

THE CORPORATION OF THE  
**CITY OF WHITE ROCK**  
**CORPORATE REPORT**



**DATE:**       **June 27, 2022**

**TO:**           **Land Use and Planning Committee**

**FROM:**       **Anne Berry, Director, Planning and Development Services**

**SUBJECT:**   **White Rock Zoning Bylaw, 2012, No 2000, Amendment (CD Zone 67 - 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435**

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**RECOMMENDATIONS**

THAT the Land Use and Planning Committee recommend that Council:

1. Receive for information the corporate report dated June 27, 2022, from the Director of Planning and Development Services, titled " White Rock Zoning Bylaw, 2012, No 2000, Amendment (CD Zone 67 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435."
2. Give first and second readings to "White Rock Zoning Bylaw, 2012, No. 2000, Amendment (CD Zone 67 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435" as presented, and direct staff to schedule the required Public Hearing;
3. Direct staff to resolve the following issues prior to final adoption, if Bylaw No. 2435 is given third reading after the public hearing:
  - a) Ensure that all engineering requirements and issues, are addressed to the satisfaction of the Director of Engineering and Municipal Operations;
  - b) Confirm and ensure the recommendations of the final arborist report, approved by the Director of Planning and Development Services and, more specifically the City's Arboricultural Technician, are implemented and maintained through future demolition and construction activities.

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**EXECUTIVE SUMMARY**

This is a draft Zoning Amendment Bylaw, and a draft Major Development Permit to be considered by Council. The bylaws and permit are related to a proposed multi-building development at – 15704, 15724/28/38/48/58/70 North Bluff Road. Therefore, the application is being presented for the first and second reading for the Draft Zoning Amendment Bylaw and, before adoption, the issuance of a Major Development Permit.

## **PREVIOUS COUNCIL DIRECTION**

<b>Motion # &amp; Meeting Date</b>	<b>Motion Details</b>
LU/P-038 March 29, 2021	THAT the Land Use and Planning Committee endorse in relation to Town Centre Transition area Option C as noted in the March 8, 2021 corporate report, with an amendment noting four (4) to six (6) stories where it is defined that along North Bluff on the east or west side permit six (6) stories; and For the remaining sites it be noted as four (4) stories to six (6) stories with a notation that proposals over four (4) stores would be considered when there is an affordable housing component. CARRIED
LU/P-039 March 29, 2021	THAT the Land Use and Planning Committee endorse Option A as noted in the March 8, 2021 corporate report titled "Results of OCP Review Survey- Building Heights Outside the Town Centre" in regard to the East Side Large Lot Infill. CARRIED
LU/P40 March 29, 2021	THAT the Land Use and Planning Committee endorse removal of the row of single family homes on Finlay Street - section below Russell Avenue from the area titled as "East Side Large Infill" from Official Community Plan and it remain with the mature neighbourhood designation. CARRIED
LU/P-041 March 29, 2021	THAT the Land Use and Planning Committee endorse a maximum of a four (4) storey height along North Bluff road along the east side (East of Lee Street to Maccaud Park). CARRIED
LU/P-042 March 29, 2021	THAT the Land Use and Planning Committee endorse the Waterfront Village be limited and/ or referred to as only the buildings that front onto Marine Drive.
LU/P-043 March 29, 2021	THAT the Land Use and Planning Committee endorse, at West Beach along Marine Drive, permitting a building height of three (3) stories. CARRIED

## **INTRODUCTION/BACKGROUND**

### **Project Overview**

#### **Initial Application**

This application has undergone several revisions based on Council direction and comments from the Public Information Meeting (PIM) and the Advisory Design Panel (ADP).

The original application presented at the PIM and to ADP was a 6-storey, 2.5 floor area ratio (FAR) form of development. It consolidates seven existing single-family home lots on North Bluff Road between Lee Street and Maccaud Park. Three buildings were proposed: two mid-rise,

multi-unit, market residential buildings and one mid-rise, multi-unit, affordable non-market rental housing located at the corner of North Bluff and Lee Street.

The project site is located within the East Side Large Lot Infill Area, as defined by the City of White Rock Official Community Plan (OCP), which at the time of the initial application allowed for the development of a 2.5 FAR density and 6 storeys building height. The initial design was for 115 homes (Figure 1).

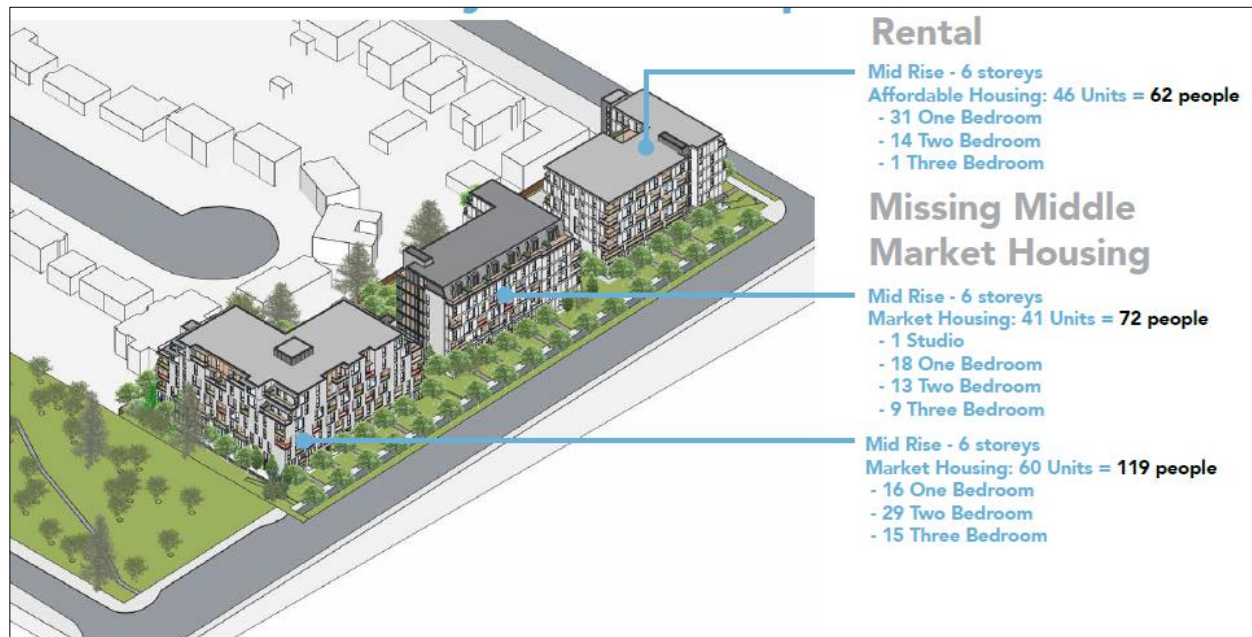


Figure 1 Birds view of the Site Plan of the APD Submission (October 1, 2020)

The community and the ADP overall supported this design. The summary of the PIM is in (Appendix A). The application complied with the OCP for height in the East Side Large Lot category. It included a car-sharing program in exchange for relaxation in the parking requirements. At the March 8, 2021, meeting as a result of the Official Community Plan Review Survey - Building Heights Outside the Town Centre, Council made a resolution to reduce the FAR and the maximum storey height from 6 to 4, with the ability for the developer to reach 2.5 FAR and 6 storeys if Affordable housing was included as per Policy 11.2.1.c.

*Affordable Housing Bonus – Allow rezonings in the Town Centre Transition area to permit buildings up to six storeys and 2.5 FAR where the development provides:*

*For a development replacing existing rental units and providing compensation to tenants in accordance with the City's Tenant Relocation Policy, at least 5% of the units as Affordable Rental Housing. Projects with applications submitted prior to 2021 may be approved with at least 5% of the units secured at average rents for a period of 10 years, instead of 20% below average for the life of the building. Developments in this category may have a density up to 2.8 FAR.*

This project progressed to the ADP and was presented to the panel at the October 20, 2020, meeting. A summary of ADP's comments and the applicants' responses are summarized in Appendix B. The ADP passed the following motion:

*It was MOVED and SECONDED THAT the Advisory Design Panel recommends that the application for the development proposal at 15704, 15724/28/38/48/58/70 North Bluff*

*Road (ZON/MJP 19-017) North Bluff Road [Beachway II] be referred to Council subject to the applicant giving consideration to.*

1. *Adequacy of parking supply:*
2. *Adequacy of the location of spaces for deliveries/drop-offs;*
3. *Management of stormwater and;*
4. *Further development of the landscape proposal in the Southeast corner of the site.*

The table below summarized the applicant's responses to the considerations ADP passed in the above motion.

Table 1

<b>Motion Consideration (1-4 above)</b>	<b>ADP Comments</b>	<b>Response</b>
1. Adequacy of parking supply.	Limited parking supply identified as a concern – reduction may be too aggressive – may require additional supply (“excavation”) – alternative opinion regarding the opportunity presented by the proposal is looking at efforts to change auto reliance.	Parking reductions are no longer being proposed. The developments parking provision will meet the requirements of the City of White Rock Zoning Bylaw.
2. Adequacy of the location of spaces for deliveries/drop-offs.	Comments were made regarding the need for allocation for service vehicles, e.g. food delivery or taxis, to stop near the buildings and overall accessibility (or distance) from portions of the overall development site.	Service parking is located both at grade with a Zoning compliant oversized loading bay. There is also smaller service/loading stalls within the below-grade parkade, one per elevator shaft. Due to prohibitions on curb cuts along both North Bluff Road and Maccaud Park, there is limited ability to achieve additional service delivery lay-by locations. Any potential on-street lay-bys would be under the purview of the City of White Rock Engineering Department.
3. Management of stormwater.	Applicant states that “all” rainwater is to be reused– that would be excellent. However, this needs to be confirmed or clarified through the City’s review of the stormwater management plan.	The current stormwater management proposal is to provide a stormwater detention tank complete with a flow control device that limits flows to the



		pre-development conditions. Stormwater reuse is not feasible for this site.
4. Further development of the landscape proposal in the Southeast corner of the site.	The landscape plan has a good flow of spaces and fits the configuration of the property well; would like to see the pedestrian path between Buildings 2 and 3 (see figures 3) made wider (~1 foot wider) and in the southeast corner of the site; would like steppingstones south of Building 3 to be evaluated in terms of the impact that trees (roots) may have on the area over time and the type of steppingstones used in terms of their longevity (larger basalt stones may be a better option).	The pedestrian path connecting Buildings 2 and 3 through the drive aisle is limited to 1.2m (4') width because of slope requirements to get to the parkade entry. Pedestrian bridge width is designed per Architecture/Structural standards. The landscape path connection matches at 1.32m (4'4"). The exit path at the southeast site corner is 1.2m (4') wide which adheres to code requirements – note this is not a main route through the site. All stepping stones on the site are located at play areas and meant to act as a nature play element, encouraging children to interact with the planting.

#### Current Application

The revisions to the proposal are in direct response to the Council motion to reduce the height to a maximum of four storeys in this area. The project no longer seeks the additional density provided for affordable housing per the East Side Large Lot Infill Redevelopment Area (*Policy 11.2.1.c*). The revised approach will meet 1.5 FAR over three buildings (two four-storey multi-family residential buildings and one three-storey townhouse building in the middle). In addition, the previous application sought reductions in parking requirements by providing a car-share program in the building. A reduction is no longer needed, and the car-sharing program has been removed. Parking is now proposed to meet the requirements in the Zoning Bylaw. Below are site plans of the two proposals (see figures 3&4).

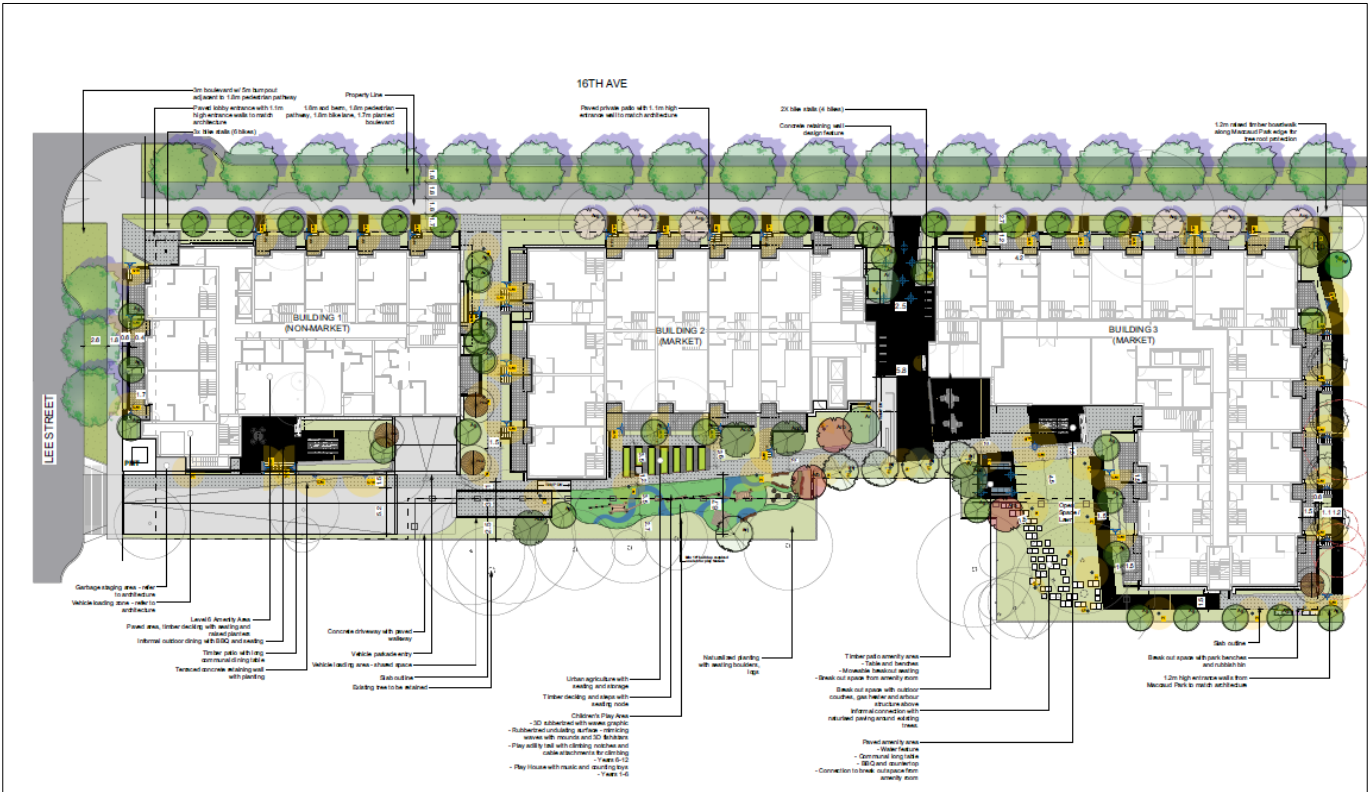


Figure 3- Site Plan of the APD Submission (Oct 1, 2020)

