



# City of Richmond

## Report to Committee

**To:** Public Works and Transportation Committee

**Date:** September 20, 2023

**From:** Suzanne Bycraft  
Director, Public Works Operations

**File:** 10-6000-01/2023-Vol  
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Lloyd Bie, P.Eng.  
Director, Transportation

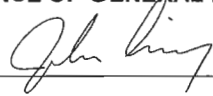

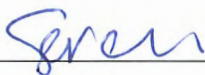
**Re:** Safety Measures for Heavy Trucks

### Staff Recommendation

That staff report titled "Safety Measures for Heavy Trucks", dated September 20, 2023, from the Director, Public Works Operations and Director, Transportation be received for information.

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<b>REPORT CONCURRENCE</b>	
<b>CONCURRENCE OF GENERAL MANAGER</b> 	
<b>SENIOR STAFF REPORT REVIEW</b>	<b>INITIALS:</b> 
<b>APPROVED BY CAO</b> 	

## Staff Report

### Origin

The following referral was made at the September 21, 2022 Public Works and Transportation Committee Meeting regarding safety measures for heavy trucks:

*“(1) That staff investigate and report back on the implications of the City of Richmond owned and contracted heavy trucks to be mandated to have side guards;  
(2) That we encourage the installation of additional blind spot side mirrors and the use of back up cameras;  
(3) That we review bike lanes in terms of turning conflicts and mitigate to reduce risk to vulnerable road users;  
(4) That we advocate with regional, provincial and federal authorities to create consistent framework for truck operators;  
(5) That we advocate to ICBC and truck-driving associations to deliver increased driver education to better inform of the responsibilities regarding vulnerable road users; and  
(6) That staff report back on any immediate actions that can be taken to improve cyclist safety.”*

This report responds to the referral.

This report supports Council’s Strategic Plan 2022-2026 Focus Area #3 A Safe and Prepared Community:

*Community safety and preparedness through effective planning, strategic partnerships and proactive programs.*

### Background

The City proactively implements a number of projects and programs every year to improve road safety, particularly for vulnerable road users (pedestrians, cyclists, etc.). Although staff are not aware of any incidents in Richmond between heavy trucks and vulnerable road users (VRUs), concerns about potential incidents have emerged.

A key aspect of traffic safety is safe vehicle design in minimizing collision severity between heavy vehicles and VRUs. Research indicates the most proven safety measure in mitigating the conflict between heavy trucks and cyclists is ongoing and up-to-date driver training and assessment programs. Physical alterations to heavy trucks can include the addition of side guards. Collision Avoidance Systems (CAS) for driver assisted camera technology can also help to improve visibility and provide warning systems to avoid conflicts between heavy trucks and VRUs.

### Analysis

As part of evaluating opportunities to minimize conflicts between heavy trucks and VRUs, staff reviewed safety measures including current City practices and emerging vehicle technologies. Staff also consulted with regulators and industry representatives.

The following section provides staff's findings regarding preventative measures to address heavy truck safety.

### Current Approach to Commercial Vehicle Safety

#### *Safer Roads*

The City proactively implements road infrastructure improvements to increase safety for VRUs. Staff have assessed high-risk places and collision prone areas and installed safety measures to reduce conflicts between vehicles and VRUs.

Projects such as the Top 20 Collision-Prone Intersections and implementation of protected cycling facilities are reducing the conflict zones between VRUs and other vehicles. City projects that improve road safety for VRUs include:

