



# City of Richmond

## Report to Committee

**To:** Public Works and Transportation Committee      **Date:** February 9, 2018  
**From:** Victor Wei, P. Eng.  
 Director, Transportation      **File:** 10-6450-09-01/2018-Vol 01  
**Re:** **River Road – Review of Proposed Alternative Road Safety Enhancement Measures**

### Staff Recommendation

1. That the road safety measures on River Road between No. 6 Road and Westminster Highway recommended by the independent traffic safety consultant and staff as outlined in the report dated February 9, 2018 from the Director of Transportation be brought forward for further public consultation, including with the area residents and businesses.
2. That staff report back with the outcome of the public consultation prior to the installation of any additional speed cushions.

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

Att. 4

REPORT CONCURRENCE		
<b>ROUTED TO:</b>	<b>CONCURRENCE</b>	<b>CONCURRENCE OF GENERAL MANAGER</b>
Engineering Fire Rescue RCMP	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
<b>REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE</b>	<b>INITIALS:</b> 	<b>APPROVED BY CAO</b> 

## Staff Report

### Origin

At the December 11, 2017 Council meeting, a delegation to Council expressed concerns regarding Council approval on September 25, 2017 of the installation of 20 additional speed humps along River Road between No. 7 Road and Westminster Highway. As a result, the following referral was carried:

*That staff review the potential solutions to traffic calming measures along River Road prior to the installation of speed humps.*

At the January 29, 2018 Council meeting, three delegations to Council expressed concerns regarding the planned speed humps as well as the behaviour of cyclists in the same section of River Road. This report responds to the referral as well as concerns noted by the delegations at the January 29, 2018 Council meeting.

This report supports Council's 2014-2018 Term Goal #1 A Safe Community:

*Maintain emphasis on community safety to ensure Richmond continues to be a safe community.*

This report supports Council's 2014-2018 Term Goal #3 A Well-Planned Community:

3.3. *Effective transportation and mobility networks.*

### Analysis

#### Update on Road Safety Measures Currently being Implemented

The installation of new "Single File" signage along with complementary "sharrow" pavement markings as well as new "Caution" signs to advise motorists to expect large volumes of cyclists on the roadway during weekends (Figure 1) commenced in Fall 2017 and is on-going with completion anticipated in Spring 2018.

Conversion of the existing solid double yellow centreline to a dashed single yellow centreline at select locations and the removal of any remaining raised pavement markers (cat's eyes) and replacement with reflective delineator posts mounted in the gravel shoulder has also been initiated (e.g., ordering of materials, further analysis of locations where centreline can be modified) with completion date of this work anticipated to be early Summer 2018.

#### Condition of Existing Speed Humps

With respect to comments from a delegation to the January 29, 2018 Council meeting regarding the condition of the existing six speed humps in the 18,000-block of River Road, an inspection has



Figure 1: Cycling-Related Signage on River Road

confirmed that the humps are structurally sound. Maintenance issues regarding refreshing the paint markings and repairing a road pothole at one location have since been addressed.

### Review of Potential Traffic Calming Measures- Independent Study by External Consultant

In light of the comments expressed from the delegations to recent Council meetings that alternative road safety measures were not sufficiently examined by staff and the subsequent direction from Council for staff to review potential traffic measures further, staff retained the services of an independent transportation planning and engineering consultant to provide an objective assessment of and recommendations for road safety measures along the corridor. The purpose of the assessment is therefore to provide an objective professional engineering opinion on the countermeasures recommended by the City (i.e., 20 speed cushions), ones suggested by the delegation to the December 11, 2017 Council meeting (Attachment 1), as well as any other measures identified as necessary based on the consultant's own technical traffic safety review. The agency was selected from a short list of consulting companies with expertise in road safety audits as recommended by ICBC.

The review was conducted based on industry-recognized methods and recommended by Transportation Association of Canada's *Canadian Guide to In-service Road Safety Reviews* with the general scope being to conduct a traffic safety and operation review of River Road (No. 6 Road to Westminster Highway) in response to trends derived from past accident records. The key components of the review included: site visit with drive- and ride-through, collision analysis based on ICBC data from 2012 through 2016, identification of issues, review of traffic data including vehicle speed, volume, and type, review and assessment of countermeasures, and development of an implementation strategy. The consultant's full report documents the findings and identifies recommended mitigation measures to address road safety and operational concerns along with an assessment of the safety benefit of each measure. Attachment 2 provides the Executive Summary of the consultant's report.

