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Date: 9/15/2015

To: Public Works Commission  
From: Norman J. Baldwin, P.E. *NJB*  
City Engineer/Ass't Director of Public Works

C.C. Chapin Spencer, Director of Public Works  
Nicole Losch, Transportation Planner

Subject: Guidelines for Pedestrian Crossing Treatments

SUMMARY: I have been tasked with determining what design policies or guidelines the City should adopt to accessibility and walkability of our community. The City has sought on many fronts to improve its walkability with the ambitious goal of achieving a gold-level Walk Friendly Community designation.

Consistent with this goal, the Commission has requested staff bring forward guidelines on two specific policy items:

1. Criteria for the establishment of mid-block crosswalks
2. Criteria for the installation of Rectangular Rapid Flashing Beacons (RRFBs)

We have reviewed the State of Vermont's recently updated Crossing Treatment Guidelines and believe the document provides good initial guideline for the City in evaluating both topics above as well as many others. As such, we are recommending the Commission adopt the State's Crossing Treatment Guidelines at its October meeting. We will be available to discuss the guidelines at the upcoming meeting in September.

BACKGROUND: With the expended employment and retail activity along the Pine Street the City sought to improve walkability and with the financial support of the State of Vermont the City installed Rectangular Rapid Flashing Beacons(RRFB's). The RRFB's have proven to be highly successful as a warning device increasing the likelihood of vehicles yielding to pedestrians seeking to cross at the various locations along the corridor. If you travel the Pine Street corridor, you are aware of a very active walking corridor, with a high volume of vehicular traffic throughout the day. Seldom can you travel the Pine Street corridor without having a RRFB being activated and have a pedestrian on one side or the other waiting to cross. The success of the Rapid Flashing Beacon in part is the prudent application and use of the RRFB's as an enhancement to an uncontrolled crosswalk location.

As a result of the Pine Street experience, there have been requests submitted to the department requesting the installation of a RRFB's in other locations within the City. At a more recent Public Works Commission a resident had asked the Commission to consider the installation of two pair of RRFB's on the north side of the Willard Street Rotary to cross Willard Street and St.Paul Street. RRFB's have only recently become available as another tool in our arsenal of influencing driver and pedestrian behavior to limit conflict, improve access and safety. As a City agency, we have had

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to grapple with developing our own policy guidelines that specify when a RRFB would be appropriate enhancement to an uncontrolled crosswalk.

In our effort determine the best practices we have researched various Federal, State and local agencies policies that speak to the design and installation of RRFB's, each agency has their own approach in determining the design and possible threshold where RRFB's should installed as an enhancement to an uncontrolled crosswalk.

Given we are not an island unto ourselves and one of the most fundamental philosophies of Traffic Engineering design is to ensure the systems we are justified, installed and built and predictably following Federal and State Standards. Manual on Uniform Traffic Control(MUTCD) has allowed for the installation of RRFB's as a warning device for crosswalks. The MUTCD speaks to how the RRFB's would be constructed and operate however has not gone so far as to provide a standard of review in which it would be appropriate and necessary to install a RRFB. Our State Agency of Transportation (VTRANS) has issued a guidance document entitled "Vermont Agency of Transportation Guidelines for Pedestrian Crossing Treatments". The VTRANS document provides a framework for decision making to determine if a crosswalk is needed, if it is needed how it would be configured, and would it require additional enhancements such as a RRFB. Given the State of Vermont is a partner on many projects providing funding for many of our initiatives, our requirements should not be in conflict with MUTCD, or VTRANS Standards.

Referencing VTRANS document on page 22, last paragraph "crosswalk enhancements are generally based on three criteria: traffic volume, posted speed and lane configurations. The tables in figures 10 and 11 indicate when marked crosswalks alone are appropriate or when use of enhancements should be considered. The tables also indicate which of the crosswalk enhancements should be considered for a given set of conditions. The tables are not meant to be proscriptive, but rather provide guidance on enhancements that could be used."

Referencing VTRANS document page 24, Figure 11 for streets with a posted speed limit 30 MPH or less which is more common in Burlington, with Annual Average Daily Traffic (AADT) of >9,000. A RRFB would be appropriate if all other requirements were meet such as adequate sight distance, there is not another crosswalk within 200 feet of the location, engineering judgment, etc.

Examining the CCRPC's Traffic Counts there are a number of street segments that would fit the AADT Criteria. For your consideration I am providing you a listing of traffic counts for streets exceeding the 9,000 AADT.

