

**TO:** CHAIR AND MEMBERS  
PUBLIC SAFETY COMMITTEE

**DATE:** 2017 June 27

**FROM:** DIRECTOR ENGINEERING

**FILE:** 38000 20  
*Ref: Traffic Safety*

**SUBJECT:** INTERSECTION OPERATIONS - BERESFORD ST AT WILLINGDON AVE

**PURPOSE:** To review safety and operational concerns at the intersection of Beresford St and Willingdon Ave.

---

#### RECOMMENDATIONS:

1. **THAT** the Committee recommend to Council geometric modifications at the intersection of Beresford St at Willingdon Ave as detailed in this report.
2. **THAT** a copy of this report be sent to Ms. Anna Solnickova of 504-4350 Beresford St, Burnaby BC V5H 4K9.

#### REPORT

##### BACKGROUND

On 2017 February 21, the Public Safety Committee received correspondence from Ms. Anna Solnickova about her concerns and day-to-day observations regarding vehicular conflicts and near misses at the intersection of Beresford St and Willingdon Ave. The request was referred to staff for review and to report back. The City has also received several other requests previously on this matter. A traffic engineering review has now been completed and the findings and recommendations are summarized herein.

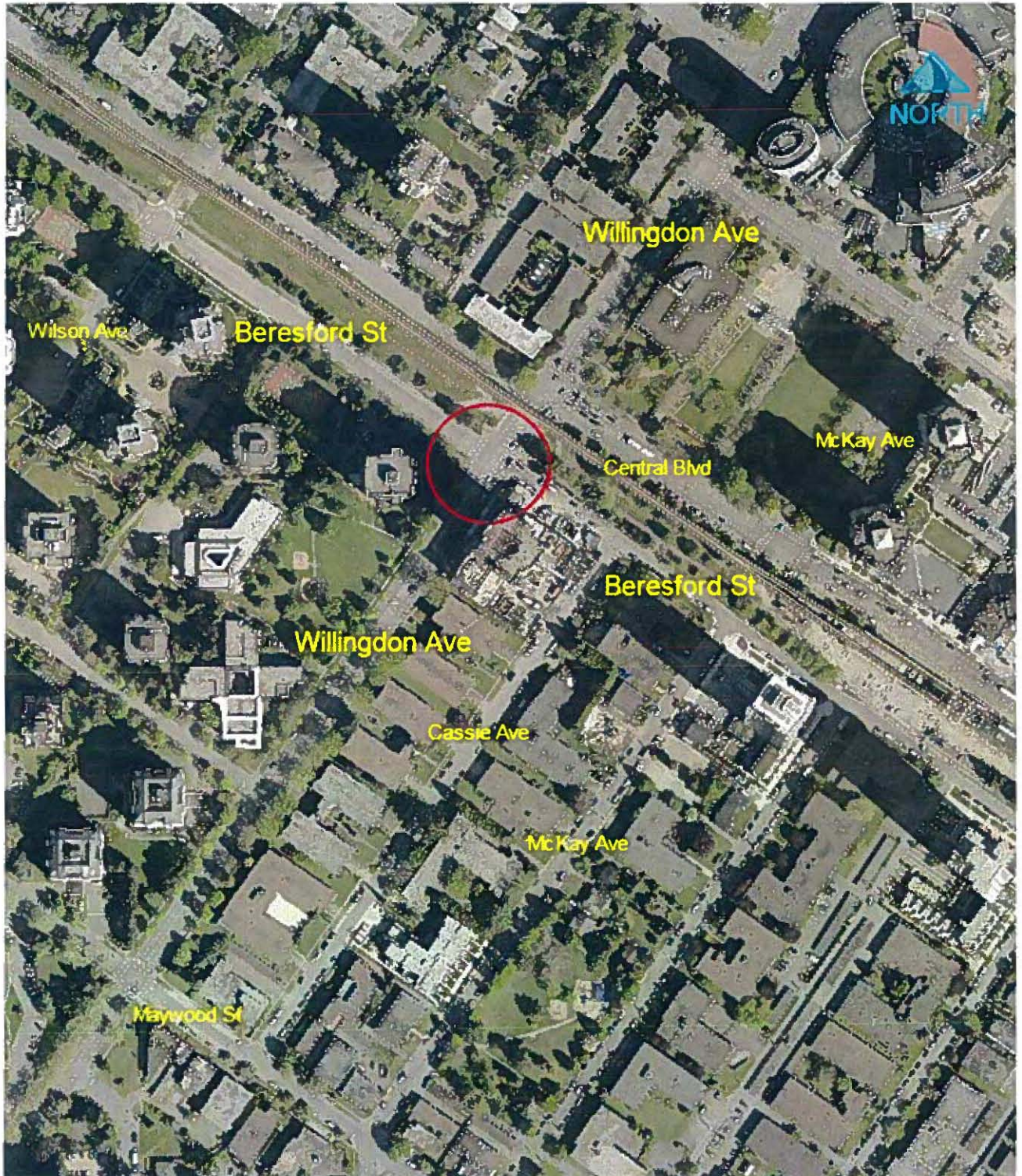
##### SITE LOCATION

Figure 1 shows the location of the intersection of Beresford St/Willingdon Ave. It is currently unsignalized and located only 33 metres south of the signalized intersection of Central Boulevard/Willingdon Ave. Through the Metrotown area, Willingdon Ave runs southwest-to-northeast and Beresford St and Central Blvd run perpendicular to it. For the purpose of clarity in this report, Willingdon Ave is assumed to run north-south while Beresford and Central Blvd are assumed to run east-west.