### Summary of Technical Findings by Independent Review

The consultant's review of ICBC crash data identified the following collision configuration types out of a total annual average of 24 collisions:

- single vehicle off-road crashes (33%);
- side impact or sideswipe crashes (31%);
- crashes involving heavy vehicles (17%);
- rear-end crashes (13%);
- cyclist-involved crashes (11%);
- single vehicle crashes – damage from debris (9%); and
- head-on crashes (3%).

In addition, a review of speed data indicated that the 85<sup>th</sup> percentile of the speeds measured generally was over 70 km/h whereas the posted speed limit is 50 km/h (30 km/h for trucks). The high travel speeds along the corridor are recognized as a concern given the characteristics of the roadway and identified as a significant contributing cause of collisions (both frequency and severity).

Based on the above findings, motorists have accounted for 100% of all collisions with cyclists involved in only 11% of the crashes. Thus, focusing on cyclists as the primary cause of safety issues on River Road is not considered to be effective as this would neglect 89% of the collisions observed. Moreover, motorists also have demonstrated excessive speeding behaviour. The consultant’s review therefore focused on the high vehicular travel speeds and the following four collision patterns to be addressed by safety countermeasures: single vehicle off-road crashes, single vehicle crashes – damage from debris, side impact and sideswipe crashes, and cyclist-involved crashes. Countermeasures are proposed that focus on engineering measures to mitigate these collisions and moderate drivers’ behaviour with education initiatives proposed for both cyclists and motorists.

**Road Safety Measures Proposed by Independent Review**

The Executive Summary (Attachment 2) of the consultant’s report outlines the road safety measures proposed to address the above collision issues, with consideration given to the measures suggested by the delegate to Council on this topic. Solutions are proposed to better align the operating speeds with the road conditions in order to reduce the frequency and severity of all of the four identified collision issues. As summarized in Table 1 below, the measures would either (1) improve existing road conditions to accommodate actual motorist operating speeds; or (2) reduce motorist operating speeds to a level appropriate to the road conditions. Attachment 3 displays a map of the proposed locations of the measures.

**Table 1: Measures Proposed by Independent Review**

Time Frame	Proposed Measure	Rationale	Estimated Cost	Staff Comments
Phase 1: Short Term (within 1 year)	Sign and pavement marking updates: <ul style="list-style-type: none"> <li>conversion of up to 7 km of centreline</li> <li>addition of sharrow stencils at 75 m spacing <sup>(1)</sup></li> </ul>	Encourage vehicle-cycle sharing and create consistent messaging along the corridor	\$67,000- \$180,000	Currently being implemented
Phase 1: Short Term (within 1 year)	Movable speed reader boards (total of 4 boards)	Provide direct feedback to motorists vis-à-vis posted speeds	\$50,000- \$60,000	Beyond staff’s original recommendations and recommended for further public consultation
Phase 1: Short Term (within 1 year)	Signage treatments at 90° curves including chevron warning signs (potential LED lit) <sup>(2)</sup>	Enhanced warning and guidance through sharp curves	\$15,000- \$50,000	
Phase 1: Short Term (within 1 year)	Anti-skid pavement treatments at 90° curves to increase friction (assume 200 m length per lane) <sup>(2)</sup>	Provide increased driver control through sharp curves	\$425,000- \$500,000	
Phase 1: Short Term (within 1 year)	Education for cyclists and motorists regarding rules of the road	May increase desirable driver and cyclist behaviour	Negligible	
Phase 1: Short Term (within 1 year)	Increase road maintenance: more frequent cleaning and refreshing of pavement markings	Reduce potential for collisions involving debris or in areas where markings may faded or obscured	Additional \$15,000 per year	

Time Frame	Proposed Measure	Rationale	Estimated Cost	Staff Comments
Phase 1: Short Term (within 1 year)	Reduce posted speed limit to 30 km/h for all vehicles with traffic calming comprising 43 speed cushions: <ul style="list-style-type: none"> <li>13 sets of 3 speed cushions spaced at 100 m between the curves with a minimum of 400 m between each set,</li> <li>1 set of 3 speed cushions on No. 6 Road approaching River Road, and</li> <li>1 speed cushion on River Road approaching Westminster Highway</li> </ul>	Observed motorist speeds are too fast for safe operation based on road conditions  Minimize excessive speeds and keep motorists within an appropriate speed	Phase 1: \$325,000-\$350,000 for initial installation of 43 speed cushions	Beyond staff's original recommendations and recommended for further public consultation
Phase 2: Medium Term (2 to 5 years)	If the Phase 1 speed cushions do not achieve 40 km/h operating speeds, then 11 additional sets of 3 speed cushions (33) can be installed between the gaps for a combined total of 76 speed cushions	Observed motorist speeds are too fast for safe operation based on road conditions  Minimize excessive speeds and keep motorists within an appropriate speed	Phase 2: Additional \$250,000-\$275,000 for installation of 33 speed cushions (if required)	
Phase 3: Long Term (> 10 years)	Re-build dyke and River Road	Match secondary arterial road classification and accommodate all road users	To be determined as part of Dyke Master Plan	

- (1) Sharrow stencils comprise a bike stencil with two chevrons as illustrated in Attachment 3.
- (2) The proposed measures would mitigate approximately 43% (annual average of 10 collisions) of the total collisions at the 90° curves at No. 6 Road and Westminster Highway.

