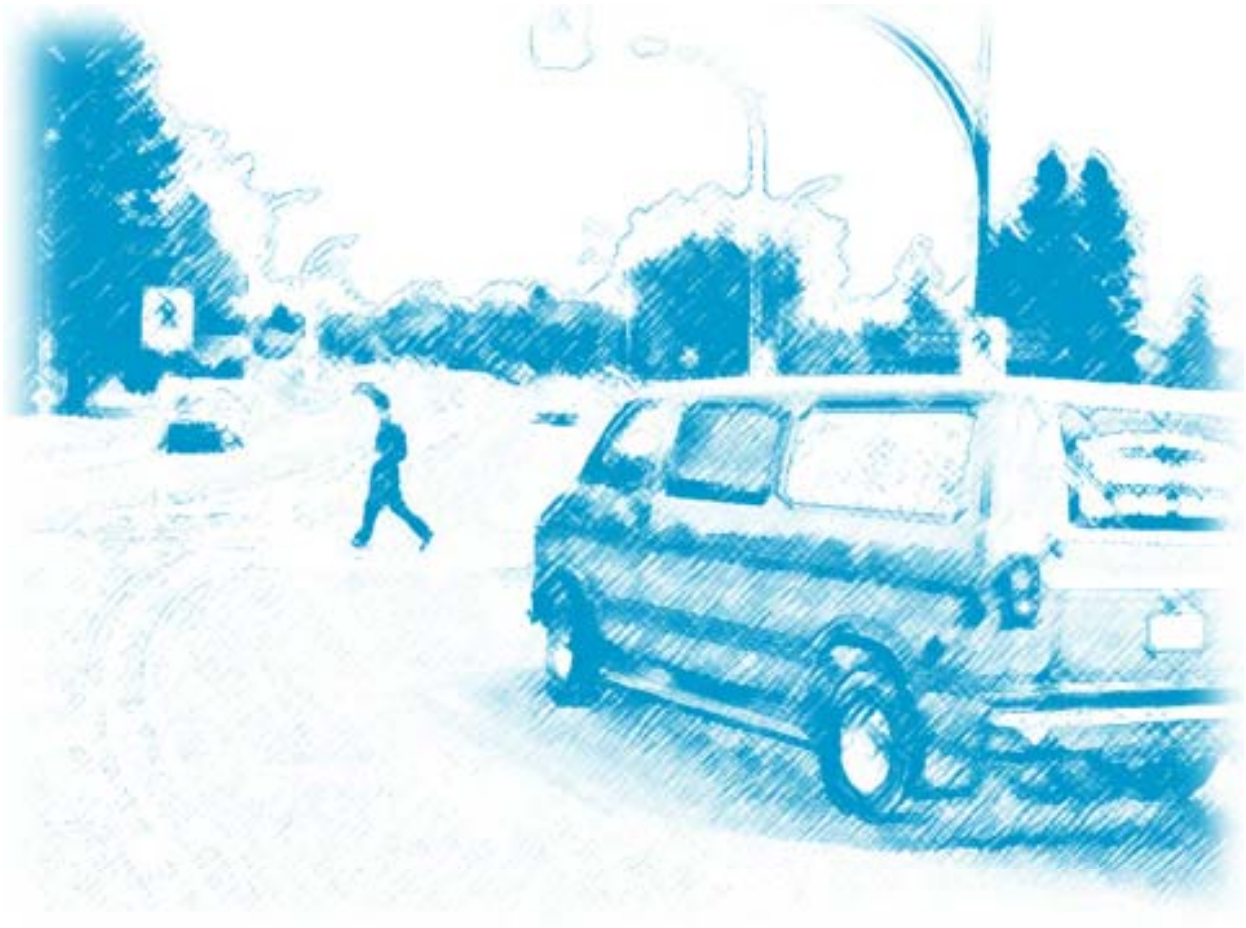
Traffic Control at

Pedestrian Crossings

City of Saskatoon 2004



Introduction

Walking is the most universal form of travel. Every personal trip involves walking, alone or in combination with taking public transit, cycling or driving. The City of Saskatoon and its citizens highly value walking as a travel mode and have constructed a comprehensive network of sidewalks and pathways to accommodate pedestrian travel.

Pedestrian crossings of streets (crosswalks) present one of the greatest challenges for traffic and safety engineering practitioners. The challenge is created by the various modes of travel that share the road. To interact safely requires an exchange of information between pedestrian and motorist. The issues associated with pedestrian crossing activities generally create considerable emotional concern within the community, especially when the community is reacting to an incident involving pedestrian injury. Pedestrian crossing safety relies on the judgment exercised by pedestrians and drivers. Traffic control devices can help to promote an exchange of information to assist pedestrians in safely crossing streets. Safety is of paramount importance, however pedestrians also desire a high level of accessibility that includes directness, convenience and comfort.

The City of Saskatoon offers a variety of traffic controls at pedestrian crosswalks. The uniform application of traffic control devices for pedestrian crossing promotes the orderly and predictable movement of vehicular and pedestrian traffic. To that end, traffic control devices should be selected and implemented in a consistent manner to ensure that all crosswalks receive appropriate attention. That is not to say that all crosswalks are equal but rather that crosswalks should be designed and constructed based on the nature and characteristics of the street and its vehicular and pedestrian traffic.

Provincial legislation defines pedestrian rights and responsibilities in *The Highway Traffic Act.* The portions relevant to pedestrians have been reprinted in Appendix A.

Traffic Control Devices

The Manual of Uniform Traffic Control Devices for Canada (MUTCD) contains the signing, pavement markings and signals and their application for pedestrian crossings with the objective of providing standards that will promote uniformity. This policy seeks to establish the traffic control devices that will be used by the City of Saskatoon along with guidance to the selection of appropriate facilities and their application. A facility selection worksheet is attached in Appendix B.

Pavement Markings

Pavement markings must not be used alone to indicate a pedestrian crossing. Crosswalk pavement markings must be used in combination with other traffic control devices such as traffic signals, pedestrian signals, and ground-mounted or overhead signing.

Crosswalk lines must be normal solid white lines extending entirely across the pavement. Twin parallel line markings shall be considered to be the minimum standard for pavement markings at marked crosswalks with dimensions.

The zebra style crosswalk markings utilize standard crosswalk markings and include longitudinal strips alternated between painted and unpainted surfaces. These markings are more visible to approaching drivers and can be used to draw additional attention to the crosswalk.

Typical pavement marking layout dimensions are shown on the figures in Appendix F.

Signing

Where ground-mounted crosswalks signs are used, they must be supplemented by appropriate crosswalk pavement markings. Signs are not required and shall not be placed for crosswalks at signalized intersections or where yield or stop signs are present.

The Pedestrian Crosswalk Sign (RA-4) is used to indicate the location of a pedestrian crosswalk. The sign is installed on both sides of the street. On two-way streets, two signs are mounted back-to-back on both sides of the road. The right (RA-4R) and left (RA-4L) version of the sign is used as appropriate so that the pedestrian symbol on each sign is walking towards the lane traffic that the sign is facing. The Pedestrian Crosswalk Sign will be used at all crosswalks whether it is a school crosswalk or not.

RA-4L

RA-4R

Size:	600 x 750 mm
Color:	White with black legend
Material:	White encapsulated bead retro-reflective sign sheeting on aluminum sheet backing

The Pedestrian Crosswalk Ahead Sign (WC-2) is used where there is limited visibility of the crosswalk or it is desired to draw additional motorist attention to an approaching crosswalk and should be placed between 65 and 85 metres in advance of the crosswalk.

WC-2

Size:	750 x 750 mm
Color:	Yellow with black legend
Material:	Yellow encapsulated bead retro-reflective sign sheeting on aluminum sheet backing

Where overhead crosswalk signing is desired, the Pedestrian Crosswalk sign will be used and will be internally illuminated. Overhead signs must be suspended at a height of not less than 5.1 metres or more than 6.0 metres from the pavement to the bottom of the sign and shall be placed over the approximate midpoint of the traffic lane or lanes.

Typical Applications

A hierarchical system of signing, marking and signal controls has been developed to provide a guide for matching crossing facilities with conditions found at specific locations. The following typical applications range in increasing complexity from unmarked crosswalks to pedestrian actuated signals.

Unmarked Crosswalks

Most crosswalk locations are currently unmarked by signs, pavement markings or signals. Crosswalks exist at each intersection of two streets by definition in the Highway Traffic Act for Saskatchewan. Further, pedestrians have the right-of-way over vehicles at

all crosswalks unless otherwise instructed by signing or signals. Drivers of vehicles can expect pedestrians to be present on all streets in an urban environment and therefore marking all crosswalk locations is unnecessary.