- *Top 20 Collision-Prone Intersections in the City:* Intersection upgrades include safety enhancements for VRUs by discouraging speeding and providing additional space and priority for pedestrians and cyclists. All short-term safety improvement identified through the study have been implemented. Medium-term safety measures are being implemented via annual capital projects.
- *Removal of Channelized Right-Turn Islands:* The Top 20 Collision-Prone Intersection study identified channelized right-turns as a safety hazard for VRUs. Two intersections have been modified with the removal of channelized right-turns and four locations are approved for construction through the City's capital plans. Additional locations are identified as part of future capital plans for Council consideration. The removal of channelized right-turn islands slows vehicle speeds and improves safety between motorists and VRUs crossing the intersection.
- *Cycling Facility Design and Upgrades:* Protection from adjacent traffic is implemented on Major Street cycling facilities to separate cyclists from adjacent traffic (e.g. Alderbridge Way multi-use pathway, Garden City Road delineators, Westminster Highway pathway, etc.).
- *Traffic Management Plans During Construction:* Where cycling facilities exist, traffic management plans are required to maintain a safe cycling route adjacent to construction zones.

The City's Traffic Safety Advisory Committee (TSAC) provides input, participates in the on-going and planned road safety initiatives, and provides feedback on a wide range of traffic safety issues. TSAC has representation from ICBC and staff will add commercial vehicle safety to future agendas for meetings of this multi-disciplinary committee.

Staff also engage in partnerships with various industry representatives such as ICBC as well as RCMP to administer safe driving campaigns. Most recently, staff worked with ICBC and the RCMP on a Distracted Driving campaign to educate Richmond commuters of the dangers of distracted driving. Staff will also be engaging and supporting ICBC and the RCMP in launching a Pedestrian Safety campaign in late October 2023 where an ICBC Road Safety and Community Coordinator and an RCMP staff member will deliver presentations and safety talks for City operations staff.

### *Provincial Commercial Vehicle Regulations*

To become a Class 1 licensed commercial driver, ICBC has a new Class 1 Mandatory Entry-Level Training (MELT) requirement. The Class 1 MELT course includes practical in-yard training, on-highway driving and theoretical learning components. The National Safety Code (NSC) is a set of national standards supported by provincial regulations. The program establishes management and performance requirements for commercial carriers. The NSC standards establish minimum safety standards for commercial vehicles and drivers.

ICBC's new commercial vehicle operator training focuses on NSC compliance for commercial vehicle safety, hours of service requirements, load securement, and other fundamentals like air brakes and professional on-highway driving skills.

### *City Heavy Vehicle Driver Safety Training and Assessments*

Through its Fleet Operations section, the City has a robust training and driving assessment program for staff who are required to drive a City vehicle, particularly for the operation of heavy trucks. The City follows National Safety Code standards for commercial drivers and provides in-house expertise for training, accident investigations, corrective action follow up and on-going assessments. A higher standard and additional training is required for City operators of heavy trucks.

In the past two and a half years, 180 heavy equipment training sessions with 518 training attendees have been undertaken. From 2014 to 2022, City owned tandem and single axle dump trucks travelled 1.7 million kilometres, or an average of 188,889 kilometres per year. The City's accident data to date indicates no instances of collision involving injury between City trucks or contracted heavy vehicles and VRUs. This is largely attributable to the standards in place for fleet training and assessments as well as monitoring contractor safety.

## Evaluation of Commercial Vehicle Safety Measures

### *Side Guards*

Staff researched vehicle side guards. Side guards are brackets or bars that are attached to the side of a heavy truck, between the front and rear wheels on both sides of the vehicle. These brackets are intended to reduce the likelihood of a VRU being hit by the side of the truck and subsequently dragged under the truck and becoming caught under the tires and wheels.

Staff have reviewed regulatory aspects and liaised with regulatory organizations such as the Ministry of Transportation and Infrastructure (MOTI), Transport Canada, British Columbia Trucking Association (BCTA) and consultants that work on investigations related to VRU incidents.

Through these research findings and consultation with regulatory organizations and industry representatives, staff have found that side guards are not an optimal approach to providing additional safety to VRUs, particularly for trucks used in an operations environment.