The consultant also concludes that proposed “speed cushions” are deemed appropriate on collector and arterial roads such as River Road, particularly to accommodate emergency vehicles such as fire and ambulance. Cushions provide a softer vertical deflection compared to speed humps and are typically installed with gaps to allow wider wheelbase emergency vehicles more easy passage while still requiring passenger vehicles to ride over the hump.

Based on the consultant’s focus on road safety and measures to mitigate crash severity and frequency to the fullest extent, a reduced speed limit of 30 km/h for all vehicles is proposed. As a cost-effective means to ensure adherence to this lower speed limit, the installation of 43 speed cushions as Phase 1 is recommended and, if the extent of these initial speed cushions does not achieve the desired motorist speed, then a further 33 speed cushions as Phase 2 for a total of 76 speed cushions. This higher number of speed cushions differs from the 20 speed cushions originally recommended by staff as the latter number was based on the following factors:

- absolute minimum number required based on maintaining the existing 50 km/h speed limit (30 km/h for trucks); and
- giving consideration to the potential impacts of the speed cushions to local residents and the road’s classification as a minor arterial currently carrying an average daily traffic volume of 3,000 vehicles that is intended to provide network mobility in the city;
- the overall length of the roadway carrying longer-distance traffic flows between activity centres; and
- the potential visual impacts from the speed cushions and related signage.

For the long term, the consultant recommends that the road be widened to an arterial standard with separate provision for cyclists and pedestrians. These improvements would have a high cost, as widening and raising of the dike would be required and would not be practical to implement at this time. Reducing vehicle operating speeds through traffic calming, regulation and enforcement is a cost-effective option that can be implemented relatively quickly.

#### Public Consultation on Proposed Road Safety Measures

In light of recent concerns expressed by area residents and Council's direction to assess alternative measures prior to the installation of additional speed cushions, staff recommend that broader public consultation be undertaken to allow not only immediate area residents and businesses but also other road users the opportunity to provide their feedback on the following road safety enhancement options:

- 20 new speed cushions previously approved by Council at its September 25, 2017 meeting (with installation deferred pending staff review the potential alternative traffic calming measures along River Road as directed by Council at its December 17, 2017 meeting);
- chevron signage, special non-skid pavement treatments, revised speed limit, and 43 (Phase 1) and 33 (Phase 2, if required) additional speed cushions proposed by the independent road safety audit consultant; and
- any other alternatives and suggestions by the public.

Two open houses would be held at the Hamilton Community Centre in April 2018 with an accompanying survey. Presentation material and the survey would also be available on the City's on-line discussion platform LetsTalkRichmond.ca. Raising community awareness of the public engagement would be undertaken via media releases, the City's website, social media messaging, and local newspaper notices. Staff will then report back on the feedback from the above public consultation prior to the installation of any additional speed cushions.

In the meantime, staff would complete the implementation of the remaining pavement marking and signage improvements as approved by Council.

#### Increased Maintenance of River Road

The subject section of River Road is currently cleaned four times per year at cost of approximately \$15,000. To address comments from the delegation to the January 29, 2018 Council meeting regarding debris along River Road as well as mitigate single vehicle crashes resulting from road debris, staff recommend that the frequency of road maintenance be doubled to eight times per year for a total annual cost of approximately \$30,000. If supported by the public, staff would submit the additional maintenance cost for Council approval as part of future operating budget considerations starting in 2019.

#### Complementary Enforcement and Education Measures

With respect to comments from the delegations to the January 29, 2018 Council meeting regarding a desire for increased enforcement for both motorists and cyclists, Richmond RCMP will be implementing a number of enforcement and education initiatives as detailed in



Attachment 4 to increase public safety along River Road (i.e., speed enforcement, cyclist enforcement and education).

#### Feedback from BC Emergency Health Services (BC Ambulance)

Further to concerns noted by the delegations at the January 29, 2018 Council meeting regarding the potential impact of speed cushions on response times for emergency services, staff sought feedback on the proposed measures from BC Emergency Health Services. Paramedic staff advise that most ambulances that have patient transport capabilities have similar wheel axle widths to Richmond Fire-Rescue vehicles. Thus, while crews may have to travel at a lower rate of speed through the traffic calming sections when carrying a patient, overall there would be little or no impact to patients or response times.