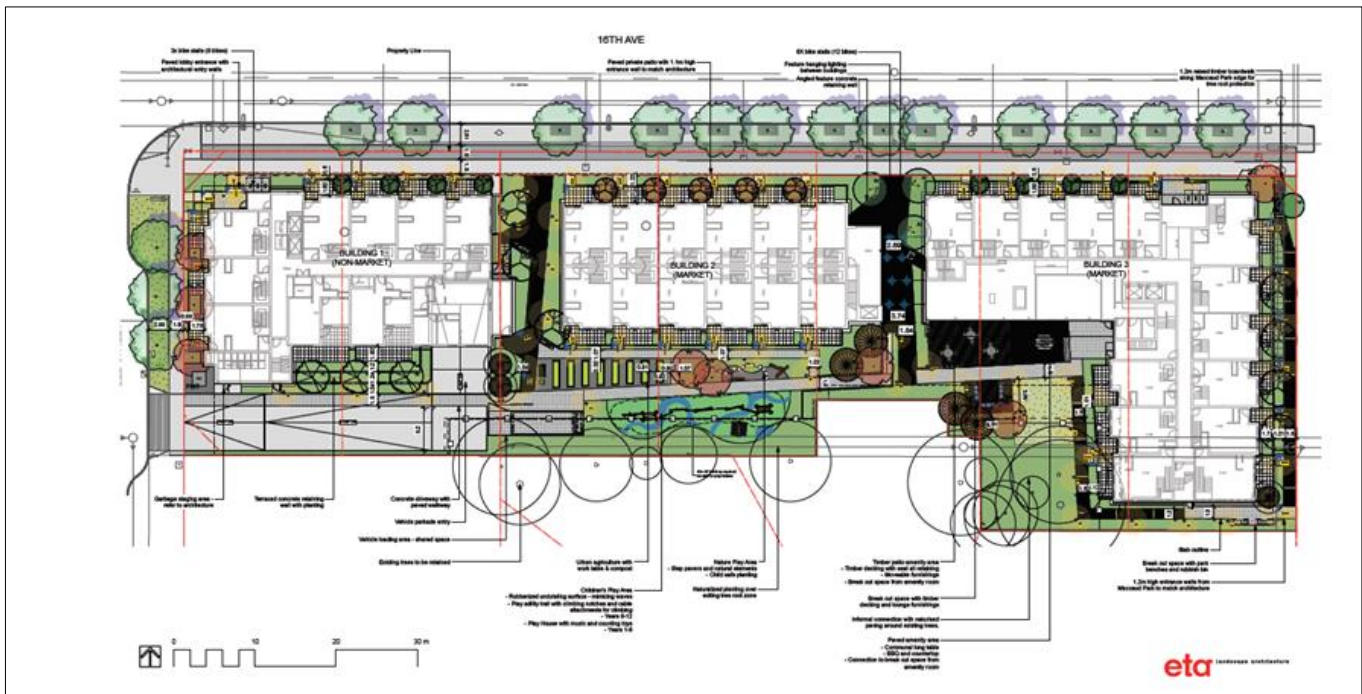


Figure 2- Site Plan of the Current Submission (Apr 14, 2022)

### Design Changes

In comparison to the past application, the development has undergone the following amendments:

Previous ADP Submission (October 1, 2020)	Current Submission (April 14, 2022)
<b>Density Comparison</b>	
<ul style="list-style-type: none"> <li>- 2.5 FAR overall</li> <li>- 149 units</li> <li>- 2.5 FAR Affordable housing was previously proposed, aligned with the East Side Large Lot Infill Redevelopment Area.</li> <li>- Lot Coverage 51.6%</li> </ul>	<ul style="list-style-type: none"> <li>- 1.5 FAR overall</li> <li>- 87 units</li> <li>- With Council's decision to reduce height/density at this location, affordable housing targets per the East Side Large Lot Infill Redevelopment Area are not being pursued. It is not financially feasible based on the rising construction cost and the allowable density.</li> <li>- Lot Coverage 46.0%</li> </ul>
<b>Form of Development</b>	
<ul style="list-style-type: none"> <li>- Three buildings at 6 storeys each per the East Side Large Lot Infill Redevelopment Area with affordable housing.</li> <li>- Each building is roughly L-shaped in plan, which results in a more broken-up courtyard space south of the buildings.</li> </ul>	<ul style="list-style-type: none"> <li>- 4-storey buildings bookend on either side of the site, with a 3-storey townhouse building. Overall footprints of Buildings 1 and 3 remain very similar to the October 1, 2020 submission. Building 2 has been revised to suit townhouses only and is no longer stacked townhomes with apartments on the upper levels.</li> <li>- The 4-storey apartment buildings are located at the corners of the site to take advantage of multiple street frontages.</li> <li>- The central townhouse building is limited in width (6 units facing North Bluff Road), and the linear form removes building mass from the south-facing courtyard, thereby increasing the size and quality of the outdoor amenity space.</li> </ul>
<b>Height</b>	
<ul style="list-style-type: none"> <li>- Building Heights previously presented at 6 storeys maximum, per the East Side Large Lot Infill Redevelopment Area.</li> </ul>	<ul style="list-style-type: none"> <li>- Building height maximum has been reduced to 4 storeys for Buildings 1 and 3. Building 2 has been proposed as a three-storey townhouse to bring the developable FAR to 1.5 FAR overall.</li> <li>- Building heights at Building 2 have been set to create a consistent street wall in relation to Building 3 along North Bluff Road.</li> </ul>

<b>Setbacks</b>	
<ul style="list-style-type: none"> <li>- Proposed minimum setbacks are in alignment with the OCP.</li> </ul>	<ul style="list-style-type: none"> <li>- No change in minimum setback requirements from OCP.</li> <li>- Townhouses (Building 2) are provided with a greater setback distance to North Bluff Road to deal with the grade change across the site and to create a more varied street wall (One of the long side boundaries of a street, formed by buildings, hedges, etc.).</li> <li>- Patio terraces have been adjusted to provide a minimum of 600mm of landscape buffer to the adjacent sidewalk.</li> </ul>
<b>Architectural Character</b>	
<ul style="list-style-type: none"> <li>- The western two buildings (Buildings 1+2) were more in character with one another, being shown with fibre-cement cladding, while the easternmost building (Building 3) has brick cladding.</li> </ul>	<ul style="list-style-type: none"> <li>- The site design allows the two larger L-shaped 4-storey buildings to act as bookends, anchoring the northwest corner of the site, facing the park, and the southwest corner at Lee Street.</li> <li>- There have been some adjustments to Building 1 to align with the character of Building 3 as previously proposed, with similar brick facades. The brick proposed for Buildings 1 and 3 is darker than presented at ADP to help “anchor” each end of the site, create streetscape variety along North Bluff Road, and differentiate from the townhouse building.</li> <li>- Balcony guardrails previously shown as coloured glass have been revised to clear safety glass.</li> </ul>
<ul style="list-style-type: none"> <li>- A common entrance to Buildings 2 and 3 was proposed from the courtyard.</li> </ul>	<ul style="list-style-type: none"> <li>- Units facing streets are similar to the previous design, with an individualized expression of each unit and semi-private front terraces. Patios have been adjusted slightly to provide for a minimum 600mm landscape buffer to the adjacent sidewalk.</li> <li>- Finish floor elevations and street-facing patios have been adjusted to provide for raised terraces within 1500 mm of grade.</li> <li>- The northeast corner townhouse unit at Building 3 has been rotated to more directly face Maccaud Park, providing eyes on the park and connectivity with the other units facing the park.</li> </ul>

<b>Amenity Spaces</b>	
<ul style="list-style-type: none"> <li>- Indoor amenity spaces totalling 207.8 sq.m (1.4 sq.m. per unit) were located in both Buildings 1 and 3.</li> </ul>	<ul style="list-style-type: none"> <li>- With the reduction in the number of units, amenity spaces have been consolidated in Building 3 to create a vibrant community hub.</li> <li>- The size has been adjusted to 187.5 sq.m. (2.1 sq.m per unit)</li> <li>- With a reduced building footprint, there is an increase in outdoor amenity area from the October 1, 2020 submission.</li> </ul>
<b>Parking and Loading</b>	
<ul style="list-style-type: none"> <li>- A parking variance was previously proposed to reduce the number of required parking stalls.</li> <li>- Loading spaces were provided both at the lane (for larger vehicles) and within the parkade (for smaller vehicles).</li> </ul>	<ul style="list-style-type: none"> <li>- Parking is proposed to meet the requirements of the Zoning Bylaw, with no requests for a variance.</li> <li>- As the request for a variance has been removed, so have car and bike share facilities. However, some enhanced bike facilities (bike repair station and bike wash) remain.</li> <li>- The approach to loading spaces is similar to the October 1, 2020 submission. with one larger loading space at the lane and smaller loading spaces within the underground parkade for more day-to-day deliveries.</li> </ul>
<b>Open Space/Landscaping</b>	
<ul style="list-style-type: none"> <li>- Buildings were provided with landscaped patio terraces facing the adjacent streets and Maccaud Park. A common courtyard south of the buildings provided an available amenity area with good solar access and site porosity.</li> </ul>	<ul style="list-style-type: none"> <li>- Overall landscape concept remains similar to the October 1, 2020 submission. However, transitions between buildings leading to the courtyard from North Bluff Road have been adjusted to suit the revised building siting.</li> <li>- The lane access from the Lee Street ramp has increased to achieve zoning-conforming clear height in the parkade. In addition, an additional accessible route into the courtyard between Buildings 1 and 2 has been added to improve accessibility to the outdoor amenity area.</li> </ul>

### Unit Changes

Overall, 62 units have been removed from the project from the October 1, 2020, submission to the current proposal (from 149 units to 86 units). As noted previously, this coincides with the overall development density and building height reduction. Below are the details of the decrease in the unit per building (1,2&3).

Previous ADP Submission (Oct 1, 2020)	Current Submission (Apr 14, 2022)
<p><b>Building 1</b></p> <p>Midrise – 6 storeys Market housing – 60 units</p> <ul style="list-style-type: none"> <li>○ 16 one-bedroom units</li> <li>○ 29 two-bedroom units</li> <li>○ 15 three-bedroom units</li> </ul>	<p><b>Building 1</b></p> <p>Midrise – 4 storeys Market housing 31 units</p> <ul style="list-style-type: none"> <li>○ 20 one-bedroom</li> <li>○ 4 two-bedroom</li> <li>○ 7 townhomes</li> </ul> <p>Detailed changes:</p> <p>Building 1 (a net reduction of 16 units):</p> <ul style="list-style-type: none"> <li>• Level 1 (+1 unit): <ul style="list-style-type: none"> <li>• Indoor amenity removed due to a lower overall building population, with the removal of overall density. This was replaced with a 1-bedroom unit.</li> </ul> </li> <li>• Level 2 (no net change in unit count): <ul style="list-style-type: none"> <li>• A minor adjustment in the size of Unit 110 to better align the structure and improve the functionality of the unit’s floor plan.</li> </ul> </li> <li>• Level 3 (no net change in unit count): <ul style="list-style-type: none"> <li>• No significant changes to units.</li> </ul> </li> <li>• Level 4 (no net change in unit count): <ul style="list-style-type: none"> <li>• No significant changes to units.</li> </ul> </li> <li>• Level 5 &amp; 6 (-17 units): <ul style="list-style-type: none"> <li>• Floor levels deleted.</li> <li>• 9 units were removed at Level 5.</li> <li>• 8 units were removed at Level 6.</li> </ul> </li> </ul>
<p><b>Building 2</b></p> <p>Midrise – 6 storeys Market housing – 41 units</p> <ul style="list-style-type: none"> <li>○ 1 Studio</li> <li>○ 18 one-bedroom units</li> <li>○ 13 two-bedroom units</li> <li>○ 9 three-bedroom units</li> </ul>	<p>Midrise – 3 storeys Market housing 12 units</p> <ul style="list-style-type: none"> <li>○ 12 townhomes</li> </ul> <p>Detailed changes:</p> <ul style="list-style-type: none"> <li>• Building 2 (a net reduction of 30 units): <ul style="list-style-type: none"> <li>• Building 2 changed from a 42-unit, 6-storey Multi-Residential Building (mix of apartments and townhouses)</li> </ul> </li> </ul>

	to twelve 3-storey townhouses. All new unit types to suit—a net total of 30 units removed from the project.
<b>Building 3</b>	
<p>Midrise – 6 storeys Non-Market housing – 46 units (affordable rental housing)</p> <ul style="list-style-type: none"> <li>○ 31 one-bedroom units</li> <li>○ 14 two-bedroom units</li> <li>○ 1 three-bedroom unit</li> </ul>	<p>Midrise – 4 storeys Market housing 44 units</p> <ul style="list-style-type: none"> <li>○ 14 one-bedroom</li> <li>○ 16 two-bedroom</li> <li>○ 14 townhomes</li> </ul> <p>Detailed changes:</p> <p>Building 3 (a net reduction of 16 units):</p> <ul style="list-style-type: none"> <li>• Level 1 (no net change in unit count): <ul style="list-style-type: none"> <li>• Entry to building relocated to face North Bluff Road, improving wayfinding, addressing, and fire department access. Unit 106B two-storey townhouse was removed (October 1, 2020 submission) to provide a location for the new building lobby; a single-storey unit on Level 2 has replaced this.</li> <li>• Unit 106B (April 14, 2022 plans) rotated to front more directly on Maccaud Park, improving the park frontage and benefitting the livability of the unit.</li> <li>• Exit stair #2 at the southeast corner of the building was adjusted to flatten the façade at this location. Minor adjustments to the entry doors into Units 111B and 112B (April 14, 2022 plans) to suit.</li> <li>• Indoor Amenity reconfigured to maximize plan efficiency.</li> </ul> </li> <li>• Level 2 (no net change in unit count): <ul style="list-style-type: none"> <li>• Adjustment of Unit 202B floor plan to suit reconfiguration of Stair #3.</li> <li>• Units 101B-105B: plans flipped to better coordinate balcony positions.</li> <li>• Unit 201B is shown as a single-storey 1-bedroom unit due to its position above the new entry lobby. This unit replaces the former two-storey townhouse unit; therefore, there is no</li> </ul> </li> </ul>

	<p>addition to the overall unit count at this location.</p> <ul style="list-style-type: none"> <li>• Unit 106B: reconfigured to face park (see above).</li> <li>• Units 107B-114B: balconies adjusted to improve building envelope detailing.</li> <li>• Level 3 (no net change in unit count): <ul style="list-style-type: none"> <li>• No significant changes to units.</li> </ul> </li> <li>• Level 4 (no net change in unit count): <ul style="list-style-type: none"> <li>• No significant changes to units.</li> </ul> </li> <li>• Levels 5 &amp; 6 (-16 units): <ul style="list-style-type: none"> <li>• Floor levels deleted. 8 units were removed at Level 5, and 8 units were removed at Level 6.</li> </ul> </li> </ul>
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Staff have reviewed the application changes and compared them to the previous plans and the ADP roles and mandate. In the review of development permits applications, the panel's mandate is to consider the following:

- *The alignment with applicable policies of the Official Community Plan and the Development Permit Area Guidelines:*
  - A local government may designate certain lands as Development Permit Areas (DPA) within an Official Community Plan (OCP). The Form and Character DPA controls the form and character objectives for commercial, industrial and residential development (e.g. landscaping, siting, exterior design).
  - The form, character, appearance and landscaping are important part of what makes a place attractive and livable.
  - Staff have concluded through the review that the application still meets the intent of the guidelines, the density has been reduced but the overall form and characteristics of the development has not changed. Modifications are primarily the reconfiguration of townhomes and apartments.
- *Form and character impacts that may arise out of a request for relief from a zoning bylaw standard(s) (e.g., reduction in yard setbacks, additional building height, etc.):*
  - There is no longer a request for relief from zoning bylaw standards.
- *The intended function of the project and how the development fits within the neighbourhood context (e.g., urban design, site design, compatibility of built form, the potential for land use impacts such as shadowing, insufficient parking, negative impacts to traffic volumes, etc.):*
  - The urban design has not changed significantly. The overall site plans in figures 1 and 2 are similar. The modification to the design include a reduction in height, number of units, and shadowing has been reduced due to the reduction in height. The proposed parking meets the requirements of our zoning bylaw and have been verified by staff. Traffic volumes will be reduced due to the reduction in units.
- *The overall quality of building and site design considering:*



- *the livability of the project for future occupants / site users including specific regard for public safety (CPTED) and accessibility;*
  - The applicant included these features into their design. No significant changes have been made to the current submission that would affect this.
- *the constructability of the design with regard to the potential impact on building longevity and cost (affordability for future owners / renters);*
  - The design for the use of a prefabricated timber system will:
    - Enhance quality of construction,
    - Sequester carbon creating an environmentally sustainable building,
    - Reduce construction time limiting the impact on neighbours,
    - Result in a quieter construction site with reduced trades on site,
    - Support local industry, and
    - Result in affordable, warm, compelling homes for a wide range of residents.

