



City of Bellevue Transportation Department

Memorandum

To: Mark Poch, P.E., PTOE, Traffic Engineering Manager

CC: File

From: Kurt Latt, P.E., PTOE, Senior Transportation Engineer

Date: December 20, 2013

Re: Annual Crosswalk Priorities – 2014 Work Plan Summary



This memorandum provides an overview of the Department's practices in establishing priorities for enhancements at pedestrian street crossings. In doing so, a priority list of manageable improvements is developed reflecting available resources in funding and staffing able to accomplish the intended work in the coming year (2014). Prioritizing of resources is reviewed throughout the year. However, a work plan is established on an annual basis in December of each year to provide the necessary guidance and allocation of resources for the ensuing year.

As requests for improvements by citizens and various sources are made, and locations subsequently identified for review, they are incorporated into a master list of candidate sites. These candidates are then scored based on criteria as outlined in *Attachment A – Practices and Priority Guidance for Allocation of crosswalk related Resources*. This scoring provides a relative comparison of candidates but is not intended to represent a formal ranking of priority. This initial scoring process is intended to filter lower risk, satisfactory crossings, and to further, highlight those crossings with the greatest need for improvement. As candidate sites surpass an established threshold score, they are placed into a discussion forum with City staff to consider the many factors of completing improvements including funding, staffing levels, timing, ability to coordinate with other projects, and other considerations. Through these staff discussions a formal ranking and work program for the coming year is established.

Attachment B – 2014 Crosswalk Priorities, provides a listing of crosswalk related improvements which can reasonably be accomplished in the coming year. Beyond these initial selected locations there are other candidates that might be available for improvement

December 20, 2013

should funding and staffing become available to support the added work effort. As this is a dynamic process, staff will consider amendments to the work plan as conditions warrant throughout the year.

Attachment C – 5 Yr Crosswalk Improvement Listing, provides a summary of completed or active improvements for pedestrian crossings over a 5 year period.

Attachments –

Attachment A – Practices and Priority Guidance for Allocation of Crosswalk Related Resources

Attachment B – 2014 Crosswalk Priorities

Attachment C – 5 Yr Crosswalk Improvement Listing



Transportation Department

Practices and Priority Guidance for Allocation of Crosswalk Related Resources

Department Practice:

The City of Bellevue's Transportation Department has developed practices and guidance for the consideration of marking crosswalks and for the allocation of enhanced crosswalk treatments at uncontrolled marked crosswalk locations. Where uncontrolled marked crosswalks are warranted based upon the conditions in the Manual on Uniform Traffic Control Devices (MUTCD), Engineering Judgment, and department practices, resources may be allocated to further support and enhance safety at a crossing location. However, with limited resources, priorities must be established to help guide the allocation of those limited resources. Additionally, improvements may be implemented in a staged manner, at the discretion of the Transportation Department, to better utilize available resources.

Treatments such as advance signing, raised medians, curb bulbs, improved lighting, radar feedback signs and raised profile crosswalks are but a few options which may be implemented prior to consideration of flashing crosswalk systems or other more intensive resource demands. The practice described herein is intended to assist in developing priorities for the allocation of resources for pedestrian crossings.

Scoring Criteria and Priorities:

Scoring criteria were developed to reflect the relative merit for improvements at a pedestrian crossing. In some cases, dependent on conditions, it may be sufficient to have only pavement markings and signing for one crossing while another crossing merits more extensive resources based on conditions. The criteria includes influences from schools, vehicle traffic, vehicle speeds, pedestrian activity and other considerations which play a role in the risk potential for a crossing location.

A location which satisfies a particular criteria is not justification in itself for alterations and no duty is implied or presumed for the city to provide a marked crosswalk or enhanced crosswalk treatment by use of this guidance. It should be recognized there are limited resources for managing the transportation system for all users and accordingly priorities for implementing new features or adjusting existing ones must be balanced with the needs citywide and assessed periodically by the City.