#### **Financial Impact**

None. The public consultation activities can be accommodated within the approved operating budget of the Transportation Department.

#### **Conclusion**

An independent road safety and operations review of River Road has confirmed the safety benefits of installing speed cushions and further identified a number of additional interim measures that would better align the operating speeds with the road conditions in order to reduce the frequency and severity of the identified collision issues. Staff recommend that public consultation be undertaken on all of the consultant's proposed road safety measures, speed cushions recommended by staff and any other alternatives from the area residents and businesses. Staff will report back on the input received with recommendations and associated costs prior to the installation of any additional traffic calming measures.



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- Att. 1: Possible Road Enhancements Proposed by Delegation to December 11, 2017 Council Meeting
- Att. 2: Executive Summary of Consultant Report: River Road Traffic Safety and Operational Review (February 2018)
- Att. 3: Consultant Report: Map of Locations of Proposed Traffic Safety Measures
- Att. 4: Memorandum from Richmond RCMP re Traffic Enforcement Initiatives for River Road

## Possible Road Enhancements Proposed by Delegation to December 11, 2017 Council Meeting

### 1. Install guard rails on the curve.

Of the 16 accidents that have occurred on River Road in the area of the proposed speed humps, 6 were between 20800 and 22180.

### 2. Install solarlite road markers along the sides and down the center line.

Removing the "cat's eye" road markers is dangerous for drivers in foggy conditions. The solarlite road markers would light the way while tying into the City of Richmond's green initiative. Solarlite markers do not rely on the illumination from headlights and so would also make night time walking or cycling safer.

### 3. Put reflective markers on the hydro poles, train bridge and fire hydrants.

Due to the physical constraints of River Road these are almost touching the pavement in some areas. Fire hydrants have been struck, and at least 2 deaths have resulted in vehicles striking the pole or bridge.

### 4. Increase the speed limit to 60k with the exception of the areas that are currently 30k as well as in front of Tom-Mac Shipyards

Research has shown that increasing vehicle speed to 60k over 50k improves fuel economy and reduces emissions and greenhouse gas. The exception areas should have reduced speed and signage for safety of residents and employees.

### 5. Reduce speed limit to 30k past Tom-Mac Shipyard and place flashing "caution" signs prior to the Tom-Mac shipyard area.

Some drivers may be unaware of the forklift and other vehicle traffic at this business location and should be alerted of such activity.

### 6. Install signboard that flashes speed.

Flashing speed signs are often the only reminder that most drivers need. Ideally this would be in the 20000 block near the new picnic area that was constructed by the City of Richmond.

### 7. Increased police presence.

We need extra police presence in our area to address issues of property theft as well as patrolling the road. If speed is a major issue, hire a full time enforcement officer – the \$100,000 allotted to this project would cover his/her initial salary and all of the speeding tickets issued would cover his/her wage on an ongoing basis. I stress that enforcement be toward both vehicles and cyclists.

### 8. Install a "caution no shoulder" sign at the start of the road in each direction

If drivers are not familiar with the area they may not realize that there actually is no or next to no shoulder on the road – especially when it is dark.

### 9. Direct recreational cyclists to the designated cycle path until such time as a cycling lane can be installed on River Road and safely accommodate these cycling groups.

This can be done by sending a letter to the cycling clubs welcoming them to cycle in Richmond, however, as River Road is under study clubs are asked to use the designated cycling lane – they of course know where this is as they must leave the cycling lane to enter River Road. Any cycling activity that continues on River Road should be single file to the right as the law states.

### 10. Install "Local Traffic Only" signs at each end and direct the non-resident traffic to Westminster Highway or the 91 connector

River Road was built many years ago to allow residents access to their properties, however, growth and densification in neighbouring Hamilton has resulted in many drivers choosing River Road rather than Westminster Highway or the 91 Connector as their commuter route. There are times when this traffic is backed up from the train bridge all the way to the corner at Westminster Highway. This increased traffic causes disruption to residents, as at times they cannot even exit their property. In addition, a look at the accident history shows that a full 50% of the accidents between No. 7 Road and Westminster Highway occur at the corner. I hazard to guess that the majority, if not all of the accidents that have occurred between No. 7 Road and Westminster Highway are non-residents. River Road was never intended to be the commuter route it has become. It must be upgraded to allow for this increase traffic flow or direct the non-resident traffic back to Westminster Highway or the 91 Connector until River Road can be upgraded. This can be accomplished by placing barricades with "Road Closed – Local Traffic Only" signs. I'm sure that after having to go back to the freeway or Westminster Highway a couple of time the commuters will stop using River Road.