To: Public Safety Committee  
From: Director Engineering  
Re: Intersection Operations – Beresford St at  
Willingdon Ave  
2017 June 27 ..... Page 2

**Figure 1: Location of Beresford St/ Willingdon Ave Intersection**





## **EXISTING CONDITIONS**

Willingdon Ave is a major road in Burnaby classified as a Secondary Arterial, while Beresford St is a Local Collector and Central Blvd is a Major Collector. Given the surrounding high density residential and mixed use developments, the regional shopping centre, Metro Vancouver's second busiest SkyTrain station, civic facilities and the BC Parkway trail, the subject location experiences a significant amount of vehicular and non-vehicular traffic activity throughout the day for every day of the week. Numerous transit buses also operate through these two adjacent intersections on Willingdon Ave. Beresford St carries much lower traffic volumes at 150 vehicles per hour compared to Willingdon Ave at 1,800 vehicles per hour during peak periods.

Due to the lack of a traffic signal and proximity to the adjacent signalized intersection at Central Blvd, safety and operational issues are experienced at the Beresford/Willingdon intersection. With growing volumes of traffic from new developments in the area, the operating condition at this intersection is likely to deteriorate further. Based on the ICBC crash data for the most recent three years, the number of crashes at this intersection has increased from four in 2013 to seven in 2014, to 12 in 2015.

