APPENDIX D
Common Safety Issues and Trends Sheets



Common Safety Issue/Trend #1: High through traffic volumes and queues

Description:

High traffic volumes and long vehicular queues due to through traffic (regional and local) were cited and experienced at major intersections and on major corridors within the City. Relatively high volumes occurred mostly in close proximity to the accesses of Highway 1, Queensborough Interchange and, boundary road with the City of Burnaby (10th Avenue), while the remaining traffic volumes were spread along major corridors such as 6th Street, 12th Street, 20th Street, and East Columbia Street. In addition, long vehicular queues are found in the Downtown (Royal Avenue) and the Uptown (6th Street and 6th Avenue). The high through traffic volumes and queues generate collisions due to short vehicle headway, stop-and-go condition, and following too closely. Aggressive drivers may also change lanes or turn left at inadequate gaps.

Affected Collision Type:

- Rear-end
- Sideswipe
- Left-turn

Number of Identified Locations (out of 25 selected locations) : 16

Photo Examples:



McBride Boulevard and 8th Avenue
Northbound Approach - facing south
(high traffic volumes)



8th Avenue and 20th Street
Southbound Approach - facing southwest
(long vehicular queue)

Suggested Countermeasures:

Short-term:

- Optimize signal coordination along commuter routes
- Increase police enforcements on turning and truck restrictions
- Enhance enforcement on red-light-running violations
- Extend left-turn storage, need to review on case-by-case basis

Medium-term:

- Review the need for left-turn lanes at intersections

Long-term:

- Implement measures to encourage modal shift
- Manage the major/internal road network to reduce high through traffic volume as per the *City's 2015 Master Transportation Plan*

Common Safety Issue/Trend #2: Steep gradients on approaches

Description:

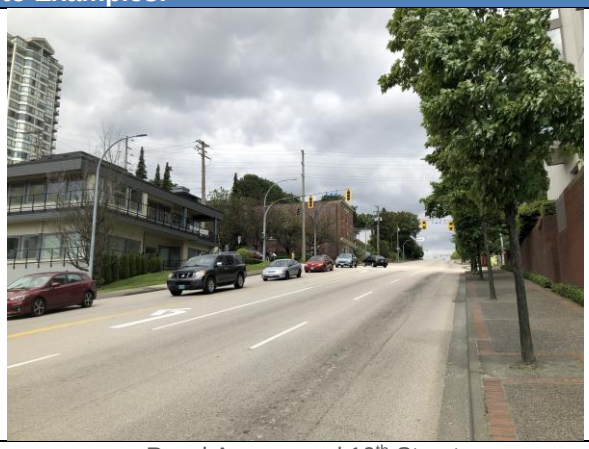
Steep gradients were identified on some approaches of intersections. Overall, the City has the characteristics of steep slopes. Steep gradients are expected to affect some vehicle braking efficiencies, in particular heavy and long trucks, to crossing pedestrian/cyclist maneuvers, as well as sightline distances due to vertical crest curves. Vehicles may also travel in relatively high vehicle speed (over the posted speed limit) with steep downhill gradient. Right-turn drivers have limited visibility of crossing traffic may not expect vehicles stopped for through traffic, generating rear-end collisions. Safety impact by steep gradients on approaches is further increased by wet and snowy road surface conditions.

Affected Collision Type:

- Rear-end
- Left-turn
- Off-road
- Pedestrian/Cyclist-involved

Number of Identified Location (out of 25 selected locations) : 16

Photo Examples:



Royal Avenue and 10th Street
Eastbound Approach - facing east
(steep gradients on all approaches)



Columbia Street and Keary Street
Southbound Approach - facing north
(steep gradient on southbound and northbound approaches)

Suggested Countermeasures:

Short-term:

- Verify stopping sight distance on approaches
- Enhance police speeding enforcement
- Provide anti-skid pavement treatments

Medium-term:

- Review the drainage system if water ponding is an issue
- Review truck route network

Long-term:

- Modify geometric layout

Common Safety Issue/Trend #3: Substantial crossing pedestrian volumes

Description:

Substantial crossing pedestrian volumes are found at high-density area such as Uptown and Downtown areas, as well as near the areas of school, church, hospital, and shopping mall. Inadequate pedestrian/cyclist connection, jaywalking, and obstructed sightlines could impose a higher safety risk for these vulnerable users. Left-turn vehicles also stopped unexpectedly for crossing pedestrians during green signal phase, causing the rear-end and left-turn collisions.