This method of construction has not changed since the Previous ADP Submission (Oct 1, 2020).
- *the environmental sustainability of the design considering efforts for stormwater; retention, passive solar gain, electric vehicle use, and other measures;*
  - See the Climate Change Implications section of the report.
- *the way in which the building design interacts with, and positively contributes to, the public realm (e.g., interface of the building with the street, landscaping treatment, pedestrian connections, variability in design and massing, etc.);*
  - The project focuses on providing open and engaging spaces for public life, enhancing the character of the built environment and public realm. A network of pedestrian routes link to the central courtyard. Green space both within and surrounding the site provides area for growth of a healthy tree canopy, improving the character and walk-ability of the neighbourhood. This has not changed from the Previous ADP Submission (October 1, 2020). The intent is the same.
- the impact of the siting of buildings and structures, as well as other site features (e.g., driveways, impermeable amenity spaces, etc.) on protected trees, both private and public, and the ability to avoid tree removals and/or support tree plantings through the design of the building(s) and the layout of the site; and
- the potential for conflicts with other municipal bylaws where such conflicts may affect the overall form and character of the development or the way in which the project upholds the policy objectives of the Official Community Plan.

Based on the above information and comments, staff concluded that the changes made to the October 1, 2020 submission are not enough to be sent back to the ADP for further comments. The revised current Submission (Apr 14, 2022) meets the intent of the design guidelines and it aligns with the mandate of the ADP. Further, all considerations made by the ADP have been addressed (table 1). Council may choose to direct this application back to the ADP should council deem a further review necessary.



NORTH BLUFF ROAD ELEVATION



COURTYARD ELEVATION

### Site Context

The development is located within the East Side Large Lot Development Infill permit area, on North Bluff Road, between Maccaud Park and Lee Street (see figure 5). This site is well placed to encourage walking, transit use, and biking:

- The site is within a 15-minute walk to the Semiahmoo Town Centre.
- The Peace Arch Hospital Precinct is a 5-minute walk to the west.
- Earl Marriot Secondary School is located north of the site along North Bluff Road, and Peace Arch Elementary School is less than 5-minute walk to the southeast through the residential neighbourhood.
- The Kent Street Activity Centre, located within Maccaud Park and home to the Kent Street Seniors Activity groups, is a 2-minute walk.
- Proposed new R1 RapidBus service will be located along 152nd Street with an extension to 156th Ave/Finlay Street and North Bluff Road within the Semiahmoo Town Centre.

The surrounding neighbourhood is generally comprised of low density, detached residential homes, except for the ‘ALTUS’ development, a 13-storey mixed-use building currently under construction. Several institutional uses are also near the site, with the BC Hydro substation and Peace Arch Hospital to the west, and Earl Marriott Secondary School (in Surrey) and Maccaud Park to the east. Nearby projects under development or construction include:

- ALTUS development with 4.3 FAR at Finlay and Russell.
- Immediately to the north of the site, the Semiahmoo Town Centre Expansion Area has a projected FAR of 2.5 between 156th and 157th streets.

- Between 157th and Earl Marriot School there includes a proposal for 114 units in 2 six storey mid-rise affordable housing and 4 storey stacked townhouses.



Figure 4 - Site Context

#### White Rock Official Community Plan, 2017, No. 2220

The Official Community Plan (OCP) sets out land use, density, height, and other policy directions for development applications. It's objective is to enable a mix of residential forms and choices in the area east of the Peace Arch Hospital – as well as select commercial uses to support the Hospital – that are compatible with adjacent Mature Neighbourhood areas and supportive of transit along North Bluff Road.

This designation contemplates providing opportunities by allowing multi-unit residential uses in townhouses and low to mid-rise buildings, mixed-use buildings (commercial/office/residential), and single family homes. In reference to permissible densities and heights the OCP would allow a density of up to 1.5 FAR (gross floor area ratio) in buildings up to four storeys in height with an 2 story addition for projects with 20% of the units with an affordable housing component.

This site is within the East Side Large Lot Infill Development Permit Area (DPA). The objectives of this Development Permit Area are to:

- Establish an attractive, comfortable, well-connected, pedestrian-oriented environment.
- Ensure the compatibility of new development with adjacent existing buildings.
- Enhance quality of life.
- Conserve energy and water and reduce GHGs.
- Enhance the character of the built environment and public realm in the City of White Rock.

#### Zoning Bylaw No. 2000

The subject properties are currently zoned 'RS-1 One Unit Residential' in the White Rock Zoning Bylaw. The intent of this zone is to accommodate one-unit residential buildings on lots of 464 m<sup>2</sup> (4,995 ft<sup>2</sup>) or larger. Under the current zoning, the subject property would be permitted to construct a 17,000 ft<sup>2</sup> (excluding basement, garage, and other areas) single-family dwelling with a maximum height of 7.7 metres (25.26 feet).

### Traffic Impact Study

The traffic impact study (Appendix C) was prepared for a development of 149 units and this revised development is for 87 units. Due to the lower number of units staff did not feel it was necessary to have the applicant update the study. The overall impact of the development on current traffic patterns is minimal.

### FINANCIAL IMPLICATIONS

The following fees would be collected if approved for rezoning and subdivision (Table 2). Note these fees are subject to change:

**Table 2: Applicable Development Costs**

	<b>Fee (per unit)</b>	<b>Units Subject to Fee</b>	<b>Sub-Total</b>
City of White Rock Development Cost Charges (DCCs)	\$11,253.27	87	<b>\$979,036.80</b>
TransLink DCCs			
- Townhomes	\$4,695.00	12	<b>\$56,340.00</b>
- Apartments	\$3,530.00	75	<b>\$264,750.00</b>
Metro Vancouver (Regional) DCCs			
- Townhomes	\$4,695.00	12	<b>\$56,340.00</b>
- Apartments	\$3,530.00	75	<b>\$264,750.00</b>
Surrey School District School Site Acquisition Charges (SSAC)	\$800.00	87	<b>\$69,600.00</b>
<b>Total</b>			<b>\$1,690,816.80</b>

This development does not meet the threshold for Community Amenity Contributions.

### COMMUNICATION AND COMMUNITY ENGAGEMENT IMPLICATIONS

A Public Information Meeting (PIM) for this proposal was held on September 9, 2020. A copy of the applicant's PIM Summary is included in Appendix A.

### INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS

The zoning bylaw amendment application and development permit were referred to municipal departments for comments. Comments provided to the applicant have been addressed related to this stage of the rezoning proposal.

Approval of the final detailed (civil) designs and the execution of a "Works and Servicing Agreement" to the satisfaction of the Director of Engineering and Operations would be required as a condition of 3<sup>rd</sup> reading.

### CLIMATE CHANGE IMPLICATIONS

The application will enable the intensification of the 'East Side Large Lot Infill Area', thereby lessening the demand for outward sprawl otherwise necessary to accommodate growth. The applicant has also proposed several initiatives to address climate change, which include the following:

- Prefabricated wood construction to reduce energy and greenhouse gas emission, support local industry, and to reduce construction time,
- High performance building envelopes and mechanical systems to conserve energy and reduce greenhouse gas emissions,
- Enhanced stormwater retention strategies will be incorporated into the buildings and site design to manage the quality and quantity of rainwater runoff,
- Native plant species and xeriscaping will ensure the landscape supports a rich biodiversity, enhancing the natural environmental and human health performance of the community

### **IMPLICATIONS FOR TREE PRESERVATION AND TREE CANOPY ENHANCEMENT**

All the trees identified on the Tree Retention/Removal Plan and have been given their Retention/Removal recommendation on a preliminary basis (Appendix E). Final recommendations will be based upon design/construction and grading details. Any City tree that is removed will have replacement tree bonds collected as Cash-in-Lieu. There are 40 total replacement and two of the trees will be handled by Cash in Lieu (\$1,500) as these are straddling city property.

The applicant has been advised that any trees that need to be removed on neighbouring properties must be approved by the property owner. The applicant has obtained letters of approval from the properties owners.

### **ALIGNMENT WITH STRATEGIC PRIORITIES**

Council has expressed a desire to support a high quality of life in the City. The ability to support residential infill can help lessen the demand for sprawl while also making the best use of existing infrastructure.

### **OPTIONS / RISKS / ALTERNATIVES**

The following options for Council's consideration are:

1. Give first and second readings to "White Rock Zoning Bylaw, 2012, No. 2000, Amendment (CD Zone 65 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435." and Development Permit No. 423 as presented, and direct staff to schedule the required public hearing; or
2. Reject "White Rock Zoning Bylaw, 2012, No. 2000, Amendment (CD Zone 65 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435.; or
3. Defer consideration of "White Rock Zoning Bylaw, 2012, No. 2000, (CD Zone 65 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435. pending further information to be identified.

Staff recommends Option 1, which is incorporated into the recommendations at the beginning of this corporate report.

## **CONCLUSION**

This application proposes to rezone seven properties from the "RS-1 One Unit Residential Zone" to the "Comprehensive Development Zone (CD) 65". If approved, it would enable the proposed multi-building residential project that consists of 87 units a mixture of townhomes and apartments ranging from studios to 3 bedroom units to be built. If council is supportive of this application staff will bring the development permit forward at third reading. Overall, staff supports the proposal subject to the recommended conditions noted.

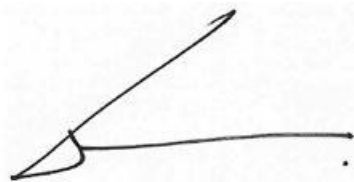
Respectfully submitted,



Anne Berry  
Director, Planning and Development Services

## **Comments from the Chief Administrative Officer**

I concur with the recommendations of this corporate report.



Guillermo Ferrero  
Chief Administrative Officer

- Appendix A: Public Information Meeting (PIM) Summary
- Appendix B: ADP Comments – Comparison Memo
- Appendix C: Traffic Impact Study for 15704, 15724/28/38/48/58/70 North Bluff Road
- Appendix D: Zoning Amendment No. 2435 - 15704, 15724/28/38/48/58/70 North Bluff Road
- Appendix E: Arborist Report - 15704, 15724/28/38/48/58/70 North Bluff Road



## **Email Correspondence: Virtual Public Information Meeting**

Below is a table outlining email correspondence (questions) that was received by the City of White Rock regarding the Virtual Public Information Meeting for the project numbered: **19-017**.

Email Correspondence Total
<b>3</b>

Upon our review, the main concerns of the public and our responses to them are below:

### **Height:**

A six-storey development is in compliance with the OCP for height in the East Side Large Lot category. Only two blocks to the east is the site of a 13-storey building.

### **Parking:**

Including the car-share rationale, we feel Beachway 2 would provide enough parking and transportation options. For construction and trade purposes, Waterstock owns lands on the Surrey side of North Bluff road that will house the parking during construction.

### **Density:**

Waterstock Properties are great champions of Floor Space Ratio (FSR) compliance. Beachway 2 fits into the allowable 2.5 FSR in the East-Side Large Lot designation.

## **Virtual Public Information Meeting Live Comments**

Below are questions or comments that were received and answered during the live Virtual Public Information Meeting for the project numbered: **19-017**. These comments are written precisely how they were presented. Any spelling or grammatical errors seen here are an exact recreation to what was shown at the Virtual Public Information Meeting.

1)	Identity	Timestamp
	<b>Anonymous</b>	<b>9/10/2020 0:39</b>

Content:

*I think it is a good fit. Height is only 69.55 feet and it is medium density.*

Response:

We thank you for your support of the project and how it will contribute to the community!





2)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 0:48</b>

Content:

*White Rock desperately needs affordable, long term rental accommodations. The designated location seems perfect!*

Response:

Thank you for the support! We are excited to bring the rental component to the area.

3)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 0:54</b>

Content:

*Below market rentals are not the same as affordable housing. It is just used to get the extra 3 stories of height for all buildings.*

*For Beechway 1 they were going to turn the affordable units property over to BC Housing ?*

Response:

Any correspondence on Beachway 1 is available on the White Rock website. Beachway 2 has been proactive in understanding all avenues with regards to affordable housing.

4)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:02</b>

Content:

*A bit too much density . Townhouses would be better like the ones yuo built in Surrey.*

Response:

We feel Beachway 2 offers a great mix for people in all stages of life. First time homebuyers, downsizers, and essential workers (especially hospital employees) were at the forefront of the design discussion.

5)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:07</b>

Content:

*A good mix of units.*

Response:

Thank you for your support!

6)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:13</b>

Content:

*From experience people living in two and three bedroom apartments need at least 2 parkade stalls each . So around 260 stalls are needed.*





Response:

Including the car-share rationale, we feel Beachway 2 would provide enough parking and transportation options.

7)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:16</b>

Content:

*When you cut down parking stalls the parking goes out to the street in the form of permit parking . Basically this project will be eligible for 584 residents only parking passes. This project will add huge street parking issues.*

Response:

Including the car-share rationale, we feel Beachway 2 would provide enough parking and transportation options. The location strategically placed on the artery that is North Bluff road to encourage different modes of transportation. The RapidBus will also be implemented to support this.

8)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:17</b>

Content:

*How many levels of underground parking?*

Response:

There will be two levels.

9)

Identity	Timestamp
<b>Erin Carter</b>	<b>9/10/2020 1:19</b>

Content:

*This looks great! As a local Realtor, I'd love to see more affordable housing options in White Rock.*

Response:

Thank you for your comment, Erin!

10)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:20</b>

Content:

*What will north bluff road look like in 5 years?*

Response:

Waterstock, and all developers, work diligently with the municipality to ensure the infrastructure is upgraded as needed.



11)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:23</b>

Content:

*I appreciate the presentation and certainly you have envisioned living in this development. What about people living on connected streets (i.e.: Parker) who have lived here a long time and may not be excited about having six stories looking down into their properties?*

Response:

Thank you for your support and envisioning living in this development. White Rock has seen exponential growth (in height) of new developments over the past few years. Beachway 2 is compliant with the OCP designation East-Side Large Lot and we feel strongly in keeping within the designated height and density parameters.

12)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:24</b>

Content:

*Are you going to use Government Loans?*

Response:

Waterstock's Founding Principal, Raghbir Gurm, spoke to this note in the PIM presentation and is available to the public on the White Rock Website. Any financial questions will not be will be deferred to further correspondence.

13)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:26</b>

Content:

*Tell me about the electric care shared program? That sounds exciting! What type of cars would there be and would this be provided to the community?*

Response:

We are excited about the car-share program as well! There are a few different options that are going through the due diligence necessary to be implemented in White Rock. We feel this will be a great start to bringing emissions down.

14)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:26</b>

Content:

*how will this development affect the market value of our existing bordering properties?*



Response:

Waterstock feels that Beachway 2 will add positively to the community. These units are a different offering than the surrounding properties and feel that it will bring economic benefit to the entire community and contribute to surrounding market value.

15)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:26</b>

Content:

*Nice looking project and needed in W.R. We need more affordable housing people cannot afford to buy into the new towers currently under construction and we are blocking no WR views with Surrey to the North*

Response:

Thank you for your comment and the support!

16)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:27</b>

Content:

*My wife works at Peace Arch Hospital and there's very little new rental in the neighbourhood, especially larger rental units where you can actually raise a kid. How would you qualify for the affordable housing component for this project?*

Response:

This is the grouping of citizens we are aiming to apply to. When it comes to the affordable rentals, parameters of qualification will be introduced as the project gets closer to that stage. We are excited to hear more people becoming interested in this!

17)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:28</b>

Content:

*Very excited about about the car share program!! Can you tells us more about the fleet and the charging infrastructure. Will it be accessible for the general community?*

Response:

Thank you for your comment! We are excited to have this come to the community as well. This was touched upon in the Public Information Meeting and various sources on the internet.

18)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:28</b>



Content:

*Times are changing... this project will reduce emissions and create housing options and transportation options for young adults. A lot of my friends don't want cars... or they cant afford cars and houses.*

Response:

Thank you for your comment, we are excited to present this project!

19)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:29</b>

Content:

*Did you look at the option of building town houses? If so what was the reason you did not choose to include this in the project*

Response:

Waterstock wanted to offer a great mix of affordable housing options for people of the area while being compliant with the OCP designation.

20)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:31</b>

Content:

Car share is the way of the future!

Response:

Thank you for your comment – we agree!

21)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:31</b>

Content:

*I love the idea of a "100 mile build" utilizing local trades and materials. Ive never heard of this before... it shows the type of planning that has gone into this project.*

Response:

Thank you for your comment! As members of this community, we understand the importance of local business and environmentally sound options for building.

22)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:33</b>

Content:

*Love the design and the fact that the main floor is wrapped with step up 2 level suites.*



Response:

Thank you for your comment! We are excited to get the opportunity to present this to the community.

23)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:35</b>

Content:

*Yes can see now*

Response:

Thank you for joining the Public Information Meeting and taking the time to comment.