## **KEY SAFETY AND OPERATIONAL ISSUES**

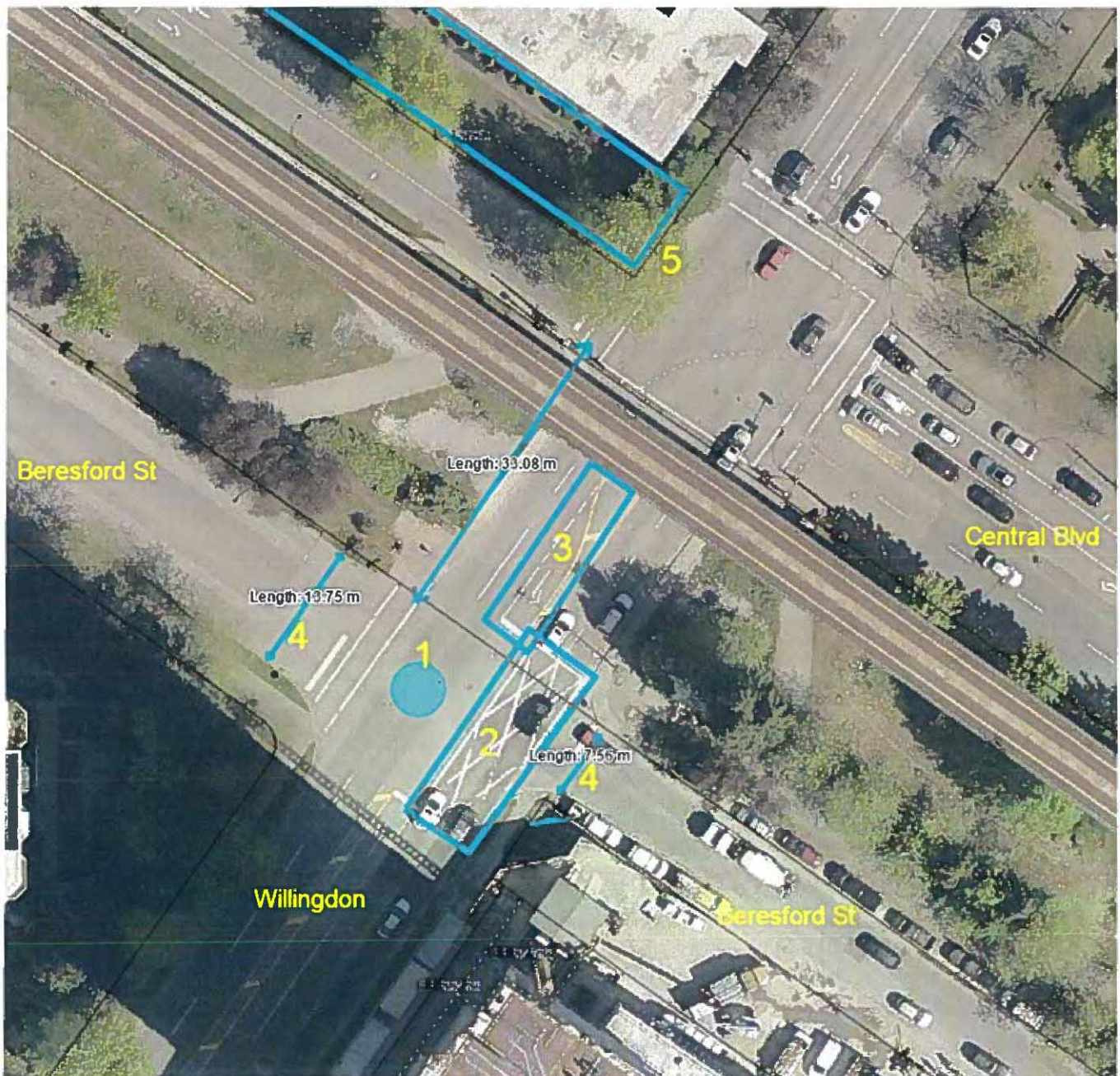
The key safety and operational issues at the Beresford /Willingdon intersection are illustrated on Figure 2 and include:

1. The stop-controlled approaches experience long delays and this causes driver frustration and encourages them to attempt unsafe turning and crossing manoeuvres. With growing traffic volumes, a higher number of crashes could be expected in the future;
2. This intersection is only 33 metres from a major signalized intersection at Central Blvd/Willingdon Ave. Because of this the queue of northbound traffic on Willingdon Ave stopped for red lights often blocks Beresford St. Despite pavement markings and traffic signs, this is a recurring issue that impedes drivers on Beresford from turning onto or going across Willingdon;
3. For southbound left turn from Willingdon onto Beresford a very short left turn lane is provided with storage for only one vehicle (7.0 m long). Therefore any additional vehicle waiting to make the same left turn from Willingdon onto Beresford would block a travel lane on Willingdon Ave. This increases the potential for rear end and side swipe crashes, and also reduces the capacity of Willingdon Ave and the signalized intersection;
4. The east and west legs of Beresford St at Willingdon Ave have an inconsistent cross-section geometry and do not align properly. Due to limited road right-of-way, Beresford St does not have standard urban design features and parking encroaches onto the adjacent BC Parkway corridor;



5. Central Blvd/Willingdon Ave is a key four-leg signalized intersection with a major right-of-way constraint on the northwest corner of this intersection. This affects the geometry and laning at this intersection and impedes signal operations. Separate signal phases for eastbound and westbound traffic have to be used due to the alignment problem which worsens operational conditions at this location.