## EXECUTIVE SUMMARY

### Study Purpose and Background

Watt Consulting Group was retained by the City of Richmond to undertake an independent traffic operations and safety review of the River Road corridor from No. 6 Road to Westminster Highway. The study was commissioned in response to safety concerns raised by the public, particularly related to off-road crashes and to crashes involving cyclists. The study is also supported by ICBC, who may contribute funding to the implementation of the proposed options.

### Method Used

The review generally followed the method recommended in the Transportation Association of Canada's *Canadian Guide to In-service Road Safety Reviews*. This method clearly identifies a problem statement then identifies countermeasures to address the issues identified.

Site visits were conducted on January 17 and 18, 2018 – both at night and in the daytime and by bike riding the corridor and driving the corridor. Crash records from the Insurance Corporation of British Columbia were reviewed for the five years between 2012 and 2016 (inclusive). The predominant crash types were identified along with the higher-crash locations. Actual vehicle operational speed profiles were also reviewed.

This study considered a broad range of countermeasures to address the identified collision issues, including countermeasures previously proposed by City staff, ICBC staff, as well as several proposed by members of the public. Additional collision-reduction countermeasures were proposed by WATT, resulting in the evaluation of a total of 29 measures.

### Findings

On average, 24 crashes were recorded annually along the corridor. The crash data indicated the highest number of crashes are at the following locations:

- No. 6 Road and River Road (22 percent of total collisions), and
- River Road and Westminster Highway curve and intersection (21 percent of total collisions).

Of known collision configuration types, 33 percent were single vehicle off-road crashes, 9 percent were single vehicle – damage by debris, 31 percent were side impact or side-swipe crashes, and eight crashes involved cyclists (11 percent). The remainder were rear-end (13 percent) or head-on (3 percent).

In terms of severity, 37 percent of the crashes were injury collisions and one percent were fatal collisions, which is typical for urban two-lane arterial roads when compared to the British Columbia average. One fatal collision occurred in 2016 involving a cyclist, and a second fatal collision occurred more recently outside the crash record period, involving a single vehicle going off-road.

The analysis indicates that most of the crashes were occurring on weekdays in the daytime, with very few collisions at night. Seasonal patterns for collisions were not evident.

The roadway design consists generally narrow lanes of variable width. There is also limited or no road-side shoulder in most areas. There is a steep drop-off to a ditch on the south side of the road in many areas which would be non-recoverable should a vehicle leave the roadway. There are utility poles, fire hydrants, trees, and fences close to the road in many areas.

Cyclist "Single File" signage was clear and implemented at a high frequency, however the additional messaging sign to drivers to change lanes to pass are difficult to read and comprehend at-speed and are contradictory to the double yellow centreline used along most of the corridor. Staff has a plan to revise the double yellow centreline to single broken lines at select locations to allow passing where safe.

Speed data was reviewed and generally the 85<sup>th</sup> percentile of the speeds measured was over 70 kilometers per hour. These travel speeds are considered high as the posted speed is 50 kilometres per hour (or 30 kilometres per hour for trucks) and the geometry of the road is not well-able to accommodate such high speeds. The rural nature of the road and area nonetheless may encourage some motorists to drive faster than is safe for conditions. A significant contributing cause of the crashes (both frequency and severity) is likely that drivers are traveling driving faster than the speed best-suited for the physical conditions. The road has an Average Annual Daily Traffic volume (AADT) of approximately 3,000 vehicles per day.

The corridor was found to be well-lit at night even in wet and rainy conditions, with most pavement markings being quite visible.

### Problem Statement

The review of crash records identified four distinct collision patterns. After discussion with staff, it was confirmed that these four collision patterns are the issues that should be addressed with any safety countermeasures:

- **single vehicle crashes – off-road;**
- **single vehicle crashes – damage from debris;**
- **side impact and sideswipe crashes;**
- **cyclist-involved crashes.**

In addition, the high travel speeds along the corridor are a concern given the characteristics of the roadway.

### Proposed Countermeasures

The proposed countermeasures were evaluated to assess whether they addressed the identified collision issues described above. The proposed measures are summarized in Table ES-1 and shown conceptually in the attached Figure – Proposed Countermeasures. In general, the proposed measures include:

- a package of sign and pavement marking improvements that provide consistent messages to drivers and cyclists;
- improved maintenance, particularly to remove debris;
- improvements to reduce off-road crashes such as increasing the pavement friction (to help motorists maintain control) at the two 90 degree curves;
- measures to guide drivers through the two 90-degree turns.

