if they are access controlled.
- For design of superelevated curves on freeways and expressways of rural cross-section:
  - A rate of superelevation of  $e = 0.06$  m/m is typical.
  - 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 (2.5%).
  - 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.

### **3.18 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 the GDG.

#### **3.18.1 Longitudinal Gradients**

Longitudinal grades are expressed as a percentage; that is rise or fall in metres over a horizontal length of 100 meters. Grades should be designed in compliance with the GDG. Generally, longitudinal gradients shall be:

- A maximum of 5%.
  - This maximum slope has been identified to increase accessibility and improve cycling comfort; steeper gradients may be considered where topography does not permit a 5% maximum grade.
- A minimum of 1% on graded areas for drainage.
- A minimum of 0.5% on curbed roadways to accommodate surface drainage.
- A minimum of 1.0% 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.

#### **3.18.2 Vertical Curves**

Vertical curves provide a smooth transition between adjacent grades and can be either crest or sag curves. Factors impacting the design of vertical curves include stopping sight distance, decision sight distance, riding comfort and safety, 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 the GDG.

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 should be verified using GDG standards during the design phase.

## **4 Street Design**

The City of Saskatoon uses the following street classifications to define the street network:

- Freeways/Expressways
- Arterials
- Collectors
- Locals
- Lanes

These classifications are described in further detail in this chapter. Indicative cross-sections and street design checklists are listed in Section 5, Indicative Cross Sections and should be referenced for the design of streets.

A complete list of attributes for each of the street classifications can be found in Table 15.

Within Table 15, residential is considered for low-density single family housing development, and commercial is considered for multi-family, commercial, institutional, and industrial land uses.

*Table 15: Street Classification Characteristics*

	Lanes		Locals		Collectors		Arterials		Freeways/ Expressways
Characteristic	Residential	Commercial	Residential	Commercial	Residential	Commercial	Minor	Major	
<b>Traffic Service Function</b>	Land access function only (traffic movement not a consideration)		Land access primary function (traffic movement secondary consideration)		Traffic movement and land access of equal importance		Traffic movement major consideration	Traffic movement primary consideration	Traffic movement primary consideration
<b>Land Service/ Access</b>	Land access only function		Land access primary function		Traffic movement and land access of equal importance		Some access control	Rigid access control	No access
<b>Typical Traffic Volume (veh/day)</b>	<500	<1,000	<1,000	<5,000	<5,000	8,000 – 10,000	5,000 – 25,000		>20,000 >10,000
<b>Traffic Flow Characteristics</b>	Interrupted flow		Interrupted flow		Interrupted flow		Uninterrupted flow except at signals and crosswalks		Uninterrupted flow except at signals Free-flow (grade separated)
<b>Typical Posted Speed Limits (kph)</b>	20		50		50		50-70		80-90
<b>Typical Vehicle Type</b>	Passenger and service vehicles	All types	Passenger and service vehicles	All types	Passenger and service vehicles	All types	All types	All types, large portion of trucks	All types, large portion of trucks
<b>Desirable Network Connections</b>	Lanes, Locals		Lanes, Locals, Collectors		Locals, Collectors, Arterials		Collectors, Arterials, Freeways/Expressways		Arterials, Freeways/Expressways
<b>Transit Service</b>	Not permitted		Generally avoided		Permitted		Permitted		Express buses only
<b>Cyclist Facilities</b>	No restrictions or special facilities		No restrictions or special facilities		No restrictions; special facilities considered		No restrictions; special facilities considered		Prohibited*
<b>Pedestrians Facilities</b>	Permitted, no special facilities		Sidewalks provided both sides		Sidewalks provided both sides, separation from traffic lanes preferred		Sidewalks provided both sides, separation from traffic lanes required		Prohibited*
<b>Typical Parking Restrictions</b>	Some restrictions		No restrictions or restrictions one side only		Few restrictions other than peak hour		Permitted, restricted or prohibited	Prohibited or peak hour restrictions	Prohibited
<b>Minimum Intersection Spacing (m)</b>	As needed		60		60		200	400	800 or 1,600 between interchanges
<b>Typical Right-of-Way Width (m)</b>	6		15–22		21–41		33–43		75-125

\*May be considered beyond the clear zone

#### **4.1 Freeway/Expressway**

Freeways and expressways are intended to carry large volumes of traffic at high speeds. They expedite the movement of through traffic across the City and should operate as uninterrupted flow. Freeways and expressways typically intersect only with other freeways/expressways or the arterial street network.

Traffic movement is the primary consideration, while access to adjacent land is prohibited. Buffer strips are implemented to control access to private property. Freeways and expressways must also be separated from adjacent lands through fencing or other barrier structures. This may include sound attenuation walls.

Freeways and expressways typically include the following street elements for consideration:

- Driving lanes;
- Median;
- Multi-use pathway;
- Shoulders;
- Rounding;
- Side slopes;
- Drainage channel;
- Buffer strip;
- Berm;
- Fencing;
- Sound attenuation;
- Clear zone; and
- Roadside safety systems.

Each of these elements should be considered when designing a freeway or expressway. Additional details can be found in Section 5, Indicative Cross Sections.

#### **4.2 Arterial**

Arterial streets 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 streets should operate as uninterrupted flow except at signals and crosswalks. In many cases they will include frequent transit



services to local area land uses and travel across the City. Arterial streets may connect to freeway/expressways, arterials, and collectors.

Traffic movement is the primary consideration while land access is a secondary consideration in the design of the arterial network. Land access shall be prohibited or strictly controlled to minimize impact to the street operation. Access to arterials will be subject to the approval of the Transportation Department and will be determined at the Concept Plan stage. Access will also be governed by *Bylaw 4785 – Sidewalks – Private Crossings Over, 1968*; the City of Saskatoon *Private Driveway Crossing Guidelines*; and the City of Saskatoon *Median Openings Policy*. Buffer strips shall be implemented to control access to private property. Median openings on divided arterials shall only be considered if sufficient adjacent land access demand is established and the proposed median opening meets the intersection spacing guidelines outlined in the GDG.

Arterial streets typically include the following street elements for consideration:

- Sidewalks on both sides and AAA cycling facilities, or multi-use pathways;
- On-street parking;
- Driving lanes;
- Median;
- Amenity strip;
- Boulevard;
- Buffer strip; and
- Berm.