The use of an unmarked crosswalk is quite acceptable in instances where:

- Visibility is clear for both pedestrians and vehicle operators.
- Sufficient gaps in vehicular traffic exist to allow a reasonable time for pedestrians to cross the road without requiring motorists to slow down or stop.
- The speed of approaching vehicles is slow enough to allow a pedestrian to judge a gap with a relatively large factor of safety.

It is desirable from a pedestrian accessibility and safety standpoint to provide signing, markings, signals or other facilities at some crosswalk locations in order to instruct pedestrians on appropriate crossing locations and to notify motorists of the presence of the crosswalk and that there is a pedestrian.

There are five typical applications of crosswalk traffic control, each described in detail below along with application guidelines to guide the designer to appropriate installation locations.

Standard Crosswalk

A standard crosswalk consists of side-mounted signing and basic pavement markings with or without advance warning signs placed in the following arrangement:

1) Pavement markings will consist of twin parallel 150mm wide white lines spaced at 3.0 metres apart.

2) Pedestrian Crosswalk (RA-4) signs shall be placed on each side of the street so that motorists will face one sign on the right side of the street and one on the left side of the street.

Typical standard crosswalk layout is shown on the figures in Appendix F.

A standard crosswalk provides information to pedestrians by way of pavement markings that the location is a legitimate crossing point and that they have the right-of-way over vehicular traffic. Vehicle operators are notified of the crossing point by signing. The pavement markings of a standard crosswalk are primarily intended to be visible to pedestrians and may not always be visible to motorists and should not be relied upon alone as notification to motorists of the presence of a crosswalk.

Consideration should be given to the installation of a standard crosswalk when at least one of the following conditions exist:

- There is a particular location on a street that is more suited for pedestrian crossings due to street geometry or restricted sight distance.

- It is desirous to have pedestrians crossing at a key location rather than at many individual locations.

- The crosswalk is used by children walking to school.

Motorists that stop for pedestrians crossing multi-lane streets may obstruct the view to pedestrians of motorists traveling in the same direction. As a result, motorists have shown a reluctance to stop for pedestrians even though they know that they are required to by law. At the same time, a marked crosswalk raises the expectation for pedestrians that motorists will stop for them. Therefore, a standard crosswalk alone should not be used on a street that is more than two through lanes in each direction (not including auxiliary lanes such as turn bays or parking lanes).

- A standard crosswalk should not be used on streets where the speed limit is 60 km/h or greater.

Zebra Crosswalk

A zebra crosswalk consists of side-mounted signing and zebra pavement markings with or without advance warning signs placed in the following arrangement:

1) Pavement markings will consist of twin parallel 150mm wide white lines and longitudinal bars.

2) Pedestrian Crosswalk (RA-4) signs shall be placed on each side of the street so that motorists will face one sign on the right side of the street and one on the left side of the street.

Typical zebra crosswalk layout is shown on the figures in Appendix F.

In order to command additional attention of motorists, zebra crosswalk bars can be added to a standard crosswalk. The zebra bars provide additional pavement marking area that can be more easily seen by motorists. Consideration should be given to the installation of a zebra crosswalk when the criteria for a standard crosswalk is met and one of the following conditions exist:

- A school patrol is in operation.

- The crosswalk is frequently used by elderly or mobility impaired pedestrians.

- The crosswalk is at a mid-block location.

- A standard crosswalk is in place but has failed to command the attention of motorists.

A zebra crosswalk alone should not be used on a street

- where the speed limit is 70 km/h or greater; or

- where the speed limit is 60 km/hr and there is more than one through lane in each direction (not including auxiliary lanes such as turn bays or parking lanes).

Pedestrian Corridor

The pedestrian corridor is a type of crosswalk that combines both pavement markings, signing and special illumination. A pedestrian corridor consists of side-mounted signing and zebra pavement markings with or without advance warning signs. In addition overhead illuminated Pedestrian Crosswalk signs with down-shining luminaires complement the crosswalk facility. The provision of overhead signing provides increased notification to motorists of the crosswalk location. Down-shining luminaries increase the conspicuity of pedestrians to motorists during hours of darkness.

1) Pavement markings will consist of twin parallel 150mm wide white lines and longitudinal zebra bars.

2) Pedestrian Crosswalk (RA-4) signs shall be placed on each side of the street so that motorists will face one sign on the right side of the street and one on the left side of the street.

3) Internally illuminated Pedestrian Crosswalk (RA-4) signs shall be suspended at a height of not less than 5.1 metres or more than 6.0 metres from the pavement to the bottom of the sign and shall be placed over the approximate midpoint of the traffic lane or lanes.

4) Sign illumination and down-shining luminaries may be photocell activated so that they are only in service during hours of darkness.

5) Stopping shall be prohibited for a minimum of 15 metres on each approach to the crosswalk and for 15 metres following the crosswalk.

6) Passing (overtaking) should be prohibited in each direction through the placement of Do Not Pass (RB-31) signs and solid centre line and/or lane lines at 30 metres in advance of the crosswalk or by the installation of physical measures.

Typical pedestrian corridor layout is shown on the figures in Appendix F.

Consideration should be given to the installation of a pedestrian corridor when the conditions for a zebra crosswalk are met and one of the following conditions exist:

- The crossing location is not a location where motorists would typically yield the right-of-way to pedestrians.
- The crossing location has no or little direct illumination.
- A pedestrian corridor should not be used on streets with more than one through lane in each direction.
- A pedestrian corridor should not be used on streets where the speed limit is 70 km/h or greater.

Active Pedestrian Corridor

The active pedestrian corridor uses all the same features of the pedestrian corridor and incorporates pedestrian activated overhead or side-mounted amber flashing beacons.

1) All of the same signing, pavement markings and illumination as a pedestrian corridor.

2) Two alternately flashing amber beacons per approach with a minimum diameter of 300 mm.

Typical active pedestrian corridor layout is shown on the figures in Appendix F.

Active Pedestrian Corridors utilize amber flashing beacons to notify motorists that a pedestrian is at the crosswalk and intending to cross.

Consideration should be given to the installation of a corridor when the warrant for active pedestrian corridors (as described in Appendix C) has been met during at least three periods.

- An active pedestrian corridor should not be used on streets with more than two lanes in each direction.
- Active Pedestrian Corridors should not be used on streets where the speed limit is 70 km/h or greater.

Pedestrian Actuated Signal

The pedestrian actuated signal is a traffic signal control for the through street traffic and stop or yield control for side-street traffic. The traffic signal can be actuated by pedestrians to create a gap in traffic to facilitate their crossing.

Typical pedestrian actuated signal layout is shown on the figures in Appendix F.

Pedestrian Actuated Signals have the unique characteristic that motorists must stop when the signal is red and cannot proceed until a green signal is displayed. This characteristic makes this device most appropriate on multi-lane streets where other pedestrian signing and marking is not appropriate. Consideration should be given to the installation of a pedestrian actuated signal when the warrant (as described in Appendix D) has produced 80 warrant points or more.

Pedestrian Actuated Signals should not be installed on streets where:

- The posted speed limit is 70 km/h or greater.
- The installation is less than 200 metres from an adjacent traffic signal.
- Where safe stopping sight distance for motorists approaching the crosswalk does not exist.

For pedestrian crossing accommodation on streets where the posted speed limit is 70 km/h or greater, full traffic signals or a grade separated facility should be considered.

Appendix A: Select Portions of *The Highway Traffic Act*

The following selected portions of *The Highway Traffic Act* respecting the rules of the road for pedestrians have been reprinted.

39 In this Part:

(a) **"crosswalk"** means:

(i) a clearly marked pedestrian crossing; or

(ii) if there is no clearly marked pedestrian crossing, the prolongation through the intersection of the lateral boundary lines of the adjacent or intersecting sidewalks at the end of a block;

(b) **"intersection"** means the area contained within the straight production:

(i) of the lateral curb lines; or

(ii) in the absence of curb lines, of the lateral boundary lines; of two or more highways that join one another at an angle, whether or not one such highway crosses the other.

Pedestrians

54 (1) When the driver of a vehicle on a highway within the boundaries of a municipality approaches an intersection or clearly marked pedestrian crosswalk where a peace officer is not on duty and traffic lights are not in operation and a pedestrian is crossing the highway, he shall stop the vehicle and yield the right of way to the pedestrian if the pedestrian is on the half of the highway on which the vehicle is travelling or is approaching so closely from the other half of the highway that he is in danger.