Affected Collision Type:

- Rear-end
- Left-turn
- Pedestrian-involved

Number of Identified Location (out of 25 selected locations) : 13

Photos:



6th Street and 6th Avenue
North-south Crosswalk on west Leg - facing southeast
(signalized intersection at the Uptown area)



Columbia Street and Keary Street
East-west Crosswalk on North Leg - facing north
(signalized intersection near Royal Columbian Hospital)

Suggested Countermeasures:

Short-term:

- Verify sight triangles at intersections
- Maintain / Add crosswalk signs and pavement markings
- Enhance enforcement for jaywalking
- Collect/Conduct pedestrian counts throughout the City at critical intersections
- Determine warrant to install appropriate crossing facility (such as Rectangular Rapid Flashing Beacon)
- Provide exclusive pedestrian phase if feasible

Medium-term:

- Review the amenities and accessibility of pedestrian network
- Review/Update the safe-route-to-schools program
- Provide traffic calming on local streets with high pedestrian volumes and/or high vehicle speeds
- Educate about the risk of jaywalking
- Install right-turn-on-red restrictions to reduce conflicts with heavy pedestrian flows

Long-term:

- Provide footbridges on roadways with high through traffic volume
- Manage the major/internal road network to reduce high through traffic volume as per the *City's 2015 Master Transportation Plan*, such as continue to enhance the pedestrian network

Common Safety Issue/Trend #4: On-street parking close to intersection

Description:

On-street parking close to intersection were found on some corridors, such as Royal Avenue, 6th Avenue, 8th Avenue and 6th Street. Parked cars that close to intersection may result in poor sightline to crossing pedestrians/cyclists, which could impose a higher safety risk for these vulnerable users. Dooring incidents are frequently reported, and it can lead to serious injuries or even death, particularly for cyclists. Parking maneuver when entering and leaving a parking space increase risks of sideswipe or rear-end collision, especially when vehicles are travelling close to intersection and drivers may not pay attention to the parked cars. However, removal of on-street parking would have difficulties such as public resistance and reduction in public revenue.

Affected Collision Type:

- Pedestrian/Cyclist-involved
- Rear-end
- Sideswipe

Number of Identified Location (out of 25 selected locations) : 12

Photos:



6th Avenue and 12th Street
Westbound Approach - facing west
(free on-street parking close to intersection)



London Street and 12th Street
Westbound Approach - facing west
(on-street parking close to stop sign)

Suggested Countermeasures:

Short-term:

- Remove/Relocate on-street parking close to the intersection

Medium-term:

- Review the provision of on-street parking on case-by-case basis
- Identify the need of on-site (off-street parking) supply during the new development applications
- Consider pay parking requirement on certain locations near high traffic volume intersections

Long-term:

- Conduct area-wide parking study to determine both on-street and off-street parking demand/supply

Common Safety Issue/Trend #5: Wide Lane(s)

Description:

Wide lanes were found at some selected intersections along local roads or collectors, such as 6th Street, 12th Street and 20th Street. Some lanes are designed wide to accommodate bus turning movements whereas the others are without traffic operation rationale, which could be safety hazard. Vehicles may use the extra space to make right-turn on red or drive around the waiting car to go through, increasing the risks of rear-end, sideswipe collisions or even hitting crossing pedestrians/cyclist due to limited sight distance. Left-turn drivers may use the wide lane to pass vehicles waiting to turn left, creating left-turn conflicts from opposing left-turn movements. Wide approach also create unnecessary pedestrian crossing distances.

Affected Collision Type:

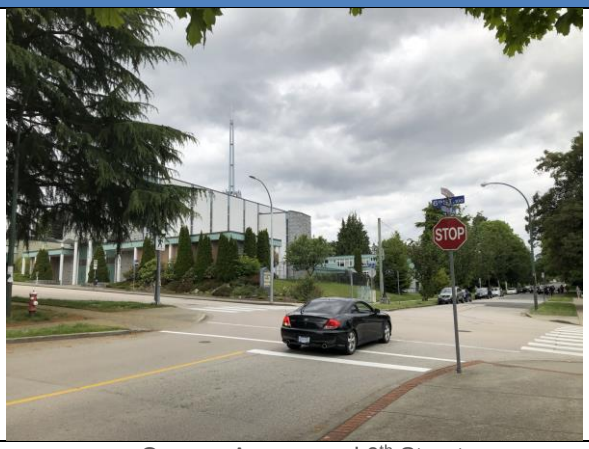
- Rear-end
- Sideswipe
- Left-turn
- Pedestrian/Cyclist-involved

Number of Identified Location (out of 25 selected locations) : 12

Photo Examples:



8th Avenue and 12th Street
Westbound Approach – facing west
(wide lane at signal approach)



Queens Avenue and 6th Street
Eastbound Approach - facing northeast
(wide lane at stop-controlled approach)