Each of these elements should be considered in conjunction with land use plans and built form context. Transit considerations should also be made when planning the street function and elements. Additional details can be found in Section 5, Indicative Cross Sections.

### **4.3 Collector**

Collector streets are intended to provide both traffic movement and land access. Collector streets typically provide neighbourhood-wide connections and may connect to arterial, collector, and local streets. Full access to adjacent land is generally provided. Access restrictions are governed by *Bylaw 4785 – Sidewalks – Private Crossings Over, 1968* and the City of Saskatoon *Private Driveway Crossing Guidelines*.

Transit service may be present on collector streets. Additionally, special cycling facilities may be considered on the collector network. This is dependent on the

neighbourhood AAA cycling network provisions, land use, expected traffic volumes, and recommendations in the *Active Transportation Plan*.

Collector streets typically include the following street elements for consideration:

- Sidewalks on both sides;
- Cycling facilities;
- On-street parking;
- Travel lanes;
- Median;
- Amenity strip; and
- Boulevard.

Each of these elements should be considered in conjunction with land use plans and built form context. Additional details can be found in Section 5, Indicative Cross Sections.

#### **4.4 Local**

The primary function of local streets is land access with traffic movement as a secondary consideration. Local streets are not intended to carry large volumes of traffic, but primarily traffic with an origin or destination along its length. Local streets may connect to collector streets, local streets, and lanes.

Local streets are generally found within residential neighbourhoods, servicing residential land use. Local streets may also be found in industrial areas, servicing industrial and commercial land uses.

Local streets typically include the following street elements for consideration:

- Sidewalks on both sides;
- Shared on-street cycling facilities;
- On-street parking;
- Travel lanes;
- Amenity strip; and
- Boulevard.

Each of these elements should be considered in conjunction with land use plans and built form context. Additional details can be found in Section 5.0.

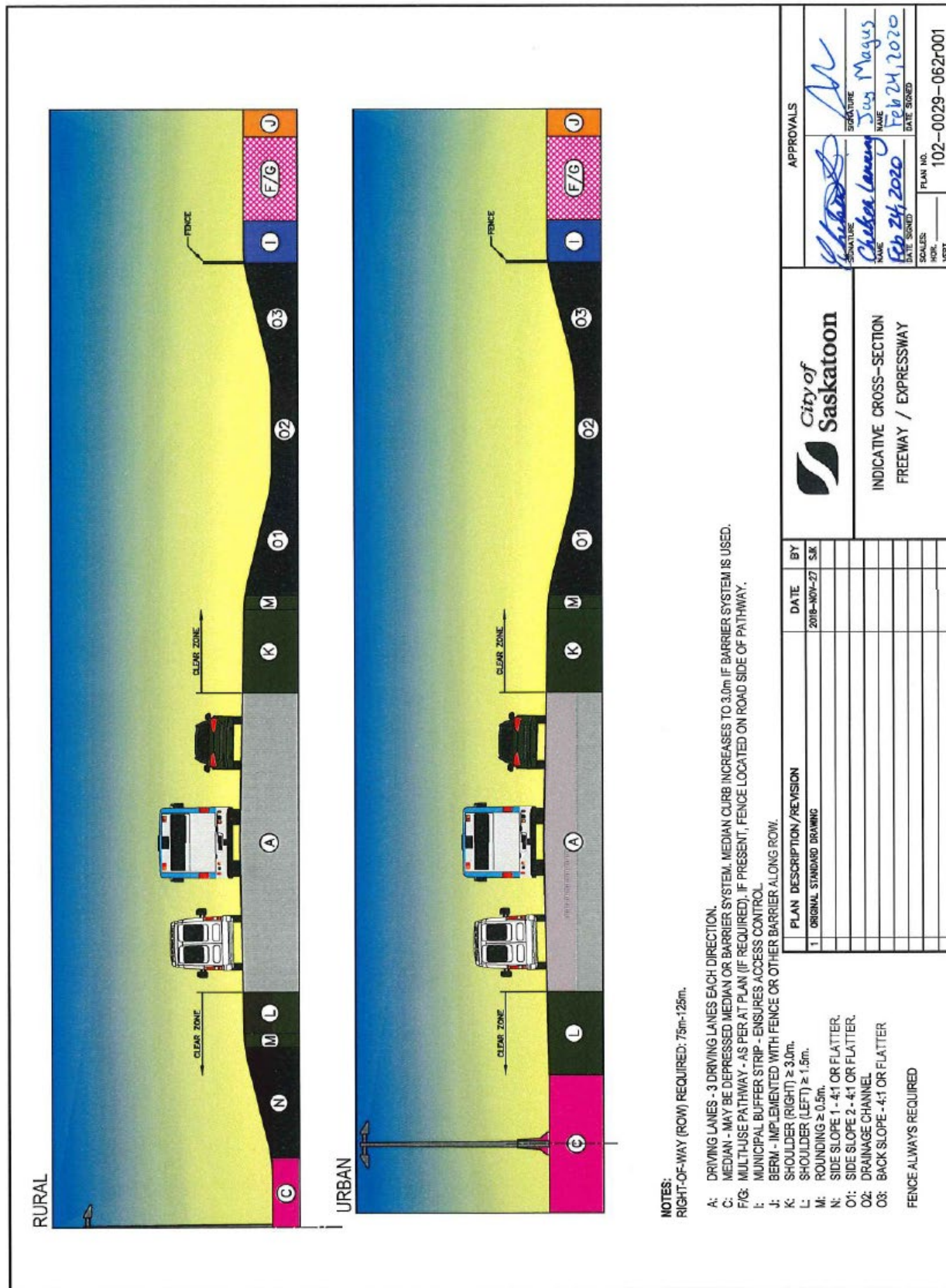
#### **4.5 Lane**

Lanes are intended to provide land access. Lanes are not intended to carry large volumes of traffic, but primarily traffic with an origin or destination along its length. Full access to adjacent land is provided and lanes may connect to collector streets, local streets, or other lanes.

If lanes are provided, they shall be constructed as an asphalt concrete or granular base roadway covering the entire 6.0 metre right-of-way. When lanes intersect other lanes, or deflect, corner visibility triangles are required.