(2) Where a vehicle is stopped in compliance with subsection (1), no person driving a vehicle proceeding in the same direction on the highway shall overtake or pass that vehicle.

(3) No pedestrian shall leave a curb or other place of safety and proceed into the path of a vehicle on a highway that is so close that it is impracticable for the driver to yield the right of way.

(4) Nothing in this section relieves the driver of a vehicle from the duty to exercise due care for the safety of pedestrians.

(5) No person, other than a pedestrian in charge of an animal, shall walk along that portion of a highway used for vehicular traffic, except close to the edge on his left.

Pedestrian signals

66 (1) Whenever special pedestrian control signals exhibiting the words or symbols which signify "walk", "wait" or "don't walk" are used, the words or symbols indicate and apply to pedestrians and to drivers of vehicles in accordance with this section.

(2) If a signal exhibits words or symbols signifying "walk", pedestrians facing the signal may proceed across the highway in the direction of the signal or, where the signal or a sign indicates that pedestrians may do so, in any direction, and drivers of vehicles shall yield the right of way to pedestrians.

(3) If a signal exhibits words or symbols signifying “wait” or “don’t walk”, pedestrians facing the signal shall not start to cross the highway in the direction of the signal, and a pedestrian who has partially crossed the highway shall proceed to a sidewalk or safety island while the words or the symbols which signify “wait” or “don’t walk” are showing.

Traffic lights

65 (1) Whenever traffic is controlled by traffic lights, the lights indicate and apply to the drivers of vehicles and to pedestrians in accordance with the other provisions of this section.

(2) If a traffic light at an intersection displays only a green light:

(a) the driver of a vehicle facing the light may proceed through the intersection or turn right or left, unless a sign at the intersection directs otherwise;

(b) pedestrians facing the light may proceed across the intersection within the crosswalk.

(3) If a traffic light at an intersection displays only an amber light:

(a) the driver of a vehicle facing the light shall stop at the crosswalk, but, if the vehicle cannot be brought to a stop with safety, he may drive cautiously through the intersection;

(b) pedestrians facing the light shall not enter the intersection.

(4) If a traffic light at a place other than an intersection displays only an amber light, the driver of a vehicle facing the light shall yield the right of way to pedestrians in the crosswalk or pedestrian corridor.

(5) Subject to subsection (5.1), if a traffic light at an intersection displays only a red light:

(a) the driver of a vehicle facing the light shall stop at the intersection;

(b) the driver of a vehicle facing the light may enter the intersection and turn to the right, after stopping and yielding the right of way as may be required, unless there is a sign prohibiting a right turn on a red light;

(c) subject to section 66, pedestrians facing the light shall not enter the intersection.

(5.1) If a traffic light at an intersection of two one-way streets displays only a red light:

(a) the driver of a vehicle facing the red light shall stop at the intersection;

(b) the driver of the vehicle facing the red light may enter the intersection and turn to the left, after stopping and yielding the right of way as may be required, unless there is a sign prohibiting a left turn on a red light;

(c) subject to section 66, pedestrians facing the red light shall not enter the intersection.

(6) If a traffic light at a place other than an intersection displays only a red light, the driver of a vehicle facing the light shall stop at the light.

(7) If a traffic light at an intersection displays one or more green arrows, the driver of a vehicle facing the light may enter the intersection and may only make a movement in the direction indicated by a green arrow.

(8) If a traffic light at an intersection displays one or more green arrows in conjunction with one or more red lights, the driver of a vehicle facing the light may enter the intersection and may only make the movement indicated by a green arrow, after yielding the right of way to pedestrians and other vehicles lawfully within the intersection.

(8.1) If a traffic light at a place other than an intersection displays one or more green arrows in conjunction with one or more red lights, the driver of a vehicle facing the light may make only the movement indicated by a green arrow, after yielding the right of way to pedestrians and other vehicles lawfully using the public highway.

(9) If a traffic light displays a green arrow directly over or controlling a traffic lane, the driver of a vehicle facing the light may proceed only in the direction indicated by the arrow.

(10) If a traffic light displays a flashing green arrow in conjunction with red or green lights controlling a traffic lane, the driver of a vehicle facing the light may make a left turn while the green arrow is flashing.

(11) If a traffic light displays a flashing red light, the driver of a vehicle facing the light shall stop at the crosswalk or at the light or sign, and shall not proceed until it is safe to do so.

(12) If a traffic light displays a flashing amber light, the driver of a vehicle facing the light may proceed with caution through the intersection.

(13) At an intersection of highways where a traffic light is in operation, no driver of a vehicle shall turn the vehicle so as to proceed in the opposite direction.

Appendix B: Facility Selection Worksheet

Facility Selection Worksheet

	Warrants	Warrant Met?	Limitations	Limitation Exists?
Standard Crosswalk	Consideration should be given when at least one of the following condition exist: 1. There is a particular location on a street that is more suited for pedestrian crossings due to street geometry or restricted sight distance. 2. It is desirous to have pedestrians crossing at a key location rather than at many individual locations. 3. The crosswalk is used by children walking to school		Not where the speed limit is 60 kph or greater.	
Zebra Crosswalk	Consideration should be given when the criteria for a standard crosswalk is met and one of the following conditions exist: 1. A school patrol is in operation. 2. The crosswalk is frequently used by elderly or mobility impaired pedestrians. 3. The crosswalk is at a mid-block location. 4. A standard crosswalk is in place but has failed to command the attention of motorists.		Not where the speed limit is 70 kph or greater. Not where the speed limit is 60 kph and the street has more than one through lane in each direction.	
Pedestrian Corridor	Consideration should be given when the conditions for a zebra crosswalk is met and one of the following conditions exist: 1. The crossing location is not a location where motorists would normally yield the right-of-way to pedestrians. 2. The crossing location has no or little direct illumination. 3. A zebra crosswalk is in place but has failed to command the attention of motorists.		Not where the speed limit is 70 kph or greater Not where the street has more than one through lane in each direction.	
Active Pedestrian Corridor	Consideration should be given when: 1. The warrant (as described in appendix A) has been met during at least three periods.		Not where the speed limit is 70 kph or greater Not where the street has more than two through lanes in each direction.	
Pedestrian Actuated Signal	Consideration should be given when: 1. The warrant (as described in appendix B) has produced 80 warrant points or more.		Not where the speed limit is 70 kph or greater. Not where the installation is less than 200 m from an adjacent traffic signal. Not where safe stopping sight distance for motorists approaching the crosswalk does not exists. Not where the installation would create constant interruptions in vehicular traffic due to the level of pedestrian and vehicular volumes.	

Appendix C: Active Pedestrian Corridor Warrant

A warrant priority process has been used for pedestrian corridors since 1978 and it is proposed that this warrant process continue to be the methodology for evaluating and prioritizing potential Active Pedestrian Corridor locations.

The Active Pedestrian Corridor Warrant utilizes a cross-product method of evaluating the ease of crossing that pedestrians have at a particular location. During 15-minute count periods at peak pedestrian activity times (normally 8:00 AM to 9:00 AM, 11:30 AM to 1:30 PM, and 3:00 PM to 4:30 PM) pedestrian crossing and vehicle counts are undertaken. Pedestrians are classified as elementary school aged, high school aged, adult and senior/mobility impaired. These classifications are weighted in the following manner:

Classification	Weighting (Pedestrian Equivalents)
Elementary School Aged	1.00
High School Aged	0.67
Adult	0.50
Seniors/Mobility Impaired	1.00

Half-hour time period's cross-products (number of pedestrians equivalents x number of vehicles) that exceed 5,000 and where there was at least one pedestrian equivalents and 100 vehicles produce one warranted period.

A sample worksheet is shown in Appendix E.

Appendix D: Pedestrian Actuated Signal Warrant

A warrant priority process has been used for Pedestrian Actuated Signals since 1988 and it is proposed that this warrant process continue to be the methodology for evaluating and prioritizing potential Pedestrian Actuated Signal locations.

The Pedestrian Actuated Signal Warrant assigns points for a variety of conditions that exist at the crossing location including:

- The number of traffic lanes to be crossed.
- The presence of a physical median.
- The posted speed limit of the street.
- The distance this crossing point is to the nearest protected crossing point.
- Pedestrian / Vehicle Volume weighted cross product.

The sum of the points produced by this methodology is used as a ranking measure in order to compare and prioritize locations for the installation of Pedestrian Actuated Signals.