24)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:35</b>

Content:

*Good presentation, can you please explain why town houses were not included in on the plan?*

Response:

Thank you for taking the time to comment and we are pleased to hear that you enjoyed the presentation. We wanted to offer an affordable and expansive unit mix to ensure options were available to the surrounding community.

25)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:35</b>

Content:

Agreed RE: the car use decrease, I didn't gas my car for a month. The proposed parking is more than enough IMO

Response:

Thank you for your support and taking the time to comment!

26)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:39</b>

Content:

*How will transit service the densification of the area?*

Response:

The location strategically placed on the artery that is North Bluff road to encourage different modes of transportation. The RapidBus will also be implemented to support this.



27)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:40</b>

Content:

*How wheelchair accessible units will there be in the rentals units and in the owner units.*

Response:

Shelley Craig, a Principal at Urban Arts Architecture spoke to this in the presentation but was unsure of the actual count. Waterstock and UAA are great champions of accessible units.

28)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:42</b>

Content:

*These homes are older now and we need to regenerate the area.*

Response:

Thank you for joining the Virtual Public Information Meeting and writing a comment!

29)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:43</b>

Content:

*For people my age (39) with two kids, this project would allow us to live close to my mom who never fails to remind us how rarely we see her...we prefer townhomes to singlefamily anyway, we don't have time to worry about things like grass mowing and roof maintenance. Whats the price ranges.?*

Response:

Thank you for writing a thoughtful comment. This is one of the demographics that Waterstock wanted to reach. The prices will be below \$800,000 to purchase, with affordable rental rates established by the city of White Rock.

30)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:47</b>

Content:

*what is the estimated time period of construction and how will the noise and dust be mitigated?*

Response:

We are hoping to start construction as early as 2021. As members of the community, Waterstock implements all the safety standards in compliance with the BC Building Code to mitigate noise and dust.



31)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:49</b>

Content:

*After reading the ocp, this is literally in lock step with what the city has asked for. Is the only holdup the parking? Or does the city not want to follow its own dictates?*

Response:

Thank you for taking the time to write a comment. Waterstock are great champions of operating within the parameters of the OCP designation. We are currently at the first stage of the process in bringing this forward to the community and we look forward to working with City Staff and the community to bring this forward to the City Councillors.

32)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:55</b>

Content:

*When you say “eyes on the street” what does that mean and how was it used for the design?*

Response:

Eyes on the street simply refers to safety. We wanted to create a space where families and individuals would always feel safe. This is a big component of the design by eliminating blind corners and creating porous spacing.

33)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:56</b>

Content:

*What sort of plans does the developer have for Construction worker parking during construction.*

Response:

Waterstock owns lands on the Surrey side of North Bluff road that will be staged for the use of construction workers and vehicles during that time.

34)

Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 1:57</b>

Content:

*thanks yes it does*



Response:

Thank you for joining the Public Information Meeting and taking the time to comment.

36)

35) Identity	Timestamp
<b>Anonymous</b>	<b>9/10/2020 2:00</b>

Content:

*I don't see any West Coast Architectural components such as the Sanctuary at Horseshoe Bay. Its too boxy?*

Response:

Thank you for taking the time to join the Public Information Meeting but we are unsure of how to answer this question. We will defer to Urban Arts architecture and if you wish further information, we recommend you reach out directly.

### **Feedback Forms**

Upon completion of the Virtual Public Information Meeting, the City of White Rock website provided an online form for public feedback. These forms were open to public completion for one (1) week after the date of the Virtual Public Information Meeting. In total, one (1) form was filled out, and was in support of Beachway 2. Below is a breakdown of the comments and responses:

1)

Identity	Timestamp
<b>Unknown</b>	<b>Unknown</b>

Content:

*Excellent location for this type of housing. Rental component Provided much needed.*

Response:

Thank you for taking the time to look over the project and to write in a comment. We feel strongly that Beachway 2 will provide a great mix of affordable homes for people at all stages of life.



## MEMO



Date: June 6, 2022

To: City of White Rock  
Planning and Development Services  
13450 - 104 Avenue, Surrey BC, V3T 1V8

Attention: Attn: Alex Wallace; Anne Berry  
E: [awallace@whiterockcity.ca](mailto:awallace@whiterockcity.ca); [aberry@whiterockcity.ca](mailto:aberry@whiterockcity.ca)

From: Alan Tse, Architect AIBC, MRAIC, Associate

Re: **Rezoning/Major Development Permit**  
**15704 North Bluff Road (Courtyard Commons)**

Dear Alex and Anne,

As discussed in your discussions with Waterstock Properties, the City of White Rock has requested that the proponent team provide a summary of changes to residential units from the previous development permit submission relating to 15704 North Bluff Road. The summary below is intended to be read in conjunction with drawings and commentary submitted to the City of White Rock on April 14, 2022 and May 4, 2022 - and is compared to the previous ADP submission, dated October 1, 2020 which represented a 6-storey, 2.5 FAR form of development.

	ADP Discussion	Response
1	Encouraged by the use of timber	The use of timber remains consistent between both iterations.
2	Appreciation expressed for context provided at the outset by the proponent;	Project context remains the same from the previous iteration.
3	General support offered for the form and massing of the buildings;	The project has been reduced in overall mass from 6 storeys to 4 storeys at Buildings 1 and 3, while Building 2 has been converted to 3-storey ground-oriented townhouses. Overall approach to building massing and site planning remains similar to previous, albeit with lower building heights.
4	What is the surface between buildings 2 and 3? It would be a different paver (colour);	Drive aisle is vehicular concrete, detail per Civil, w/ vehicular pavers at crossings and a 6m wide paver area at entry.
5	Demarcation of open spaces between Buildings 1 and 2 more semi-private in its design due to the private balconies which access the space; the space between Buildings 2 and 3 are more open and publically accessible	Open spaces between buildings are intended to have a more publicly-accessible character. With the proposed re-grading of the parking ramp area to suit Zoning requirements for clear overhead height within the parkade, the route between Buildings 1 and 2 has been provided as an additional accessible route into the common outdoor space.

6	Concerns raised about the façade, including coloured glass, and how it would look in many years – later discussed by Panel with support for the use of colour and the “playfulness” it adds to the development;	Coloured glass guardrails have been removed from the current project proposal. Coloured glass guardrails could be considered at Buildings 1 and 3.
7	Limited parking supply identified as a concern – reduction may be too aggressive – may require additional supply (“excavation”) – alternative opinion regarding the opportunity presented by the proposal in looking at efforts to change auto-reliance;	Parking reductions are no longer being proposed; parking provision will meet the requirements of the City of White Rock Zoning By-law.
8	Would like to see more (100%) of the parking spaces roughed in for electrical vehicles	100% of parking spaces are intended to be roughed-in for electric vehicles.
9	Garbage collection details including location for pickup and terms of pick-up (internal garbage storage tied to each building)	<p>A location for waste pick-up staging is located at the laneway off of Lee Street. This staging area (enclosed but outside the building thermal boundary) is intended to accept waste bins transferred from below-grade waste sorting rooms on pick-up day.</p> <p>Below-grade waste collection and sorting rooms are located on the parkade level in proximity to the elevator cores, for the convenience of residents. On pick-up day, maintenance staff will transfer the bins via pickup truck to the staging area, from which location the oversized garbage/recycling truck will receive the bins for final delivery to the landfill/transfer station.</p>
10	Separation of laneway/garbage loading and children’s play-area – grade differential (less than 5%) and plantings used to separate the two activities / spaces	Separation of outdoor spaces remains similar to previous iterations. The parking ramp has been adjusted to ensure zoning-conforming overhead clearance for the below-grade parking while retaining unit entrances within 1.5m of grade along North Bluff Road. An additional accessible route to the common outdoor space has been provided between Buildings 1 and 2.
11	Applicant states that “all” rainwater to be reused – that would be excellent but needs to be confirmed or clarified through City’s review of stormwater management	The current stormwater management proposal is to provide a stormwater detention tank complete with a flow control device that limits flows to the pre-development conditions. Stormwater re-use is not feasible for this site.
12	Accessibility of units- how many are there and can the proposed units be converted to accessible units in the future	20 adaptable units conforming to BC Building Code are proposed within Building 1. This equates to 23% of total units across the development.
13	Rain-screen assembly (brick as cladding with air gap, exterior insulation, wood stud, vapor barrier, and dry wall) – looking as mass timber for the floor structure, roof structure and elevator core with wood stud infill	Wall assembly design intent remains consistent with previous iterations.
14	Configuration and design of the rental units (Building 1)	Unit types within the Multi-unit residential buildings (1 and 3) remain largely the same as

		previous. Building 2 has been replaced with townhouse units.
15	Design of the mansard roof with Building 1 – provides variability in the design and accommodates some stepping of height moving west to east	The reduction of building height from 6 storeys to 4 storeys mitigates overall height impacts to adjacent buildings.
16	Design of floors, mass timber with concrete topping to help with sound attenuation and additional space for insulation to keep rainwater out of the building	Floor assembly design intent remains consistent with previous iterations.
17	How will rainwater management facilities impact the design of the roof of Building 2 – intent is to manage rainwater through plumbing within the party walls or to hide the infrastructure if required on the exterior of the building	Rainwater is intended to be managed via rainwater leaders whenever feasible.
18	Management of market and non-market buildings, ideally, undertaken by same entity so that there is a cohesive management direction between buildings	Non-market housing is no longer proposed. Differences in management structure is no longer applicable.
19	Construction materials should weather well in the White Rock context	Construction materials selected are similar to previous and are intended to be long-lasting and durable.
20	Compliment for use of renderings and variability / breaks in massing	Proposed breaks in massing remain consistent with previous iterations.
21	Building 1 and 2 are similar in design and material, and may be read as a single large building – perhaps worth looking at materiality to create some additional variation between buildings	With the reconfiguration of building typology at Building 2 from a multi-unit residential building to grade-oriented townhouses, there variation in form, massing, and material character proposed. Buildings 1 and 3 have been reconsidered with more similar treatments between them, effectively “bookending” the site and providing greater visual coherence amongst the buildings.
22	Comments made regarding the need for a location for service vehicles, e.g. food delivery or taxis, to stop near the buildings and overall accessibility (or distance) from portions of the overall development site	Service parking is located both at grade (Zoning-compliant oversized loading bay) as well as with smaller service/loading stalls within the below-grade parkade, one per elevator shaft. Due to prohibitions on curb cuts along both North Bluff Road and McCaud Park, there is limited ability to achieve additional service delivery lay-by locations. Any potential on-street lay-bys would be under the purview of the City of White Rock.
23	Landscape plan has good flow of spaces and fits the configuration of the property well; would like to see the pedestrian path between Buildings 2 and 3 made wider (~1 foot wider) and in southeast corner of the site; would like stepping stones south of Building 3 to be evaluated in terms of the impact that trees (roots) may have on the area over time and the type of stepping stones used in terms of their longevity (larger basalt stones may be a better option).	Pedestrian path connecting Building 2 and 3 through the drive aisle is limited to 1.2m (4') width because of slope requirements to get to the parkade entry. Pedestrian bridge width is designed per Arch/Structural, and landscape path connection matches at 1.32m (4'4"). Exit path at S-E site corner is 1.2m (4') wide which adheres to code requirements – note this is not a main route through the site. All stepping stones on the site are located at play areas and meant to act as a nature play element, encouraging children to interact with the planting.

The Advisory Design Panel recommended that the application for the development proposal be referred to Council subject to the applicant giving consideration to the following. Please see below and above for responses to the items requiring further consideration.

	<b>Consideration to be given</b>	<b>Response</b>
A	Adequacy of parking supply	Refer to Item 7, above.
B	Adequacy of location of spaces for deliveries / drop-offs	Refer to Item 22, above.
C	Management of stormwater	Refer to Item 11, above.
D	Further development of the landscape proposal in the Southeast corner of the site.	Refer to Item 23, above.

We look forward to working with the City of White Rock on this much needed housing project. Please feel free to call if you have any questions.

Sincerely,  
URBAN ARTS ARCHITECTURE



Alan Tse, Architect AIBC, MRAIC, Assoc. AIA, LEED AP  
Associate

Date: 23 October 2019  
Our File No: 7130-01

**BY EMAIL**

**Mr. Raghbir Gurm**  
1168620 BC Limited  
13063 56 Ave  
Surrey BC  
V3X2Z3

Dear Mr. Gurm,

**Re: Beachway 2 – Residential Development Traffic Impact Assessment  
White Rock, BC**

Creative Transportation Solutions Ltd. (CTS) is pleased to submit this **DRAFT** report summarising our work on the above study. CTS was retained by Mr. Raghbir Gurm on September 26<sup>th</sup>, 2019 to undertake a traffic impact study for a proposed residential townhouse and condominium development in the City of White Rock. The primary objectives of this study are as follows:

1. To undertake a traffic impact assessment of the development site;
2. To provide a rationale for the proposed 30% parking variance;
3. To review the swept path requirements; and,
4. To document the results in a report suitable for submission to the City of White Rock.

This report documents our analyses and findings.

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## 1.0 BACKGROUND

### 1.1 The Site

1168620 BC Ltd is proposing to build a residential development, Beachway 2, at the following addresses in the City of White Rock, BC:

- 15704 North Bluff Road
- 15724 North Bluff Road
- 15728 North Bluff Road
- 15738 North Bluff Road
- 15748 North Bluff Road
- 15758 North Bluff Road
- 15770 North Bluff Road

The current zoning is RS-1 (One Unit Residential Zone) and the site is located in the east side large-lot infill redevelopment area. The proposed development location is illustrated in **FIGURE 1** below.

The residential development is proposed to be rezoned as a comprehensive development and will have 34 city homes and 113 condominium units for a total of 147 dwelling units. Of the 147 units, 46 are designated as non-market units with seven (7) of them being townhouse units, and 39 of them being condominium units.

Access to the site is proposed via a driveway on Lee Street. For the purposes of this study, development was assumed to be completed and fully occupied by 2021.

The study area and the existing roadways are illustrated in **FIGURE 2**. The referenced site plan is included in **APPENDIX A**.

**FIGURE 1  
SITE CONTEXT**



Beachway 1, an adjacent residential development highlighted in orange in **FIGURE 1** above, was examined in a separate traffic impact assessment and is attached as **APPENDIX B**. The study site of this report, Beachway 2, is highlighted in yellow in **FIGURE 1** above.

The 400 metre radius illustrated in **FIGURE 1** above represents a five minute walk from the site.

As illustrated in **FIGURE 1**, the site has excellent walking access to significant commercial and retail areas.

The following attractions and destinations are all approximately a five (5) to fifteen (15) minute walk from the study site:

- Semiahmoo Shopping Centre
- Semiahmoo Public Library
- Peace Arch Hospital
- Commercial / retail developments all along Johnston Road
- White Rock Centre transit exchange
- Earl Marriott Secondary School
- Peach Arch Elementary
- Kent Street Activity Centre
- Maccaud Park

The study intersections analyzed within this traffic impact assessment include the following:

- Lee Street at North Bluff Road
- Lee Street at Russell Avenue

The following study intersections were counted and analyzed in the traffic impact assessment for Beachway 2 and may be referenced to in **APPENDIX B**:

- Maple Street at North Bluff Road
- Maple Street at Russell Avenue

**FIGURE 2  
STUDY AREA AND INTERSECTIONS**



## 1.2 Site Visit/Road Network

A site visit was conducted in order to document current conditions. The following road network characteristics were confirmed.

### North Bluff Road / 16th Avenue

- East-west arterial
- Centerline forms the municipal boundary between City of White Rock and City of Surrey.
- Four lanes.
- Truck Route.
- No Stopping on north side. 'Permit Parking Only' on south side
- Concrete curb and gutter along both sides of the road.
- Street lighting.

### Russell Avenue

- East / west primary collector
- Two lanes – two through lanes with two parking lanes.
- 'Permit parking Only' on both sides
- Concrete curb and gutter along both sides of the road.
- Street lighting.