### **5 Indicative Cross Sections**

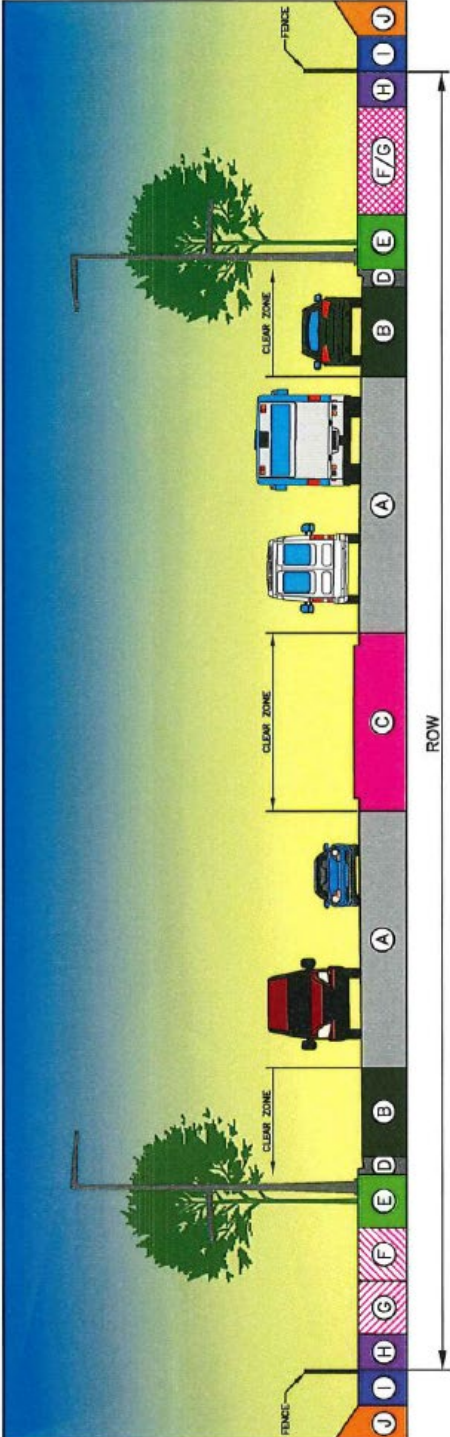
Freeway/Expressway			Street Design Checklist Definition & Design Elements	
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
10,000 +		4-6	75m – 125m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
N/A		N/A	Stops Not Permitted	
TRUCK ROUTE		PARKING	POSTED SPEED	
Yes		Prohibited	80 - 90 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
Not Required		Required	102-0029-062r001	
FUNCTION				
<ul style="list-style-type: none"><li>Intended to carry large volumes of traffic moving at high speeds. They expedite movement of through traffic across the City.</li><li>Uninterrupted flow.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties		Not Permitted	<ul style="list-style-type: none"><li>Access to individual properties is prohibited</li><li>Buildings are not street oriented</li></ul>	
Commercial Properties		Not Permitted		
Multi-Unit Residential Properties		Not Permitted		
Low-Rise Residential Properties		Not Permitted		
Park		Not Permitted		
Community Centre		Not Permitted		
School/Institutional		Not Permitted		
NOTES		<ul style="list-style-type: none"><li>Access to adjacent land is prohibited.</li><li>Connections to arterial streets.</li></ul>		
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width	Generally 3.7m (GDG Table 4.2.2)	Illumination	Median or roadside
B	Parking	Prohibited	Sound Attenuation	Required
C	Median	May be ditch or barrier system (GDG Section 4.5)	Traffic Control	Free-flow
D	Curb & Gutter	N/A	Pedestrian Crossings	Grade separated
E	Amenity Strip	N/A	Accessibility	Ramps required
F	Cycling Facility	N/A	Active Transportation Network	Shared pedestrian and cycling facilities may be considered beyond the clear zone (GDG Table 7.3.1)
G	Sidewalk	N/A		
F/G	Multi-Use Pathway	May be considered on backslope		
H	Boulevard	N/A		
K	Shoulder (right)	Minimum 3.0m (GDG 4.4.2.1)	Clear Zone	(GDG Section 7.3)
L	Shoulder (left)	Minimum 1.5m (GDG 4.4.2.1)		
M	Rounding	Minimum 0.5m (GDG 4.4.5)	Fencing	Always Present
N	Side Slope 1	4:1 or flatter (GDG Figure 4.5.1 & Section 4.5.2)	Traffic Barrier Systems	(GDG Section 7.6)
O1	Side Slope 2	4:1 or flatter (GDG 7.4.1)		
O2	Drainage Channel	(GDG 7.4.1)		
O3	Back Slope	4:1 or flatter (GDG 7.4.1)		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	1.0m		
J	Berm	Implemented with fence or other barrier along entire ROW		



Arterial Major		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
5,000 – 25,000		4 - 6	34 – 43 m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium - High		AAA Likely	Local or BRT Likely	
TRUCK ROUTE		PARKING	POSTED SPEED	
Delivery Route		Not Permitted	50 – 70 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
May be Required		May be Required	102-0029-061r001	
FUNCTION				
<ul style="list-style-type: none"><li>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.</li><li>Uninterrupted flow except at signals and crosswalks.</li><li>In many cases they will include frequent transit services to local area land uses and travel across the City.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties	Possible	<ul style="list-style-type: none"><li>Integrated with mixture of retail, office, and residential.</li><li>Rigid access control</li><li>Buildings should be street oriented or provide pedestrian linkages when oriented to back the street.</li></ul>		
Commercial Properties	Likely			
Multi-Unit Residential Properties	Likely			
Low-Rise Residential Properties	Not Desirable			
Park	Not Likely			
Community Centre	Possible			
School/Institutional	Possible			
NOTES				
<ul style="list-style-type: none"><li>Traffic movement is the primary consideration while land access is secondary.</li><li>Full channelization at intersections with freeways/expressways and controlled access, high speed arterials. Otherwise channelization not required (low speed arterials and collectors).</li><li>Increased intersection spacing if warranted by higher traffic volumes.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width	3.2 – 3.6m	Illumination	Median or roadside
	Turn Lane Width	3.0 – 3.6m		
B	Parking	Not permitted	Sound Attenuation	See policy C07-028
C	Median	Varies	Traffic Control	Traffic signals/roundabout as warranted
	Paved Shoulder	None		
D	Curb & Gutter	Vertical curb varies with parking provision	Pedestrian Crossings	At-grade, marked
E	Amenity Strip	Minimum 2.0m	Accessibility	Curb ramps required
F	Cycling Facility	Protected facility, both sides; and	Clear Zone	(GDG Section 7.3)
G	Sidewalk	Minimum 2.5m, both sides; or	Fencing	To be installed when street is adjacent to back yards
F/G	Multi-Use Pathway	Minimum 3.0; offset from street 1.5m		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	Employed to control access to private property		
J	Berm	May be implemented when land use backs street		
Arterial Minor		Street Design Checklist Definition & Design Elements		



DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
5,000 – 25,000		4 - 6	33 – 43 m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium - High		AAA Likely	Local or BRT Likely	
TRUCK ROUTE		PARKING	POSTED SPEED	
Delivery Route		May be Permitted	50 – 70 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
May be Required		May be Required	102-0029-061r001	
FUNCTION				
<ul style="list-style-type: none"><li>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.</li><li>Uninterrupted flow except at signals and crosswalks.</li><li>In many cases they will include frequent transit services to local area land uses and travel across the City.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties		Possible	<ul style="list-style-type: none"><li>Integrated with mixture of retail, office, and residential.</li><li>Access to individual properties to be managed.</li><li>Buildings should be street oriented or provide pedestrian linkages when oriented to back the street.</li></ul>	
Commercial Properties		Likely		
Multi-Unit Residential Properties		Likely		
Low-Rise Residential Properties		Not Desirable		
Park		Not Likely		
Community Centre		Possible		
School/Institutional		Possible		
NOTES				
<ul style="list-style-type: none"><li>Traffic movement is the primary consideration while land access is secondary.</li><li>Full channelization at intersections with freeways/expressways and controlled access, high speed arterials. Otherwise channelization not required (low speed arterials and collectors).</li><li>Increased intersection spacing if warranted by higher traffic volumes.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width Turn Lane Width	3.2 – 3.6m 3.0 – 3.6m	Illumination	Median or roadside
B	Parking	May be permitted	Sound Attenuation	See policy C07-028
C	Median	Varies	Traffic Control	Traffic signals/ roundabout as warranted
	Paved Shoulder	None		
D	Curb & Gutter	Vertical curb varies with parking provision	Pedestrian Crossings	At-grade, marked
E	Amenity Strip	Minimum 2.0m	Accessibility	Curb ramps required
F	Cycling Facility	Protected facility, both sides; and	Clear Zone	(GDG Section 7.3)
G	Sidewalk	Minimum 2.5m, both sides; or	Fencing	To be installed when street is adjacent to back yards
F/G	Multi-Use Pathway	Minimum 3.0; offset from street 1.5m		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	Employed to control access to private property		
J	Berm	May be implemented when land use backs street		



**NOTES:**

RIGHT-OF-WAY (ROW) REQUIRED: 30m-43m.

A: DRIVING LANES - 4 OR 6 DRIVING LANES. (SEE FUNCTIONAL PLAN)

B: PARKING LANES - MAY BE PRESENT BASED ON LAND USE IF POSTED SPEED LIMIT ≤ 50kph.

C: MEDIAN - MAY CONTAIN ROADWAY LIGHTING, LEFT TURN BAYS AND ACCESS CONTROL.

D: CURB & GUTTER - VERTICAL CURB: 150mm IF PARKING IS PRESENT, OTHERWISE 200mm.

E: AMENITY STRIP - MAY CONTAIN ROADWAY LIGHTING, TRANSIT WAITING AREAS, BICYCLE PARKING, STREET TREES AND OTHER AMENITIES.

F: CYCLING FACILITY - ALL AGES & ABILITIES (AAA) FACILITY REQUIRED.

G: SIDEWALK - PEDESTRIAN FACILITY REQUIRED ON BOTH SIDES OF STREET.

F/G: MULT-USE PATHWAY - PEDESTRIAN & CYCLIST COMBINED FACILITY MAY BE APPROPRIATE BASED ON ADJACENT LAND USE.

H: BOULEVARD - COULD BE HARD OR SOFT-SCAPED DEPENDING ON ADJACENT LAND USE. MAY CONTAIN UTILITIES.

I: BUFFER STRIP - IMPLEMENT IF STREET IS FULL ACCESS CONTROLLED.



J: BERM - ONLY IMPLEMENTED IN CONJUNCTION WITH BUFFER STRIP.

FENCE OPTIONAL

**PLAN DESCRIPTION/REVISION**

1	DATE	BY
1	2018-NOV-27	SJK

**APPROVALS**

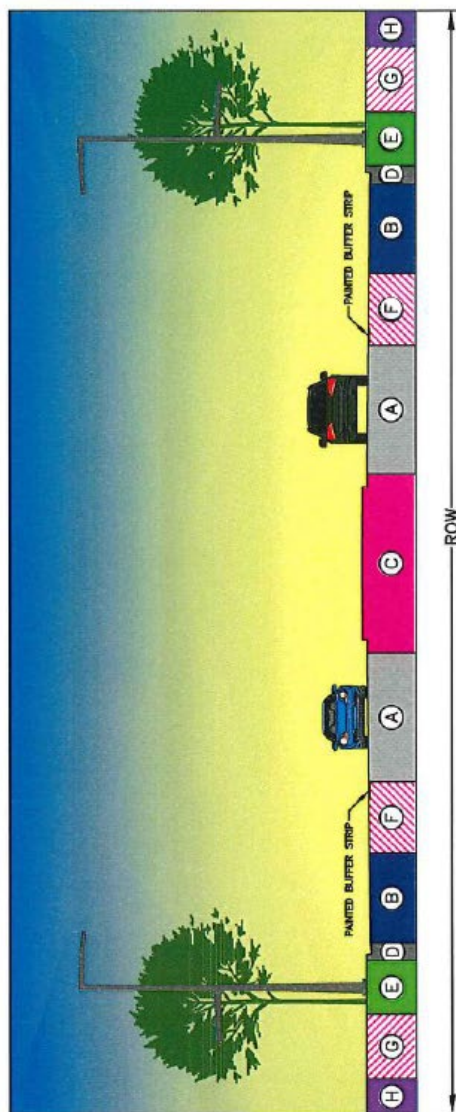
SIGNATURE	NAME	DATE
	Chris Leary	Feb 24, 2020
	Sara Magnus	Feb 24, 2020