To reduce the frequency and severity of all of the four identified collision issues, solutions are proposed to better align the operating speeds with the road conditions. Changes would either:

- improve the road conditions to accommodate the actual vehicles operating speeds, or
- reduce operating speeds to a more appropriate level relative to the road conditions.

### **Improving Road Conditions**

The road is classified as a secondary arterial which suggests that the road surface should be widened to standard, shoulders installed, and roadside hazards located sufficiently far from the edge of road or protected. As well, given the nature of the road adjacent the River and the recreational use it attracts, pedestrian and cycling facilities (and possibly equestrian facilities) should be considered. It is acknowledged that these improvements would come at a high cost and likely be done when the dyke is re-built and therefore an interim option should be considered.

### **Reducing Operating Speeds**

Reducing the vehicle operating speeds through traffic calming, regulation, and enforcement can be a cost-effective option which can be implemented relatively quickly. Reducing speeds can be achieved through physical measures that require vehicles to slow down, but may also include other traffic control elements that better reflect conditions.

Speed humps are a proven effective means of maintaining a lower operational speed whilst other speed calming measures and techniques do not have reliable results. Speed humps are appropriate on local roads however the modification of speed humps to create a “speed cushion” are more appropriate on collector and arterial roads such as River Road, particularly to accommodate emergency vehicles such as fire and ambulance. Cushions provide a softer vertical deflection compared to speed humps, and are typically installed with gaps to allow wider wheelbase emergency vehicles more easy passage while still requiring passenger vehicles to ride over the hump. Cyclists are not typically bothered by speed humps or cushions and this is evident by the existing installation of speed humps on the corridor. With cyclists “taking the lane” by driving single file in the middle of the lane they will have the option of driving over the speed hump or using the gap in the cushion without adversely affecting other traffic.

Speed reader boards can also be effective in reducing speeds and alerting drivers they are going too fast for conditions. However, their effectiveness is more when first installed and gradually reduces over time, suggesting that movable devices be installed and their location be changed from time to time.

### **Recommendations**

It is recommended that the City develop a long-term plan to widen River Road to a 50 kilometer per hour design speed and to provide for shoulders, and separate recreational users from general traffic (cyclists, pedestrians, equestrians).

In the interim, it is recommended that the City implement measures to reduce operating speeds and mitigate the occurrence of the four key collision types. Proposed measures include the installation of a series of speed cushions to minimize excessive speeds and keep motorists within an appropriate speed to share the road single file with cyclists (40 km/h or less). Speeds should be reduced further at the No. 6 Road and the Westminster Highway 90-degree curves.

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The speed cushions should be accompanied with appropriate speed hump warning signs, regulatory 30 kilometer per hour signs for all (including trucks), 20 kilometer per hour advisory speeds should be posted on 90 degree curve ahead signs at the two 90 degree curves. Speed reader boards should be installed, and should be movable so that different areas along the corridor can be benefited. Additional measures listed below should also be implemented as part of the short term and/or interim approach.

ICBC is a project partner, and funding from ICBC is likely available for many of the recommended measures.

TABLE ES-1: Summary of Proposed Countermeasures

Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
<u>Sign and Pavement Marking Updates</u> (including conversion to single broken yellow centreline, addition of sharrow stencils, and signage improvements). High end estimate assumed conversion of up to 7000m of double yellow to single broken markings, sharrows spaced at 75m for the entire corridor, and up to 40 new signs.	To clarify shared use motorist-cyclist nature of the road and to create clear and consistent messaging along the corridor. Narrow (shared) road and high motorists speeds create speed differential and safety risk.  <b>Target:</b> Reduce cyclist collisions.	Short Term	\$67,000 to \$180,000
<u>Speed Reader Boards</u> (assuming four boards). Recommend that the boards be movable, to reduce driver complacency and allow for flexibility in application at areas of concern.	Speed reader boards provide direct feedback to drivers vis-à-vis posted speed limit and road conditions and can reduce speeds. Observed speeds are currently faster than are safe for road conditions.  <b>Target:</b> Reduce speed-related collisions.	Short Term	\$50,000 to \$60,000
<u>Curve Treatments</u> , including chevron warning signs (possible LED enhancements). These would be installed at the 90 degree curves.	Provide enhanced warning and guidance through sharp curves where collision frequency is higher. Sharp curves may be unexpected after long, relatively straight and unimpeded approach.  <b>Target:</b> Reduce off-road collisions.	Short Term	\$15,000 to \$50,000
<u>Pavement Treatments – to increase friction</u> (assumed 800 lane-metres of application; assumed 200m length per lane at each curve)	Provide increased driver control through sharp curves where collision frequency is higher. Sharp curves may be unexpected after a long, relatively straight and unimpeded approach.  <b>Target:</b> Reduce off-road collisions.	Short Term	\$425,000 to \$500,000