Side guards can present safety and operational challenges such as:

- Side guards may eject or divert a VRU into oncoming traffic or other lanes, potentially causing a secondary event with another vehicle or with the road/sidewalk surface.
- If a VRU gets trapped under a vehicle, first responders may not be able to provide assistance due to limited access.
- Side guards may help prevent a VRU from going under a truck, however, they do not reduce the potential life altering impact of hitting a rigid side guard.
- Side guards would need to be removed at dumping facilities due to uneven terrain and to avoid damage that would result when items such as wood or rebar get caught or projected under the truck. This is not practical.
- Side guards have to be removed during snow and ice events due to the possibility of snow build up between the side guard and back wheels, which can impede and impact driving conditions, creating a potential hazardous situation.
- Side guards add additional gross vehicle weight therefore increasing fuel consumption and impacting the City's efforts to reduce greenhouse gas emissions.
- There is a scarcity of local product availability per staff's research findings with local vendors.

While some countries and various cities have mandated the use of side guards, Transport Canada has stated that there are no conclusive studies which demonstrate the effectiveness of side guards in preventing casualties. Transport Canada studied road casualty data and actual collision investigations, and concluded in a 2010 study that; "At present, there is no way to accurately quantify the potential reduction in VRU death or serious injury as a result of side guard installation." Therefore, side guards are not a regulatory requirement in Canada or the United States, nor is it anticipated that they will become mandated.

#### *Collision Avoidance Systems*

A Collision Avoidance System (CAS), also known as a Driver Assistance System (DAS), is a safety system designed to prevent a collision or decrease its severity through visual, auditory, and/or haptic warnings to alert the driver in advance. These systems help with blind spot detection and assist in early detection of VRUs.

#### *How the technology works:*

- Sensors/cameras are placed on various locations of a vehicle, continuously monitoring the driving environment in order to detect pedestrians and cyclists hidden in the vehicle's blind spots. Upon detection, the driver is alerted prior to any potential contact with VRUs.
- Pedestrian and blind spot detection utilizes dynamic detection angles to constantly monitor the vehicle's blind spots on the right- and left-hand sides of the vehicle.
- A yellow visual signal warns the driver that a pedestrian, cyclist or motorcyclist has been detected in the vehicle's blind spot and to act with caution.
- A red visual signal accompanied by an audio alert warn the driver of the risk of an imminent collision and of the need to take immediate preventative action.

- The Time to Collision (TTC) is calculated and when it drops below two seconds, a Pedestrian Collision Warning (PCW) is generated.

Collision avoidance technology does not alter any physical aspects of the heavy truck nor interfere with standard truck uses. Staff have identified challenges with CAS in an operations environment such as sensors/cameras being dislodged or knocked off, or sensor/camera impediment by dirt or debris, thereby potentially impacting system detection. Each CAS equipped vehicle is an estimated \$11,450 for one-time costs, plus approximately \$800 per year for annual operating costs.

Staff regularly monitor emerging opportunities as vehicle technology evolves for appropriate application to the City's fleet.

### *Summary*


The current approach of conducting robust driver safety training and assessment programs for City staff, combined with monitoring of hired heavy truck contractors, has proven an effective approach to maximizing safety for VRUs, with no related accidents involving VRUs and heavy trucks in the City's historical records. This, coupled with the lack of conclusive studies that side guards offer any additional protection and can present other operational challenges, and the high costs associated with CAS at this time, would indicate the current training and assessment model offers considerable safety for VRUs. Staff will continue to evaluate cost effective vehicle technology-based safety systems as part of continuous improvement for safety-related initiatives.

### **Financial Impact**

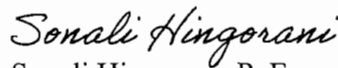
None.

### **Conclusion**

The City is proactive in implementing projects that revise road geometry to increase safety, particularly for VRUs. There is no mandate at the Provincial or Federal level for the provision of side guards as part of commercial vehicle specifications given the lack of conclusive evidence in the effectiveness in mitigating conflicts between VRUs and heavy trucks. The City's current investment in infrastructure upgrades and commercial vehicle operator training has proven successful as staff are not aware of any incidents between heavy trucks, or City owned and contracted heavy trucks, and vulnerable road users.



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