Suggested Countermeasures:

Short-term:

- Narrow lane width by pavement markings (subject to turning path)
- Install curb extension at intersection approaches

Medium-term:

- Consider exclusive left-turn or right-turn lanes/bays if needed/feasible
- Review the lane configuration at intersections based on traffic volumes and delays

Long-term:

- NIL

Common Safety Issue/Trend #7: Considerable lane changing/weaving

Description:

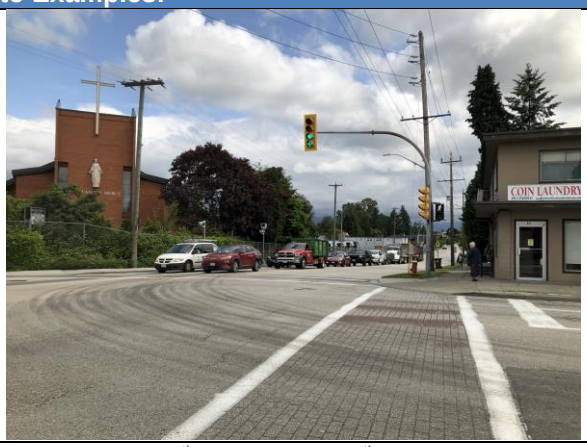
Considerable lane change and/or weaving movements were found at the upstream of intersection approaches, which are due to lack of left-turn lanes or advance left-turn signal phase. Lane changes are also found for lane drops due to on-street parking or conversion to turn lanes at intersection approaches. On-street parking and bust stop that close to intersection approach also increase the propensity for weaving movements and even weaving collisions. For instance, many intersections along 10th Avenue were identified with this common safety issue/trend. Uncommon dual left-turn lanes at intersections without advance overhead signs also generate the collision risk.

Affected Collision Type:

- Rear-end
- Sideswipe
- Off-road

Number of Identified Location (out of 25 selected locations) : 10

Photo Examples:



10th Avenue and 12th Street
Westbound Approach - facing east
(high volume of left-turn vehicles without left-turn lane)



Royal Avenue and 6th Street
Southbound Approach - facing north
(downstream lane drop)

Suggested Countermeasures:

Short-term:

- Provide clear advance laning designation signs at major intersections
- Review the need for left-turn traffic signal phasing and provide it if needed
- Review the lane configuration at intersections based on traffic volumes and delays
- Install way-finding/guide signage in the City

Medium-term:

- Review the need for left-turn lanes
- Consider left-turn restrictions at some major intersections (it may result in collision migration)
- Review the possibility in removing on-street parking close to the intersection
- Review the locations of bus stop with TransLink / CMBC

Long-term:

- Review the laning consistency balance along major corridors

Common Safety Issue/Trend #8: Inadequate street lighting

Description:

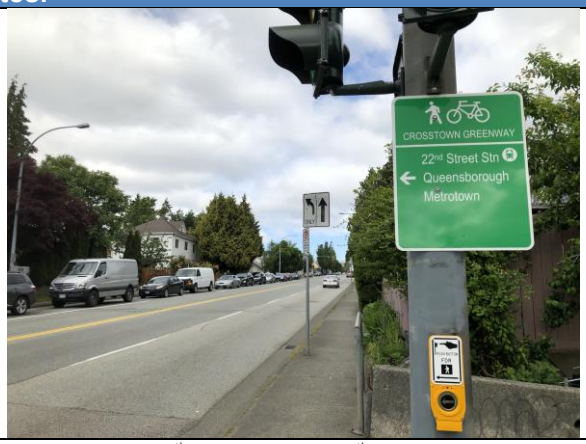
Street lighting was noted as missing at certain corners of an intersection (signalized and unsignalized) along major corridors at areas such as school (route-to-school), church, residential (pathways), etc. The number of rear-end and off-road collisions happened in the night-time could be increased as well as pedestrian/cyclist-involved collision risk. The constrained sight triangle may also impose a higher risk on top of the inadequacy of street lighting.