In consideration of limited resources, at this time a minimum score of 20 must be achieved by the sum of criteria. This minimum score may be adjusted up or down in the future by the Transportation Department to reflect changes in resources and priorities. Once this threshold is satisfied, the subject site will be considered a candidate for improvements together with other locations which also exceed this score threshold. The Transportation Department will then evaluate more subjective conditions such as community support, availability of funds relative to cost of improvement, engineering judgment on potential risk to safety at the crossing, department crosswalk study findings, or other considerations as deemed appropriate by the Transportation Department.

SCORING CRITERIA

- A. Elementary School 5 , Middle School 4 , High School 3 (max score 5); _____ **Score.**
- B. Travel lanes – 2 score for each through travel lane, 1 score for center turn lanes or median areas, 2 score where bike lanes and/or parking exist (max score value 10); _____ **Score.**
- C. Posted Speed Limit – 5 score for 35 mph or higher, 4 for 30 mph, 3 for 25 mph, 2 for 20 mph established school zone. The 85th percentile speed data may be used in lieu of posted speed at discretion of the engineer; _____ **Score.**
- D. ADT – Average Weekday Daily traffic below 10,000 vehicles is 0, 10,000 to 15,000 is 3 and above 15,000 is 5; _____ **Score.**
- E. Accident History (pedestrian/bike) – one non-motorized accident within crossing location in past 3 years = 5. More than one pedestrian/bike accident within past 3 years or a single fatality is score of 10 if determined to be clearly located within the crossing limits as determined by the engineer; _____ **Score.**
- F. Accident History (vehicle) – 2 score for 5 or more rear end collision (or other relatable collision not included in E. above) in past 3 years associated with activity from the crossing as determined by the engineer; _____ **Score.**
- G. Traffic Signal or existing marked crosswalk located within 500 feet of subject review location – deduct 5 score. Where traffic signals are within 300 feet of the crossing outside of the downtown district, flashing crosswalk systems will not be considered. Within the downtown district, this criteria may be overridden at the engineer’s discretion; _____ **Score.**
- H. Crossing is located on a designated arterial – Major is 5, Minor is 3, Collector is 2; Local Street is 0; _____ **Score.**
- I. Coordination. Project can be coordinated with another Capital Improvement Project, Grant Opportunity, Development, or Overlay project for efficiency in design and construction and reduced resource demand is 5; _____ **Score.**
- J. Pedestrian volume of 20 peds or higher in peak one hour period is 5 score. Where 20 peds is not achieved for a crossing assign 0 score; _____ **Score.**
- K. Site Conditions. This category allows the professional to assign up to 10 points for site conditions which are unusual, such as a side trail connection, or roadway gradient, or other aspect that in the opinion of the professional elevate the subject crossing beyond typical consideration; _____ **Score.**
- L. Implementation Complexity. If the site meets criteria for installation or enhancement, satisfies certain community goals, and can be implemented relatively simply with minimal costs, staff time, or other resources as determined by the Department, assign a 5 score; _____ **Score.**

The City retains the right to remove or modify any enhanced treatment or marked crosswalk within the public right-of-way at its sole discretion and may from time to time develop pilot projects to evaluate new technologies and advances in crosswalk safety. The above criteria is developed by the Transportation Department staff and any interpretation of criteria or conditions rests with the Department Director or their designee.

SUBJECT LOCATION: _____
TOTAL SCORING: _____

Prepared by: _____ Date: _____

Guidance Last Updated: January 3, 2013.

ATTACHMENT B - 2014 Crosswalk Priorities

(Top 30 Candidates)

Priority	Reference Number	Location	Comment
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TIER 1 - 2014 Design/Construction

1	#175	108th Ave NE @ BNSF Trail Crossing	Coordinate with 2014 Overlay
2	#195	Main St @ 150th Ave Vicinity (Kelsey Creek Shop. Ctr.)	
3	#33	161st Ave NE @ NE 33rd St (Spirit Ridge Park)	
4	#199	Highland Drive @ 139th Ave Vicinity (Forest Park Open Space)	Coordinate with 2014 Overlay
5	#22	SE 60th St @ 128th Ave SE	
6	#205	Newport Way west of 152nd Ave SE (Eastgate Elementary)	Coordinate with CIP project
7	#49	Northup Way near I-405 overcrossing	Coordinate with CIP project
8	#47	Northup Way east of NE 33rd Pl	Coordinate with CIP project

