



City of Richmond

Report to Committee


To: Public Works and Transportation Committee
From: Victor Wei, P. Eng.
Director, Transportation
Date: April 21, 2011
File: 6450-08-01
Re: **NO. 1 ROAD AND MONCTON STREET - PROPOSED INTERSECTION AND
SURROUNDING PEDESTRIAN CROSSWALK IMPROVEMENTS**

Staff Recommendation

1. That the proposed intersection and pedestrian crosswalk improvements at the following locations in the Steveston Village area, as described in the attached report dated April 21, 2011, be approved for implementation:
 - a) No.1 Road/Moncton Street - signalization with "pedestrian scramble" phase and raising of pavement with artistic design of crosswalk markings;
 - b) Moncton Street/Hayashi Court, No .1 Road/Chatham Street, Moncton Street/Easthope Avenue – raising of crosswalk pavement; and
 - c) Chatham Street between 1st Avenue and 4th Avenue - introduction of temporary curb extensions for a test period of 12 months followed by permanent installation if supported by area stakeholders.
2. That staff monitor the effectiveness of the above pilot "pedestrian scramble" feature at No.1 Road/Moncton Street intersection and report back to Council after one year of implementation.
3. That a public information process for the above improvements be carried out during Summer 2011 prior to the start of construction and activation of the traffic signals at the No. 1 Road/ Moncton Street intersection.

Victor Wei, P. Eng.
Director, Transportation
(604-276-4131)

Att. 1

FOR ORIGINATING DEPARTMENT USE ONLY			
ROUTED TO:	CONCURRENCE		CONCURRENCE OF GENERAL MANAGER
Engineering	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	 for Joe Erceg.
Arts, Culture and Heritage	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Community Bylaws	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Budgets & Accounting	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Fire Rescue	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
RCMP	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Policy Planning	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
Parks and Recreation	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>	
REVIEWED BY TAG	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	REVIEWED BY CAO YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Staff Report

Origin

At its September 28, 2009 regular meeting, Council endorsed a number of short-, medium- and long-term traffic and parking improvements in the Steveston Village area, including the signalization, enhancement and raising of the intersection at No. 1 Road and Moncton Street. In addition, as part of Council resolution, staff were directed to:

- (c) *Install raised pedestrian crosswalks on*
 - (i) *No. 1 Road at Chatham Street; and*
 - (ii) *Moncton Street at Easthope Avenue.*

This report presents staff's findings of an intersection traffic analysis conducted recently to develop a functional traffic signal design for the No. 1 Road and Moncton Street intersection and outlines the recommended intersection enhancements to address pedestrian safety issues. The recommended enhancements include streetscape features to provide a distinct but compatible realm in character with the adjacent surroundings of Steveston Village. This report also proposes additional pedestrian safety measures at other intersections in the Steveston Village area.

Analysis

1. Existing Traffic Conditions at No. 1 Road and Moncton Street

The intersection of No.1 Road and Moncton Street is the primary gateway to the Steveston Village core. At busy times such as weekends and summer, motor vehicle, pedestrian and cycling volumes are often found to exceed the capacity of the current intersection control of 4-way stop signs. In addressing this issue with input from the public, a report to Council dated August 31, 2009, provided the results of a public survey and conceptual design study indicating strong public support for signalizing the intersection and raising the ground plane to reduce traffic speeds.

The results of the study confirmed that high volumes of vehicular and pedestrian traffic utilize the No. 1 Road and Moncton Street intersection with pedestrian flows at least 30 per cent higher on weekends versus weekdays. As such, the current 4-way stop control often results in considerable confusion on the right-of-way between vehicles and pedestrians. Based on the pedestrian and vehicle traffic volumes, a traffic signal is warranted at the intersection.

The goal of the functional design of the traffic signal and intersection enhancements at No. 1 Road and Moncton Street is to accomplish the following objectives:

- enhance the safety of the intersection for pedestrians by alerting motorists to slow down as they approach the intersection;
- reduce confusion regarding the right-of-way of pedestrians, cyclists and motorists at the intersection;
- reinforce the unique heritage character of Steveston Village; and
- create a special place at a landmark intersection of which the community can be proud of.