**Figure 2: Existing Issues at the Beresford St/Willingdon Ave Intersection**





## IMPROVEMENT ALTERNATIVES

To address safety and operational problems at the Beresford/Willingdon intersection, a number of improvement options were considered. The operational performance under each option was then analyzed and the findings are as follows.

- a) Option A – New Traffic Signal: The analysis found that traffic volumes on Beresford St are very low and well below the standard warrant thresholds to justify a traffic signal. The majority of the traffic in the area does not rely on the intersection of Beresford St/Willingdon Ave and utilize alternative routes in the network. Only a small amount of traffic from both sides of Beresford attempt to turn left onto or go across Willingdon. Only 5 and 12 vehicles in the a.m. peak hour and 15 and 13 vehicles in the p.m. peak hour currently attempt such movements from the two sides. A signal for such small volumes would unnecessarily delay 1,800 vehicles per hour on Willingdon Ave.

A traffic signal at Beresford/Willingdon would also be inappropriate because it would increase the queue of southbound left turning vehicles. This queue would extend into the signalized intersection of Central Blvd/Willingdon Ave blocking traffic and increasing congestion. This would also affect the safety of pedestrians and cyclists on the crosswalks and deteriorate the level of service for transit buses. Signal coordination between the adjacent signals cannot resolve the problem because of a high volume of southbound traffic along Willingdon.

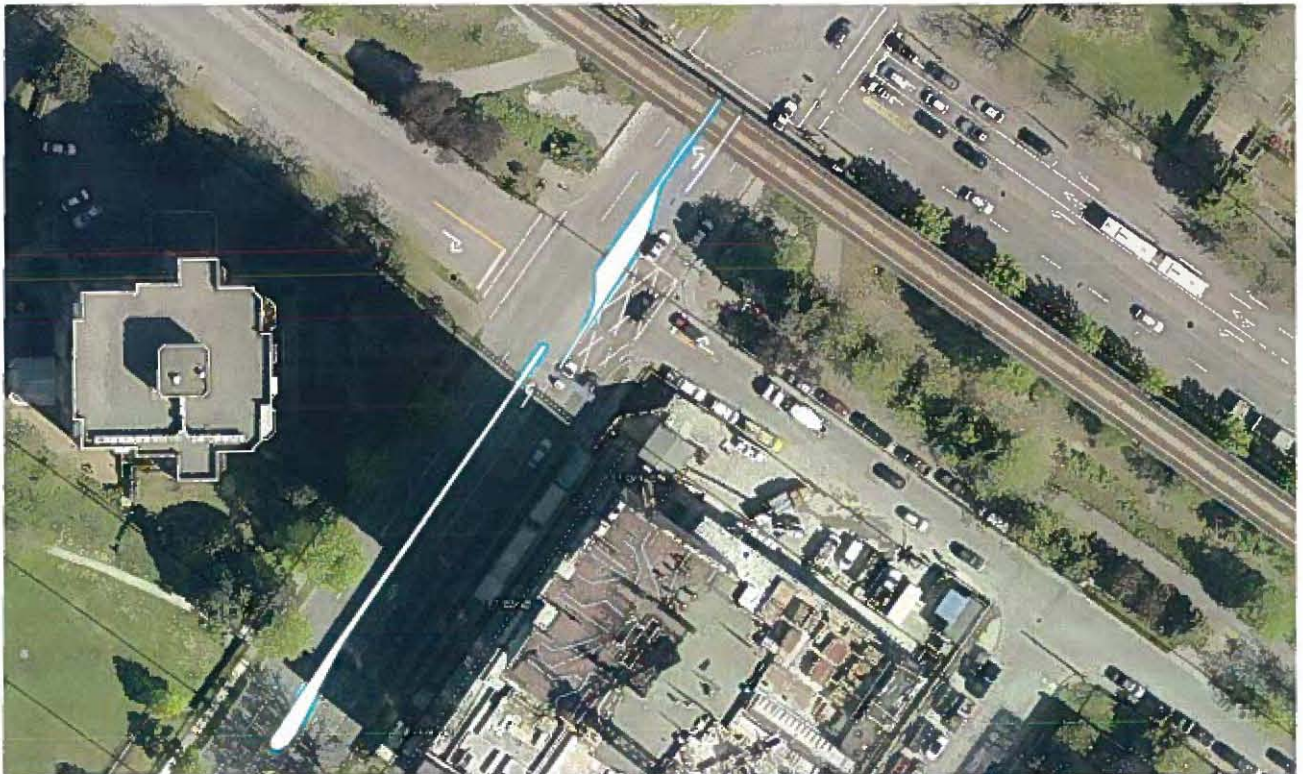
- b) Option B - Road Closure: The full closure of Beresford St at Willingdon would help establish only one intersection at Central Blvd/Willingdon Ave. All conflicting movements and the dilemma of two closely spaced intersections along Willingdon would be eliminated. This measure would provide satisfactory operational performance and improve overall safety. However, access to developments will be less direct and network connectivity would decrease. It would be logical to implement this change in the longer term in conjunction with the proposed land redevelopment and transportation network envisioned in the Metrotown Master Plan. For example, McKay Ave could be extended across the former rail corridor which will provide suitable alternative routes and thereby support growth, connectivity and access to developments in this area. For the immediate term, the full closure of Beresford St at Willingdon Ave would be too drastic without first establishing other alternative accesses.
- c) Option C - Minor Geometric Modifications: A raised concrete centre median can be constructed along Willingdon Ave south of Central Blvd as shown in Figure 3.