CCRPC ID	Count Date	Description	AADT
BURL44	2005	PINE ST. BTW LOCUST & HOWARD ST.	13000
D144	1993	PEARL ST. EAST OF N.UNION ST.	12930
D155	2009	PEARL ST. JUST EAST OF SOUTH WILLIAMS ST.	12300
BURL02	2005	NORTH AVE. SOUTH OF INSTITUTE RD.	12000
BURL75	2010	COLCHESTER AVE. BTW CHASE ST. & GREENMOUNT CEMETERY	12000
BURL80	2010	PEARL ST. BTW SOUTH WILLIAMS ST. & HANDY CT.	12000
D507	2002	SOUTH WINOOSKI AVE. BTW MAIN ST & COLLEGE ST	12000
D447	2005	S.PROSPECT ST. NORTH OF MAIN ST.	11800
D541	2009	PINE ST. NORTH OF LAKESIDE AVE.	11800
D045	2009	NORTH AVE. 0.25 MI. SOUTH OF INSTITUTE RD.	11700
D444	2009	PINE ST. BTW LOCUST ST. & HOWARD ST.	11700
D446	2009	SHERMAN ST. BTW PARK ST. & NORTH ST.	11600
D457	1989	EAST AVE. NORTH OF US 2	11140
D154	2009	COLCHESTER AVE.EAST OF NASH PLACE	11100
D456	1989	COLCHESTER AVE. NORTH OF CHASE ST.	10970
D097	1996	BATTERY ST.SOUTH OF MAIN ST.	10900
D164	2002	US 7 NORTHWEST OF MARIAN ST.	10900
D148	2009	NORTH AVE.NORTH OF COTTAGE GROVE	10800
D460	2009	PEARL ST. WEST OF WINOOSKI AVE.	10600
D169	2009	MANHATTAN DR. EAST OF N.CHAMPLAIN ST.	10500
D168	1989	SOUTH PROSPECT ST. SOUTH OF COLCHESTER AVE.	10310
BURL14	1994	MANHATTAN DR. EAST OF PARK ST.	9840
BURL01	2005	PLATTSBURG AVE. SOUTH OF SUNSET DR.	9600

D171	2009	PINE ST.SOUTH OF MAPLE ST.	9600
D163	2009	ST,PAUL ST.SOUTH OF MAPLE ST.	9400
AOT20	2002	N. WINOOSKI AVE. (ALT US 7) BTW ARCHIBALD ST & RIVERSIDE	9100
BURL78	2010	EAST AVE. BTW EAST VILLAGE & BILODEAU CT.	9000
D138	2009	EAST AVE. SOUTH OF BILODEAU CT.	9000
D172	2009	EAST AVE. SOUTH OF COLCHESTER AVE.	8600
D157	2002	ST. PAUL ST SOUTH OF HI-RISE	8400
D475	2009	VT 127 (NORTHERN CONNECTOR) 0.2 MILES NORTH OF EXIT TO NORTH AVE.	8100

This list of streets may not be all representative of every street meeting this criteria, given a portion of this data may be aged, or segments of the roadway are missing from the counts performed by CCRPC but is representative of our roadway network volumes.

At a recent Commission meeting a resident was expressing concern that the State managed Willard Street Roundabout Project was taking too long to go to construction and that it was increasing difficult for residents and school children to cross safely at Willard Street and St.Paul Street north of the rotary. The resident was pleading with the Commission to have the City with its own resources advance the installation of RRFB's at the two crossings in advance of the State Fund Safety Improvement Project. In giving this resident the due consideration staff did use the above referenced guidelines to review the locations and determined the installation of RRFB's were warranted, in addition the States plan set for the Willard Street Roundabout Project does include the RRFB's as requested.

Staff feels strongly these two locations are strong candidates for RRFB's as a crosswalk enhancement given the volume of vehicular traffic, the distance in separation to the nearest crossing location, the need to provide a higher degree of crossing protection to a vulnerable population (School Kids).

I am recommending:

- the adoption and the application of Vermont Agency of Transportation guidelines for Pedestrian Crossing Treatments dated January 2015 is a very good first step and will allow us to review the various crosswalk and RRFB requests.
- the installation of RRFB's at the two crosswalk locations just north of the Willard Street Rotary

If you have any question please feel free to give me a call.