TIER 2 - Remaining Unfunded/Unresourced Priority Candidates

9	#60	140th Ave NE @ N. City Limit Trail Crossing	
10	#200	140th Ave NE @ 12th St Vicinity	
11	#74	Northup Way @ NE 10th St	
12	#103	NE 24th St @ 166th Ave NE (Sherwood Elementary)	Coordinate with #189
13	#189	164th Ave NE S. of NE 24th St (Sherwood Elementary)	Coordinate with #103
14	#183	160th Ave SE @ SE 33rd St (DOE vicinity)	Coordinate with #184
15	#184	160th Ave SE N. Of SE 33rd St (Boeing Access)	Coordinate with #183
16	#80	100th Ave NE @ NE 1st St (Downtown Park)	
17	#187	106th Ave NE @ NE 9th St (Top Pot vicinity)	Coordinate with development
18	#71	100th Ave NE @ NE 23rd St	
19	#67	100th Ave NE @ NE 21st St	
20	#186	116th Ave NE vicinity of NE 20th St	Coordinate with 2015 overlay
21	#202	Somerset Blvd @ Somerset Drive	

TIER 3 - Watch List - Planning for 2015 and Beyond

22	#70	Newport Way near KC Library	
23	#161	NE 4th St @ 105th Ave NE	Coordinate with development
24	#206	SE 16th St between 148th and 156th	Coordinate with CIP
25	#192	160th Ave SE @ Boeing/Microsoft entrance	
26	#204	Phantom Way @ 160th Ave SE	
27	#196	NE 1st St Near 100th Ave	
28	#194	NE 24th St @ 171st Ave NE (Park)	
29	#29	Main St/140th Ave SE	
30	#30	Main St/145th Pl SE	

ATTACHMENT C - 5 Yr Crosswalk Improvement Listing *

Ref. No.	Location	Improvements	Date Completed
#28	120th Ave NE Vicinity CIP (NE 6th St, NE 4th St)	Full Signal at 6th, RRFB at 4th St**	1Q - 2014
#185	NE 8th St west of 164th Ave (Crossroads Park)	RRFB Flashing Crosswalk System**	1Q - 2014
#44	156th Ave SE S. of SE 27th St (Wilberton Trail)	RRFB Flashing Crosswalk System	3Q - 2013
#46	156th Ave SE N. of Eastgate Way (midblock)	RRFB Flashing Crosswalk System	3Q - 2013
#17	W. Lk. Samm. Pkwy Stage 1 Vicinity CIP (Vasa Park & 41.5)	RRFB Flashing Crosswalk System	3Q - 2013
#87	108th Ave NE @ NE 38th Pl (Kirkland P & R)	Full Signal	3Q - 2013
#207	Northup Way at 160th Ave NE (& ADA signal upgrades nearby)	ADA accessibility, relocated crossing	2Q - 2013
#72	156th Ave NE @ NE 16th St vicinity (Crossroads midblock)	Pedestrian Traffic Signal	4Q - 2012
#188	NE 24th St @ 161st Ave NE (Interlake High School)	RRFB Flashing Crosswalk System	3Q - 2012
#58	145th Pl SE Vicinity CIP (145th/144th & 145th/SE 22nd)	Overhead signing/median	3Q - 2012
#42	SE 22nd St west of 150th Ave (Robinswood Park)	Raised Crosswalk	3Q - 2012
#23	108th Ave NE @ NE 11th St vicinity (midblock)	Flashing beacon Crosswalk System	4Q - 2010
#26	108th Ave NE @ NE 2nd Pl vicinity (midblock)	Flashing beacon Crosswalk System	4Q - 2010
#48	NE 10th St west of 110th Ave NE (KC Library midblock)	Pedestrian Traffic Signal	4Q - 2010
#24	SE 38th St west of 150th Ave (freeway path connection)	median, ADA accessibility	3Q - 2010

