

JUL 27 2015

ITEM: TT 2015-0554
Urgent Business
CITY CLERK'S DEPARTMENT

ISC: UNRESTRICTED
TT2015-0554
Page 1 of 3

Transportation Report to
SPC on Transportation and Transit
2015 July 22

RECTANGULAR RAPID FLASHING BEACON (RRFB) TRIAL FINDINGS

EXECUTIVE SUMMARY

The Rectangular Rapid Flashing Beacon (RRFB) has proven to be an effective traffic control device and is recommended for continued installation in the City of Calgary. The RRFB has been shown to increase motorist yielding behaviour and provides an additional treatment to the current set of traffic control devices for improving pedestrian safety. (Attachment 1)

ADMINISTRATION RECOMMENDATION(S)

That the SPC on Transportation and Transit recommends that Council direct the City of Calgary to adopt Rectangular Rapid Flashing Beacon's (RRFB) as a pedestrian crossing treatment, using a modified pedestrian corridor warrant until their inclusion in the Transportation Association of Canada's Pedestrian Crossing Control Guide.

RECOMMENDATION OF THE SPC ON TRANSPORTATION AND TRANSIT, DATED 2015 JULY 22:

That the Administration Recommendation contained in Report TT2015-0554 be approved.

Excerpt from the Minutes of the Regular Meeting of the SPC of Transportation and Transit, held 2015 July 22:

"And further, that Report TT2015-0554 be forwarded, as an item of Urgent Business, to the 2015 July 27 Regular Meeting of Council."

PREVIOUS COUNCIL DIRECTION / POLICY

On 2014 January 13, Council received Report PFC2013-0780, Rectangular Rapid Flashing Beacon (RRFB) Pilot Project, and adopted the following recommendations that Council direct Administration to:

1. Expand the pilot project, at an additional cost of up to \$400,000. This will be funded by the Roads business unit unless alternative financing is arranged; and
2. Report to Council with Rectangular Rapid Flashing Beacon (RRFB) trial results and recommendations no later than July 2015.

On 2012 November 26, Council approved "Proposed Adjustments to the 2013-2014 Business Plans and Budgets" (C2012-0717), which recommended a budget of \$200,000 for the Rectangular Rapid Flash Beacon Pilot Project from the Council Innovation Fund.

On 2011, June 20, Council received Report C2011-60, Rectangular Rapid Flash Beacon (RRFB) Solar Powered Pedestrian Crossing Pilot, and adopted the following amended recommendations that Council:

1. Receive this report for information; and
2. Allocate up to \$200,000 of the Council Innovation Fund towards the trial installation of up to 10 solar powered pedestrian crossing signals.

RECTANGULAR RAPID FLASHING BEACON (RRFB) TRIAL FINDINGS

BACKGROUND

In 2013 solar powered RRFBs were installed at eight locations to test the device under a pilot program. Studies were undertaken, the results of which indicated improvements in motorists yielding behaviour at locations with the RRFB devices. The pilot revealed performance shortcomings with the solar power supply, mainly related to reliability.

In 2014, the RRFB pilot was extended to include ten additional installations which would allow further study and the opportunity to test advancements in solar power and RRFB technology. One test location was also attached to a continuous source of power.

INVESTIGATION: ALTERNATIVES AND ANALYSIS

RRFB Effectiveness:

Yielding behaviour studies during the 2013 trial revealed that the RRFBs increased yielding compliance at all crosswalks where the devices were installed. Motorist yielding increased between 5 and 26 percent, depending on the site, with compliance increasing by an average of 15 percent. A follow up field compliance study conducted in June 2014 to examine the effectiveness of these devices after a year of operation revealed that the RRFBs continue to be highly effective. These results are shown in Table 1.

Table 1: Yield compliance results before and after RRFB installations in Calgary

#	Location	Facility Type	Traffic Volume (24 hr)	Pedestrian Volume (24 hr)	Lanes	Posted Speed (km/h)	Median Type	Yielding Percentage Before RRFB	Yielding Percentage After RRFB (2013)	Yielding Percentage After RRFB (2014)
1	Glenmore Trail/18 Street SE	Freeway Interchange Loop Ramp	10,208	112	1	50	-	81	100	95
2	Crowchild Trail/Shaganappi Trail NW	Freeway Interchange Channelized Right Turn	4,776	106	1	60	-	77	90	85
3	Sun Valley Boulevard/Sun Harbour Road SE	Multi-lane Arterial near a recreation area	8,098	41	5	60	Concrete	87	98	100
4	18 Street/Riverview Close/Riverwood Circle SE	Multi-lane Arterial	14,565	162	5	50	Concrete	74	100	95
5	Radcliffe Drive/100 Radcliffe Place SE	Collector within School Zone	7,479	128	2	30	-	84	99	100
6	Douglasdale Boulevard/Douglas Ridge Close SE	Collector within School Zone	6,051	304	2	30	Boulevard	94	99	100
7	Harvest Hills Boulevard/harvest Oak Drive NB	Multi-lane Arterial	11,306	106	2 1-way	50	Grassy	87	98	95
8	Harvest Hills Boulevard/harvest Oak Drive SB	Multi-lane Arterial	8,999	106	2 1-way	50	Grassy	83	96	93