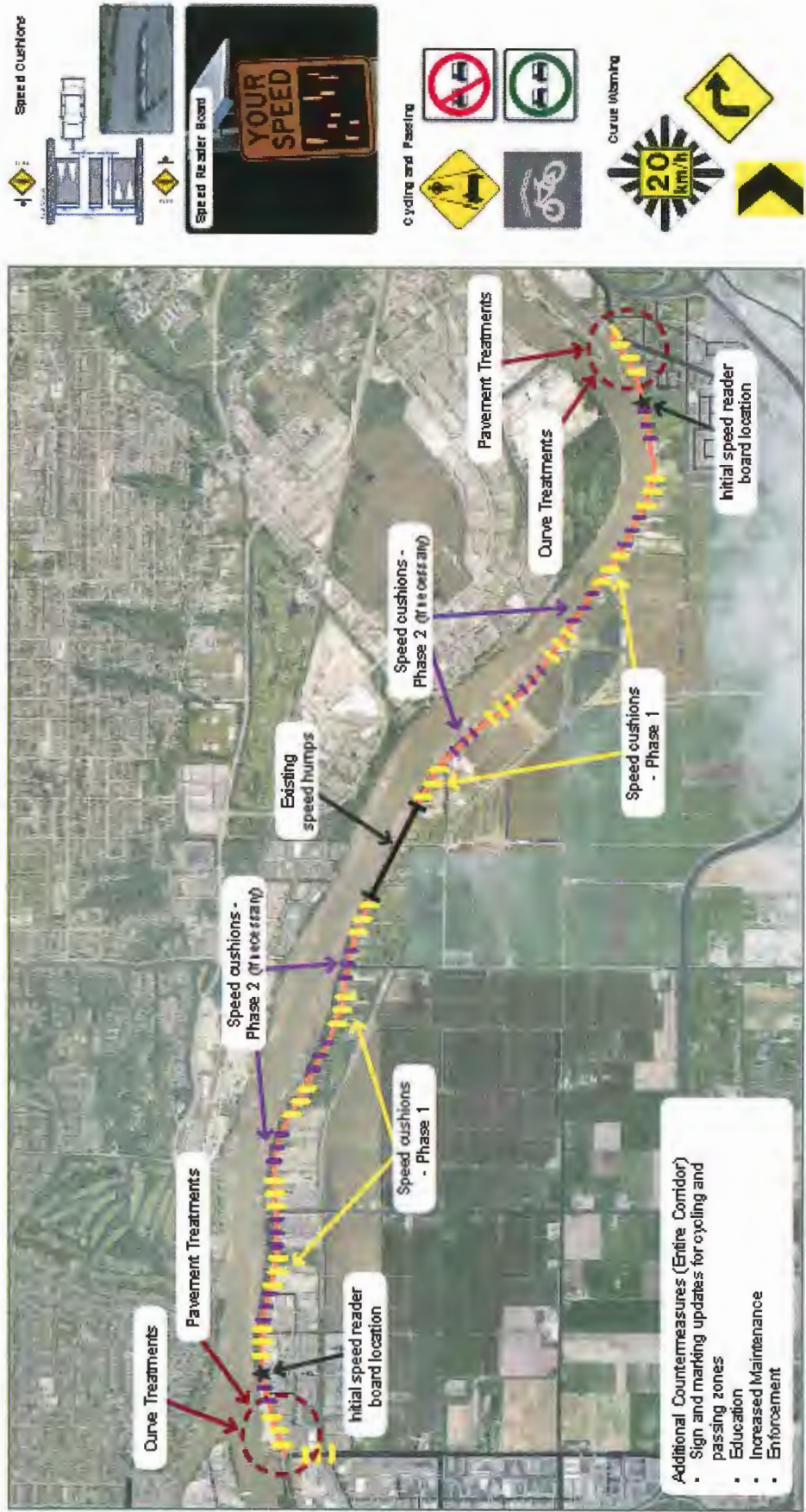


Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
<u>Education</u> (for both drivers and cyclists, regarding shared roads and single file operations. Could include informational material or presentations to cycling groups.)	May increase driver understanding and behaviour toward cyclists, and cyclists understanding towards driver behaviour, regarding desirable single file and passing behaviour.  <b>Target:</b> Reduce cyclist collisions	Short Term	Not estimated
<u>Increase Maintenance</u> (more frequent debris clearing / street sweeping, and/or re-striping of pavement markings).	Reduce potential for collisions involving debris, or off-road collisions in areas where markings may be faded or obscured. Debris was a noted factor in some single vehicle collisions.  <b>Target:</b> Reduce debris-related and off-road collisions.	Short Term	Not estimated
<u>Traffic Calming – Speed Cushions</u>  Reduce posted speed limit to 30 km/h for all vehicles with traffic calming comprising 43 speed cushions: <ul style="list-style-type: none"> <li>• 13 sets of 3 speed cushions spaced at 100 m between the curves with a minimum of 400 m between each set</li> <li>• 1 set of 3 speed cushions on No. 6 Road approaching River Road, and</li> <li>• 1 speed cushion on River Road approaching Westminster Highway.</li> </ul> If the above speed cushions do not achieve 40 km/h operating speeds, then 11 additional sets of 3 speed cushions (33) can be installed between the gaps for a combined total of 76 speed cushions.	This design will minimize excessive speeds and keep motorists within an appropriate speed to share the road with cyclists. Speed cushions have lesser response time impacts to emergency vehicles than speed humps. Narrow (shared) road and high motorists speeds create speed differential and safety risk for cyclists. Observed motorist speeds are currently faster than are safe for road conditions.  <b>Target:</b> Reduce cyclist collisions, reduce off-road collisions, and reduce sideswipe collisions.	Interim	\$325,000 to \$350,000 for initial installation of 43 speed cushions.  \$250,000 to \$275,000 for Phase 2 installation of 33 speed cushions (if required).



Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
<u>Re-Build Dyke and Road</u>	Design would match the secondary arterial roadway classification, and accommodate all road users.  <b>Target:</b> Reduce all collisions.	Long Term	Not estimated
<u>Enforcement</u>	Enforcing vehicle speeds and other rules of the road (e.g. passing behaviour) can improve safety. The benefits, however, lessen over time unless enforcement is frequent or continual (which may be prohibitive).  <b>Target:</b> Reduce all collisions.	Short and Long Term	Not estimated

River Road Traffic Operations Safety Review - City of Richmond  
Proposed Countermeasures





# City of Richmond

## Memorandum Richmond RCMP Detachment

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**To:** Mayor and Councillors **Date:** February 8, 2018  