* Excludes locations with only markings and/or signing improvements

** project is under construction

updated December 20, 2013



Crosswalk Markings at Non-Signalized Locations

Responsible Division: Traffic Mgmt.	Category: Select...
APWA Accreditation Chapter Number(s): 31	APWA Practice(s):

Revision History:

Revision Date	Revision	Revision by:
6/15/2011	Administrative edits	

Applicable Divisions:

<input type="checkbox"/> Entire Department	<input type="checkbox"/> Director's Office	<input checked="" type="checkbox"/> CPS	<input checked="" type="checkbox"/> Traffic	<input type="checkbox"/> Planning
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Capital Program Services:

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Design | <input checked="" type="checkbox"/> CIP Construction | <input type="checkbox"/> Development and Pavement Management |
| <input type="checkbox"/> Financial Services | <input type="checkbox"/> Administrative Support | <input type="checkbox"/> Program Services |

Traffic Management Sections:

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Development Review | <input checked="" type="checkbox"/> Right-of-Way Management | <input checked="" type="checkbox"/> Neighborhood Services |
| <input checked="" type="checkbox"/> TR Operations & Design | <input checked="" type="checkbox"/> Signals & Lighting | |

Purpose:

To establish guidelines for the installation of marked crosswalks at unsignalized intersections and midblock locations.

Procedures:

Principles

The design and operation of a roadway and its intersections shall take into consideration the mobility needs of pedestrians and the provision for adequate crossing safety.

Criteria

Providing new marked crosswalks is based on an engineering study of conditions surrounding the desired crossing. These conditions may include the demand or need for the crossing, locations of alternative marked crossings, roadway characteristics, funding availability, and influence of limiting constraints such as inadequate sight distance or right-of-way.

The principals set forth in the MUTCD carry significant weight in guiding the engineering study and determination of marking a crosswalk.

Crosswalks marked at stop controlled intersections are Parallel Bar style as defined in the City of Bellevue's Standard Plans. Crosswalks marked at uncontrolled or yield sign controlled locations are Piano Key style as defined in the City of Bellevue's Standard Plans.

Procedure

General:

The MUTCD describes the application of crosswalk markings including their color, characteristics, appropriateness of installation and other considerations. The decision to install, modify, or remove crosswalk pavement markings for a particular condition is made based on either engineering study or engineering judgment.

Non-Signalized Intersections:

- For stop controlled intersections, install Parallel Bar crosswalk markings in location and orientation as directed by the Traffic Engineering Division.
- For uncontrolled or yield controlled intersections, install Piano Key crosswalk markings in location and orientation as directed by the Traffic Engineering Division.
- At crosswalks with special surface treatment, or in special districts, crosswalk marking shall be designed for the specific circumstance as determined by the Traffic Engineering Division.

Non-Signalized Midblock Locations:

- For any midblock location determined through an engineering study to merit a marked crosswalk, the marking shall be a Piano Key style crosswalk marking in location and orientation as directed by the Traffic Engineering Division.
- At crosswalks with special surface treatment, or in special districts, crosswalk marking shall be designed for the specific circumstance as determined by the Traffic Engineering Division.

All new marked crosswalks shall have a minimum of one street light pole located within 50 feet of the crossing unless otherwise determined by engineering judgment. Additional street lighting will be provided as funding and engineering study determines.

Material for marked crosswalks shall be installed per project specific plans, specifications and/or City of Bellevue Transportation Design Manual standard plans.

References (associated SOPs, City Code and Ordinances, RCWs, etc):

- Manual on Uniform Traffic Control Devices (MUTCD), current adopted edition with Washington Modification
- Revised Code of Washington (RCW) 46.04.160
- City of Bellevue Transportation Design Manual

Definitions:

Marked crosswalk is defined under state law in RCW 46.04.160 and further described and defined in the MUTCD. Any crosswalk whether marked or unmarked is defined as:

RCW 46.04.160. Crosswalk Defined.

"Crosswalk" means the portion of the roadway between the intersection area and a prolongation or connection of the farthest sidewalk line or in the event there are no sidewalks then between the intersection area and a line ten feet therefrom, except as modified by a marked crosswalk.