2. Raising of Intersection

At its September 28, 2009 regular meeting, Council directed staff to pursue a 30 km/hr posted speed limit in the Village core, including Moncton Street in front of Steveston Community Centre. To support the reduction in speed limit and to maintain consistency with the raising of the pedestrian crosswalks on Moncton Street and at Chatham Street in advance of the entrance to Steveston Village, staff recommend raising the No. 1 Road and Moncton Street intersection to further enhance the pedestrian realm and gateway feature of the area. With this improvement, the intersection pavement, including the crosswalks, would be retrofitted at a higher elevation than the approaching roadways and thus would deter traffic from speeding through the intersection especially during green-to-amber phase. Table 1 below outlines the advantages and disadvantages of a raised intersection at No.1 Road and Moncton Street.

Table 1: Advantages & Disadvantages of Raised Intersection

Advantages	Disadvantages
<ul style="list-style-type: none"> Provides higher effectiveness of speed reduction by slowing traffic down and increases safety for pedestrians and vehicles Greater accessibility for all pedestrians by eliminating the need of letdowns from the sidewalk to the crosswalks Considerably lower impact to street parking compared to other forms of traffic calming measures such as curb extensions Enhances the gateway feature of the intersection to Steveston Village Consistent with Steveston Conservation Strategy Intersection drains away from gutter near pedestrian refuge area especially during inclement weather conditions 	<ul style="list-style-type: none"> Additional construction cost of \$51,000 Temporary disruption to road users during construction

By raising the intersection, the pedestrian ground plane and the roadway would be at the same elevation. As there is no standard curb demarking the terminus of the pedestrian sidewalk area and the start of the roadway, bollards will be installed at the four corners of the intersection to provide positive guidance to users and a physical separation between vehicles and pedestrians. Figure 1 depicts the recommended bollard to provide a clear delineation between the pedestrian sidewalk and the roadway while preserving the visual simplicity of the historic character of Steveston Village.



Figure 1: Proposed Intersection Bollard Design

3. Proposed Traffic Signal Operation

The introduction of traffic signal operation would significantly reduce potential right-of-way conflicts and in turn would reduce confusion for all users. As part of signalization, the following alterations to the intersection geometry and operation are proposed:

- convert intersection lane configuration to provide left-turn bays on all four approaches; and
- restrict right-turn movements on red to improve pedestrian priority.

Impact on Existing Curb Parking

The geometric changes would have minimal impacts to the existing parking on the approaches of the intersection. Staff estimate approximately four curb parking spaces would be eliminated due to signalization of the intersection. However, alternative locations in the vicinity of the intersection to offset the parking loss have been identified.

Pedestrian Scramble

As shown in Figure 2, the pedestrian priority phase in the form of a “pedestrian scramble” would enhance the signal intersection environment for pedestrians as it would prohibit all vehicular movements and allow pedestrians to cross in any direction at the intersection including diagonally. Staff recommend introducing this special traffic signal feature on a pilot basis to address the high pedestrian volumes in Steveston Village as it would place a higher priority on pedestrian movements and further promote walking as the primary mode to move within the village core. If implemented, it would be the first “pedestrian scramble” in British Columbia.