SCALE: HOR: VERT: 102-0029-061r001



Collector Commercial		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
8,000 – 10,000		2	22m – 41m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium - High		See AT Plan	Permitted	
TRUCK ROUTE		PARKING	POSTED SPEED	
Delivery Route		Permitted	50 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
May be Required		N/A	102-0029-060r001	
FUNCTION				
<ul style="list-style-type: none"><li>Intended to provide both traffic movement and land access. Collectors carry traffic between local and arterial streets.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties	Possible	<ul style="list-style-type: none"><li>Integrated with mixture of retail and residential.</li><li>Access to individual properties to be managed.</li><li>Buildings should be street oriented.</li></ul>		
Commercial Properties	Possible			
Multi-Unit Residential Properties	Likely			
Low-Rise Residential Properties	Possible			
Park	Likely			
Community Centre	Possible			
School/Institutional	Possible			
NOTES				
<ul style="list-style-type: none"><li>Full access to adjacent land is generally provided.</li><li>No direct access to a collector shall be allowed within 60m of its intersection with an arterial street.</li><li>Connections to arterial, collector, and local streets.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width Turn Lane Width	3.2 – 3.6m 3.0 – 3.6m	Illumination	Median or roadside
B	Parking	Permitted	Sound Attenuation	Not required
C	Median	Optional, varies	Traffic Control	Traffic signals/ roundabout as warranted
D	Curb & Gutter	Vertical curb varies with parking provision		
E	Amenity Strip	Minimum 2.0m	Pedestrian Crossings	At-grade, marked
F	Cycling Facility	Exclusive facility may be considered; see AT Plan	Accessibility	Curb ramps required
G	Sidewalk	Minimum 1.8m, both sides		
F/G	Multi-Use Pathway	N/A		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	N/A		
J	Berm	N/A		

Collector Residential		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
< 5,000		2	22m – 41m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium - High		See AT Plan	Permitted	
TRUCK ROUTE		PARKING	POSTED SPEED	
Delivery Route		Permitted	50 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
May be Required		N/A	102-0029-060r001	
FUNCTION				
<ul style="list-style-type: none"><li>Intended to provide both traffic movement and land access. Collectors carry traffic between local and arterial streets.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties	Possible	<ul style="list-style-type: none"><li>Integrated with mixture of retail and residential.</li><li>Access to individual properties to be managed.</li><li>Buildings should be street oriented.</li></ul>		
Commercial Properties	Possible			
Multi-Unit Residential Properties	Likely			
Low-Rise Residential Properties	Possible			
Park	Likely			
Community Centre	Possible			
School/Institutional	Possible			
NOTES				
<ul style="list-style-type: none"><li>Full access to adjacent land is generally provided.</li><li>No direct access to a collector shall be allowed within 60m of its intersection with an arterial street.</li><li>Connections to arterial, collector, and local streets.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width Turn Lane Width	3.2 – 3.6m 3.0 – 3.6m	Illumination	Median or roadside
B	Parking	Permitted	Sound Attenuation	Not required
C	Median	Optional, varies	Traffic Control	Traffic signals/ roundabout as warranted
D	Curb & Gutter	Vertical curb varies with parking provision		
E	Amenity Strip	Minimum 2.0m	Pedestrian Crossings	At-grade, marked
F	Cycling Facility	Exclusive facility may be considered; see AT Plan	Accessibility	Curb ramps required
G	Sidewalk	Minimum 1.8m, both sides		
F/G	Multi-Use Pathway	N/A		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	N/A		
J	Berm	N/A		



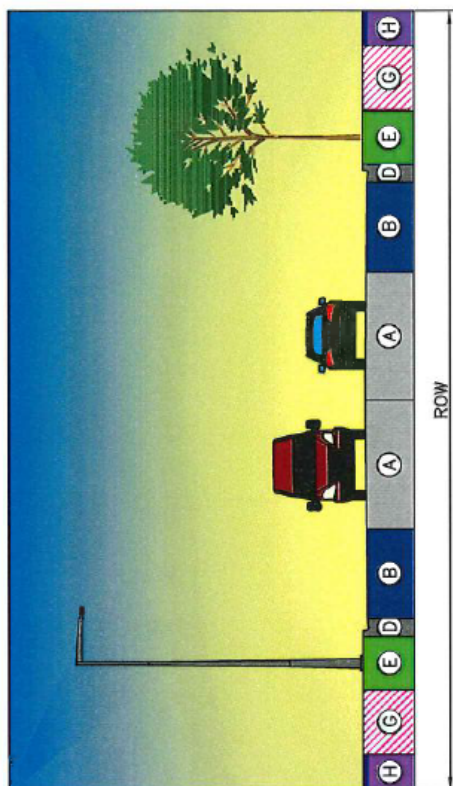
NOTES:  
RIGHT-OF-WAY (ROW) REQUIRED: 21m-41m

- A: DRIVING LANES - 2-4 DRIVING LANES.  
B: PARKING LANE - UNMARKED, BOTH SIDES.  
C: MEDIAN - MAY BE PRESENT, MAY CONTAIN ROADWAY LIGHTING.  
D: CURB & GUTTER - 150mm VERTICAL CURB.  
E: AMENITY STRIP - MAY CONTAIN ROADWAY LIGHTING, TRANSIT WAITING AREAS, STREET TREES & OTHER AMENITIES.  
F: CYCLING FACILITY - FACILITY MAY BE REQUIRED (SEE AT PLAN), BOTH SIDES.  
G: SIDEWALK - PEDESTRIAN FACILITY REQUIRED ON BOTH SIDES OF STREET.  
H: BOULEVARD - COULD BE HARD OR SOFT-SCAPED DEPENDING ON ADJACENT LAND USE. MAY CONTAIN UTILITIES.

