

The Reduction of Parking Restrictions around Fire Hydrants: An Examination of Parking Distances and Setback Regulations



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Executive Summary

Fire hydrants are a crucial part of British Columbia (BC) communities' fire prevention system and a source of water. In the City of Surrey, Engineering Operations and Surrey firefighters maintain and repair hydrants located on public land. As is the case in most urban centres in BC, fire hydrants in Surrey are connected to the City's water system via underground pipes maintained by public works.

The water that comes through the fire hydrant is the same as the water that comes into public and private properties in the City. As a source of water to support fire suppression efforts, its operation is simple yet crucial: a hose is attached to the fire hydrant and the valve is opened to provide a flow of water. This study does not speak to the technical specifications of the fire hydrant nor does it address the complex, multi-faceted steps involved in striking down fires through its use and application at the fire scene. Rather, this study examines the no stopping zone regulations adjacent to fire hydrants in the province of BC with the intent of supporting an alternative to the existing 5.0 metre setback on either side of a hydrant to 2.5 metres.

The no stopping zone is governed by the *BC Motor Vehicle Act* [RSBC 1996] Chapter 318. Municipal bylaws typically mirror provincial regulations as they are not supposed to be in conflict. Section 189 (d) of the *BC MVA* specifically prohibits vehicle stopping "within 5 metres (each side) of a fire hydrant measured from a point in the curb or edge of the roadway that is closest to the fire hydrant" (The BC MVA is current to January 4, 2017). This study examines the operational impact on delivery of fire department services by evaluating the minimum distance that vehicles may park in relation to fire hydrants. A series of evaluations were conducted by the Surrey Fire Service in 2016 to determine any impact in a reduction in parking distance would occur. It was determined that parking distance became a factor at less than 2.0 metres, there were no operational impedances over 2.0 metres. The National Fire Protection Association (NFPA), an international body that develops standards and codes for usage and adoption by local government states that a clear space of not less than 5 feet shall be provided in front of each hydrant connection having a diameter greater than 2 1/2 inches. The NFPA hydrant clearance standard of 60 inches converts to 5 feet or 1.524 meters, significantly less than the requirement of 5.0 metres under section 189 (d) of the *BC MVA*.

Based on the findings of this study and NFPA fire hydrant setback standards, it concluded that a reduction of the existing 5.0 metre fire hydrant setback on either side of a hydrant to 2.5 metres would not impede safe and effective operations, and should be appropriately reflected in the provincial statute. It is assumed that the provisions of section 189 (d) of the *BC MVA* are required to meet the operational needs of BC fire services; this research proposes a 2.5 metre setback which achieves that objective. The research might be considered in amendment to the *BC Motor Vehicle Act* which will enable the introduction of new criteria to reflect a new proposed parking standard.

Introduction

RATIONALE

In most jurisdictions it is illegal to park a car within a certain distance of either side of a fire hydrant. In North America the distances are commonly 3.0 to 5.0 metres or 10 to 15 feet, often indicated by yellow or red paint on the curb. The rationale behind these laws is that fire hydrants need to be visible and accessible in an emergency. This study asserts that reducing the length of the no stopping zone to 2.5 metres would increase the availability on-street parking without impeding fire ground operations or public safety. Depending on the number and location of fire hydrants in urban settings, such a reduction may result in freeing up several hundred additional parking stalls. This is of immense value to most urban communities in BC given the increasing trend toward densification of the built environment. One of the reasons for the existing 5.0 metre no stopping zone is to assist emergency vehicle operators (EVO) to more easily spot the hydrants. This requirement does seem to be a valid reason.

With the advancement of geographic positioning systems (GPS), CAD maps in the fire trucks, and other related technologies along with the driver's awareness of hydrant locations, this is not widely seen as an issue any longer at least in the compact urban setting. This is particularly true in those jurisdictions where fire crews maintain hydrants in their own areas of responsibility. Operationally, fire apparatus rarely, if ever, pull next to the curb at the fire hydrants, and the travelling lane(s) are blocked anyway as necessary. Earlier assumptions about hydrant setback regulations no longer apply and the changing nature of the fire services and the communities they serve along with new technologies makes it possible to reconsider no stopping regulations at or near fire hydrants.

This study challenges prevailing assumptions relating to fire hydrant regulations based on extensive field testing and research, and supports a change of the existing 5.0 metre setback on either side of a fire hydrant to 2.5 metres.

INTENT OF STUDY

This study examines the operational impact on delivery of fire department services by decreasing the minimum distance that vehicles may park in relation to fire hydrants. Of specific concern to the fire department was the potential for impeding the flow through 4 inch supply lines running off the side ports of the fire hydrant (see figure 1). The study also looked at potential damage to vehicles parked adjacent to fire hydrants.

Figure 1: Hydrant Side Port



Source: Surrey Fire Service, Training Branch, 2016

In order to support the case for a change of fire hydrant parking setbacks in BC, an evaluation was carried out by Surrey Fire Service that has demonstrated that a reduction of the existing 5.0 metre setback on either side of hydrants to 2.5 metres does not adversely affect fire ground operations. A review of best practices relating to hydrant law is instructive. The NFPA states that a clear space of not less than 5 feet shall be provided in front of each hydrant connection having a diameter greater than 2 1/2 inches.

The NFPA hydrant clearance standard of 5 feet converts to 1.524 meters, less than the requirement of 5.0 metres under section 189 (d) of the *BC MVA*. National Fire Protection Administration standards and codes are based on in-depth and comprehensive research and testing, and are adopted for use by modern fire services in North America.