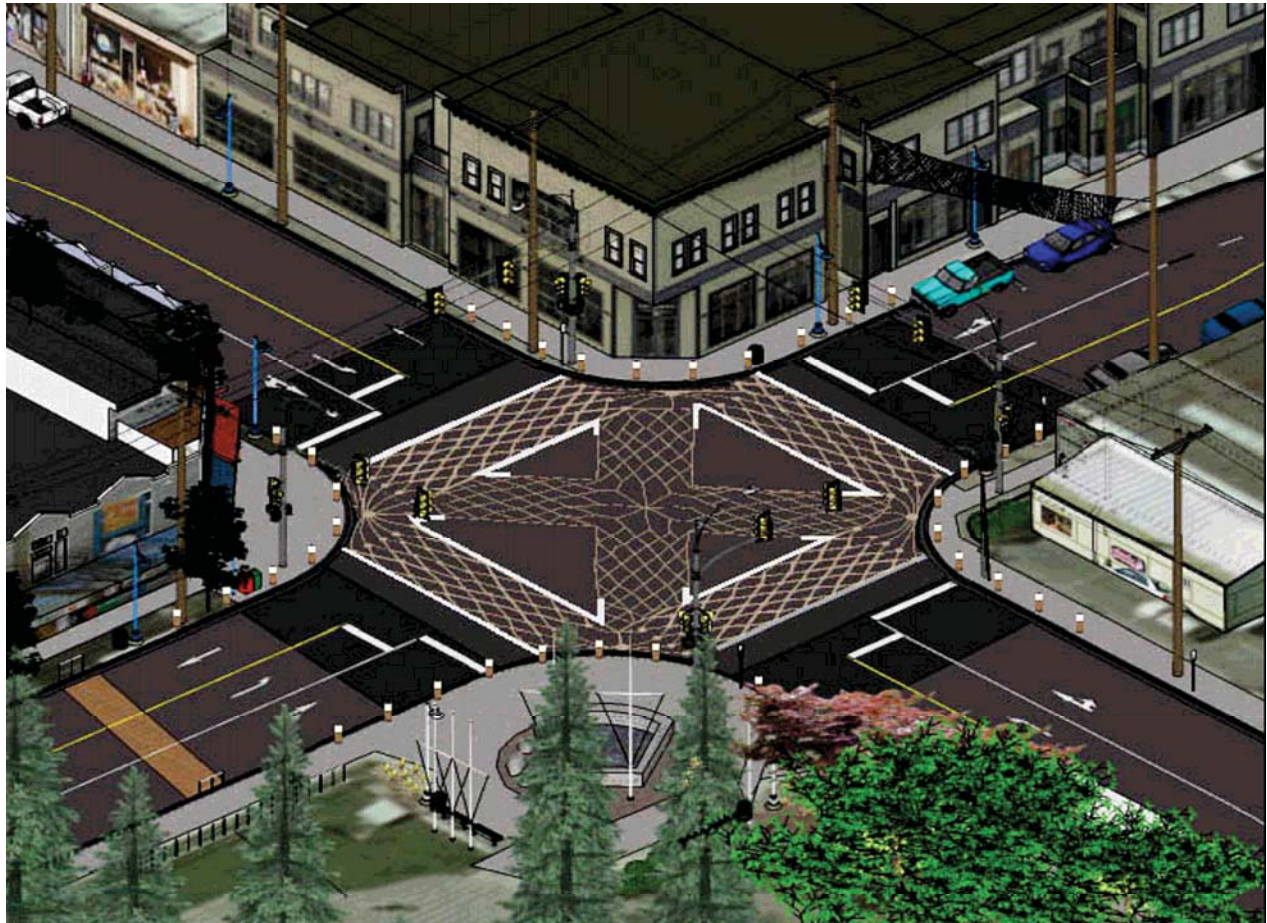
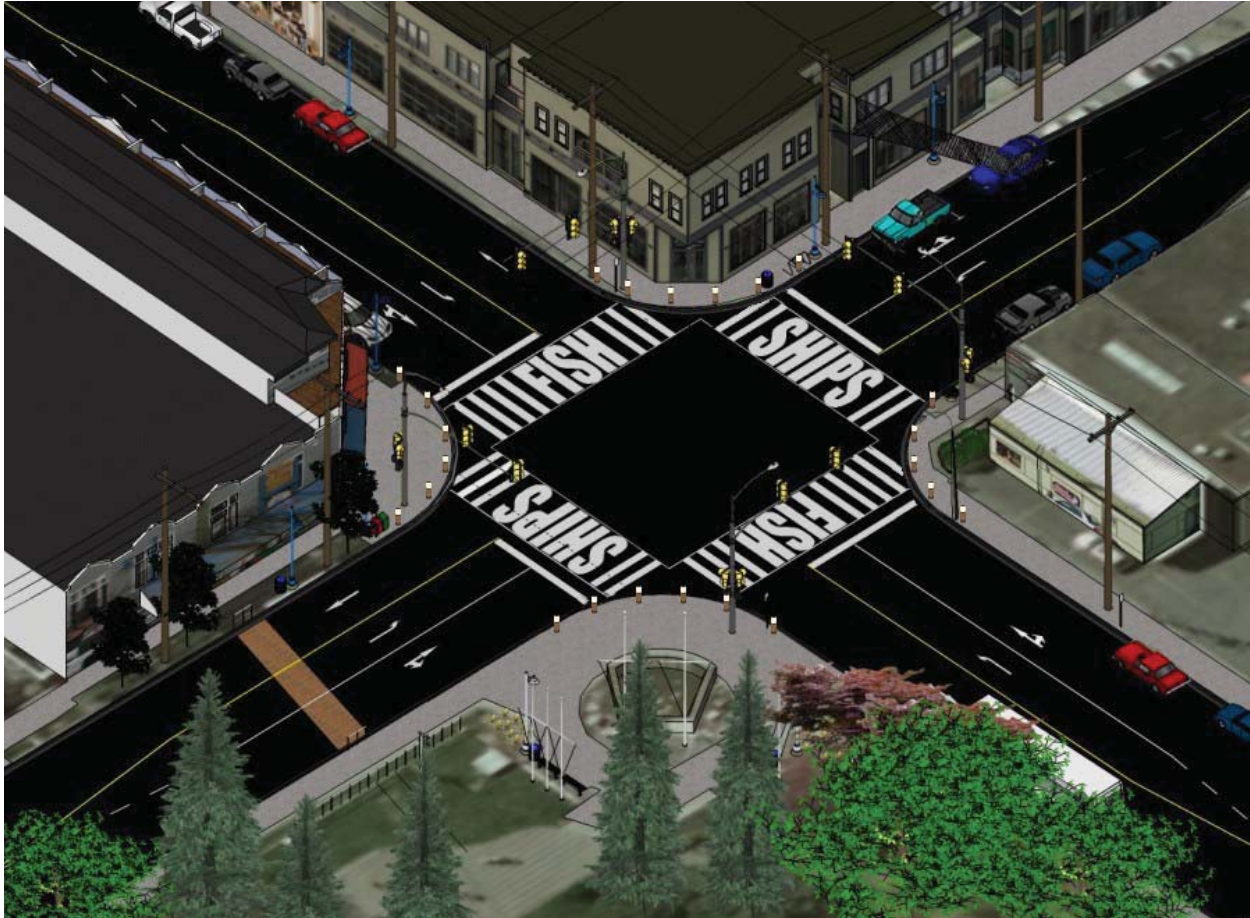