[illegible]

Local Commercial		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
< 5,000		2	15m - 22m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium		Yes	Not Permitted	
TRUCK ROUTE		PARKING	POSTED SPEED	
Property Access Only		Required	50 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
Not Required		N/A	102-0029-059r001	
FUNCTION				
<ul style="list-style-type: none"><li>Intended 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.</li><li>Interrupted flow.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties		Possible	<ul style="list-style-type: none"><li>Primarily residential land use</li><li>Full access to individual properties is provided, generally with vertical curb and gutter.</li><li>Buildings should be street oriented.</li></ul>	
Commercial Properties		Not Desirable		
Multi-Unit Residential Properties		Not Desirable		
Low-Rise Residential Properties		Possible		
Park		Possible		
Community Centre		Possible		
School/Institutional		Not Desirable		
NOTES				
<ul style="list-style-type: none"><li>Full access to adjacent land is provided.</li><li>Connections to collector streets, local streets, and lanes.</li><li>Shared space.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width	2 : minimum 3.4m	Illumination	Roadside
B	Parking	Required	Sound Attenuation	Not required
C	Median	N/A	Traffic Control	Stop and Yield
D	Curb & Gutter	Typically 150 vertical curb rolled curb only considered for Low-Rise Residential land use		
E	Amenity Strip	Minimum 2.0m	Pedestrian Crossings	At-grade
F	Cycling Facility	Shared on-street facility, both sides	Accessibility	Curb ramps required
G	Sidewalk	Minimum 1.5m, both sides		
F/G	Multi-Use Pathway	N/A		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	N/A		
J	Berm	N/A		

Local Residential		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)		NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT	
< 1,000		1 wide shared or 2 narrow	15m - 22m	
PEDESTRIAN VOLUME		CYCLING ROUTE	TRANSIT ROUTE	
Medium		Yes	Not Permitted	
TRUCK ROUTE		PARKING	POSTED SPEED	
Property Access Only		Required	50 kph	
TRAFFIC SIGNALS		SOUND ATTENUATION	PLAN NO.	
Not Required		N/A	102-0029-059r001	
FUNCTION				
<ul style="list-style-type: none"><li>Intended 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.</li><li>Interrupted flow.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties	Possible	<ul style="list-style-type: none"><li>Primarily residential land use</li><li>Full access to individual properties is provided, generally with rolled curb and gutter.</li><li>Buildings should be street oriented.</li></ul>		
Commercial Properties	Not Desirable			
Multi-Unit Residential Properties	Not Desirable			
Low-Rise Residential Properties	Possible			
Park	Possible			
Community Centre	Possible			
School/Institutional	Not Desirable			
NOTES				
<ul style="list-style-type: none"><li>Full access to adjacent land is provided.</li><li>Connections to collector streets, local streets, and lanes.</li><li>Shared space.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width	1 wide: minimum 4.0m; or 2 narrow: minimum 3.0m	Illumination	Roadside
B	Parking	Required	Sound Attenuation	Not required
C	Median	N/A	Traffic Control	Stop and Yield
D	Curb & Gutter	If back lane; 150 vertical curb If no back lane; rolled curb		
E	Amenity Strip	Minimum 2.0m	Pedestrian Crossings	At-grade
F	Cycling Facility	Shared on-street facility, both sides	Accessibility	Curb ramps required
G	Sidewalk	Minimum 1.5m, both sides		
F/G	Multi-Use Pathway	N/A		
H	Boulevard	Minimum 1.0m		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	N/A		
J	Berm	N/A		



## NOTES:

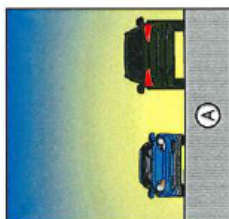
ROW (RIGHT-OF-WAY) REQUIRED: 15m-22m

- A: DRIVING LANES - 1 OR 2 DRIVING LANES.  
B: PARKING LANE - UNMARKED, BOTH SIDES.  
C: CURB & GUTTER - IF REAR LANES ARE PROVIDED FOR ADJACENT DEVELOPMENT, 150mm VERTICAL CURB, ELSE ROLLED CURB.  
D: AMENITY STRIP - MAY CONTAIN ROADWAY LIGHTING, STREET TREES & OTHER AMENITIES.  
E: SIDEWALK - PEDESTRIAN FACILITY REQUIRED ON BOTH SIDES OF STREET.  
F: G: BOULEVARD - MAY CONTAIN ROADWAY LIGHTING & OTHER AMENITIES.

[illegible]



Lane		Street Design Checklist Definition & Design Elements		
DAILY TRAFFIC VOLUME (vehicles/day)	NUMBER OF LANES	RIGHT-OF-WAY REQUIREMENT		
< 1,000	2	6m		
PEDESTRIAN VOLUME	CYCLING ROUTE	TRANSIT ROUTE		
Low	No	Not Permitted		
TRUCK ROUTE	PARKING	POSTED SPEED		
Property Access Only	Not Permitted	20 kph		
TRAFFIC SIGNALS	SOUND ATTENUATION	PLAN NO.		
Not Required	N/A	102-0029-058r001		
FUNCTION				
<ul style="list-style-type: none"><li>Intended to provide land access. Lanes are not intended to carry large volumes of traffic, but primarily traffic with an origin or destination along its length.</li><li>Interrupted flow.</li></ul>				
LAND USE & ACCESS CONDITIONS				
Industrial Properties	Not Desirable	<ul style="list-style-type: none"><li>Primarily residential or commercial/office land use</li><li>Full access to individual properties is provided</li></ul>		
Commercial Properties	Possible			
Multi-Unit Residential Properties	Not Desirable			
Low-Rise Residential Properties	Possible			
Park	Possible			
Community Centre	Possible			
School/Institutional	Not Desirable			
NOTES				
<ul style="list-style-type: none"><li>Full access to adjacent land is provided.</li><li>Connections to collector streets, local streets, and lanes.</li><li>Shared space.</li></ul>				
CROSS SECTION ELEMENTS			Additional Elements	
A	Travel Lane Width	Minimum 3.0m	Illumination	Not required
B	Parking	Not permitted	Sound Attenuation	Not required
C	Median	N/A	Traffic Control	Unmarked
D	Curb & Gutter	N/A; center drainage		
E	Amenity Strip	N/A	Pedestrian Crossings	At-grade
F	Cycling Facility	N/A	Accessibility	Must be accessible
G	Sidewalk	N/A		
F/G	Multi-Use Pathway	N/A		
H	Boulevard	N/A		
ADDITIONAL DEDICATIONS MAY BE REQUIRED				
I	Municipal Buffer Strip	N/A		
J	Berm	N/A		



## NOTES:

ROW (RIGHT-OF-WAY) REQUIRED: 6m

- A: DRIVING LANES - 2 DRIVING LANES USED FOR ACCESS TO PRIVATE PROPERTY, UTILITY ACCESS ETC. MAY BE USED FOR LOADING/UNLOADING ACTIVITIES IN COMMERCIAL AREAS.  
OR  
SHARED SPACE, ALL MODES; NO DELINEATION, NO SEPARATION.