RECTANGULAR RAPID FLASHING BEACON (RRFB) TRIAL FINDINGS

RRFB Technical Specifications:

Refinements in the technical specs have led to improvements in the performance of the RRFB devices from the initial trial to the extended trial. These refinements include adjustable solar panels, battery cabinets accessible from the ground, the ability to retrofit to continuous AC power or streetlight power, capability of using City of Calgary standard pedestrian push-buttons, solar sizing design for each specific location, and operating temperature range of -40C to +40C.

RRFB Costs:

Installation costs of the RRFBs vary greatly depending on location specifics. These include roadway geometry, number of vehicle lanes, presence of a median, suitable visibility, ability to install unobstructed solar panels, and existing devices along the roadway.

Solar technology continues to advance and evolve and have potential for cost savings, however since reliability is of the greatest concern when implementing any traffic control device, power supply decisions are best determined through the design process.

Table 2 shows the range of costs from recent installations for different power options, it also includes the estimated cost for a traditional overhead mounted pedestrian corridor. It should be noted that as technology improves and products becomes more readily available, the costs associated with RRFB installation should go down. Administration is constantly reviewing options to maximize cost-effectiveness with RRFBs.

Table 2: RRFB installation costs in Calgary

RRFB Power Configuration	Cost Range*
Solar-powered	\$25,000 - \$45,000
Streetlight power	\$45,000 - \$75,000
AC power	\$55,000 - \$75,000
Overhead Pedestrian Corridor (for comparison)	\$85,000 - \$110,000

*based on current installations

Transportation Association of Canada:

In 2014 November, the Transportation Association of Canada (TAC) approved the RRFB as a traffic control device, and its inclusion in the Manual of Uniform Traffic Control Devices - Canadian Edition.

An essential component of RRFB adoption is to determine how the device consistently fits into the spectrum of pedestrian crossing treatments. A funded TAC project has been established to include RRFBs into the Pedestrian Crossing Control Guide in order to ensure the consistent application of the device across Canada. Until such a time as there is a national standard for the installation of RRFBs, The City of Calgary will continue to install the devices based on a modified pedestrian corridor warrant system and by applying design experience.

RECTANGULAR RAPID FLASHING BEACON (RRFB) TRIAL FINDINGS

Stakeholder Engagement, Research and Communication

Calgarians have been kept up to date on the RRFB pilot project via Calgary.ca and message boards located near trial installations. Citizen engagement was undertaken during the original and extended pilots. The results indicated user satisfaction with the devices, and further, recommendations by citizens on the optimal height of RRFBs have been incorporated into subsequent installations. Respondents to an on-site survey after the extended pilot indicated they see the benefit of another pedestrian-activated device.

The Transportation Association of Canada has been closely linked to the RRFB pilot project, and awarded The City of Calgary with the 2015 Road Safety Engineering Award for its work with RRFBs.

Collaboration is underway with the City of Edmonton to exchange experiences and lessons learned regarding RRFBs.

Strategic Alignment

The addition of RRFBs to Calgary's approved traffic devices aligns with the Calgary Transportation Plan's key directions to promote safety for all transportation system users, enable walking as a preferred mobility choice and provide transportation services in a safe, effective, affordable and efficient manner.

Social, Environmental, Economic (External)

Innovations in pedestrian crossing safety, such as RRFBs, encourage Calgarians to use active modes of travel. This can foster a stronger sense of community connection through increased walking and opportunities for interaction.

Continuing to investigate advances in the effectiveness of renewable energy sources, such as solar power for traffic control devices, will help to reduce dependence on non-renewable energy sources and reduce The City's environmental footprint.

Financial Capacity

Current and Future Operating Budget:

This report has no direct impact on the Roads current or future operating budget.

Current and Future Capital Budget:

This report has no direct impact on the Roads capital budget, pedestrian crossing devices will continue to be funded from the existing budgets.

Risk Assessment

Adopting the RRFB as an approved device for use at pedestrian crossings in the city going forward will increase safety for all road users.

Continuing to investigate solar power options, as the technology continues to make advancements, will ensure that The City maximizes the effectiveness and efficiency of its traffic control devices.

RECTANGULAR RAPID FLASHING BEACON (RRFB) TRIAL FINDINGS

REASON(S) FOR RECOMMENDATION(S):

Rectangular Rapid Flashing Beacons have proven to be a device that creates excellent motorist yielding behaviour. Their adoption as a pedestrian crossing tool going forward will increase safety for Calgary road users of all types.

ATTACHMENT(S)

1. Rectangular Rapid Flashing Beacon (RRFB) Findings of Field Trial – Technical Report