A sample worksheet is shown in Appendix E.

Appendix E: Pedestrian Warrant Worksheets

Data Entry Page for

Active Pedestrian Corridor and Pedestrian Actuated Signal Warrant Calculations

Municipal Engineering

Location: _____

Date of Count: _____

Day of Week: _____

Comments: _____

File Name: _____

Prepared By: _____ Date: _____

1. Number of travel lanes passing through the crosswalk(s) ……..…..…. _____ lanes
2. Is there a physical median in this crosswalk(s)? ....…..…..……..…. _____ (y or n)
3. Speed limit (or 85th percentile speed) ….....…..……..…. _____ kph
4. Distance to nearest protected crosswalk ……..…. _____ m
5. Is the orientation of this crosswalk(s) N-S? .....…….…..... _____ (y or n)
6. Duration of pedestrian count …… _____ hrs
7. Enter the pedestrian counts first and determine which crosswalk is used the most.
8. Complete Tables A and B on Sheet "Veh" and then come back and finish this page.

Time	Vehicle Counts				Pedestrian Counts					
					North Crosswalk			South Crosswalk		
	NB	SB	EB	WB	Elem	H.S.	Adult	Adult	H.S.	Elem
07:00-07:15	0	0	0	0						
07:15-07:30	0	0	0	0						
07:30-07:45	0	0	0	0						
07:45-08:00	0	0	0	0						
08:00-08:15	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	0	0	0	0	0	0
08:45-09:00	0	0	0	0	0	0	0	0	0	0
AM Totals ->	0	0	0	0	0	0	0	0	0	0
11:30-11:45	0	0	0	0	0	0	0	0	0	0
11:45-12:00	0	0	0	0	0	0	0	0	0	0
12:00-12:15	0	0	0	0	0	0	0	0	0	0
12:15-12:30	0	0	0	0	0	0	0	0	0	0
12:30-12:45	0	0	0	0	0	0	0	0	0	0
12:45-13:00	0	0	0	0	0	0	0	0	0	0
13:00-13:15	0	0	0	0	0	0	0	0	0	0
13:15-13:30	0	0	0	0	0	0	0	0	0	0
Noon Totals ->	0	0	0	0	0	0	0	0	0	0
14:00-14:15	0	0	0	0						
14:15-14:30	0	0	0	0						
14:30-14:45	0	0	0	0						
14:45-15:00	0	0	0	0						
15:00-15:15	0	0	0	0	0	0	0	0	0	0
15:15-15:30	0	0	0	0	0	0	0	0	0	0
15:30-15:45	0	0	0	0	0	0	0	0	0	0
15:45-16:00	0	0	0	0	0	0	0	0	0	0
16:00-16:15	0	0	0	0	0	0	0	0	0	0
16:15-16:30	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0						
17:00-17:15	0	0	0	0						
17:15-17:30	0	0	0	0						
17:30-17:45	0	0	0	0						
17:45-18:00	0	0	0	0						
18:00-18:15	0	0	0	0						
18:15-18:30	0	0	0	0						
18:30-18:45	0	0	0	0						
18:45-19:00	0	0	0	0						
19:00-19:15	0	0	0	0						
19:15-19:30	0	0	0	0						
19:30-19:45	0	0	0	0						
19:45-20:00	0	0	0	0						
20:00-20:15	0	0	0	0						
20:15-20:30	0	0	0	0						
20:30-20:45	0	0	0	0						
20:45-21:00	0	0	0	0						
PM Totals ->	0	0	0	0	0	0	0	0	0	0
Totals->	0	0	0	0	0	0	0	0	0	0
					North crossing =		**0**	South crossing =		**0**

Therefore, enter vehicle counts relative to the ***North*** *crosswalk only.*

SUMMARY:

Elementary: **0**
High School: **0**
Adult: **0**
Vehicles: **0**

Total Warranted PC Points: **0** or **0** / period
Highest PC point value: **0** at
Periods warranting a PC: **0**
Ped Act Warrant Points: **3**

Data Entry Page for Vehicle Counts

Location: **0**

Date of Count: 0 0

Comments: 0

File Name: 0

Prepared By: 0 Date: 0

Table A: Enter all raw vehicle data in this table only, then revise Table B below this one.

Time	Northbound			Southbound			Eastbound			Westbound		
	LT	Thru	Rt	LT	Thru	Rt	LT	Thru	Rt	LT	Thru	Rt
07:00-07:15	0											
07:15-07:30												
07:30-07:45												
07:45-08:00												
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	0	0	0	0	0	0	0	0	0	0	0	0
AM Totals ->	0	0	0	0	0	0	0	0	0	0	0	0
		0			**0**			**0**			**0**	
11:30-11:45	0	0	0	0	0	0	0	0	0	0	0	0
11:45-12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:00-12:15	0	0	0	0	0	0	0	0	0	0	0	0
12:15-12:30	0	0	0	0	0	0	0	0	0	0	0	0
12:30-12:45	0	0	0	0	0	0	0	0	0	0	0	0
12:45-13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:00-13:15	0	0	0	0	0	0	0	0	0	0	0	0
13:15-13:30	0	0	0	0	0	0	0	0	0	0	0	0
Noon Totals ->	0	0	0	0	0	0	0	0	0	0	0	0
		0			**0**			**0**			**0**	
14:00-14:15												
14:15-14:30												
14:30-14:45												
14:45-15:00												
15:00-15:15	0	0	0	0	0	0	0	0	0	0	0	0
15:15-15:30	0	0	0	0	0	0	0	0	0	0	0	0
15:30-15:45	0	0	0	0	0	0	0	0	0	0	0	0
15:45-16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45												
16:45-17:00												
17:00-17:15												
17:15-17:30												
17:30-17:45												
17:45-18:00												
18:00-18:15												
18:15-18:30												
18:30-18:45												
18:45-19:00												
19:00-19:15												
19:15-19:30												
19:30-19:45												
19:45-20:00												
20:00-20:15												
20:15-20:30												
20:30-20:45												
20:45-21:00												
PM Totals ->	0	0	0	0	0	0	0	0	0	0	0	0
		0			**0**			**0**			**0**	
Totals->	0	0	0	0	0	0	0	0	0	0	0	0
		0			0			0			0	
		NB			SB			EB			WB	

Active Pedestrian Corridor Warrant Calculation

City of Saskatoon

Municipal Engineering Branch

Location: **0**

Date of Count: 0 0

Comments: 0

File Name: 0

Prepared By: 0 Date: 0

Time Period	Vehicle Counts 15 min.	Vehicle Counts 30 min.	Pedestrian Counts Total Both Sides Elem	H.S.	Adult	Total	Factored Counts 15 min.	Factored Counts 30 min.	P.C. Warrent Points	Periods Wrnt'd (1=Yes)	Points of Wrnt'd Periods
07:00-07:15	0		0	0	0	0	0				
07:15-07:30	0	0	0	0	0	0	0	0	0		
07:30-07:45	0	0	0	0	0	0	0	0	0		
07:45-08:00	0	0	0	0	0	0	0	0	0		
08:00-08:15	0	0	0	0	0	0	0	0	0		
08:15-08:30	0	0	0	0	0	0	0	0	0		
08:30-08:45	0	0	0	0	0	0	0	0	0		
08:45-09:00	0	0	0	0	0	0	0	0	0		
AM Totals ->	0		0	0	0	0					0
11:30-11:45	0		0	0	0	0	0				
11:45-12:00	0	0	0	0	0	0	0	0	0		
12:00-12:15	0	0	0	0	0	0	0	0	0		
12:15-12:30	0	0	0	0	0	0	0	0	0		
12:30-12:45	0	0	0	0	0	0	0	0	0		
12:45-13:00	0	0	0	0	0	0	0	0	0		
13:00-13:15	0	0	0	0	0	0	0	0	0		
13:15-13:30	0	0	0	0	0	0	0	0	0		
Noon Totals ->	0		0	0	0	0					0
15:00-15:15	0		0	0	0	0	0				
15:15-15:30	0	0	0	0	0	0	0	0	0		
15:30-15:45	0	0	0	0	0	0	0	0	0		
15:45-16:00	0	0	0	0	0	0	0	0	0		
16:00-16:15	0	0	0	0	0	0	0	0	0		
16:15-16:30	0	0	0	0	0	0	0	0	0		
16:30-16:45	0	0	0	0	0	0	0	0	0		
16:45-17:00	0	0	0	0	0	0	0	0	0		
17:00-17:15	0	0	0	0	0	0	0	0	0		
17:15-17:30	0	0	0	0	0	0	0	0	0		
17:30-17:45	0	0	0	0	0	0	0	0	0		
17:45-18:00	0	0	0	0	0	0	0	0	0		
18:00-18:15	0	0	0	0	0	0	0	0	0		
18:15-18:30	0	0	0	0	0	0	0	0	0		
18:30-18:45	0	0	0	0	0	0	0	0	0		
18:45-19:00	0	0	0	0	0	0	0	0	0		
19:00-19:15	0	0	0	0	0	0	0	0	0		
19:15-19:30	0	0	0	0	0	0	0	0	0		
19:30-19:45	0	0	0	0	0	0	0	0	0		
19:45-20:00	0	0	0	0	0	0	0	0	0		
20:00-20:15	0	0	0	0	0	0	0	0	0		
20:15-20:30	0	0	0	0	0	0	0	0	0		
20:30-20:45	0	0	0	0	0	0	0	0	0		
20:45-21:00	0	0	0	0	0	0	0	0	0		
PM Totals ->	0		0	0	0	0					0
Totals ->	**0**		**0**	**0**	**0**	0					
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!					
			North crossing =			**0**					
			South crossing =			**0**					