Bellevue further expands this definition by the following:

Marked crosswalk – any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by a contrasting pavement texture, style, or color. Crosswalk pavement markings shall be white consistent with the MUTCD.

Engineering Judgment – the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in the MUTCD and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.

Engineering Study – the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in the MUTCD and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.

Piano Key Style crosswalk is a series of white lines 2 foot in width and generally 10 feet in length. Although, the length may exceed 10 feet if conditions dictate such as large crossing areas and/or very high pedestrian volume. City of Bellevue Standard Plans provide additional description.

Parallel Bar Style crosswalk are two white lines 1 foot in width running parallel to one another and separated at their edges by a minimum of 8 feet and no further distance apart than permitted under the MUTCD.



Crosswalk Markings at Signals

Responsible Division: Traffic Mgmt.	Category: Select...
APWA Accreditation Chapter Number(s): 31	APWA Practice(s):

Revision History:		
Revision Date	Revision	Revision by:
6/15/2011	Administrative edits	

Applicable Divisions:

<input type="checkbox"/> Entire Department	<input type="checkbox"/> Director's Office	<input checked="" type="checkbox"/> CPS	<input checked="" type="checkbox"/> Traffic	<input type="checkbox"/> Planning
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Capital Program Services:

- | | | |
|---|--|---|
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| <input type="checkbox"/> Financial Services | <input type="checkbox"/> Administrative Support | <input type="checkbox"/> Program Services |

Traffic Management Sections:

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Development Review | <input checked="" type="checkbox"/> Right-of-Way Management | <input checked="" type="checkbox"/> Neighborhood Services |
| <input checked="" type="checkbox"/> TR Operations & Design | <input checked="" type="checkbox"/> Signals & Lighting | |

Purpose:

To establish guidelines for the installation of marked crosswalks at signalized intersections.

Procedures:

Principles

The design and operation of traffic control signals shall take into consideration the needs of pedestrians as well as vehicular traffic.

Criteria

Crosswalks are typically marked on all legs of a signalized intersection unless specific circumstances as determined by engineering judgment deem the marking of a crosswalk not warranted. Such circumstance may include non-continuous sidewalks, half-block signal with crosswalk available at adjacent signalized intersection, tee-intersections, or channelizing pedestrians to alternate safer crossings at the intersection.

Crosswalks at signalized intersections are parallel bar. Channelized right-turns controlled by yield signs are piano key. Signalized intersections with special surface treatments or in special districts may have site specific crosswalk markings.

Procedure

Signalized Intersections:

- Install parallel bar crosswalk markings on all legs of the signalized intersection unless it is determined that an individual crosswalk(s) is not warranted
- Select type of marking. Parallel bar crosswalk marking is used except at channelized right turns with a yield sign, where the piano key marking is used
- At crosswalks with special surface treatment, or in special districts, crosswalk marking shall be designed for the specific circumstance
- Ensure that marked crosswalks have associated pedestrian pushbutton detectors and pedestrian signal head displays. Newly constructed signalized intersections shall have audible pedestrian signals at all marked crosswalks

References (associated SOPs, City Code and Ordinances, RCWs, etc):

- Manual on Uniform Traffic Control Devices (MUTCD), current adopted edition with Washington Modification
- City of Bellevue Transportation Design Manual

Definitions:

Marked crosswalk – any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by a contrasting pavement texture, style, or color.