### Lee Street

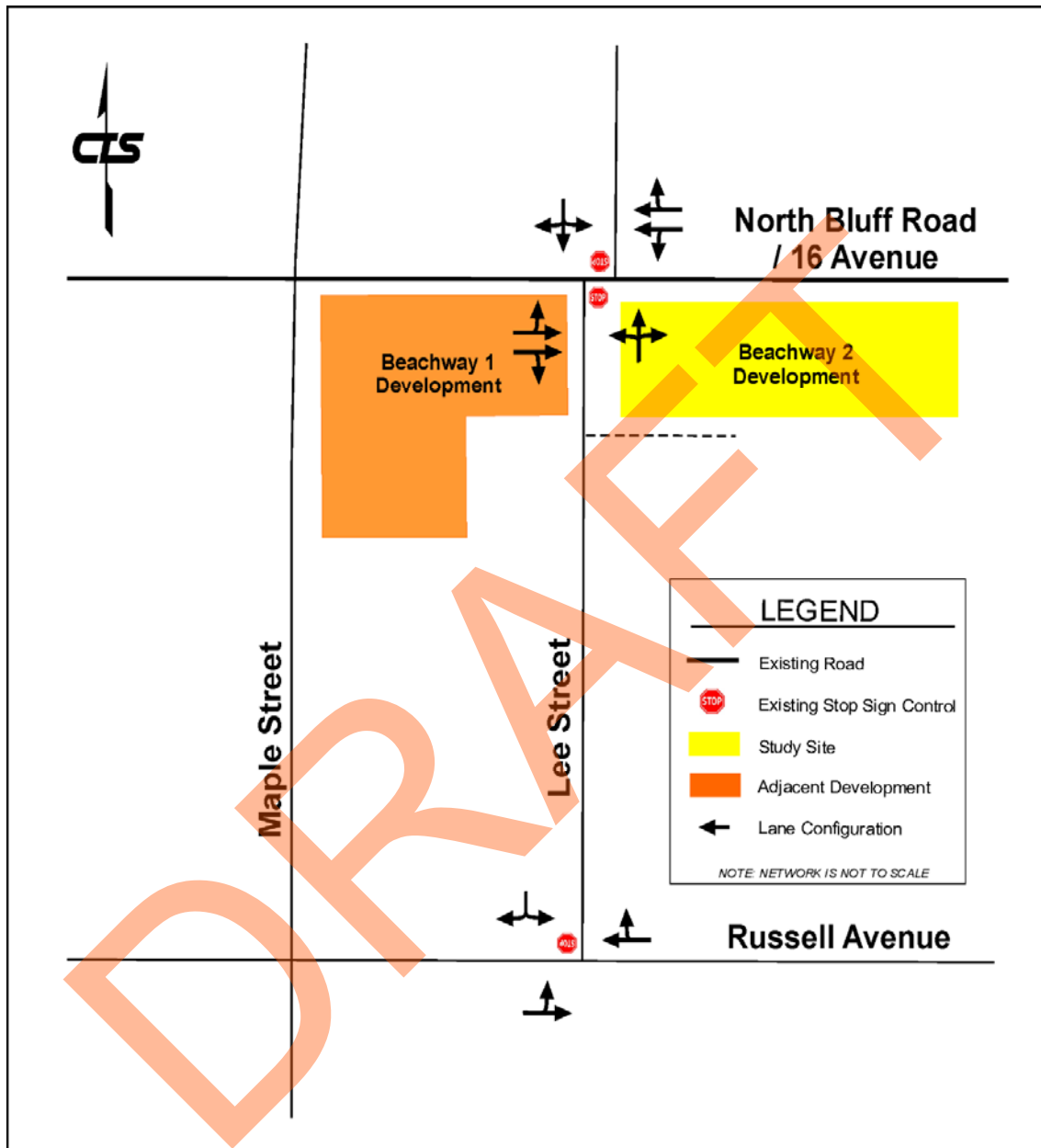
- North / south neighborhood local road.
- Two lanes.
- 'Permit parking Only' on both sides
- No curb or gutter.
- Street Lighting.

The laning configuration for the study intersections are illustrated in **FIGURE 3**.

It should be noted that due to the proximity of Peace Arch Hospital, on-street parking management is a key traffic management element for the City of White Rock.



**FIGURE 3  
LANING CONFIGURATION**



### 1.3 Scope of Work

CTS selected the weekday morning and afternoon peak hours as the analysis design hours for this study as it represents the peak traffic time for the adjacent road network and the peak traffic times a residential development.

The following scenarios were used in this traffic impact assessment:

1. 2019 existing base traffic
2. 2021 future base traffic
3. 2026 future base traffic
4. 2021 future base traffic + proposed development traffic
5. 2026 future base traffic + proposed development traffic

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## 2.0 BASE TRAFFIC VOLUMES

### 2.1 Existing Base Traffic Volumes

#### 2019 Base Traffic Volumes

CTS conducted turning movement counts from 07:00 to 09:00, and 15:00 to 18:00 to document the typical weekday peak hour traffic volume for the following intersections on the following dates:

- Lee Street and North Bluff Road (Thursday, November 8th, 2018);
- Lee Street and Russell Avenue (Thursday, November 8th, 2018);

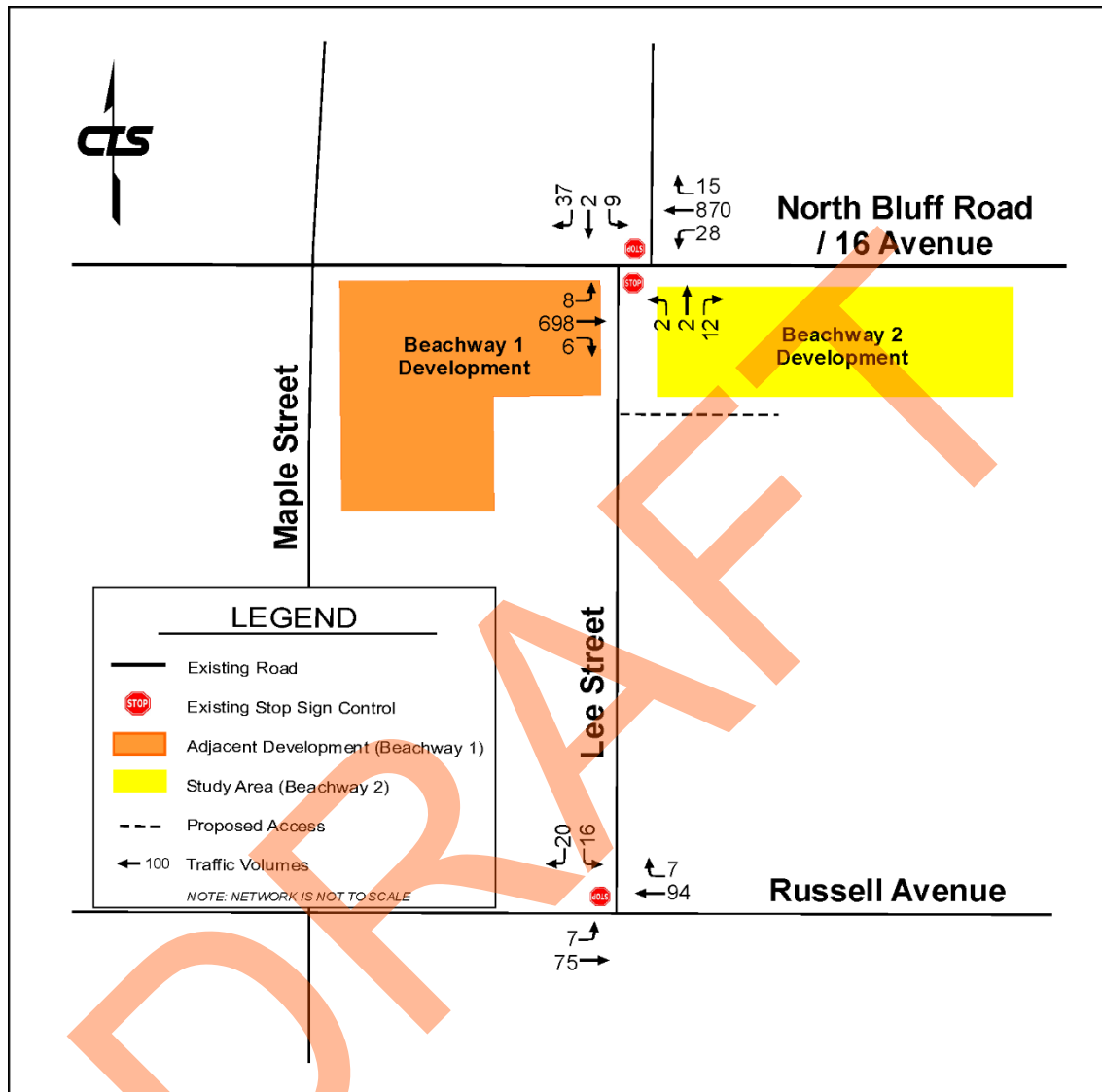
The traffic count data was summarized and reviewed to ensure data integrity and validity. The summarized traffic data sheets are included in **APPENDIX C**.

The 2018 base traffic volumes were factored up by a traffic volume growth rate of 2.0% to represent base year 2019 volumes.

From the collected data, the weekday morning peak hour was determined to occur from 7:45 to 8:45 and the afternoon peak hour was determined to occur from 15:00 to 16:00.

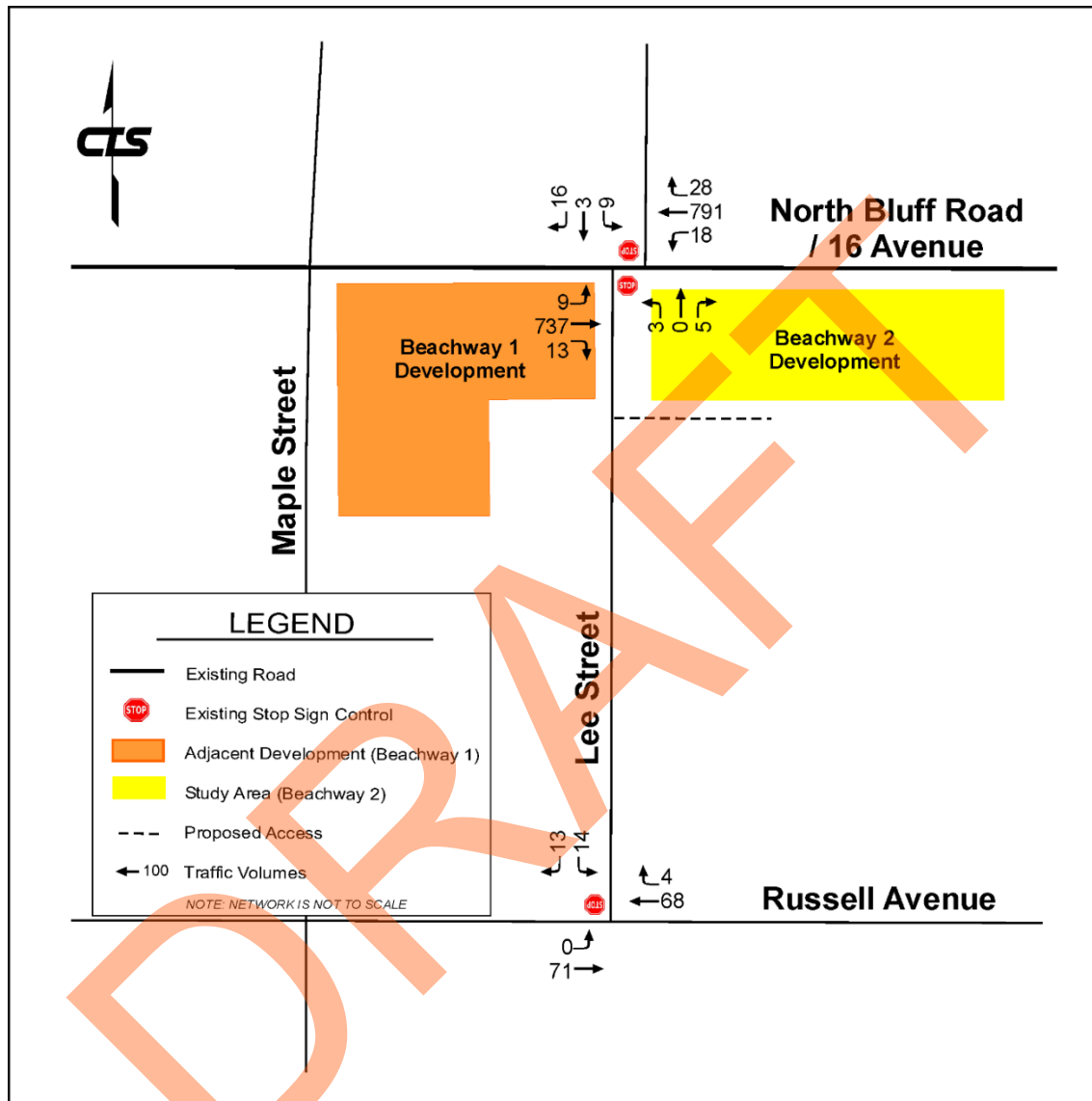
The 2019 base traffic volumes for the weekday morning and afternoon peak hours are illustrated in **FIGURE 4** and **FIGURE 5** respectively.

**FIGURE 4**  
**2019 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**





**FIGURE 5**  
**2019 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**



## 2.2 Future Base Traffic Volumes

The 2019 base volumes were factored up by a traffic volume growth rate of 2.0% to the 2021 and 2026 horizon years.

### 2021 Future Base Traffic Volumes

2021 is anticipated to be the year of full buildout for the proposed development. The 2018 base traffic volumes were factored up by a traffic volume growth rate of 2.0% per annum (simple straight line) to represent base year 2021 volumes.

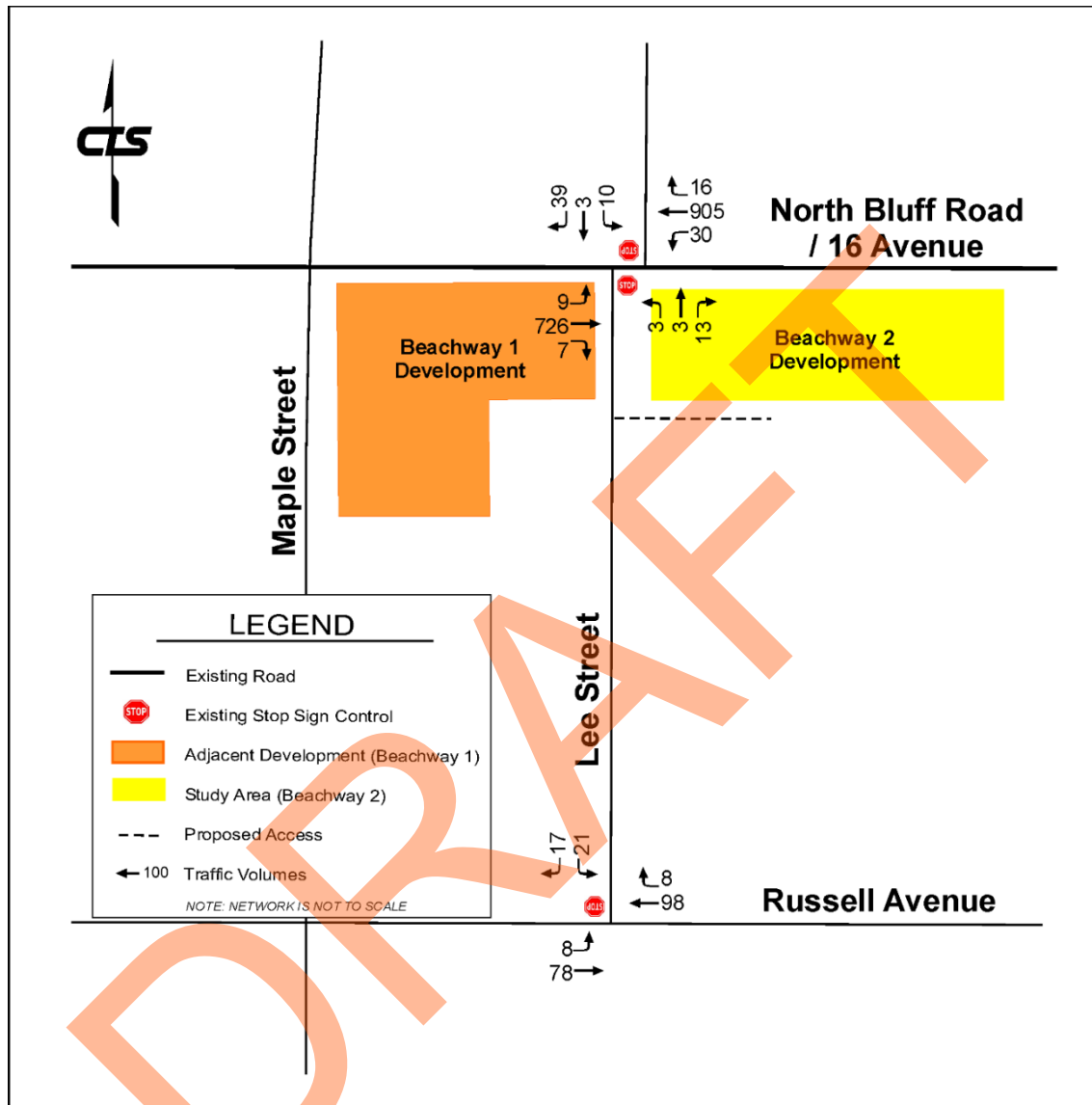
**FIGURE 6 and FIGURE 7** illustrate the weekday morning and afternoon peak hour vehicle volumes, respectively.