National Fire Protection Association 2015 Hydrant Setback Standards

Section 18.5 of NFPA 1 (2015) provides requirements for fire hydrants, including location, distribution, minimum number, clearance, marking, and testing and maintenance. Section 18.5 was revised in its entirety for the 2015 edition of the Code. Previous editions provided a performance-based requirement that the number and type of fire hydrants and connections to other approved water supplies is capable of delivering the required fire flow and be provided at approved locations. The former Annex E was deleted for the 2015 edition of the Code; in its place, Section 18.5 was revised by the addition of prescriptive, mandatory requirements for fire hydrant location and distribution based on the required fire flow determined in accordance with Section 18.4.

18.5.1.6 Fire hydrants shall be located not more than 12 ft (3.7 m) from the fire departments access road.

18.5.2 Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for detached one-and two-family dwellings in accordance with both of the following:

- (1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 600 ft (183 m).
- (2) The maximum distance between fire hydrants shall not exceed 800 ft (244 m).

18.5.3 Buildings Other than Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for buildings other than detached one-and two-family dwellings in accordance with both of the following:

- (1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 400 ft (122 m).
- (2) The maximum distance between fire hydrants shall not exceed 500 ft (152 m).

NFPA 1, 2015 edition, states the following regarding accessibility of fire hydrants:

18.5.7 Clear Space around Hydrants.

18.5.7.1 A 36 in. (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.

18.5.7.2 A clear space of not less than 60 in. (5 feet or 1524 mm) shall be provided in front of each hydrant connection having a diameter greater than 21/2 in. (64 mm).

18.5.8 Protection. Where required by the AHJ (Authority Having Jurisdiction), fire hydrants subject to vehicular damage shall be protected unless located within a public right of way.

Measure and Method

The Surrey Fire Service Training Branch conducted a number of evaluations to determine any impact a reduction in parking distance would have. Factors for evaluation were vehicle parking distance from fire hydrant and setback of fire hydrant in relation to the curb. Evaluations were conducted using the following scenarios:

- One metre hydrant setback from curb – vehicles parked at 1.5m, 2.0m, 2.5m and 3.0 m from hydrant
- Two metre hydrant setback from curb – vehicles parked at 1.5m, 2.0m, 2.5m and 3.0 m from hydrant
- Three metre hydrant setback from curb – vehicles parked at 1.5m, 2.0m, 2.5m and 3.0 m from hydrant

Evaluations were conducted by creating a wooden curb at the prescribed distance from the hydrant and locating vehicles at their set distances from the point where the hydrant would intersect the street. Once the scenarios were established, a fire crew arrived on scene, stopped adjacent to the hydrant and removed the necessary equipment and hose from the truck before sending the truck further down the road. This simulated a “forward lay” tactic where water uses existing head pressure to make it way to the fire engine located at the fire scene (figure 2).

Figure 2: Forward Lay Tactic



Source: Surrey Fire Service, Training Branch, 2016

A baseline flow of 250 gallons per minute (gpm) was established to measure any reduction in available flow through kinking of hose lines attempting to make corners.

Table 1: Evaluation Results

Hydrant Vehicles	Test #	1m Setback			Test #	2m Setback			>3m Setback
		Flow	Impact	Impedance		Flow	Impact	Impedance	
(distance from hydrant)									
1.5 m	1A	250 gpm	Yes - tires	Partial	2A	250 gpm	Possible	No	No compromise to flow, impact, or impedance at >3.0m
2.0 m	1B	250 gpm	Yes - tires	Highly possible	2B	250 gpm	Less likely	No	
2.5 m	1C	250 gpm	Yes - tires	Possible	2C	250 gpm	Less likely	No	
3.0 m	1D	250 gpm	Yes - tires	Possible	2D	250 gpm	Less likely	No	

Source: Surrey Fire Service, Training Branch, 2016

Definition of relevant terms:

Flow - any measurable decrease in a flow of 250 gpm from the truck discharge

Impact - measures the impact between the hose as it charges and the vehicles on the street

Impedance - measures any kinking in the hose line

Several random tests were conducted with greater hydrant offsets however this had no impact. The impact on the available water and contact with parked cars was greater the closer the hydrant was to the curb. Although parking distance was a factor at less than 2.0 metres, there were no issues over 2.0 metres.

Conclusion

A reduction of the minimum parking distance from 5.0 metres to 2.5 metres distance from a fire hydrant would have no operational impact on the fire department’s ability to draw maximum available water from a fire hydrant. Although there was kinking of 4 inch supply line in most scenarios, it was not any more than is normally seen and typically straightened out by the hydrant firefighter as he/she made their way up to the apparatus. As hoses were charged with water, they did move and strike the tires of parked vehicles. This only occurred when the hydrant was located closest to the curb (1.0 metre) and the vehicles did not receive any damage.

Recommendation

Based on the findings of this study and NFPA fire hydrant setback standards, it is recommended that a reduction of the existing 5.0 metre fire hydrant setback on either side to 2.5 metres be applied. This will require an amendment to the *BC Motor Vehicle Act* which will, in turn, permit the introduction of new local government bylaws to reflect the new standard. While each BC municipality would have to determine the total amount of parking stalls freed up through a

reduction of the no stopping requirements, this is yet another compelling rationale for an amendment to provincial legislation. The proposed reduction of the no stopping zone requirement at fire hydrants is proven to be safe and effective, has no negative impact on fire operations, and affords BC fire services continued flexibility while maximizing parking space in compact urban settings.

References

1. Government of British Columbia. *BC Motor Vehicle Act [RSBC 1996] Chapter 318*. 1996. Victoria, BC: Queen's Printer.
2. National Fire Protection Administration. *NFPA 1: Fire Code*. 2015. Quincy, MA: National Fire Protection Administration.

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