[illegible]



## Appendix A: Applicable 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>	
102-0029-014	Bus Turnout Bay
102-0029-026	Design Vehicles Arterials, Expressways, Freeways & Highway Geometric Design
102-0029-027	Standard Neighbourhood Entrances, New Neighbourhoods Only
102-0029-031	Design Vehicle for Collectors and Roundabouts
102-0029-032	Class B Arterial Staging Options
102-0029-035	Cul-De-Sac – Residential, Commercial and Industrial Roadways
102-0029-045	Typical Road and Back Lane Subdrainage Details
102-0029-048	Design Vehicle Site Load Garbage Truck
102-0029-049	Design Vehicle Firetruck (E-One Cyclone)
102-0029-050	Design Vehicle Articulating Bus
102-0029-051	Design Vehicle Medium Single Unit Truck (MSU)
102-0029-052	Design Vehicle Heavy Single Unit Truck (HSU)
102-0029-053	Cross-Sections On-Street Bike Lane (Non All Ages & Abilities)
102-0029-054	Cross-Sections Buffered Bike Lane (Non All Ages & Abilities)
102-0029-055	Cross-Sections Protected Bike Lane (All Ages & Abilities)
102-0029-056	Cross-Sections Raised Cycle Track (All Ages & Abilities)
102-0029-057	Cross-Sections Multi-Use Pathway (All Ages & Abilities)
102-0029-058	Indicative Cross-Section Lane
102-0029-059	Indicative Cross-Section Local
102-0029-060	Indicative Cross-Section Collector
102-0029-061	Indicative Cross-Section Arterial
102-0029-062	Indicative Cross-Section Freeway/ Expressway
102-0029-063	Commercial and Downtown Streets with On-Street Parking on All Legs Corner Radius = 3m

Drawing Number	Title
102-0029-064	Local and Collector Streets with On-Street Parking on All Legs Corner Radius = 5m
102-0029-065	Industrial Streets Corner Radius = 15m
102-0029-066	Pedestrian Ramp Placement Local & Collector Intersections
102-0029-067	Pedestrian Ramp Placement Arterial Intersections
102-0029-068	Arterial – Arterial Intersection Unchannelized Layout
102-0029-069	Arterial – Arterial Intersection Channelized Layout
102-0029-070	Arterial Channelized Intersection 45 Degree Entry Angle Lane Drop
102-0029-071	Arterial Channelized Intersection High Entry Angle Lane Drop
<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
102-0002-006	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

<b>Drawing Number</b>	<b>Title</b>
102-0002-023	Sidewalk Ramp Details
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
102-0002-035	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
102-0002-049	Gutter Patch Paving
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
102-0002-062	Traffic Calming at a T-Intersection – School/Commercial Crossing
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
102-0008-002	Speed Hump Cross Sections (local streets)
102-0002-067	150 Vertical Curb & Gutter with Paver Lip
102-0002-069	Concrete Swale
102-0002-070	Cut-Through Median Detail, Pedestrian/Cyclist Crossing
102-0002-071	Walk, Reversed Rolled Curb and Gutter
102-0002-077	Mountable Curb
<b>Fences</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

Drawing Number	Title
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
102-0006-006	Traffic Calming Template Temporary Median Island
<b>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>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

Drawing Number	Title
102-0017-031	Temporary Sign Base
102-0017-054	Signage Typical Installation Depth Sign Post Base
102-0017-055	Signage Typical Sign Post Base Detail
102-0017-056	Signage Typical Installation Sign Post
102-0017-057	Signage Typical Installation Traffic Control Sign
102-0017-058	Signage Typical Installation Crosswalk
<b>Pavement Markings</b>	
102-0034-001	Bike Stencil Bike Pavement Marking
102-0034-002	Bike Diamond Symbol Stencil Reserved Bike Lane Pavement Marking
102-0034-003	Bike Arrow Stencil Bike Direction Pavement Marking
102-0034-004	Sharrow Stencil Shared Bike Lane Pavement Marking
102-0034-007	Bike Ends Stencil Reserved Bike Lane Ends Pavement Marking
102-0034-008	Typical Pavement Markings Shared Bike Lane Sharrow Symbol Placement
102-0034-009	Typical Pavement Markings Reserved Bike Lane Reserved Bike Symbols Placement
102-0034-016	Two-Stage Turn Bike Box Bike Direction Pavement Marking
102-0034-017	Longitudinal Pavement Markings
102-0034-018	Transverse Pavement Markings
102-0034-019	Gore Marks
102-0034-020	Lane Line Dimensioning Practice
<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
	Class A

Drawing Number	Title
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
<b>Lanes</b>	
102-0005-002	Lane, Paved Typical Lane Cross Section
102-0005-003	Residential Lane Dead-End Turnaround T-Type Design Vehicle: Large Car
102-0005-004	Residential Lane Dead-End Turnaround T-Type Design Vehicle: Light Single Unit
102-0005-005	Commercial Lane Dead-End Turnaround T-Type Design Vehicle: Medium Single Unit
102-0005-006	Residential Lane Dead-End Turnaround L-Type Design Vehicle: Large Car
102-0005-007	Lane, Paved 2 Stage Construction

Source:

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

## Appendix B: Street Design Memo

### Transportation Network

#### Design Memo

- ☐ Street name \_\_\_\_\_
- ☐ Engineer identified \_\_\_\_\_
- ☐ Classification \_\_\_\_\_
- ☐ Cross section \_\_\_\_\_
- ☐ Statement that it meets or exceeds TAC guidance Yes / No
- ☐ Statement that it meets or exceeds COS standards Yes / No
- ☐ Statement that complete streets guidance incorporated Yes / No
  - Typology, context, cross section elements
- ☐ Statement that AT Plan guidance incorporated Yes / No
  - Appropriate facility

The following table is to be filled out by the designer in order to verify that COS Standards, or TAC standards in the absence of COS standards, are met. If a deviation from those standards is proposed, an explanation is required.