### 2026 Future Base Traffic Volumes

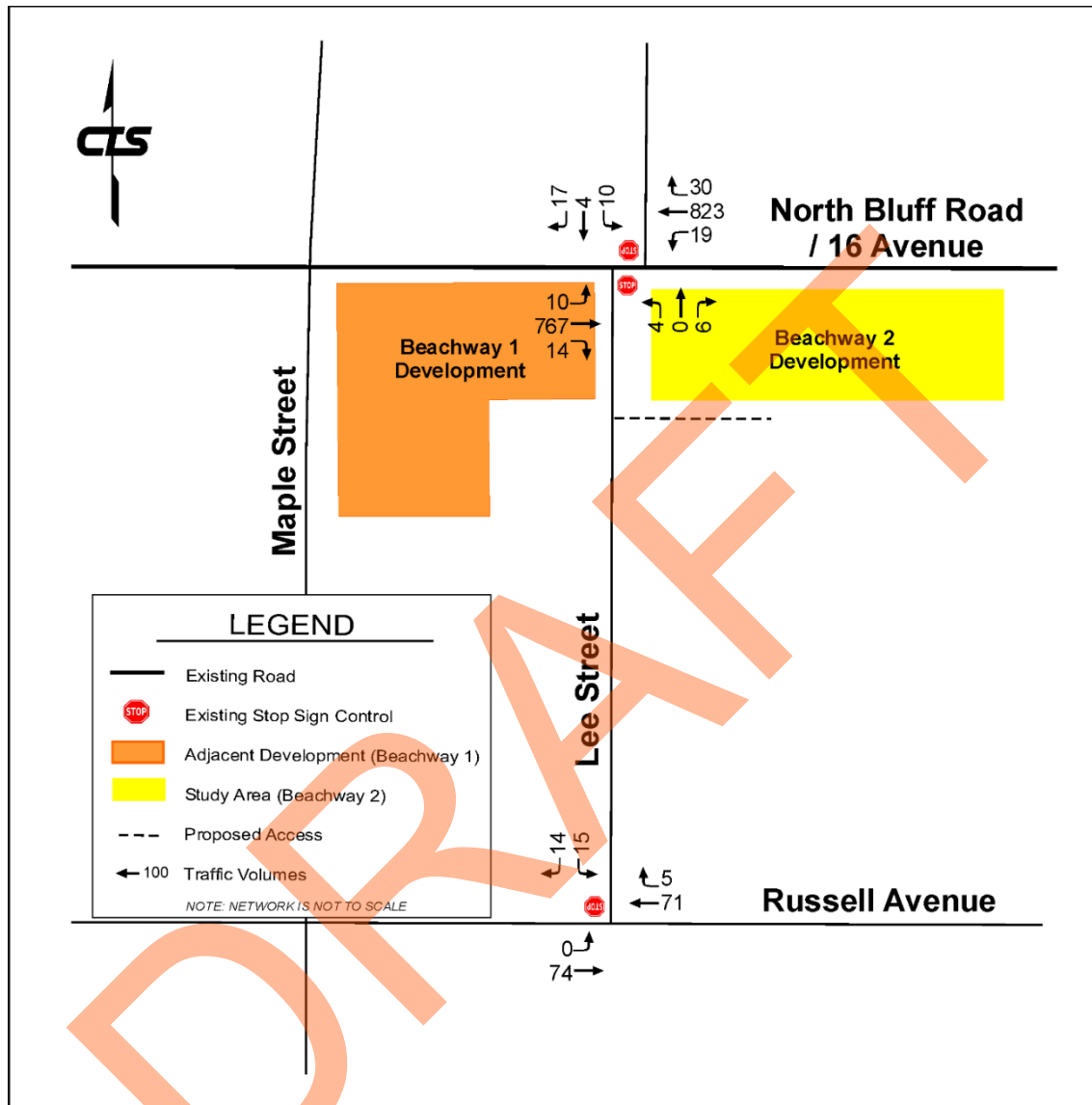
2026 is ten years after the anticipated year of full buildout for the proposed development, and is a scenario requested by the City of White Rock. The 2019 base traffic volumes were factored up by a traffic volume growth rate of 2.0% per annum (simple straight line) to represent base year 2026 volumes.

**FIGURE 8 and FIGURE 9** illustrate the weekday morning and afternoon peak hour vehicle volumes, respectively.

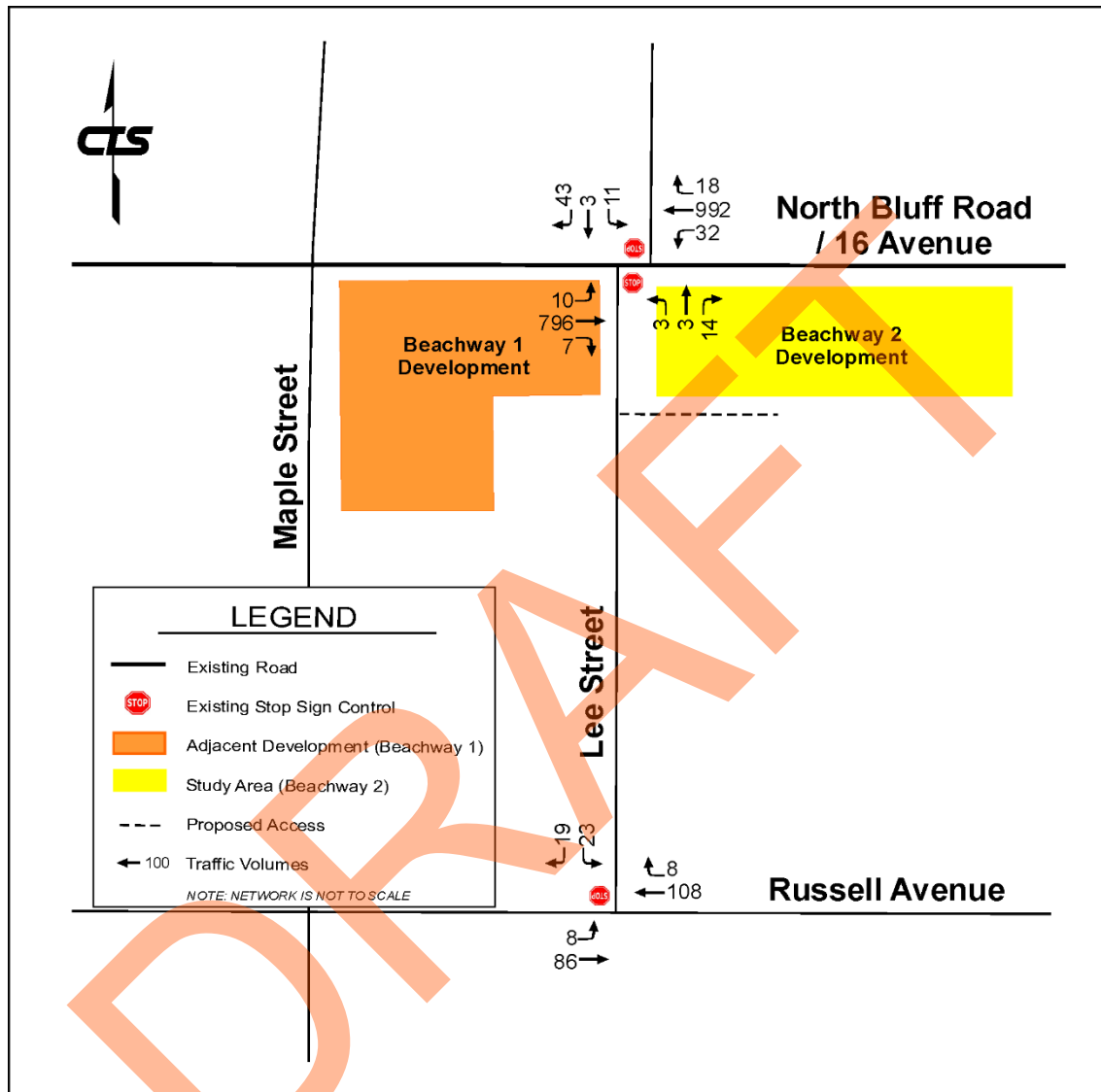
**FIGURE 6**  
**2021 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**



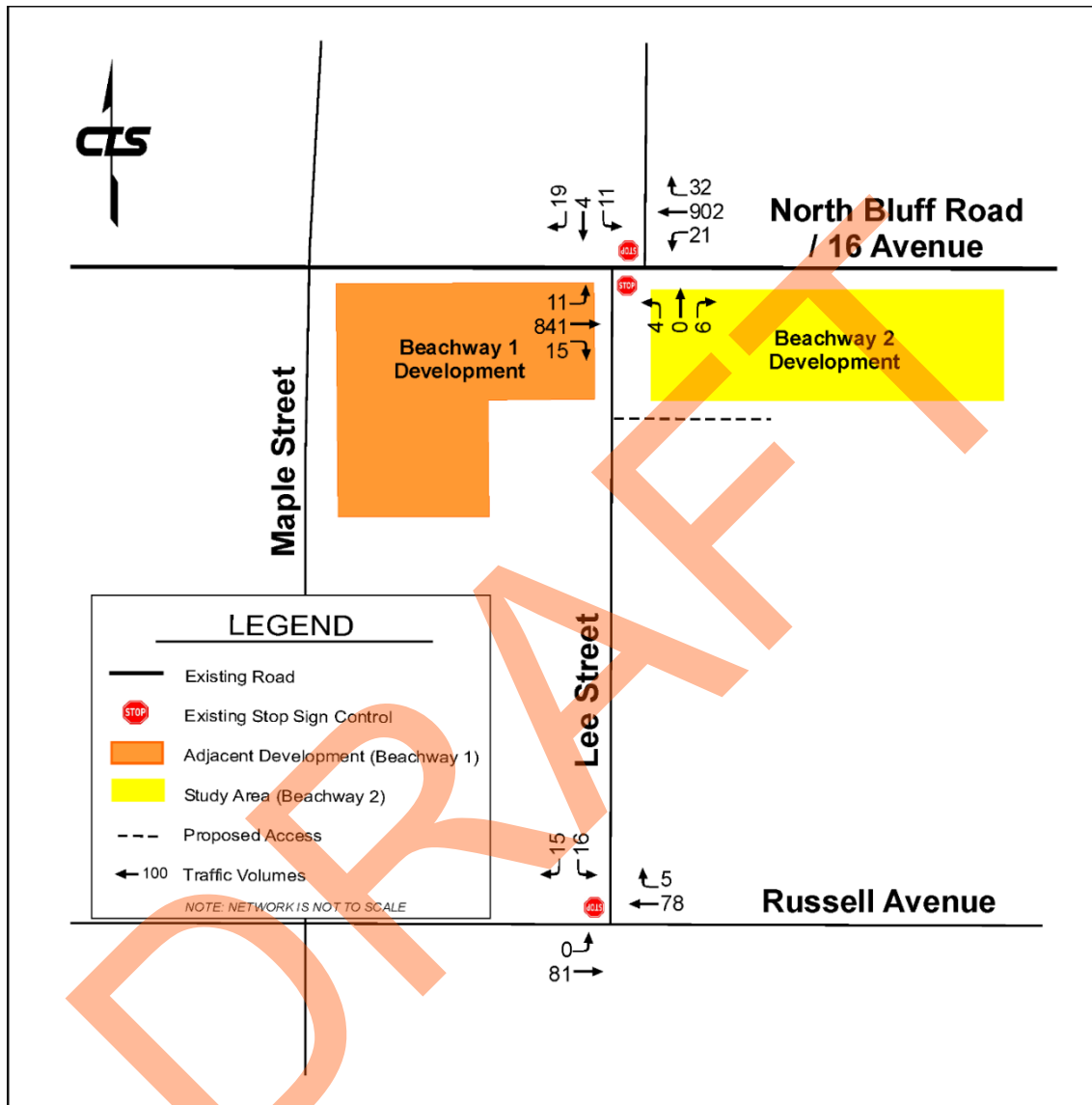
**FIGURE 7**  
**2021 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**



**FIGURE 8**  
**2026 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**



**FIGURE 9**  
**2026 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**



### 3.0 SITE TRAFFIC VOLUMES

#### 3.1 Trip Generation

The published vehicle trip rates from *the Institute of Transportation Engineers (ITE) 10<sup>th</sup> Edition* were used to forecast the site generated traffic volumes. The proposed residential development consists of 34 townhouse units and 113 condominium units.

**TABLE 1** summarizes the estimated site generated traffic for the existing apartment building as well as the forecast site generated traffic from the proposed development.

**TABLE 1  
SUMMARY OF SITE GENERATED TRAFFIC**

Land Use	Trip Generation Variable	Scope of Development	Trip Rate Source	Peak Hour	Vehicle Trip Generation Rate	Directional Split		Peak Hour Volumes (vph)		
						% in	% out	in	out	total
Multifamily Housing (Low-Rise)	Dwelling Units	34	ITE 10th Edition - Code 220	Weekday Morning	0.46	23%	77%	3	13	16
				Weekday Afternoon	0.56	63%	37%	12	8	20
Multifamily Housing (Mid-Rise)	Dwelling Units	113	ITE 10th Edition - Code 220	Weekday Morning	0.36	26%	74%	10	31	41
				Weekday Afternoon	0.44	61%	39%	30	20	50
WEEKDAY MORNING PEAK HOUR TRAFFIC VOLUMES								13	44	57
WEEKDAY AFTERNOON PEAK HOUR TRAFFIC VOLUMES								42	28	70

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have three or more levels (floors). The Vehicle Trip Generation Rate was selected using the General Urban/Suburban setting.

From **TABLE 1**, the proposed development is forecasted to generate a total of 57 vehicle trips (13 inbound, 44 outbound) during the weekday morning peak hour and 70 vehicle trips (42 inbound, 28 outbound) during the weekday afternoon peak hour. This is the equivalent of approximately one vehicle movement every 1.1 minutes during the weekday morning peak hour and one vehicle movement every 57 seconds during the weekday afternoon peak hour.

#### 3.2 Trip Distribution

The trip distribution parameters for distributing site generated vehicle trips to / from the site were developed from existing traffic patterns entering and exiting the study area. The traffic volume assignment is summarized in **TABLE 2**.