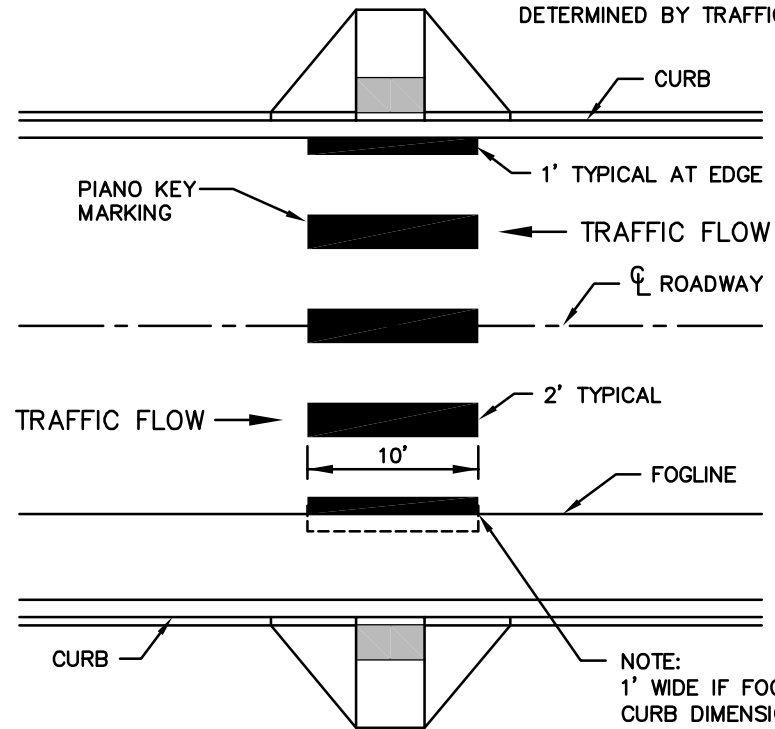
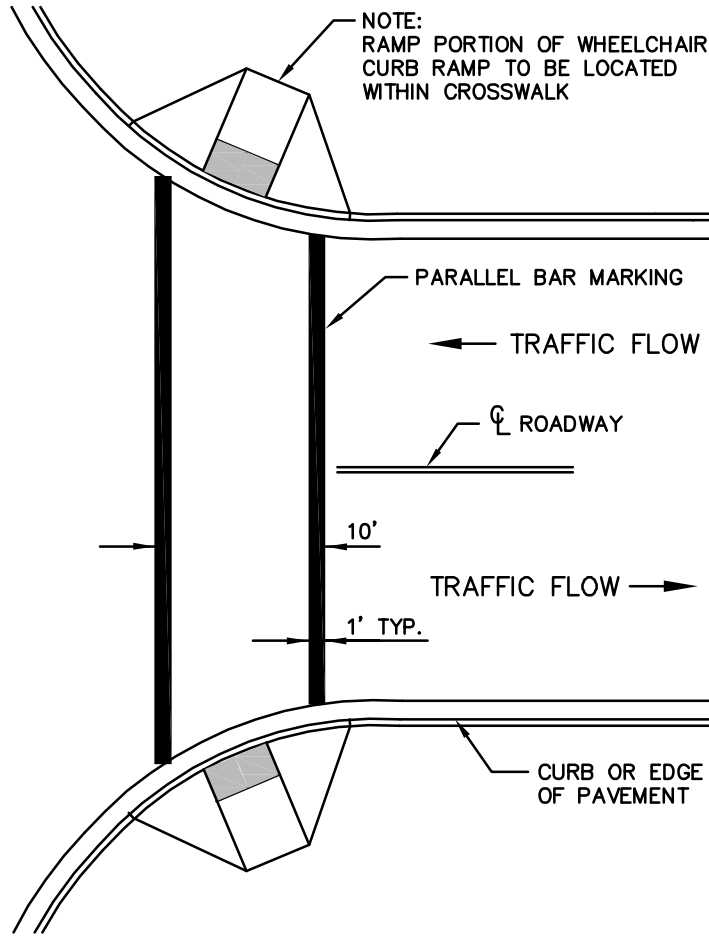
Engineering Judgment – the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in the MUTCD and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.

Piano Key Style crosswalk is a series of white lines 2 foot in width and generally 10 feet in length. Although, the length may exceed 10 feet if conditions dictate such as large crossing areas and/or very high pedestrian volume. City of Bellevue Standard Plans provide additional description.

Parallel Bar Style crosswalk are two white lines 1 foot in width running parallel to one another and separated at their edges by a minimum of 8 feet and no further distance apart than permitted under the MUTCD.