SUMMARY

Total Warranted PC Points:	**0**	or	**0** / period
Highest PC point value:	**0**	at	
Average PC point value:	**0**		
No. of periods warranted:	**0**		

Pedestrian Actuated Signal Warrant Calculation

City of Saskatoon
Transportation Department

Location:	**0**		
Date of Count:	0	0	
Comments:	0		
File Name:	0		
Prepared By:	0	Date:	0

1. Lanes Priority Points:

L = 0 = number of lanes.

LANF = 0.0 points = (L-2) x 3.6 to a max of 15 points, urban x-section only.

2. Median Priority Points:

MEDF = 3.0 points, indicating there is a physical median here.

3. Speed Priority Points:

S = 0 kph = speed limit or 85th percentile speed.

SPDF = 0.0 points = (S-30) / 3 to a maximum of 10 points.

4. Pedestrian Protection Location:

D = 0 m = distance from study location to nearest protected crosswalk.

LOCF = 0.0 points = (D-200) / 13.3 to a maximum of 15 points.

5. Pedestrian/Vehicle Volume Priority Points:

H =	0.0 hours	= duration of counting period.
Ps =	0.0	= total number of elementary and high school students counted.
Pa =	0.0	= total number of adults counted.
Pw =	0.0	= weighted average of pedestrians crossing the main street.
Pcm =	0.0	= weighted average hourly pedestrian volume crossing the main street.
V =	0.0	= volume of traffic passing through the crossing(s).
Vam =	0.0	= average hourly volume of traffic passing through the crossing(s).

VOLF = 0.0 points = Vam x Pcm / 500

6. Satisfaction of Installation Criteria:

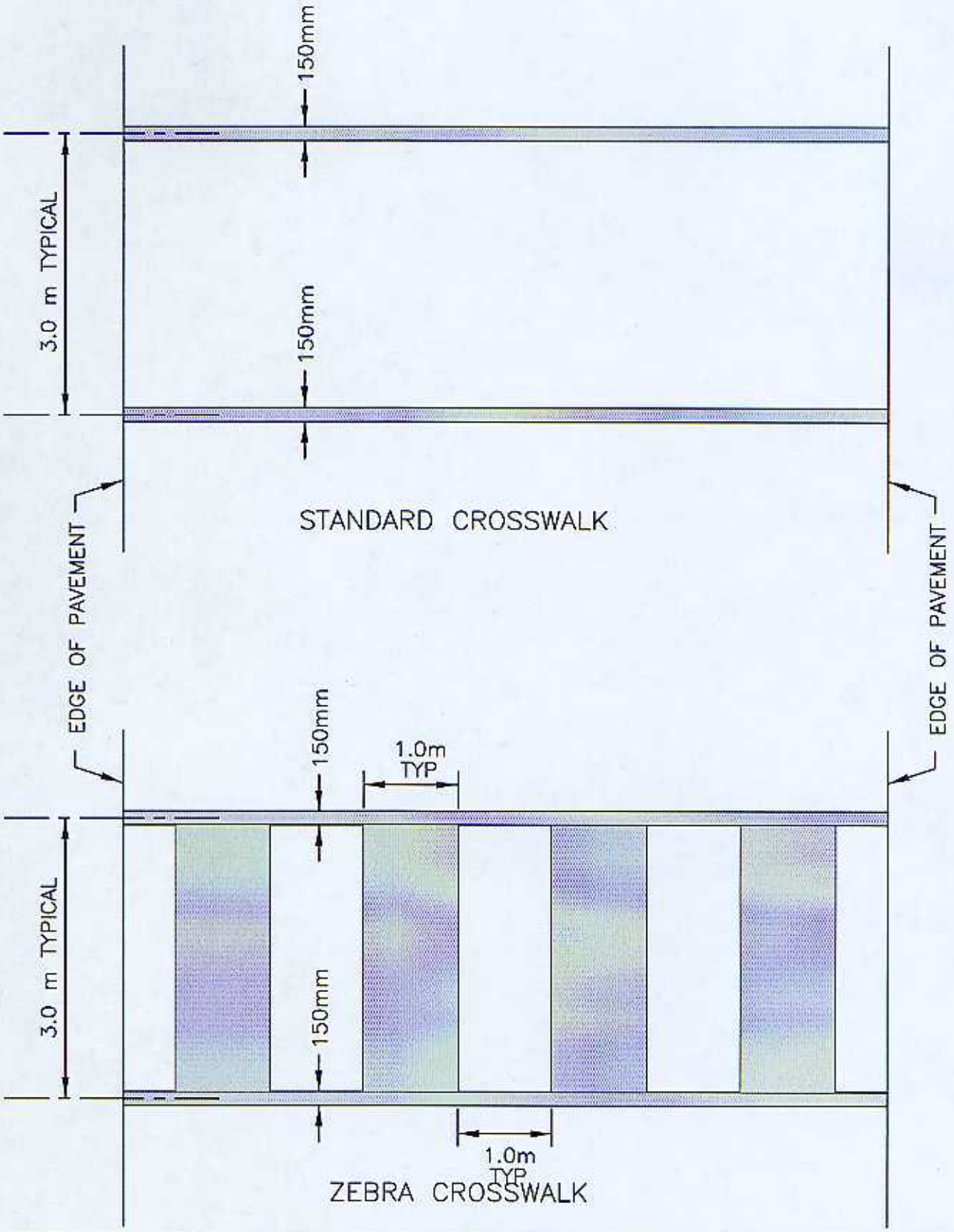
SUMF = LANF+MEDF+SPDF+LOCF+VOLF

SUMF = 3 points

(P.A. Signal Warrant Points)

The total of the warrant points is less than 100 indicating that a pedestrian actuated signal is NOT warranted.

Appendix F: Figures – Typical Dimensions and Layouts



REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

City of Saskatoon
Infrastructure Services Department

APPROVED

GENERAL MANAGER P. ENG.