Figure 2: Traffic Signal with Pedestrian Scramble, Intersection Enhancements and Public Art

The additional capital cost of the pedestrian scramble feature to the project is estimated at \$53,000.

Alternatively, as shown in Figure 3, the implementation of conventional traffic signals at the intersection can also be considered without the pedestrian scramble feature. With this option, like all other existing signalized intersections, pedestrian movements occur simultaneously with the parallel traffic movement and there would not be any special priority for pedestrians over motor vehicles. With this option, a different artistic design of pavement marking would be used as explained in Section 5 of this report.



**Figure 3: Conventional Traffic Signal (no Pedestrian Scramble)
with Intersection Enhancements and Public Art**

Evaluation of Options

Table 2 summarizes an assessment of the pedestrian scramble feature in terms of safety, delay and priority for pedestrians and motorists compared to a conventional traffic signal.

Table 2: Operational Evaluation of Pedestrian Scramble

Pedestrian Scramble (with diagonal crossing) Recommended		
Advantages/ Disadvantages	For Pedestrians	For Motorists
Advantages	<ul style="list-style-type: none"> Increased safety for pedestrians with an additional exclusive crossing phase Reduced delay for pedestrians as crossing is permitted on every phase Special priority level as pedestrians can cross on all three phases and complete a 2-legged crossing in one movement 	<ul style="list-style-type: none"> Fewer conflicts with pedestrians on right turns
Disadvantages	<ul style="list-style-type: none"> Initial learning period for pedestrians to get accustomed to special signal operation Visually impaired may not utilize diagonal crossing due to lack of formal training 	<ul style="list-style-type: none"> Added overall delay to motorists during the pedestrian scramble Lower priority for motorists over pedestrians Initial learning period for motorists

Conventional Traffic Signal (no pedestrian scramble)		
Advantages/ Disadvantages	For Pedestrians	For Motorists
Advantages	<ul style="list-style-type: none"> No added learning phase with conventional signal operation Recognized as universally accessible 	<ul style="list-style-type: none"> Equal priority as pedestrians
Disadvantages	<ul style="list-style-type: none"> No priority for pedestrians Increased conflicts with motorists 	

Currently the 4-way stop control at the No. 1 Road/Moncton Street intersection results in considerable delays due to the uncertainty of right-of-way at the intersection. As presented in Table 2, the recommended traffic signal operation with a special pedestrian scramble would provide the best improvement for pedestrians. As well, this special treatment at the gateway corner to the historic Steveston Village area will further provide a pedestrian friendly environment for this popular location.

