Queen's Park Traffic Calming

Review of Proposed Traffic Calming Devices

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Our File:	**2422.B01**
Date:	**January 8, 2019**

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1.0 INTRODUCTION

Watt Consulting Group was retained by the City of New Westminster to provide assistance in developing strategy for the Queen's Park Neighbourhood and surrounding streets – specifically to consider traffic calming devices and changes to traffic operations. This memorandum presents a discussion of the proposed traffic calming devices, the benefits and challenges of each device, and a review of the proposed changes to traffic operations.

1.1 Existing Site

The study area is bounded by Sixth Street, Sixth Avenue, Royal Avenue, and Queen's Park. There are existing traffic calming devices in place in the neighbourhood, such as raised crosswalks, curb extensions, speed humps, a traffic circle, and a directional diverter. **Figure 1** shows the locations of existing traffic calming devices and traffic control (i.e. stop signs and signals) in the Queen's Park Neighbourhood.

1.2 Background

An engagement process was completed by the City in June 2017, as part of the public engagement plan for traffic calming in the Queen's Park Neighbourhood. Issues and concerns noted by residents included, but are not necessarily limited to:

- Illegal U-Turns at the Parking Lot at Royal Avenue and Fourth Street;
- Drivers ignoring the southbound left turn restriction during the afternoon peak periods at the intersection of Royal Avenue and First Street;
- Relatively high traffic volumes and speeds on First Street;
- Relatively high traffic volumes and speed on Fourth Avenue that are a detriment to the walking and cycling environment; and
- Desire to maintain 105 bus service and to increase transit frequency on Sixth Street.

Other issues were identified through a review of traffic volume and speed count data that were collected between the years of 2015 and 2018. The review found vehicles were operating at speeds in excess of the posted speed limits on some streets (speed limits are 50 km/h in most areas and 30 km/h in a few sections). Furthermore, traffic volumes were above 1,000 vehicles per day on some local roads. Local roads are expected to prioritize land access over traffic movement and should typically convey traffic volumes below 1,000 vehicles per day.

Figure 2 shows the areas with operating speeds in excess of the posted speed limit and traffic volumes above 1,000 vehicles per day on local roads.