ENGINEER

ENGINEER

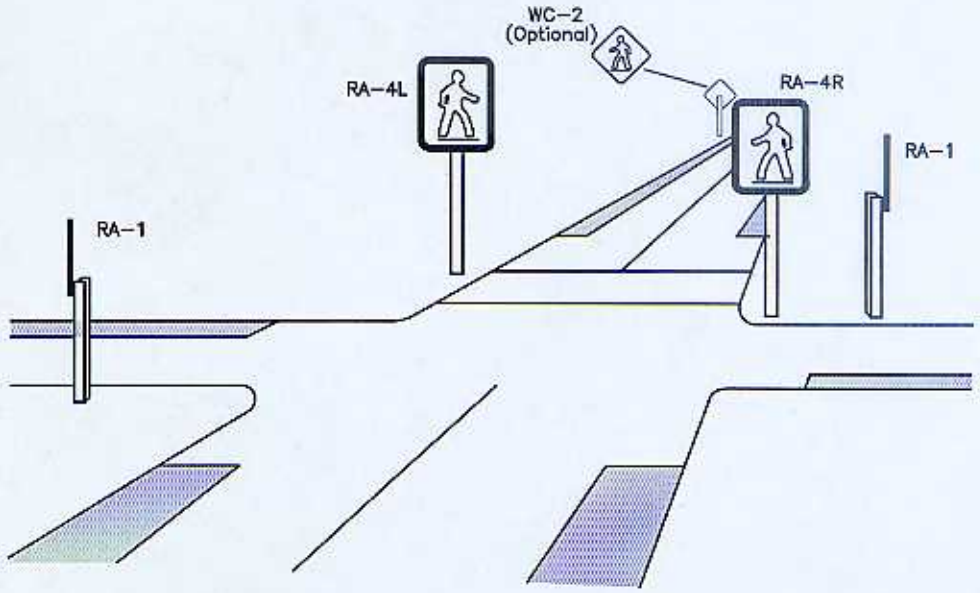
DRAWN BY CJP
DATE 04 07 13

CHECKED BY
DATE

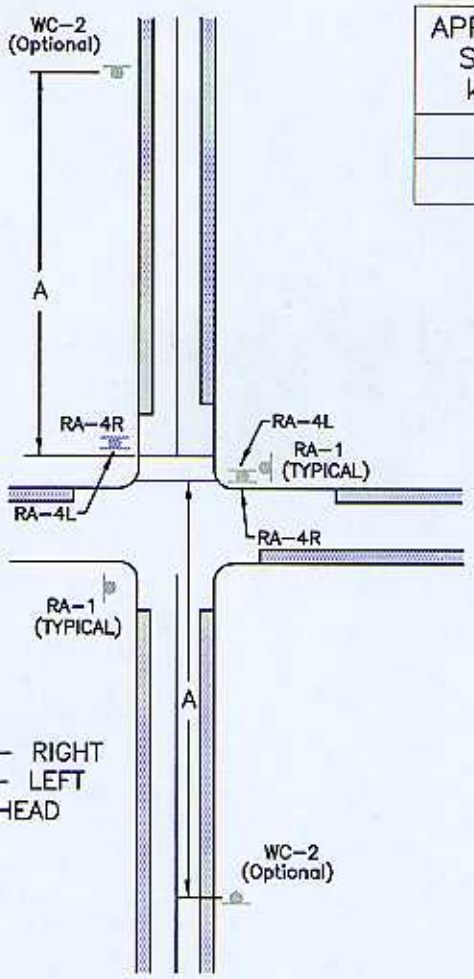
CROSSWALK PAVEMENT MARKINGS

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-001r002



APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85



SIGN LEGEND

RA-1	STOP
RA-4R	PEDESTRIAN CROSSWALK – RIGHT
RA-4L	PEDESTRIAN CROSSWALK – LEFT
WC-2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

DRAWN BY CJP
DATE 04 07 13

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City of Saskatoon
Infrastructure Services Department

TYPICAL STANDARD CROSSWALK

APPROVED

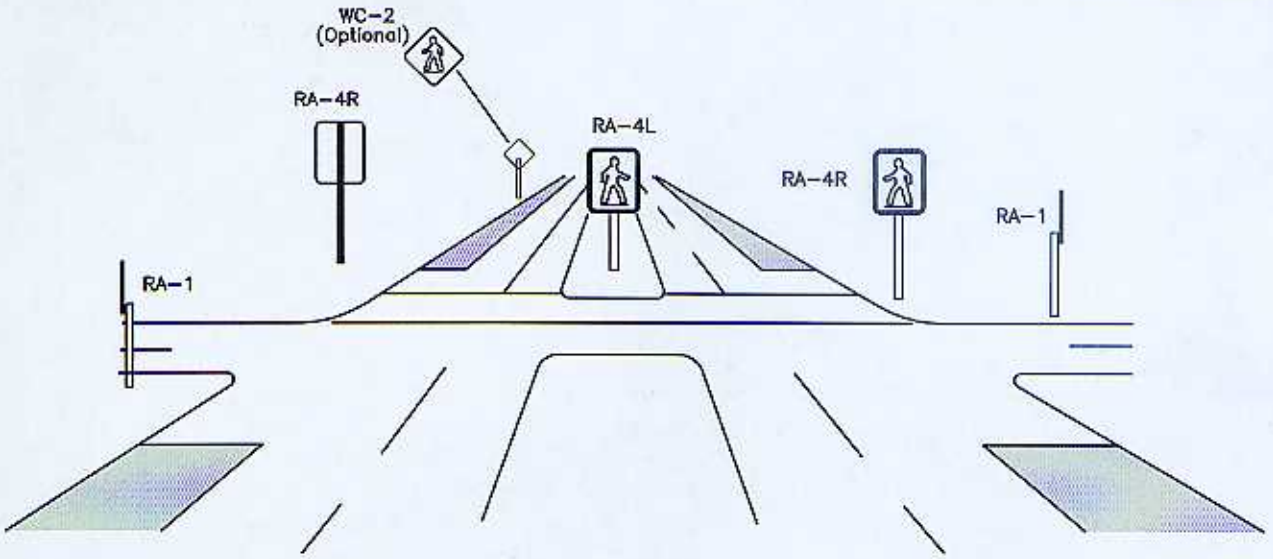
GENERAL MANAGER P. ENG.

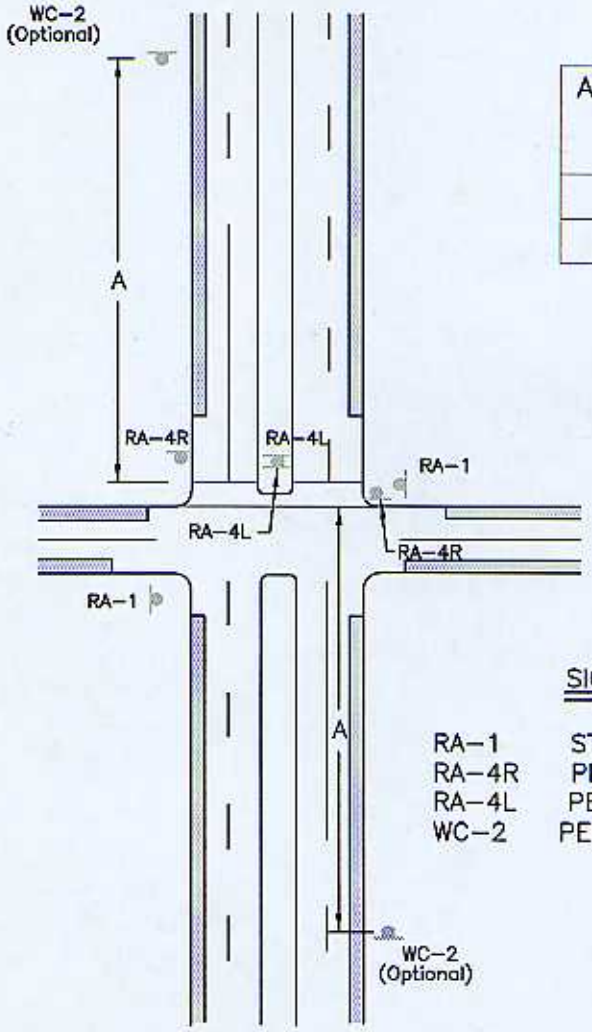
ENGINEER

ENGINEER

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-002r002





APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85

SIGN LEGEND

RA-1	STOP
RA-4R	PEDESTRIAN CROSSWALK – RIGHT
RA-4L	PEDESTRIAN CROSSWALK – LEFT
WC-2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

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City of Saskatoon
Infrastructure Services Department

TYPICAL STANDARD CROSSWALK
4 LANE, 2-WAY DIVIDED

APPROVED

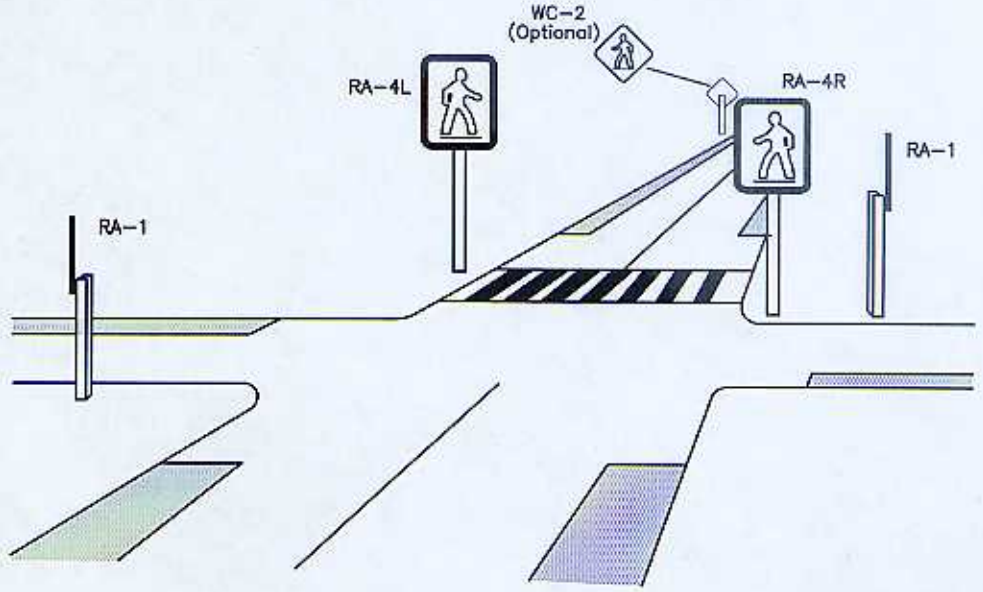
GENERAL MANAGER P. ENG.