Design Element	COS (or TAC) Standard	Design	Meets COS Standard (Y/N)	Notes
Design Vehicle				
Design Speed				
Centerline Radius (if curved roadway)				
Travel Lane Width				
Parking				
Median				
Curb & Gutter				
Amenity Strip				
Cycling Facility				
Sidewalk				
Multi-Use Pathway				
Boulevard				
Municipal Buffer Strip				
Berm				
Corner Radii				
2 or 3 Centered Curves	R1 R2 R3			
K (if vertical curve)				

Signature \_\_\_\_\_

Date \_\_\_\_\_

COS Approval \_\_\_\_\_

Date \_\_\_\_\_



## Appendix C: Transportation Drawing Review Checklist

The City of Saskatoon will follow this checklist when reviewing street design submissions.

Plan No: \_\_\_\_\_

Sheet No: \_\_\_\_\_

- ☐ Driveways
  - Sidewalks should be continuous through driveways
  - Driveways should not “look” like intersections, no corner radius style
  - Previously approved (through a TIS), otherwise not shown
    - Number & widths (see bylaw 4785)
- ☐ Paved widths of road & lane
  - Classification matches Concept Plan
  - Cross-section matches Concept Plan and COS standards
  - Crossfall 2.5%
- ☐ Sidewalks
  - Widths must acknowledge AT Plan
  - Widths, meet or exceed COS standards
  - Crossfall 3%
- ☐ Rolled curb & gutter
  - Local residential streets with frontage only
  - Local residential streets with lanes should be vertical curb & gutter
- ☐ Vertical curb & gutter
  - Collectors
  - Arterials
  - Along parks & schools
  - Single-family residential with back lanes
  - All separate walk and curb
- ☐ Accessibility Ramps on all corners
  - Connected to other accessibility ramps, in straight lines
  - Access routes to Municipal Reserve (parks), schools, commercial sites, transit
  - Check no catch basins at bottom of accessibility ramps

- ☐ Property lines
  - Where possible, ensure driveways are functionally located
  - Corner cuts everywhere, check TAC guidance
- ☐ A subdivision has occurred (for arterials and higher)
  - Dedication of right of way
  - Dedication of buffer strips
- ☐ Traffic islands
  - Accessibility Ramps
  - Clear areas, square landing areas 1.5 x 1.5m
  - Crosswalks
- ☐ Centre medians
  - Mountable tip
  - Left Turn bays
  - Width
  - Landscaping
- ☐ Divisional islands
  - Confirm turning templates
- ☐ Turning templates for arterial intersections
  - Design vehicle
  - Control vehicle
- ☐ Lane continuity
  - Balanced
  - Lane add / lane drop
  - Lateral shift
- ☐ Construction limits
  - Turnarounds required
  - Transitions to existing conditions
  - Logical staging
- ☐ Traffic calming
  - Matches Concept Plan and COS standards
- ☐ Roundabouts
  - Matches Concept Plan
  - Design details, confirm with Canadian Roundabout Guide (TAC)
- ☐ Bus routes/stops
  - Matches Concept Plan and/or existing routes

- ☐ Traffic Impact Study
  - Completed?
  - Matches the TIS recommendations
- ☐ Pavement markings & signage outline plan
  - Lane designation
  - Lane widths
  - Turning templates for design vehicles at pinch points and intersections
  - All signs
  - Traffic control
    - Stop bars
    - Signs
    - Signals
  - Pedestrian crossing devices
  - Crosswalks
  - Traffic calming
  - One-way roads require special attention & details
  - Parking restrictions
  - Signage plan request
    - Must be submitted at least 6 weeks before tentative opening
- ☐ Design memo attached, for each street
  - Design memo (as per Appendix B) verified
  - If curved roadway, centreline radius shown, end of curve (EC) & start of curve (SC) shown on plan
  - All corner radius shown, EC & SC shown on plan
  - 2 or 3-centred curves, radii shown, EC & SC shown on plan
  - If vertical curve, K, EC & SC shown on plan

## Appendix D: Suggested Intersection Design Process

### Step 1: Identify Street Classifications

Major Street: \_\_\_\_\_

Minor Street: \_\_\_\_\_

*Design Aid: All arterial intersections will have widened right-of-way requirements on all legs.*

### Step 2: Select Desired Traffic Operations

Unsignalized:

Signalized:

Roundabout:

### Step 3: Identify Appropriate Design Vehicle

Design Vehicle: \_\_\_\_\_

Justification (if not standard as per Table 12: Typical Design, Control, and Managed Vehicles):  
\_\_\_\_\_

### Step 4: Identify Lane Requirements

Lane continuity by direction:

Major Street: \_\_\_\_\_

Minor Street: \_\_\_\_\_

Lane add / Lane drop

*Design Aid: Shifts in horizontal alignment through an intersection must be less than 1.5 meters.*

### Step 5: Select Median Treatment and Complete Left Turn Design

No Median or Divisional Island or Median

*Design Aid: Median tip to median tip for standard arterial intersections = 15 meters.*

### Left Turn Design

Number of left turn lanes required: \_\_\_\_\_

Shared Left Turn/Through Lane or Standard Bay or Slotted Bay

Design vehicle envelope ( $\geq 1.5$  meters between opposing simultaneous left turns of the identified design vehicle)

### Step 6: Complete Right Turn Design

Choose Channelization (Suburban) or Corner Radius (Urban) for Right Turns

Unchannelized: Determine corner radius

Flared: Determine number of lanes required at the intersection and appropriate corner radii.

Channelized: Determine traffic island design

Approach: Bay or Taper

Receiving: Added Lane or Yield at  $45^\circ$  or Yield at  $60^\circ$

### Step 7: Establish Functional Area of the Intersection

Requires left turn, right turn, and through queue lengths.

Prohibits on street parking and driveways.

Consider corner visibility triangles

### Step 8: Provide Accessible Pedestrian Crossings

### Step 9: Provide AAA Cycling Facilities as per AT Plan and/or street design

### Step 10: Accommodate Utilities

Allowances for installation of street lighting, traffic control devices, junction boxes, traffic signal cabinets, etc.

### Step 11: Validate critical movements with turning templates

## Appendix E: Cycling Facility Selection Process