Affected Collision Type:

- Pedestrian/Cyclist-involved
- Rear-end
- Off-road

Number of Identified Location (out of 25 selected locations) : 10

Photos:



7th Avenue and 20th Street
Northbound Approach - facing north
(northeast corner at pedestrian access)



20th Street and 7th Avenue
Southbound Approach - facing south
(northwest corner)

Suggested Countermeasures:

Short-term:

- Verify lighting adequacy at intersection with over-represented night-time collisions

Medium-term:

- Provide/Upgrade additional lighting and street lighting standards
- Review/Update maintenance practice
- Review the need of streetlighting on major pedestrian/cyclist routes

Long-term:

- Review the area-wide streetlighting upgrade

Common Safety Issue/Trend #6: Inadequate cyclist facilities

Description:

Inadequate cyclist facilities were found at some intersections with/without bicycle lanes. Overall, the City lacks cycling connections in north-south directions. Furthermore, although some intersections are along the shared bikeways, bike lanes or MUPs corridor, cyclist crossing facilities are not provided at some of these intersections, such as cyclist push buttons, crossing signs, and crossing pavement markings. In this case, drivers may not have the awareness to take extra cautions for the crossing cyclists, causing traffic-cyclist collisions.

Affected Collision Type:

- Cyclist-involved
- Rear-end
- Sideswipe

Number of Identified Location (out of 25 selected locations) : 9

Photos:



McBride Boulevard and 8th Avenue
Southbound Approach - facing south
(no bike lanes at all approaches)



Carnarvon Street and 6th Street
Westbound approach - facing west
(no shared bikeway signs)

Suggested Countermeasures:

Short-term:

- Add cyclist crosswalk signs and pavement markings
- Provide cyclist crossing push buttons at intersections with bicycle routes
- Collect/Conduct cyclist counts throughout the City at critical intersections
- Determine warrant to install appropriate crossing facility

Medium-term:

- Review the amenities and accessibility of cycling network

Long-term:

- Provide footbridges on roadways with high through traffic volume
- Manage the major/internal road network to reduce high through traffic volume as per the *City's 2015 Master Transportation Plan*, such as continue to enhance the cycling network

Common Safety Issue/Trend #9: Significant heavy vehicle volumes

Description:

Large amount of regional and local heavy vehicles was noted on the existing truck routes in New Westminster, including McBride Boulevard, E. Columbia Street, Stewardson Way, 10th Avenue, 8th Avenue. Ewen Avenue and Royal Avenue. High number of heavy vehicles stopped at the approach may limit the signal head visibility. Longer stopping/crossing distances and wide turning paths are expected for long heavy vehicles. When long heavy vehicles are involved in collisions, it is expected to have high severity collisions and serious impacts to traffic condition.

Affected Collision Type:

- Rear-end
- Sideswipe
- Left-turn / Right-turn

Number of Identified Location (out of 25 selected locations) : 8

Photos:



McBride Boulevard and 8th Avenue
Southbound Approach - facing southeast
(high number of heavy vehicles)



Stewardson Way and 12th Street
Westbound Approach - facing west
(high number of heavy vehicles)

Suggested Countermeasures:

Short-term:

- Enhance joint enforcement activities with Commercial Vehicle Safety and Enforcement (Ministry and TransLink – MRN)
- Enhanced signal displays – enlarged signal lenses and//or add signal head
- Enhance enforcement of truck route restrictions and review locations of truck route signage
- Review the signal clearance intervals to accommodate truck deceleration/acceleration on truck routes

Medium-term:

- Provide traffic calming along local roads or collector roads on a case-by-case basis
- Review curb radius dimension to accommodate truck turning safely
- Review truck route network including the adequacy of truck routes

Long-term:

- Manage good movements to reduce high through truck traffic volume as per the *City's 2015 Master Transportation Plan*, such as continue to implement changes to the New Westminster truck route network

Common Safety Issue/ Trend #10: High left-turn volume(s) and queue(s)

Description:

High left-turn volume(s) and queue(s) were noted along major south-east corridors such as 10th Avenue and 8th Avenue. The high left-turn traffic volumes and queues generate rear-end collisions due to short vehicle headway, stop-and-go condition, and following too closely. Aggressive drivers may also make improper lane changing movements, run at red-light or turn left at inadequate gaps, causing side conflicts when changing lanes and impacts with opposing through vehicles when making left-turn.

Affected Collision Type:

- Rear-end
- Sideswipe
- Left-turn

Number of Identified Location (out of 25 selected locations) : 8

Photos:



Boyd Street and Howes Street
Westbound Approach - facing southwest
(vehicular queues at left-turn lanes)



8th Avenue and 20th Street
Westbound Approach - facing southwest
(left-turn from opposite approaches at yellow light)

Suggested Countermeasures:

Short-term:

- Extend left-turn storage, need to review on case-by-case basis
- Review the need for left-turn traffic signal phasing and provide it if needed

Medium-term:

- Review the need for left-turn lanes at intersections
- Consider left-turn restrictions at some major intersections (it may result in collision migration)

Long-term:

- Manage the major/internal road network to reduce high left-turn traffic volume as per the *City's 2015 Master Transportation Plan*, such as dispersing left-turn traffic at multiple locations.