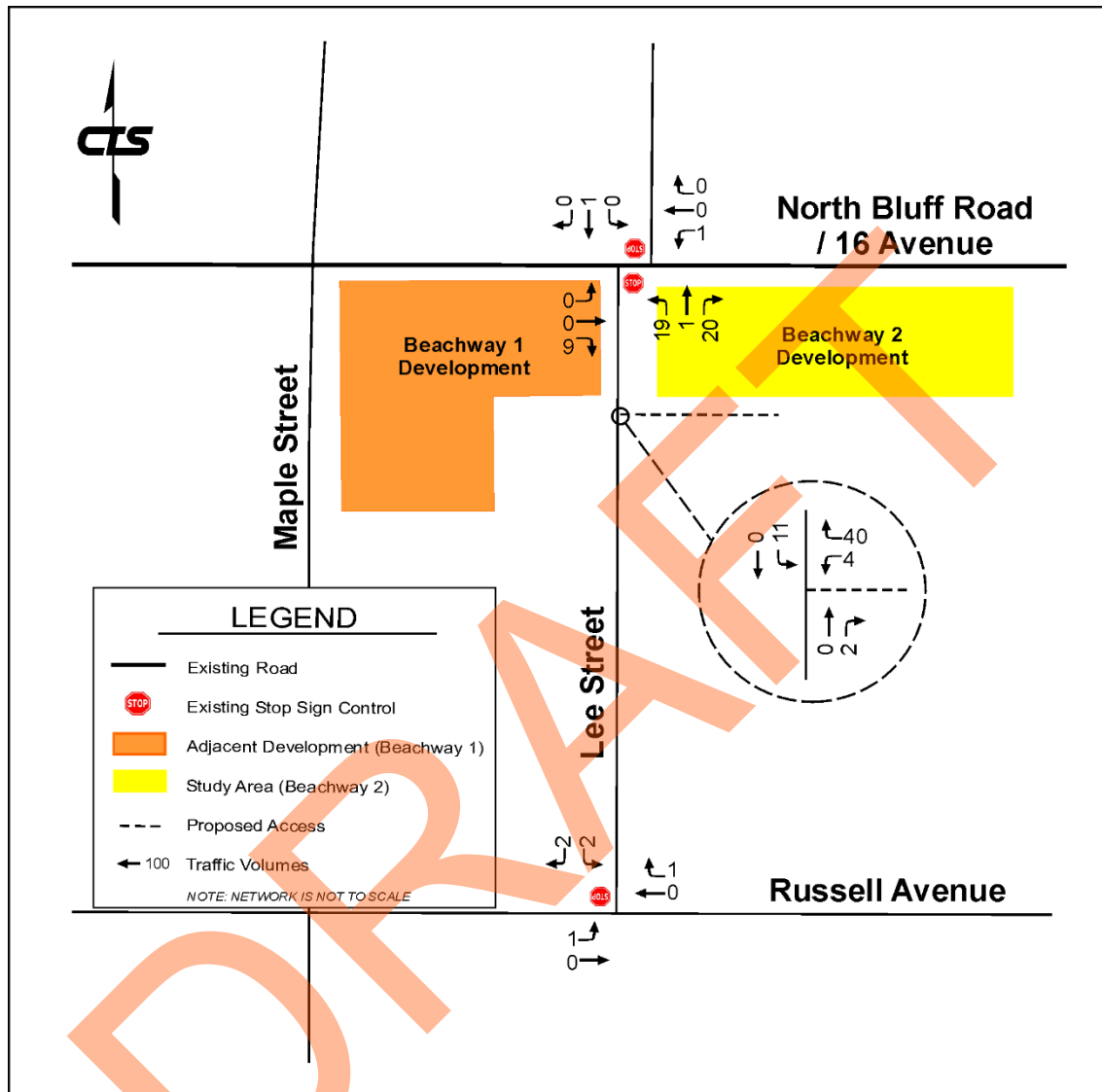
**TABLE 2**  
**TRIP DISTRIBUTION VEHICLE VOLUMES**  
**FOR SITE GENERATED TRAFFIC**

From / To	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
North Bluff Road (W)	9	19	20	13
Lee St (N)	1	1	1	1
North Bluff Road (E)	1	20	17	12
Russell Ave (E)	1	2	2	1
Russell Ave (W)	1	2	2	1
<b>TOTAL</b>	<b>13</b>	<b>44</b>	<b>42</b>	<b>28</b>
	<b>57</b>		<b>70</b>	

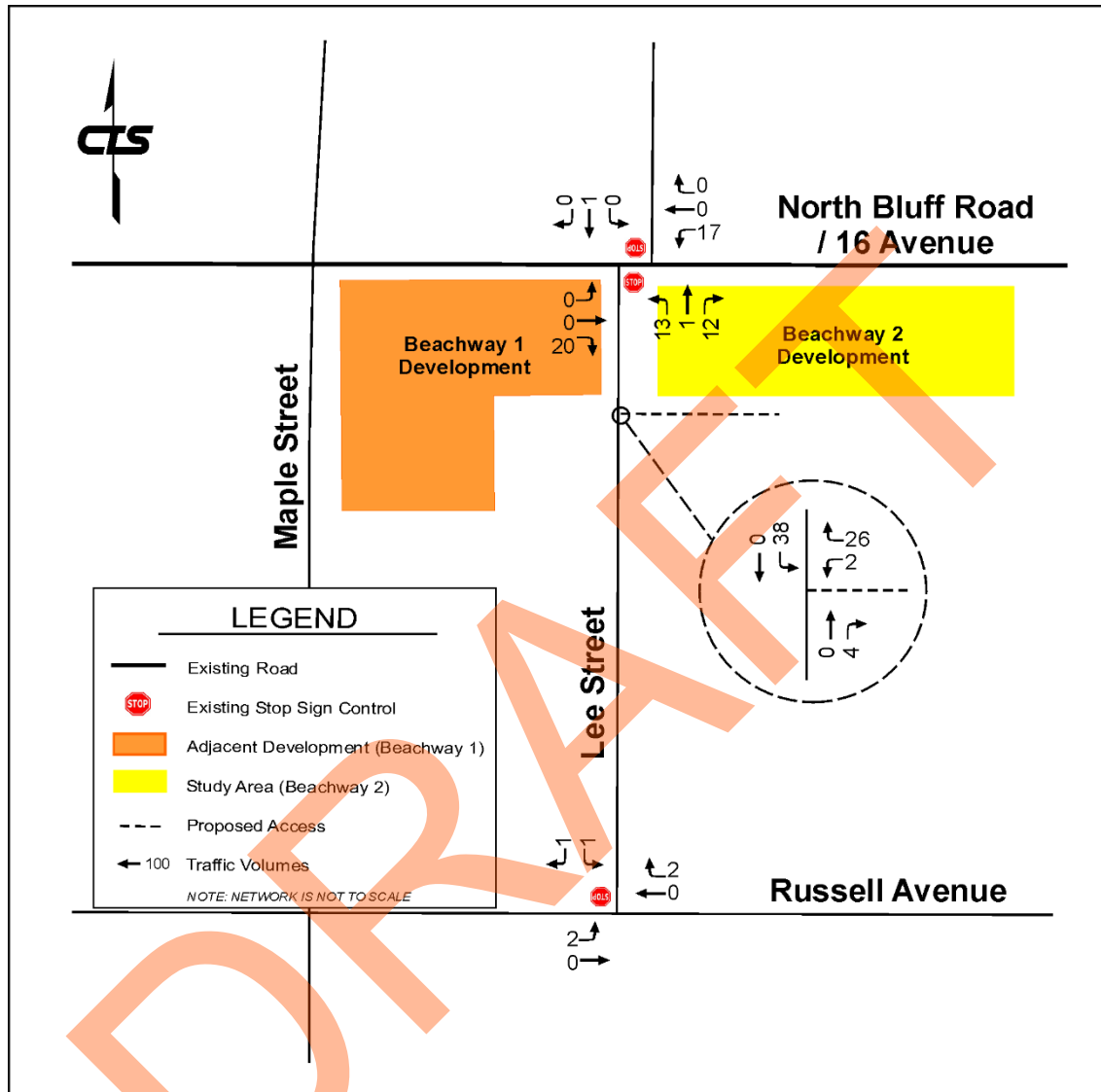
The weekday morning and afternoon peak hour site generated traffic volumes of the proposed development for the build-out year of 2021 are illustrated in **FIGURE 10** and **FIGURE 11**.



**FIGURE 10**  
**WEEKDAY MORNING PEAK HOUR SITE TRAFFIC VOLUMES**



**FIGURE 11**  
**WEEKDAY AFTERNOON PEAK HOUR SITE TRAFFIC VOLUMES**



## 4.0 BASE + SITE TRAFFIC VOLUMES

### 2021 Future Base + Site Traffic Volumes

For the purposes of this study, the proposed development is assumed to be fully built-out and occupied by the year 2021. The 2021 future base plus proposed development traffic volumes were calculated by first factoring up the 2019 base traffic volumes up by the approved volume growth rate of 2.0% per annum (simple-straight line) to the year 2021. Then, the forecast traffic generated by the proposed development were added to the 2021 base traffic volumes.

**FIGURE 12** illustrates the total projected traffic for the 2021 weekday morning peak hour consisting of the future base plus the proposed development site generated traffic.

**FIGURE 13** illustrates the total projected traffic for the 2021 weekday afternoon peak hour consisting of the future base plus the proposed development site generated traffic.

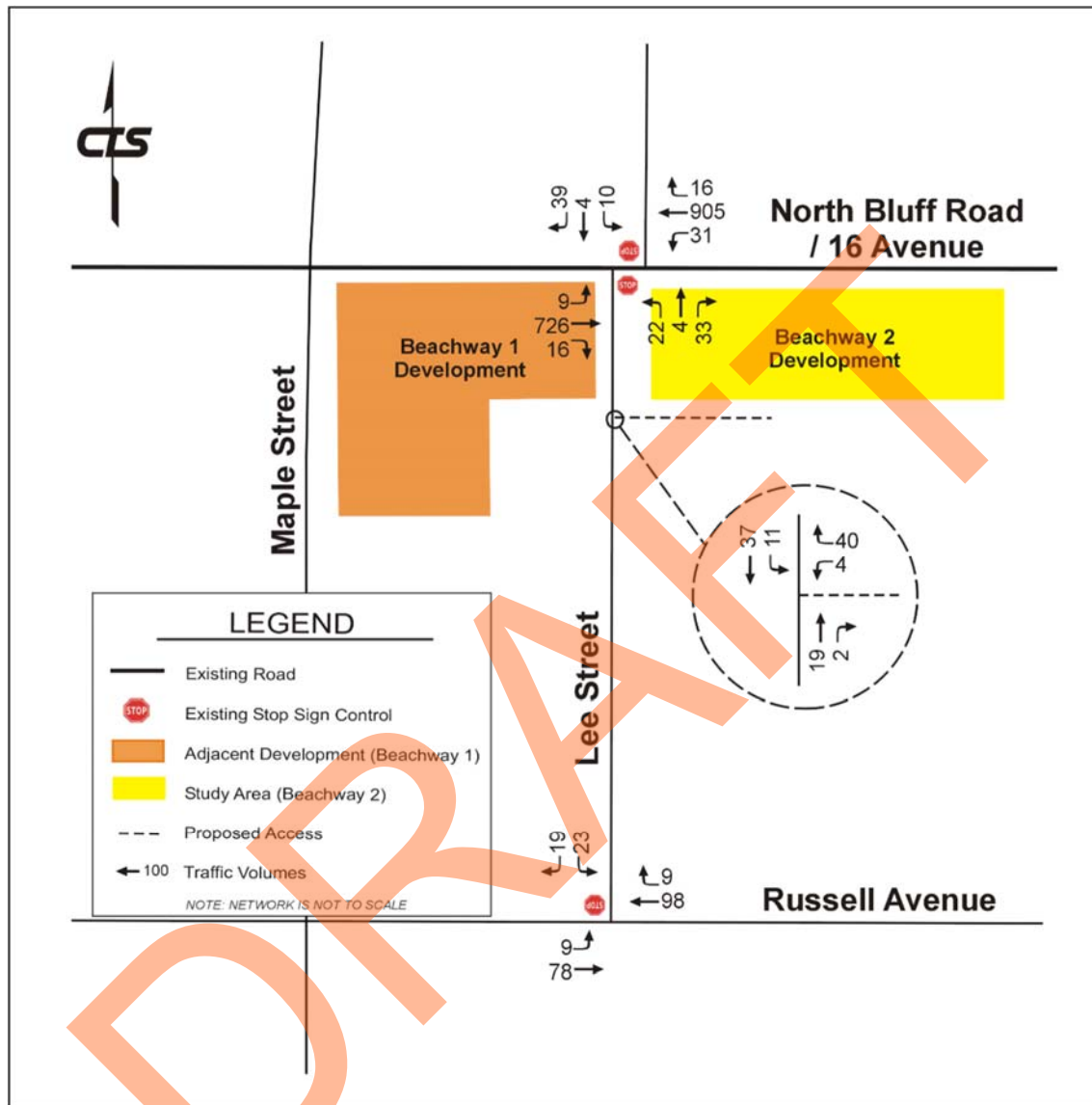
### 2026 Future Base + Site Traffic Volumes

For the purposes of this study, the proposed development is assumed to have been fully built-out and occupied for five years by the year 2026. The 2026 future base plus proposed development traffic volumes were calculated by first factoring up the 2019 base traffic volumes up by the approved volume growth rate of 2.0% per annum (simple-straight line) to the year 2026. Then, the forecast traffic generated by the proposed development were added to the 2026 base traffic volumes.

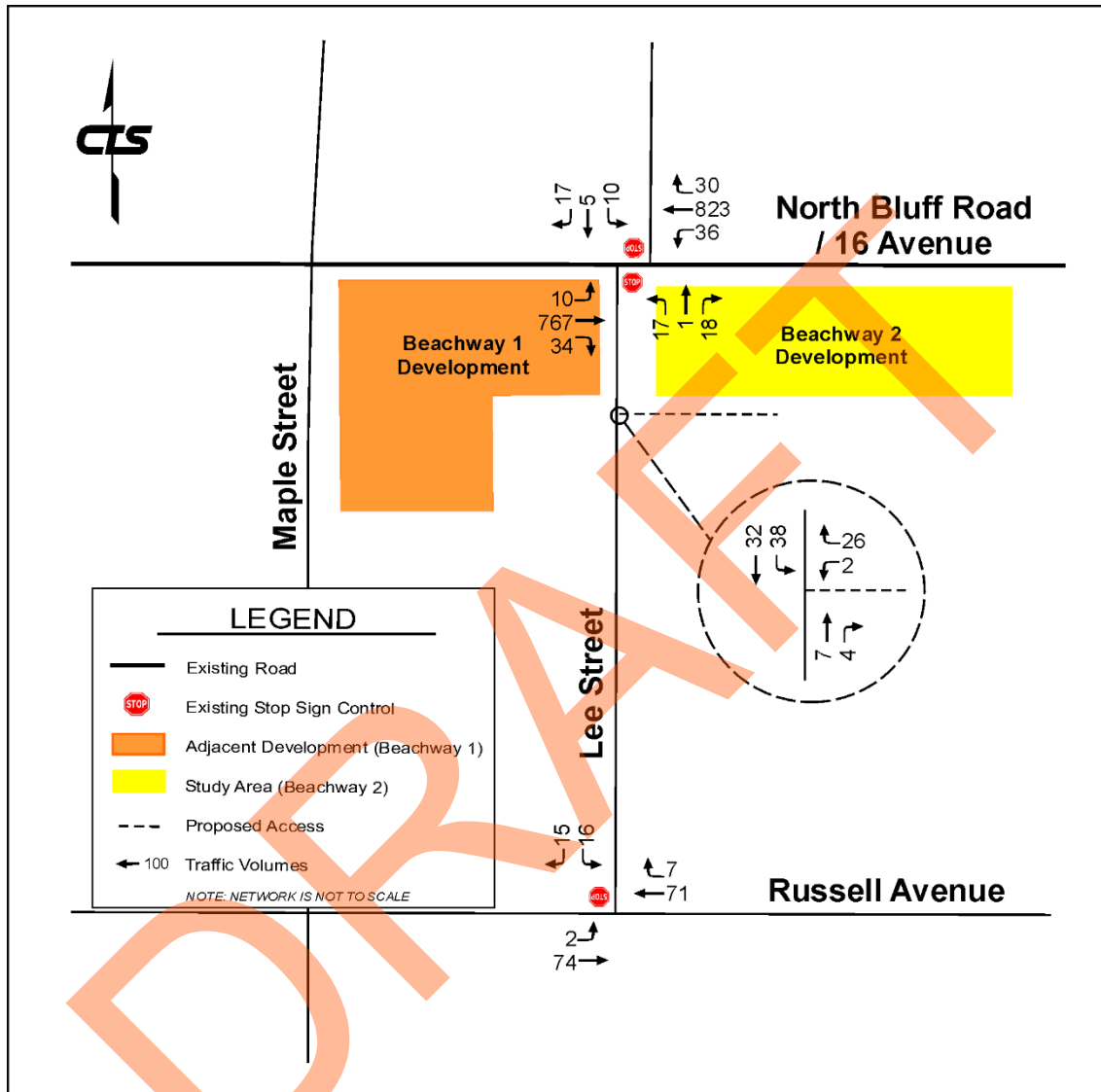
**FIGURE 14** illustrates the total projected traffic for the 2026 weekday morning peak hour consisting of the future base plus the proposed development site generated traffic.