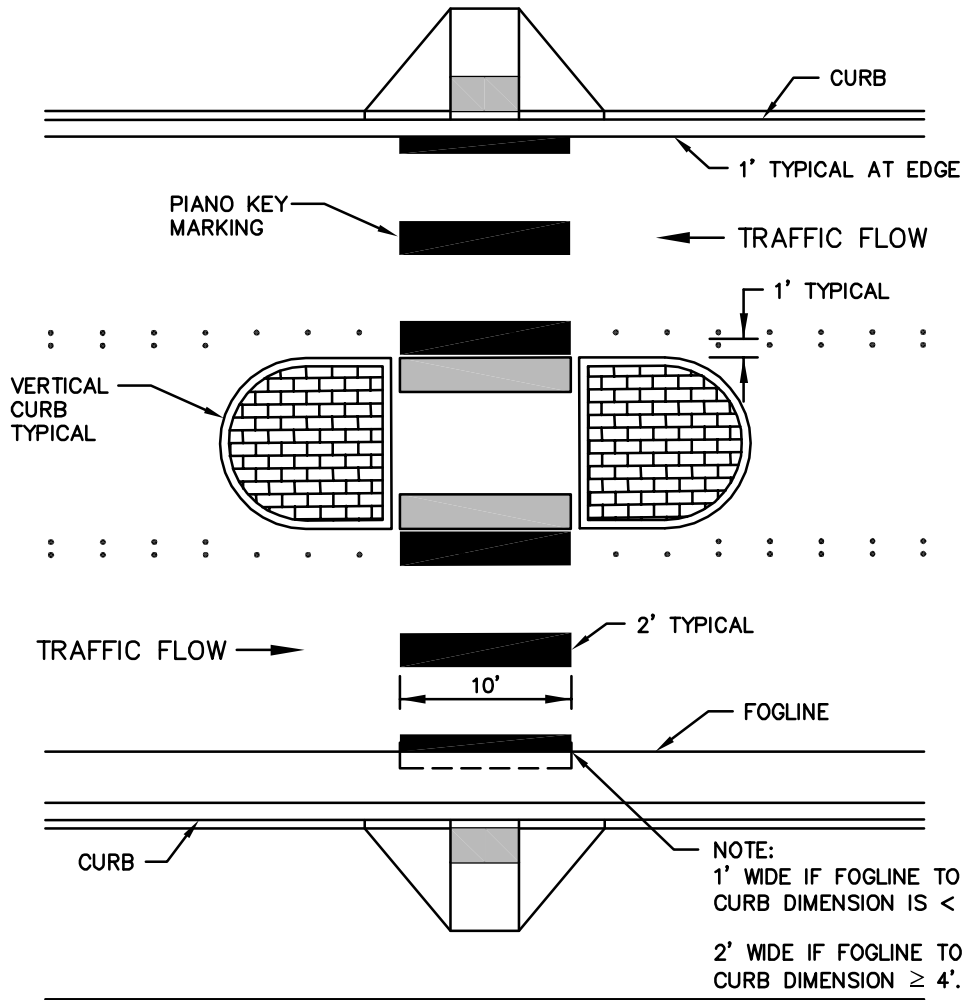
NOTES:

1. MATERIAL SHALL BE THERMOPLASTIC, HOT APPLIED OR HEAT FUSED PREFORMED (90 MIL. MIN.), UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. GAP WIDTH SHALL BE 2' MINIMUM.
3. CROSSWALK MARKING STYLE TO BE DETERMINED BY TRAFFIC ENGINEERING.



NOTE:
1' WIDE IF FOGLINE TO FACE OF CURB DIMENSION IS < 4'.
2' WIDE IF FOGLINE TO FACE OF CURB DIMENSION ≥ 4'.

DRAWING NUMBER	TE-7A
SCALE	NONE
REVISION DATE	01/14
DEPARTMENT	TRANS



NOTES:

1. MATERIAL SHALL BE THERMOPLASTIC, HOT APPLIED OR HEAT FUSED PREFORMED (90 MIL. MIN.), UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. GAP WIDTH SHALL BE 2' MINIMUM.
3. IF THERE IS NO CURB AND GUTTER CONTACT TRAFFIC ENGINEER FOR LAYOUT.



CROSSWALK MARKINGS

DRAWING NUMBER	TE-7B
SCALE	NONE
REVISION DATE	12/12
DEPARTMENT	TRANS