ENGINEER

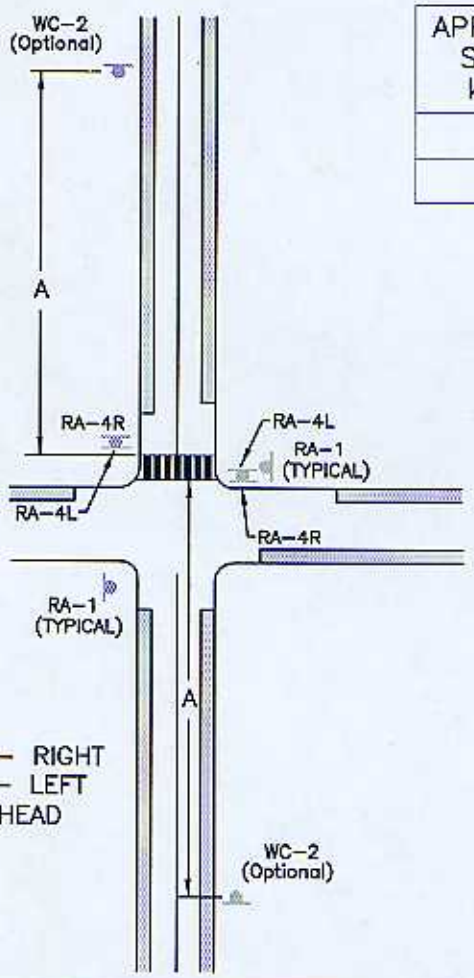
ENGINEER

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-003r002



APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85



SIGN LEGEND

RA-1	STOP
RA-4R	PEDESTRIAN CROSSWALK – RIGHT
RA-4L	PEDESTRIAN CROSSWALK – LEFT
WC-2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

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City of Saskatoon
Infrastructure Services Department

TYPICAL ZEBRA CROSSWALK

APPROVED

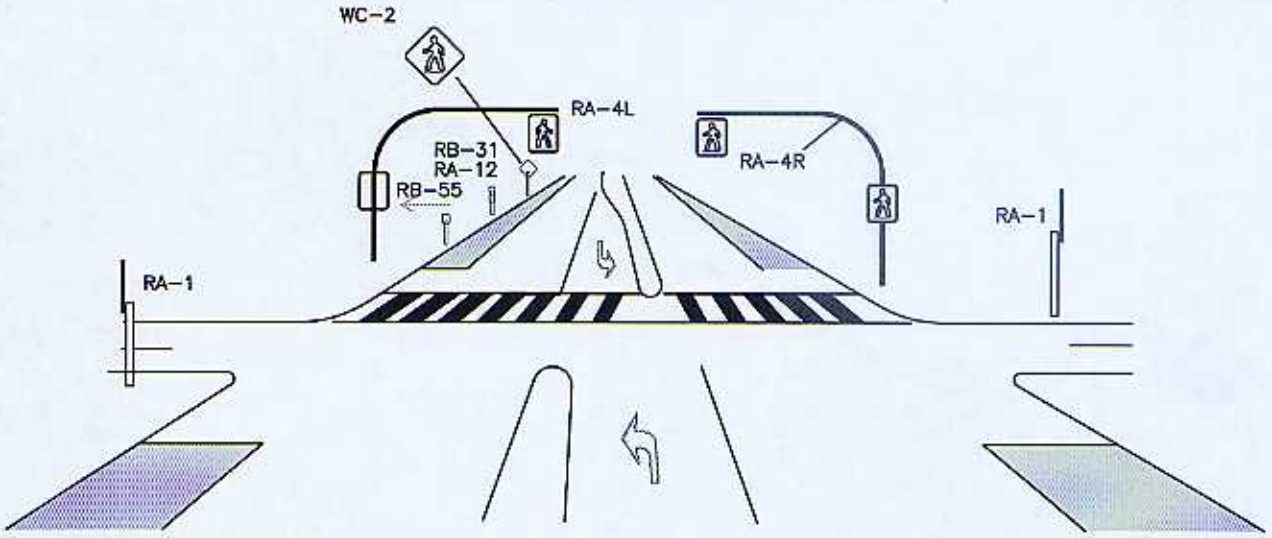
GENERAL MANAGER P. ENG.

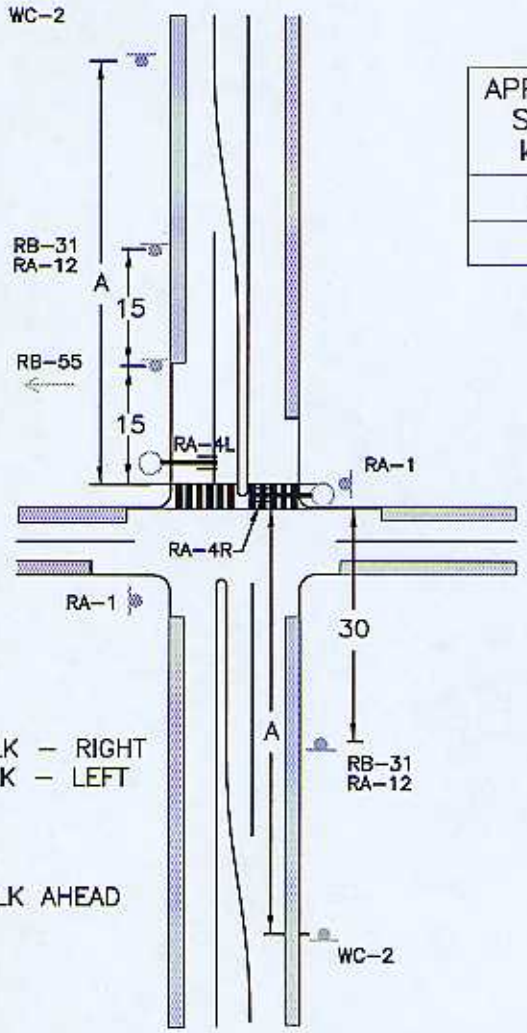
ENGINEER

ENGINEER

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-004r002





APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85

SIGN LEGEND

RA-1	STOP
RA-4R	PEDESTRIAN CROSSWALK – RIGHT
RA-4L	PEDESTRIAN CROSSWALK – LEFT
RA-12	TO CORRIDOR
RB-31	DO NOT PASS
RB-55	NO STOPPING
WC-2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

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DATE 04 07 13

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DATE

City of Saskatoon
Infrastructure Services Department

TYPICAL PEDESTRIAN CORRIDOR

APPROVED

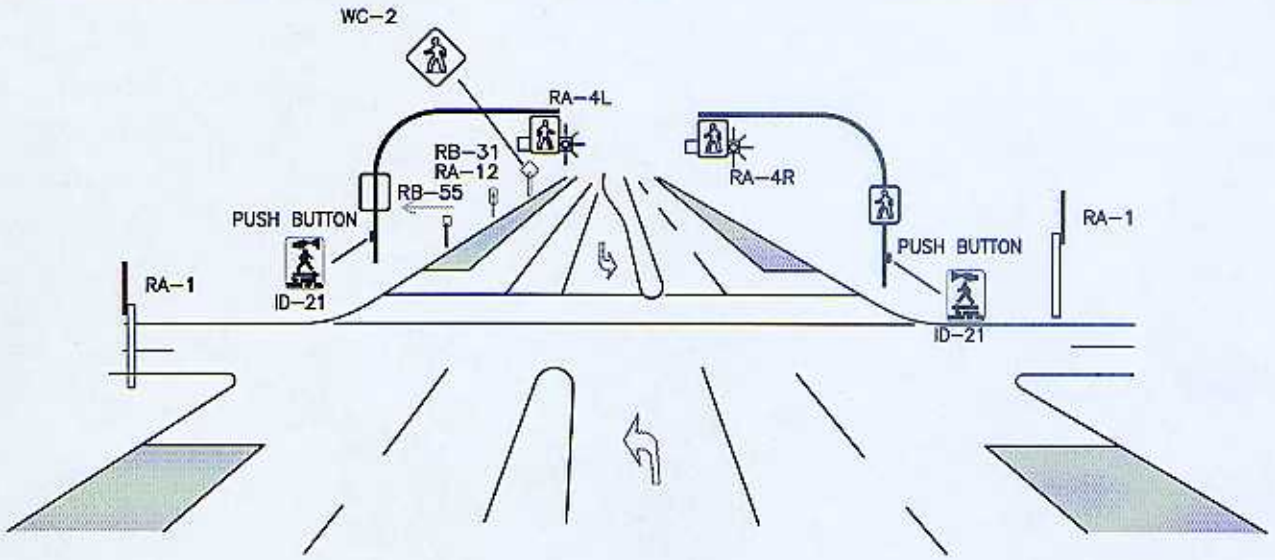
GENERAL MANAGER P. ENG.