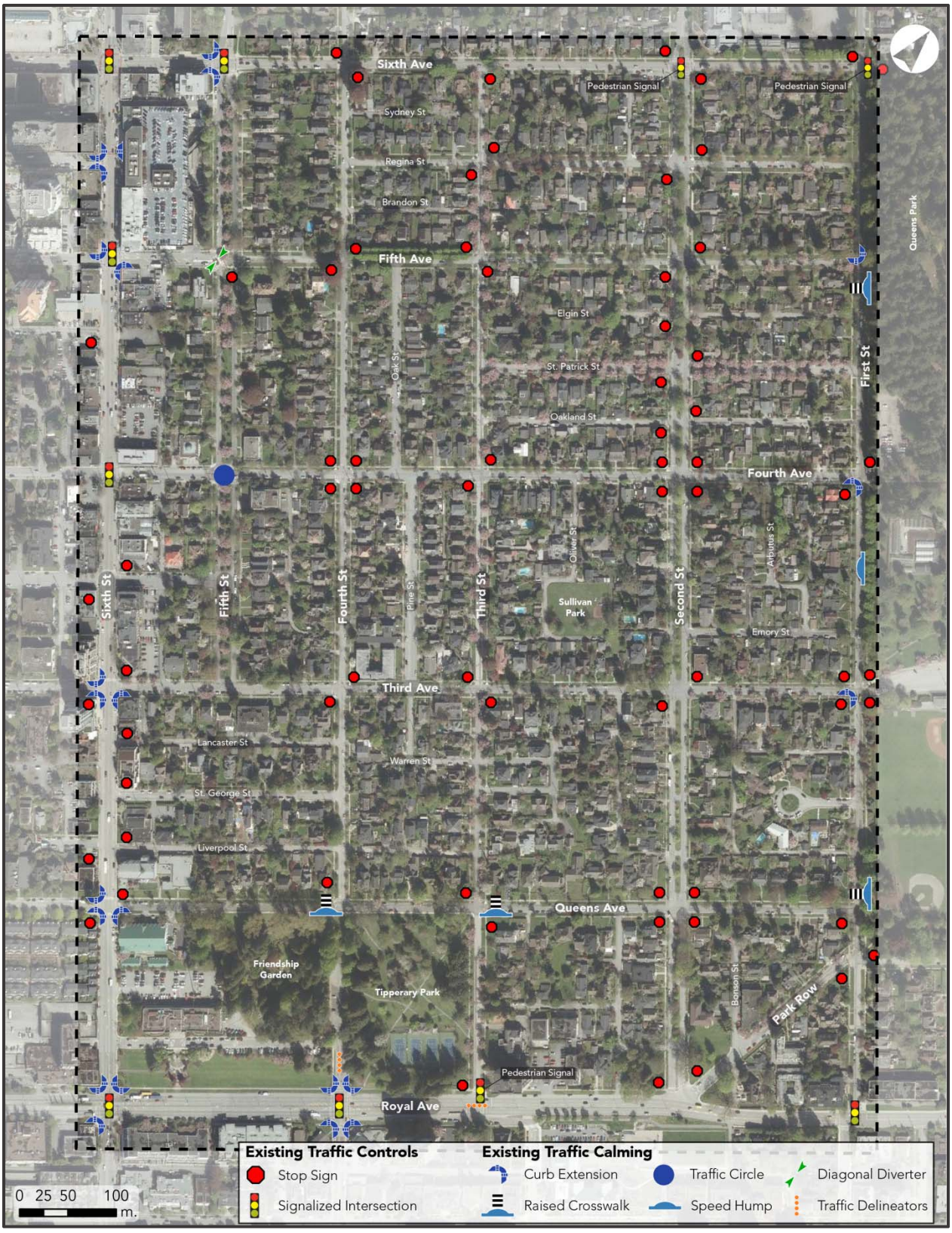

Figure 1: Existing Traffic Calming Devices in the Queen's Park Neighbourhood



Figure 2: Areas of Concern Identified by Speed & Traffic Volume Data

2.0 PROPOSED TRAFFIC CALMING DEVICES AND TRAFFIC OPERATIONS

To address public concerns and issues identified through data analysis, the City could consider the following traffic calming devices and traffic operation changes:

- Speed humps or speed tables and other speed management measures on various roads in the neighbourhood.
- Closure of Park Row between Bonson Street and Royal Avenue.
- Full-time southbound left-turn restriction and potential implementation of split phasing at the First Street and Royal Avenue intersection.
- All-way stop control at three intersections:
    - First Street at Queens Avenue.
    - First Street at Fourth Avenue.
    - Second Street at Third Avenue.

Figure 3 shows the location of the proposed traffic calming measures and the candidate intersections for all-way stop control.

2.1 Speed Humps & Speed Tables in the Queen's Park Neighbourhood

Traffic calming measures to reduce speeds are proposed along Queens Avenue, First Street, and Second Street where operating speeds exceed the posted speed limit. This would typically consist of speed humps or speed tables, which are raised areas of roadways that cause drivers to reduce speeds due to the vertical upward movement, by causing discomfort for drivers travelling at higher speeds. Speed tables have an elongated raised surface to reduce the impacts to larger vehicles, such as transit vehicle. Speed humps and tables can be considered as short-term improvements, along with other speed management measures to indicate to drivers that slower speeds are expected.

Speed humps and tables have the following advantages and disadvantages.

Advantages	• Reduction in speeds. • Reduction in vehicle volumes. • A reduction in shortcutting due to increased travel time along the corridor.
Challenges	• Increase in emergency response time due to speed humps. • Increase in noise from vehicle acceleration. • Increase in travel time on transit routes (a series of speed humps affects travel time more than a series of speed tables.) • Traffic may be diverted to parallel streets due to the reduced speeds.



Figure 3: Proposed Traffic Calming Devices and All-Way Stops

Speed humps and speed tables would work to reduce vehicle speeds and volumes along these road segments. However, they would increase emergency response times and may divert traffic to parallel streets. Traffic that is shortcutting through the neighbourhood may take another route.

To achieve 30km/h speeds on the roads, it is recommended that speed humps/tables be placed in pairs, between 4 metres and 12 metres apart, with the pairs spaced every 60 metres. This may be phased in with single speed humps prior to installing the second. To achieve 40km/h speeds on the road, it is recommended that speed humps or tables are placed every 80 metres. Speed tables, as opposed to speed humps, should be installed on routes that have transit, such as Second Street. Speed tables on transit routes should also be placed at least 25 metres in advance of the bus stops.

2.2 Road Closure of Park Row between Bonson St and Royal Ave

Park Row intersects the Second Street and Royal Avenue intersection at approximately a 45-degree angle (see **Figure 4**). This creates a conflict within the intersection and challenging conditions for people walking through the intersection. Observed vehicle speeds on this street exceed the speed limit of 50 km/h.



Figure 4: Park Row between Royal Avenue & Bonson Street

A road closure is being considered for Park Row between Bonson Street and Royal Avenue as a short-term improvement. Residents would then need to use First Street or Second Street instead to access Royal Avenue. Initially, this closure would be temporary to determine whether it is acceptable to permanently close this section of roadway. With only local traffic being able to travel a short distance, speeds are expected to be reduced from the 55km/h observed operating speeds (posted for 50 km/h).

Advantages	• The road closure would eliminate neighbourhood shortcutting and reduce speeds (existing speed exceeds posted speed limit). • Noise reduction and improvement in air quality, especially if the area is repurposed for more park space. • Improvement to safety and traffic operations as Park Row and Second Street are not aligned at 90 degrees at the existing Royal Avenue / Second Street and Park Row intersection. • Simplification of the Royal Avenue intersection would make it more comfortable for people walking in the area.
Challenges	• Residents on Park Row lose access to Royal Avenue and would need to reroute to First Street and Second Street. • Potential increase in emergency response time.

The closure of Park Row between Royal Avenue and Bonson Street would improve intersection safety as speeds along Park Row have been observed to be over the posted speed limit. The closure would mitigate the speeding issue and could a benefit to the neighbourhood if the closed section of road is converted to park space.