Other Intersection Enhancements

Additional enhancements to further improve traffic safety and address stakeholders' concerns expressed during past public consultation phases include the following key elements, which would be incorporated into the proposed improvements at the No. 1 Road/Moncton Street intersection in addition to the pedestrian scramble feature:

- a reduced posted speed limit from 50 km/hr to 30 km/hr at the approaches to the No. 1 Road and Moncton Street intersection as well as within Steveston Village;
- separate pedestrian signal heads, push buttons and signage for the pedestrian scramble indication;
- application of a tactile surface treatment to detect the boundary between the sidewalk and the street in accordance with CNIB standards;
- accessible pedestrian signals (APS) to provide verbal messaging consistent with the City's APS strategy endorsed by Council in September 2010 as well as specific messaging activated for the pedestrian scramble; and

- special pavement marking delineating the diagonal crosswalks (see Section 5).

4. Stakeholder Consultation

Staff have discussed the proposed design of the intersection including the pedestrian scramble operation and raised intersection with various stakeholder groups including:

- Advocates for Sight Impaired Consumers (ASIC)
- Richmond Centre for Disability (RCD)
- Richmond Community Cycling Committee
- Coast Mountain Bus Company
- Steveston Community Society
- Cycling BC
- Steveston special events representatives
- Richmond Fire-Rescue

With respect to the Steveston Community Society, which organizes the annual Sockeye Spin bicycle race in Steveston, this concept was shared with the Society's President who expressed an initial potential concern with raising the intersection on the Sockeye Spin event. Staff have subsequently discussed this with Cycling BC's Director of Technical Programs and further met with a Steveston Sockeye Spin Committee technical representative and the Society's President. After providing more detailed explanation that the design of the raised intersection would not resemble a speed 'hump' but rather would be constructed with approach ramps that incline very gradually with a maximum gradient of 5% (which would not adversely impact bicycle racers), Cycling BC, the Sockeye Spin Committee, and the Society's President have now endorsed the conceptual design of the raised intersection. The concept of raising the intersection is also supported by the Richmond Community Cycling Committee. All the above stakeholders are therefore in support of the recommended intersection signal design with raised pavement and pedestrian scramble operation.

Heritage Consultation

The proposed intersection improvements are consistent with the *OCP-Steveston Area Plan* and heritage conservation guidelines.

5. Intersection Public Art Project

The inclusion of public art at the No.1 Road/Moncton Street intersection would contribute to Council Term Goals to advance the city's world-class destination status and ensure that the city continues to grow as a vibrant cultural community. As such, the central paved area encompassed by and including the pedestrian crosswalk area of this intersection is proposed for a potential public art project as part of the intersection improvements.

In Fall 2010, through the Public Art Program, the City put out an Artist's Call to submit original two-dimensional concept sketches for the pavement surface design of the intersection as part of developing the overall intersection design. A public art Terms of Reference, describing the art opportunity, site description, themes, budget, selection process, and submission requirements

was developed specifically for the contest. These Terms of Reference were reviewed and endorsed by the Public Art Advisory Committee.

A total of 70 submissions were received from multiple artists. Per the public art decision-making process for a City-initiated public art project, a selection panel reviewed the artist submissions on January 5, 2011. The members of the selection panel included:

- James Burton: architect and heritage consultant;
- Ron Hyde: writer, Steveston resident, board member of Richmond Museum, and director of London Heritage Farm Society; and
- Michael Rossiter: graphic designer and Steveston resident.

Following review of the submissions, the panel unanimously recommended the design by artist Carlyn Yandle for the pedestrian scramble option (Figure 4) and the design by Hapa Collaborative for the conventional non-pedestrian scramble option (Figure 5).