**From:** Edward Warzel **File:** 09-5375-00/2018-Vol 01  
 Manager, RCMP Administration  
**Re:** **Richmond RCMP Traffic Enforcement Initiatives for River Road between No. 6 Road and Westminster Highway**

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### Introduction

This memorandum provides information in response to delegations at the January 29, 2018 Council meeting regarding a desire for increased enforcement.

### Background

- At the December 11, 2017 Council meeting, a delegation at Council expressed concerns regarding Council approval on September 25, 2017 about the installation of 20 additional speed humps along River Road between No. 7 and Westminster Highway. A referral was carried requesting staff review the potential solutions to traffic calming measures along River Road prior to the installation of speed humps.
- At the January 29, 2018 Council meeting, three delegations at Council expressed concerns regarding the planned speed humps as well as the behaviour of cyclists in the same section of River Road.
- Comments from the delegations from the January 29, 2018 Council meeting indicated a desire for increased RCMP enforcement in this area.

### Updates

The OIC Richmond Detachment has conducted a review of the issues and as such will be strategically deploying resources to tactically address concerns brought forth by the community which are:

- Richmond RCMP Road Safety Unit will take the lead and commit to having increased presence and regular speed enforcement along River Road.
- As this problem is not a solely resident generated issue but rather a multi-jurisdictional one, the Lower Mainland District Integrated Road Safety Unit will also be deployed to conduct speed enforcement along River Road. Both units will provide statistical evidence including number of service hours delivered, outputs, initiatives, and public feedback.

- Richmond RCMP volunteers will implement the Speed Watch program to raise driver awareness of local speed limits and encourage speed reductions. This will include recording license plate numbers of speed offenders and following up with reminder letters.
- As an educational component the Richmond RCMP Road Safety Unit, Bike Unit and Media Relations Unit, in collaboration with ICBC will meet with local Bike Clubs to raise awareness of the importance of Road Safety along River Road. Cyclists will be encouraged through education to obey the law and to be respectful to drivers, pedestrians and residents.
- Richmond RCMP Media Relations Unit will increase publication of articles on safety along River Road for drivers, pedestrians and cyclists. There will be additional announcements of enforcement and safety campaigns in this area.
- There will be continued collaboration between the RCMP and the Richmond Transportation department to enhance design and safety measures along the identified area of River Road.

Please contact the writer at [ewarzel@richmond.ca](mailto:ewarzel@richmond.ca) or (604) 207-4767 if you require further information.



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