2.3 Turn Restrictions & Signal Phasing Changes at First St & Royal Ave

First Street intersects Royal Avenue at two T-intersections offset by 12 metres (illustrated in **Figure 5**). Enhanced turn restrictions and signal phasing adjustments could be considered at First Street and Royal Avenue to address neighbourhood shortcutting and vehicle conflicts in the offset intersection. Southbound left-turn movements would be restricted at all times by regulatory signage (currently restricted during the PM peak hour on weekdays). This proposed measure could be considered over the longer term.

Split phasing on the signal would break up northbound and southbound movements on First Street to eliminate vehicular conflicts from opposing movements, particularly benefiting the 105 bus route that passes through the intersection. Implementation may be done in phases, with the full-time turn restriction reinforced with temporary traffic delineators. Subsequently, the signal phasing may be adjusted. Should the full-time left-turn prohibition be proven effective, a permanent right-turn diverter could be installed.



Figure 5: First Street & Royal Avenue Intersection

Restricting the left-turn movement for all times of day and applying split phasing is expected to have the following characteristics.

Advantages	• Turn restrictions may reduce collisions at the intersection for all times of day (when complied with by drivers). • Phasing changes may also reduce collisions at the intersection from opposing movements in offset intersection. • Reduce neighbourhood shortcutting traffic through First Street. • Signal actuation for the southbound movement could be limited to transit vehicles only, further discouraging shortcutting through the neighbourhood.
Challenges	• Split phasing for the minor street may result in increased delays and queues for Royal Avenue from the increased cycle length.

Split phasing at the intersection would reduce vehicle conflicts for northbound and southbound traffic. Furthermore, the traffic operations of the Royal Avenue signal corridor would also need to be reviewed as split phasing may create additional delay for the major through movement on Royal Avenue. As noted above, the signal changes could be implemented after a temporary right-turn diverter is installed on the north leg of the intersection.

2.4 Proposed Locations of All-Way Stops

All-way stops were proposed for consideration at three intersections in the Queen's Park Neighbourhood:

- First Street at Queens Avenue;
- First Street at Fourth Avenue; and
- Second Street at Third Avenue.

There is a tendency to use all-way stops as traffic calming devices as there is a perception that motorists will stop. Studies have shown that this is typically not the case. As a result, stop signs were removed as a traffic calming device from the Second Edition of the TAC Canadian Guide to Traffic Calming. All-way stops are generally installed through a warrant process. If all-way stops are not warranted from a technical standpoint, then poor compliance from drivers and increased aggressive driver behaviours (acceleration to regain speeds between blocks) may be observed.

All-way stops are generally recommended when at least one of the following conditions, from the Manual of Uniform Traffic Control Devices for Canada, is met:

- Traffic volumes are approximately equal, and combined pedestrian-vehicle volumes on the minor road meet or exceed 200 per hour for an eight-hour period;
- Average delay to minor road vehicle traffic exceeds 30 seconds per vehicle during the peak hour;
- Where traffic signals are not warranted, and there have been five or more collisions of a certain type which may have been prevented by an all-way stop;
- As an interim measure before installation of a traffic signal; and
- As an interim measure to switching stop control from one road to another intersecting road.

Based strictly on the technical analysis, all-way stop control is not yet warranted at the intersections of First Street and Queens Avenue, First Street and Fourth Avenue, nor Second Street and Third Avenue. At each of the intersections traffic volumes are not balanced (approximately equal on all approaches) and the minor street vehicle and pedestrian traffic do not exceed 200 during the AM and PM peak hour. They each have a low number of collisions that would not meet the collision condition.

3.0 RECOMMENDATIONS & CONCLUSIONS

Residents in the Queen's Park Neighbourhood have expressed a number of concerns due to shortcutting through traffic which has been contributing to higher than expected traffic volumes and, in some cases, speeds on certain roads. Traffic speed and volume counts at various locations were completed between 2015 and 2018. These counts indicated that volumes were higher than expected on several road segments and that vehicle speeds for some road segments exceeded the posted speed limit. Speeds on many segments are perceived as too high for a residential neighbourhood.

The City has identified a number of potential traffic calming measures to implement in response to the concerns of residents in the Queen's Park Neighbourhood. A high-level review was completed of each traffic calming measure and/or operation change to understand whether the proposed measure is appropriate, or requires more in-depth study before implementation.

The review found that the all-way stop control was not technically warranted at the three proposed intersections. The City may wish to consult the neighbourhood and then weigh this option along with other considerations before making a final decision on implementation. The City may also wish to consider re-locating the southbound transit service from First Street to Third Street in the longer term if split signal phasing at the intersection of First Street and Royal Avenue is found to be problematic.

The following recommendations are made.

Short-Term Measures

- Install speed humps or speed tables along three to reduce traffic volumes and speeds along these corridors – specifically speed humps on Queens Avenue and First Street and speed tables or other speed management measures on Second Street.
- Close Park Row between Bonson Street and Royal Avenue.

Long-Term Measures

- Implement a full-time southbound left-turn restriction and split signal phasing at the First Street and Royal Avenue intersection.