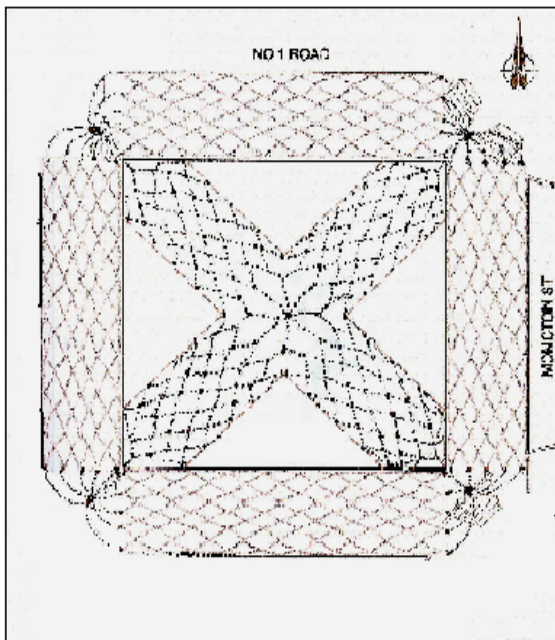


Figure 4: Recommended Design for Pedestrian Scramble Option

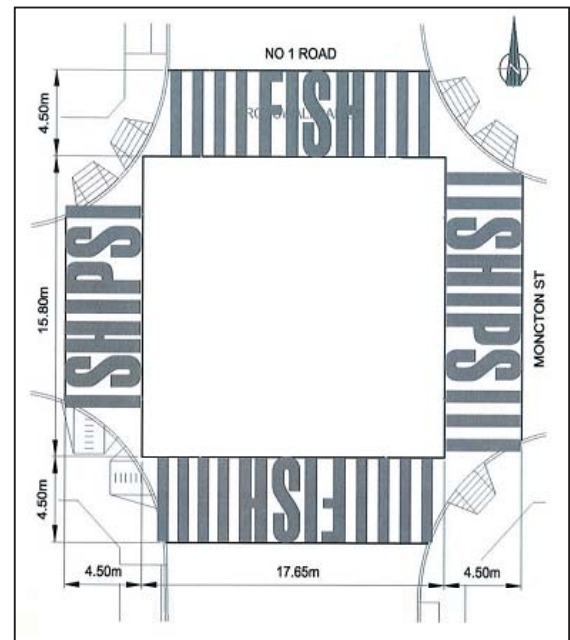


Figure 5: Alternate Design for Non-Pedestrian Scramble Option

Several pavement surface materials are available to create the proposed intersection design. Following research into the different suppliers, staff recommend that Duratherm material be used for the pavement surface treatment of the crosswalk as it is the most proven, flexible and durable product available. The application process involves heating the existing asphalt and pressing a template of the chosen decorative pattern into the surface. Duratherm sections are then set into these impressions and heated to fuse the Duratherm to the asphalt (see **Attachment 1** for examples). The estimated cost to implement the intersection surface design for the recommended option with pedestrian scramble (Figure 4) is \$69,000, which is included in the project budget.

6. Raised Pedestrian Crosswalks on No. 1 Road at Chatham Street and on Moncton Street at Easthope Avenue and east of Bayview Street

At its September 28, 2009 regular meeting, Council endorsed installing raised crosswalks on No.1 Road at Chatham Street and Moncton Street at Easthope Avenue. A raised crosswalk is a marked pedestrian crosswalk at an intersection or mid-block location constructed at a higher elevation than the adjacent roadway to match the sidewalk elevation. Raised crosswalks reduce vehicle speeds and improve pedestrian visibility. Staff recommend that the implementation of raising the two existing crosswalks on No. 1 Road at Chatham Street and on Moncton Street at Easthope Avenue be coordinated with the work at No. 1 Road and Moncton Street.

In addition to the two identified crosswalks, raising a third existing crosswalk on Moncton Street east of Bayview Street at Hayashi Court has the potential to further calm traffic as it approaches the gateway to Steveston Village and supports the reduction of the posted speed from 50 km/hr to 30km/hr in the study area. Staff, therefore, recommend that all three crosswalks be raised in coordination with the proposed works at No. 1 Road and Moncton Street employing similar design concept (i.e. using gradual approach ramps of 5% maximum gradient).

Figures 6 and 7 below illustrate the effect of raising the existing crosswalk on Moncton Street at Easthope Avenue from the perspective of a motorist (Figure 6) and overhead (Figure 7).



Figure 6: Raised Crosswalk on Moncton St at Easthope Ave (Motorist Perspective)

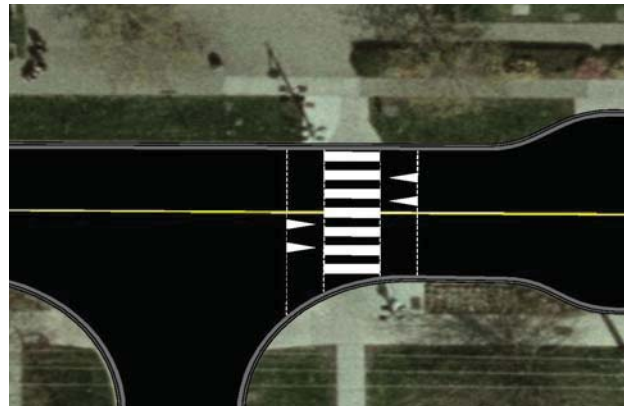


Figure 7: Raised Crosswalk on Moncton St at Easthope Ave (Aerial View)