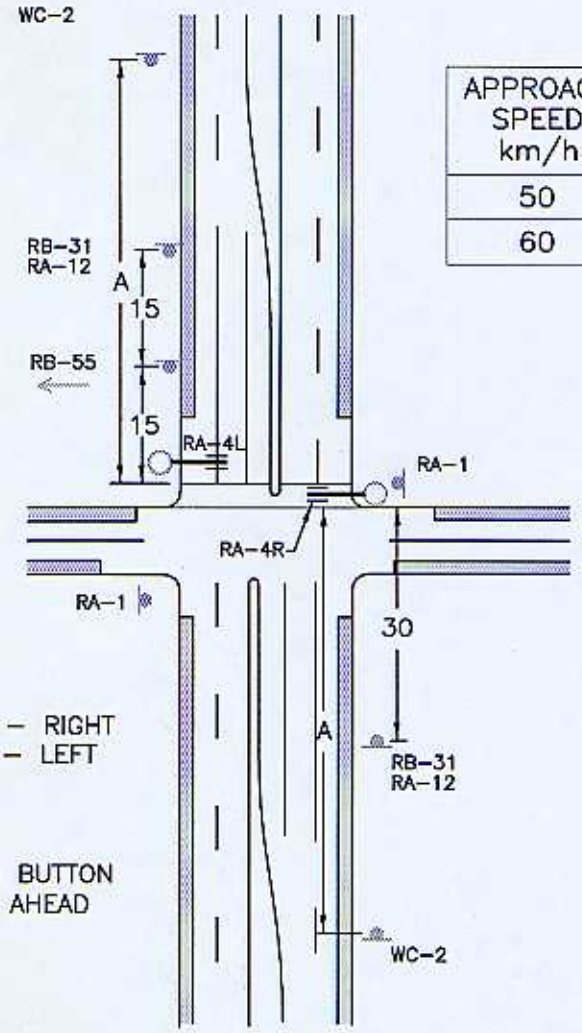
ENGINEER

ENGINEER

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-005r002





APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85

SIGN LEGEND

RA-1	STOP
RA-4R	PEDESTRIAN CROSSWALK – RIGHT
RA-4L	PEDESTRIAN CROSSWALK – LEFT
RA-12	TO CORRIDOR
RB-31	DO NOT PASS
RB-55	NO STOPPING
ID-21	FOR WALK SIGNAL PUSH BUTTON
WC-2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

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DATE

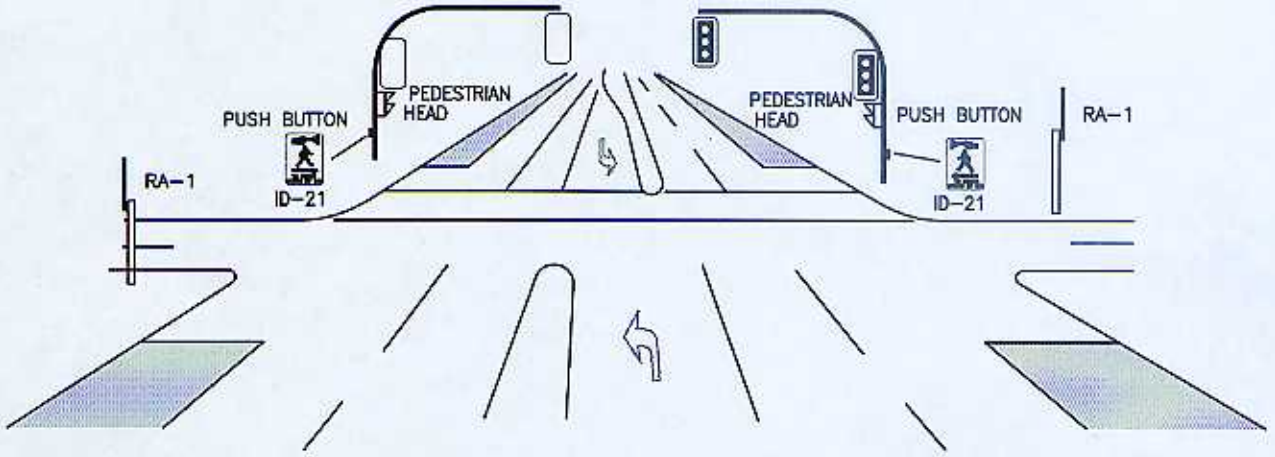
City of Saskatoon
Infrastructure Services Department

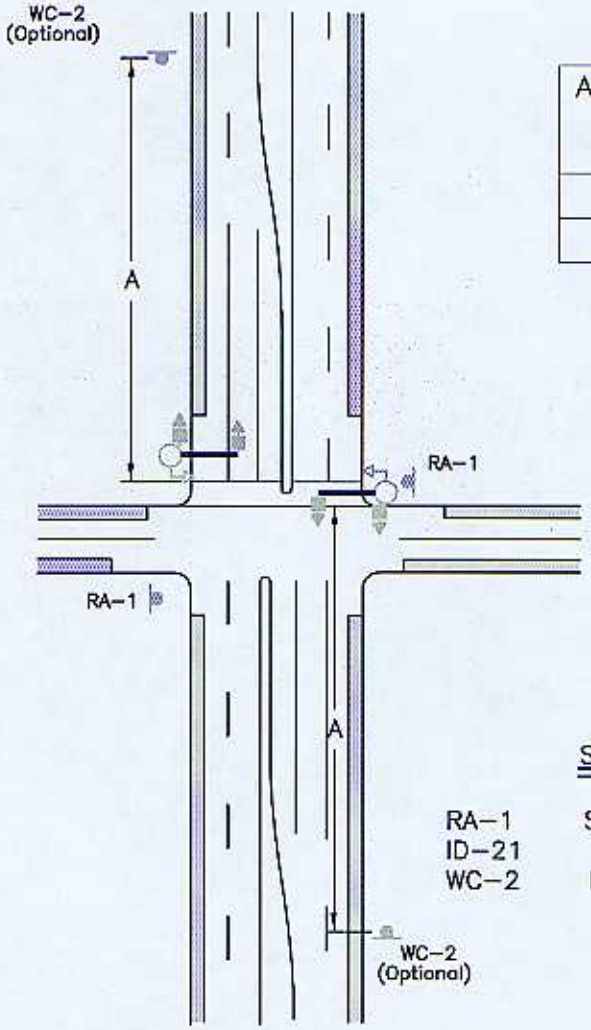
TYPICAL ACTIVE PEDESTRIAN CORRIDOR

APPROVED

GENERAL MANAGER P. ENG.
ENGINEER
ENGINEER

SCALES HOR. NTS VERT.
PLAN NO. 102-0028-006r002





APPROACH SPEED km/h	DIMENSION A (m)
50	65
60	85

SIGN LEGEND

RA–1	STOP
ID–21	FOR WALK SIGNAL PUSH BUTTON
WC–2	PEDESTRIAN CROSSWALK AHEAD

PARKING LANE

REVISIONS	
1	REVISE NOTES HAF 04-10
2	
3	

City of Saskatoon
Infrastructure Services Department

DRAWN BY CJP
DATE 04 07 13
CHECKED BY
DATE

TYPICAL PEDESTRIAN ACTUATED SIGNALS

APPROVED

GENERAL MANAGER P. ENG.
ENGINEER
ENGINEER

SCALES : HOR. NTS VERT.

PLAN NO. 102-0028-007r002