The median would prohibit the most problematic left out and through crossing movements from Beresford, as well as the southbound left turn movements from Willingdon onto Beresford. This 100 m long concrete median can be constructed without widening the road or affecting existing curbs, drainage or sidewalks. As illustrated in Figure 3, the proposed median will include an opening to allow northbound left turn from Willingdon Ave onto the west leg of Beresford St. The demand for this left turn movement is relatively high at 123 vehicles during the peak hour. The median would also create the opportunity to extend the northbound left turn lane at the Central Blvd/Willingdon Ave intersection. The proposed median will include a fence to guide pedestrians to the signalized crosswalks at the Central Blvd/Willingdon Ave intersection for further safety.

Based on the above three alternatives, the recommended approach to resolve current safety and operational issues is to make minor geometric modifications as outlined in Option C. The proposed median along Willingdon provides a balanced approach where the most problematic traffic movements are prohibited, while maintaining some access in and out of Beresford.

**Figure 3: Recommended Modifications at Beresford/Willingdon**



To: Public Safety Committee  
From: Director Engineering  
Re: Intersection Operations – Beresford St at  
Willingdon Ave  
2017 June 27 ..... Page 7

## CONCLUSIONS

A traffic engineering review of the intersection of Beresford St/Willingdon Ave shows that there are existing safety and operational issues that need to be resolved. After a review of different alternatives, it is recommended that a median along Willingdon be constructed to prohibit left turn and through movements from Beresford. This would effectively make access into and out of Beresford by right turns only. However, northbound left turn movement from Willingdon onto Beresford would continue to be permitted. The new configuration will improve traffic operations as well as enhance safety at the intersection.

The cost to implement the above work is estimated to be \$130,000 and the work can be completed in conjunction with road rehabilitation pavement works scheduled for 2018. Given the safety benefits, contribution from ICBC's Road Improvement Program will also be sought to help offset some of the City's cost.

It is further recommended that a copy of this report be sent to Ms. Anna Solnickova for her information.



Leon A. Gous, P. Eng., MBA  
DIRECTOR ENGINEERING

MH/DL/ac

Copied to: City Manager