7. Curb Extensions on Chatham Street

As part of the implementation of the recently approved Crabapple Ridge Bikeway, which starts/ends at 2nd Avenue and Chatham Street, staff also recommend the installation of a total of 15 curb extensions along Chatham Street at 1st, 2nd, 3rd, and 4th Avenues to supplement the pedestrian improvements at No. 1 Road/Moncton Street and to facilitate cyclists crossing Chatham Street. The curb extensions would enhance pedestrian safety by increasing the visibility of pedestrians to approaching motorists (and vice-versa) as well as shortening the crossing distance. These measures would complement the existing curb extensions along Moncton Street at the same cross-streets.

Staff propose to first install temporary curb extensions, comprised of delineator posts similar to those existing at a mid-block crossing on Railway Avenue south of Steveston Highway, at 4th Avenue only for a trial period of 12 months to allow for public feedback and staff assessment of any impacts on street operations (e.g., ability of transit buses to pull in/out from the curb). Any resulting design modifications necessary to address public and operational concerns would then be undertaken prior to permanent installation of the curb extensions at the remaining locations.

8. Summary of Recommended Improvements

Figure 8 illustrates the location of the various recommended improvements associated with signalizing the No. 1 Road and Moncton Street intersection as well as other proposed pedestrian improvements in the Steveston Village area to achieve the project objectives.

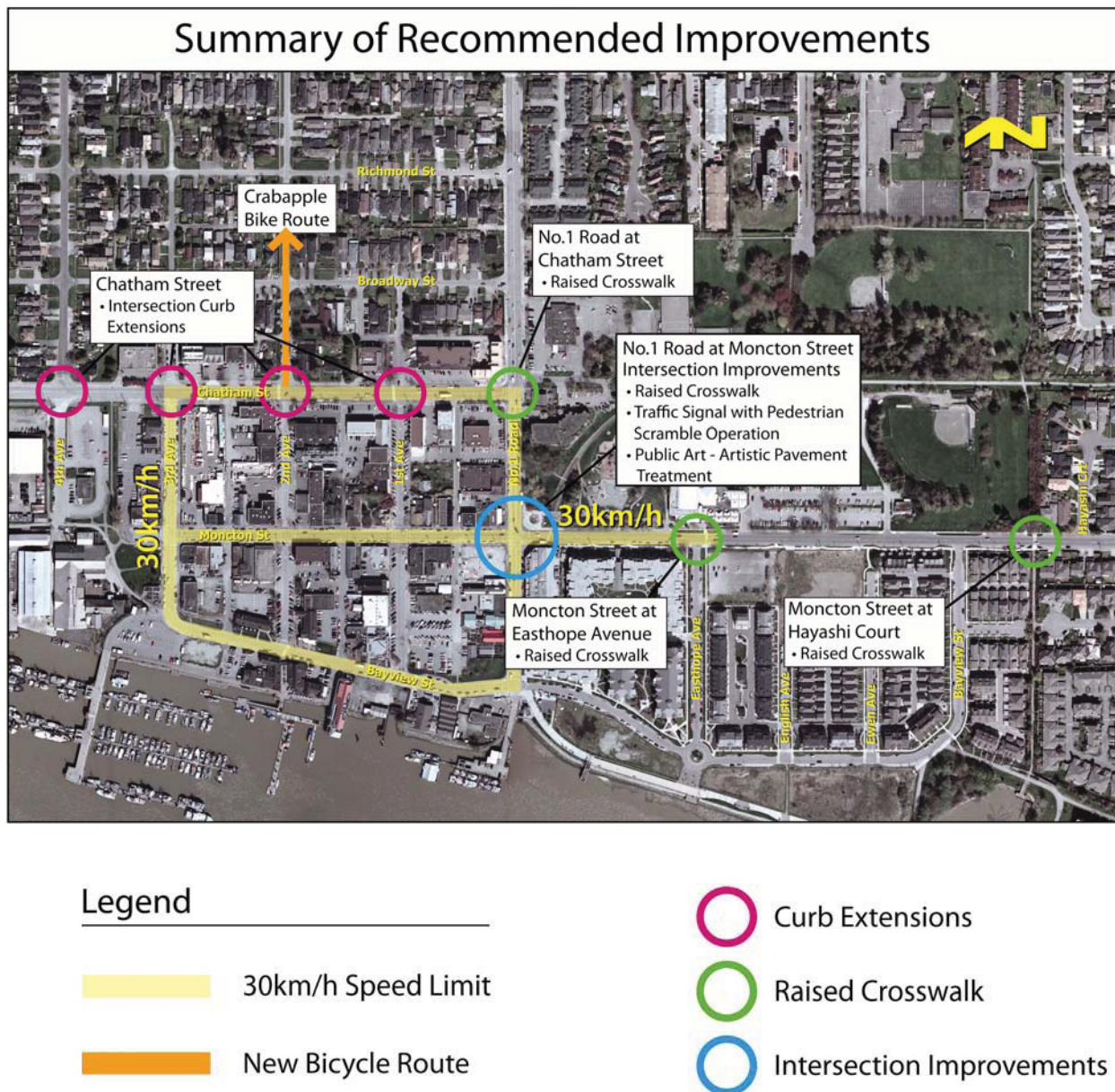


Figure 8: Proposed Intersection and Crosswalk Improvements in Steveston Village Area

9. Next Steps

The following implementation actions would be undertaken upon Council approval of the improvements recommended in this report:

- complete detailed design of the No. 1 Road and Moncton Street intersection and other crosswalk improvements;
- carry out a public information program during Summer 2011 to inform and educate the public about the various new improvements at the No.1 Road and Moncton Street intersection (especially the operation of “pedestrian scramble”) including public display of information boards at Steveston Community Centre, temporary poster boards at the intersection, distribution of brochures, notices in local newspapers, and website notifications prior to the installation of the traffic signals; and
- construction will commence in mid September with the installation of the traffic signals and completion of other improvements by the end of October 2011. A detailed traffic management plan will be developed for the construction period to minimize any business impacts.

Financial Impact

Table 3 provides the construction cost estimate breakdown for the various components of the project as well as the individual funding sources, all of which have been previously approved as part of the annual capital budget process. The permanent installation of the remaining sets of curb extensions on Chatham Street would be considered as part of the 2012 Capital Budget process, which is subject to Council approval.

Table 3: Construction Cost Breakdown (includes 20% contingency)

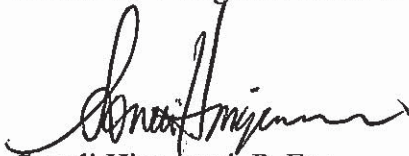
Improvement	Amount	Funding Source
No.1 Road and Moncton Street signalization, raised intersection and artistic crosswalk marking design (Duratherm)	\$600,000	2011 – No.1 Road and Moncton Street – Signalization and Improvements Project
Three raised crosswalks: <ul style="list-style-type: none"> • No. 1 Road at Chatham Street • Moncton Street at Easthope Avenue • Moncton Street and Hayashi Court 	\$46,000	2011 – No.1 Road and Moncton Street – Signalization and Improvements Project
Chatham Street Temporary Curb Extensions at 4 th Ave	\$6,000	2010 PW Minor Capital Traffic

With respect to annual operating costs, the maintenance of the traffic signal equipment has been included in the 2011 annual operating costs for the No .1 Road and Moncton Street Capital Project. Associated maintenance of the special Duratherm surface treatment would be negligible as the life of the material is the same as that of the asphalt underneath it. There is no anticipated utility maintenance work required at this intersection within the next five years. In the event any unexpected underground work arises, replacement of the Duratherm material would cost approximately \$250 to \$300 per m², depending on the length of the trench and degree of impact to the surface treatment. This cost is in addition to the pavement repair that would need to be undertaken regardless. The repair work would need to be contracted out as special equipment and training are required for the Duratherm installation.

Conclusion

To accommodate the growing pedestrian and traffic activities at the No. 1 Road and Moncton Street intersection, staff recommend a number of improvements to complement the proposed signalization of the intersection as well as additional streetscape features to enhance the pedestrian realm and village gateway character of this location. These improvements include raising the intersection, providing pedestrian priority via a "pedestrian scramble" signal phase and distinct pavement textures and markings to better define the pedestrian precinct.

The recommended pedestrian scramble as part of this project supports the City's updated Official Community Plan theme which is towards a sustainable community and is consistent with the City's long term goal to improve walkability in the city. Staff also recommend the installation of additional complementary crosswalk enhancements at several intersections in the vicinity of Steveston Village to further achieve this goal.



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SH: lce

Examples of DuraTherm™ Projects