**FIGURE 15** illustrates the total projected traffic for the 2026 weekday afternoon peak hour consisting of the future base plus the proposed development site generated traffic.

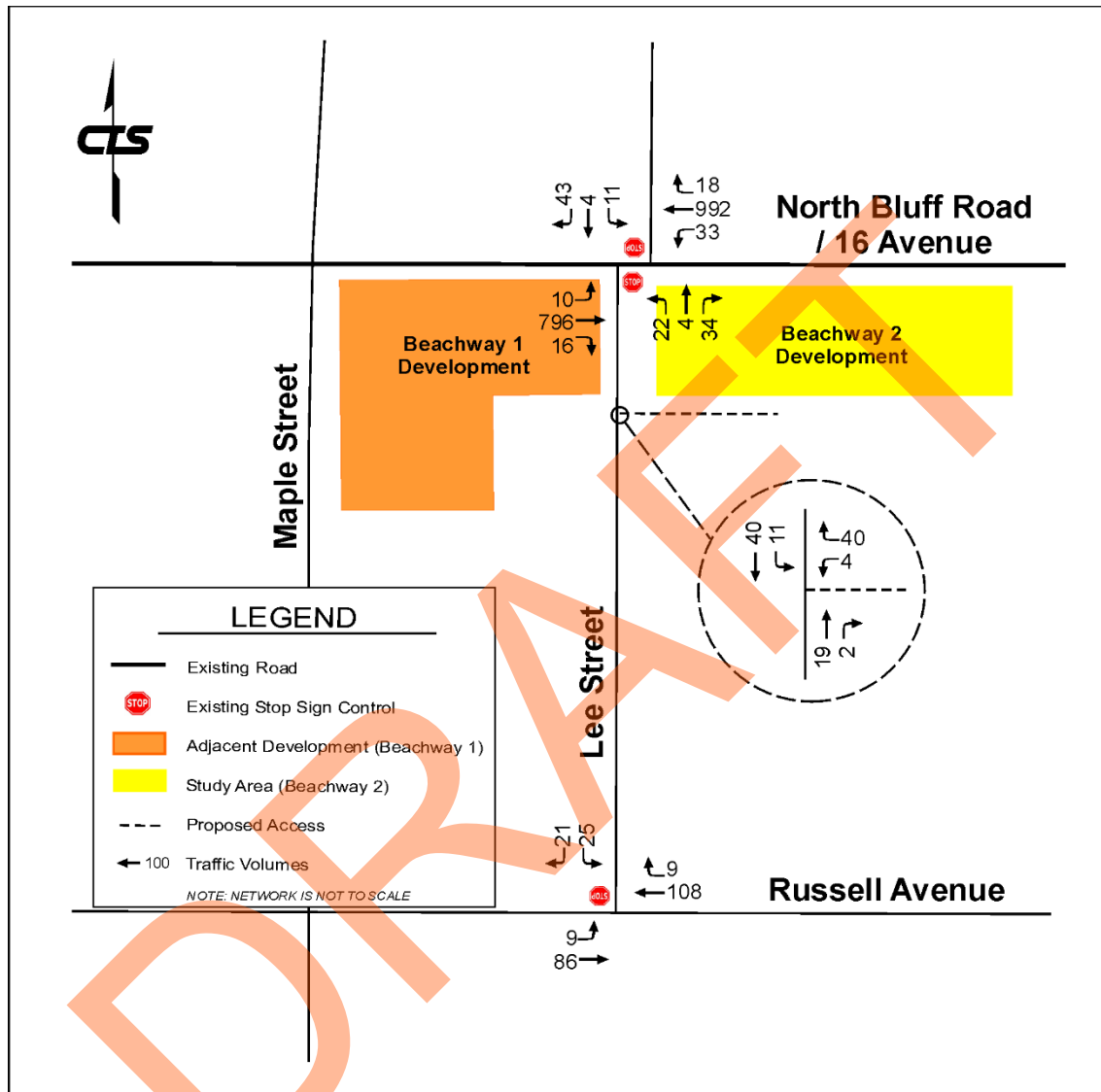
**FIGURE 12**  
**2021 WEEKDAY MORNING PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



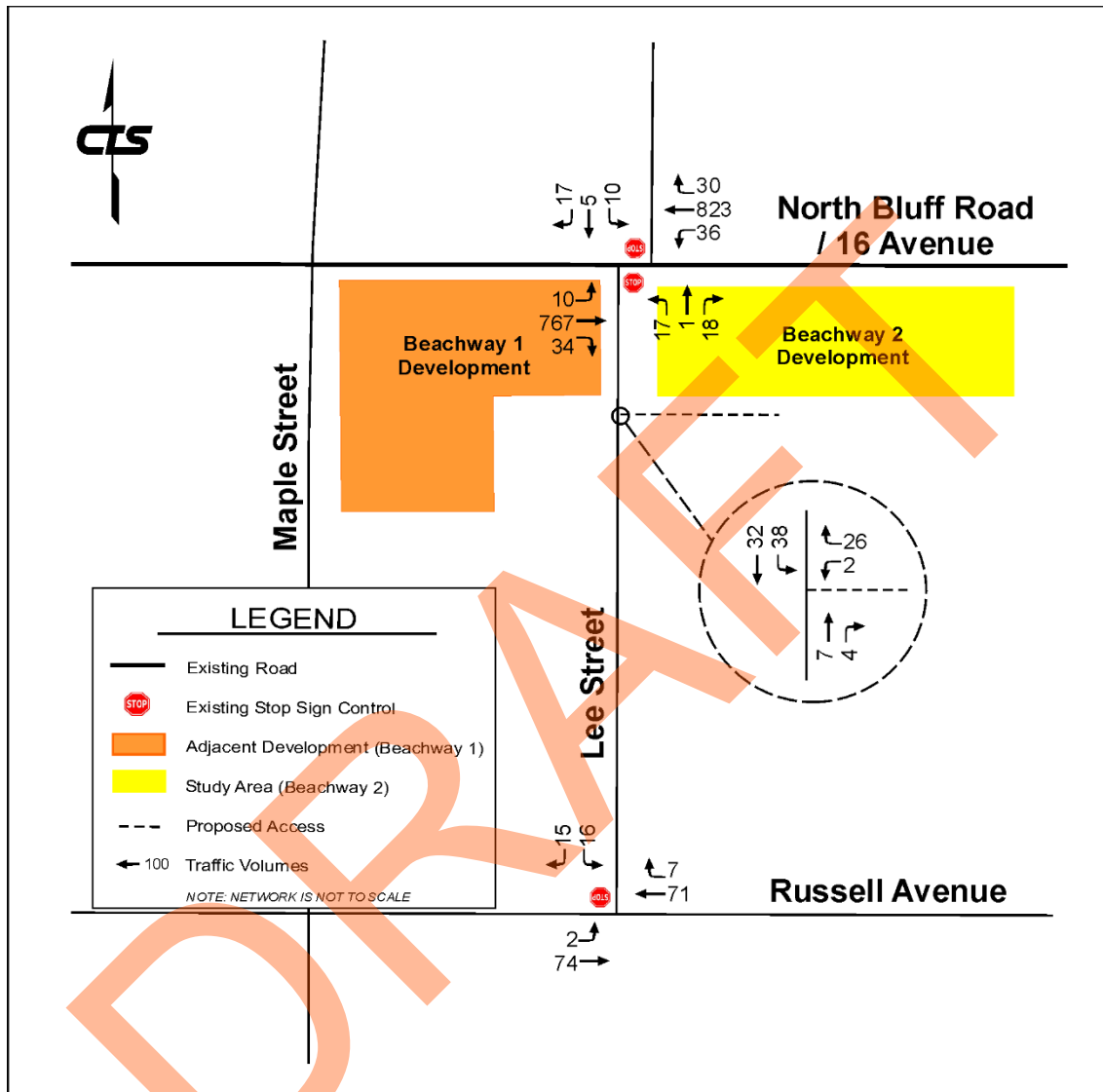
**FIGURE 13**  
**2021 WEEKDAY AFTERNOON PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



**FIGURE 14**  
**2026 WEEKDAY MORNING PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



**FIGURE 15**  
**2026 WEEKDAY AFTERNOON PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



## 5.0 INTERSECTION CAPACITY ANALYSIS

### 5.1 Capacity Analysis

Capacity analysis was performed at each of the locations in order to determine the intersection levels of service (LOS) that is provided to motorists. The LOS for intersections and movements is defined in terms of delay (seconds per vehicle), which is a measure of driver discomfort and frustration, fuel consumption and lost travel time.

An intersection or movement LOS can range from "A" (Excellent) to "F" (Fail). See **TABLE 3**. A LOS of "F" (Fail) indicates that an intersection or movement is failing because the intersection or movement is over capacity and delays are considered excessive. A LOS of "D" during the critical peak hours is considered acceptable by many public agencies in large urban areas for overall intersection operation and a LOS of "E" or better is considered acceptable for left turn movements as it recognizes that the intersections normally perform much better the remaining 90% of the day.

**TABLE 3**  
**LEVEL OF SERVICE DESCRIPTIONS**

Level of Service	Description
A	Excellent
B	Good
C	Fair
D	Poor
E	Very Poor
F	Fail

Highway Capacity Software (HCS 7.8.5) was used for the analysis of the unsignalized intersections.

The following assumptions were made with respect to the intersection capacity analysis:

- *Saturation flow rate* = 1,900 passenger cars/hour of green time/lane (pcphgpl)
- *Peak hour factor* (PHF) = 0.83 (weekday morning peak hour) and 0.85 (weekday afternoon peak hour) were the weighted average factors observed from the surveyed intersections.
- Heavy vehicle percentage for roads = 2%

*Saturation flow rate* is the equivalent hourly rate at which previously queued vehicles can traverse an intersection approach under prevailing conditions, assuming that the green signal is available at all times and no lost times are experienced. It is a base rate to which adjustment factors are applied.



*Peak Hour Factor* is a measure of traffic demand fluctuation within the analysis hour. The closer the number is to 1.00, the less fluctuation during the hour.

**TABLE 4** to **TABLE 6** summarizes and compares the main performance parameters of the intersection capacity analysis for the unsignalized intersections.

For unsignalized intersections, the delay time in seconds for each lane group is summarized. Delay is additional travel time experienced by a driver, passenger, bicyclist, or pedestrian beyond that required to travel at the desired speed.

This analysis does not include the effects of upstream signals. In addition, it is assumed that all of through movements travelling eastbound and westbound on North Bluff Road will experience the same delay as the eastbound and westbound left turn movements. Hence, the results of this analysis are more conservative. The capacity analysis worksheets with level of services for each individual movement are included in **APPENDIX D**.

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**TABLE 4**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTION**  
**LEE ST AT NORTH BLUFF RD**

INTERSECTION	TIME OF DAY	SCENARIO	PERFORMANCE MEASURE	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND			LOS	NOTES
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Lee Street (N/S) and North Bluff Road (E/W)	Weekday Morning Peak Hour	2019 Base	Volumes	8	698	6	28	870	15	2	2	12	9	2	37	B	NB and SB approaches are experiencing medium delays.
			Delay	10.7	10.7	0.0	10.6	10.6	0.0	33.0			35.4				
			95% Queue (m)	0.0	0.0	0.0	0.2	0.2	0.0	0.4			1.4				
		2021 Base	Volumes	9	726	7	30	905	16	3	3	13	10	3	39	B	NB and SB approaches are experiencing medium delays.
			Delay	11.0	11.0	0.0	10.8	10.8	0.0	46.6			48.7				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	0.7			2.0				
		2026 Base	Volumes	10	796	7	32	992	18	3	3	14	11	3	43	B	NB and SB approaches are experiencing high delays.
			Delay	11.6	11.6	0.0	11.3	11.3	0.0	65.0			84.2				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	1.1			3.2				
		2021 Base + Site	Volumes	9	726	16	31	905	16	22	4	33	10	4	39	C	NB and SB approaches are experiencing high delays.
			Delay	11.0	11.0	0.0	10.8	10.8	0.0	129.7			58.6				
			95% Queue (m)	0.1	0.1	0.1	0.2	0.2	0.0	4.2			58.6				
		2026 Base + Site	Volumes	10	796	16	33	992	18	22	4	34	11	4	43	C	NB and SB approaches are experiencing high delays.
			Delay	11.6	11.6	0.0	11.3	11.3	0.0	260.3			110.5				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	5.7			3.8				
	Weekday Afternoon Peak Hour	2019 Base	Volumes	9	737	13	18	791	28	3	0	5	9	3	16	B	NB and SB approaches are experiencing medium delays.
			Delay	10.2	10.2	0.0	10.3	10.3	0.0	28.7			36.6				
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.2			0.8				
		2021 Base	Volumes	10	767	14	19	823	30	4	0	6	10	4	17	B	NB and SB approaches are experiencing medium delays.
			Delay	10.4	10.4	0.0	10.5	10.5	0.0	33.9			45.4				
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	0.3			1.1				
		2026 Base	Volumes	11	841	15	21	902	32	4	0	6	11	4	19	B	NB approach is experiencing medium delays. SB approach is experiencing high delays.
			Delay	10.9	10.9	0.0	10.9	10.9	0.0	44.1			64.8				
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	0.4			1.7				
		2021 Base + Site	Volumes	10	767	34	36	823	30	17	1	18	10	5	17	B	NB and SB approaches are experiencing high delays.
			Delay	10.4	10.4	0.0	10.8	10.8	0.0	68.8			59.5				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	1.8			1.5				
		2026 Base + Site	Volumes	11	841	35	38	902	32	17	1	18	11	5	19	B	NB and SB approaches are experiencing high delays.
			Delay	10.9	10.9	0.0	11.3	11.3	0.0	114.5			93.0				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	2.6			2.2				

Delay = Average Delay (seconds/vehicle)

Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

UNSIGNALIZED QUEUE IS PER VEHICLE

From **TABLE 4**, the following observations can be made:

**Lee Street at North Bluff Road:**

- During the weekday morning peak hour:
  - The intersection is forecast to operate at LOS B (Good) for the 2019, 2021, and 2026 base years. However, the northbound and southbound approaches are expected to experience medium delays for the 2019 and 2021 base years and high delays for the 2026 base year.
  - The intersection is forecast to operate at LOS C (Fair) for the 2021 and 2026 base + site years. However, the northbound and southbound approaches are expected to experience high delays for the 2021 and 2026 base + site years.

- During the weekday afternoon peak hour:
  - The intersection is forecast to operate at LOS B (Good) for all horizon years and scenarios. However, the northbound and southbound approaches are expected to experience medium delays for the 2019 and 2021 base years and high delays for the 2026 base, 2021 base + site, and 2026 base + site years.

**TABLE 5**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTION**  
**LEE ST AT RUSSELL AVE**

INTERSECTION	TIME OF DAY	SCENARIO	PERFORMANCE MEASURE	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND			LOS	NOTES
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Lee Street (N/S) and Russell Avenue (E/W)	Weekday Morning Peak Hour	2019 Base	Volumes	7	75			94	7				20		16	A	Okay.
			Delay	7.5				0.0					9.7				
			95% Queue (m)	0.0				0.0					0.2				
		2021 Base	Volumes	8	78			98	8				21		17	A	Okay.
			Delay	7.5				0.0					9.8				
			95% Queue (m)	0.0				0.0					0.2				
		2026 Base	Volumes	8	86			108	8				23		19	A	Okay.
			Delay	7.6				0.0					9.9				
			95% Queue (m)	0.0				0.0					0.2				
		2021 Base + Site	Volumes	9	78			98	9				23		19	A	Okay.
			Delay	7.5				0.0					9.8				
			95% Queue (m)	0.0				0.0					0.2				
		2026 Base + Site	Volumes	9	86			108	9				25		21	A	Okay.
			Delay	7.6				0.0					10.0				
			95% Queue (m)	0.0				0.0					0.2				
	Weekday Afternoon Peak Hour	2019 Base	Volumes	0	71			68	4				14		13	A	Okay.
			Delay	7.5				0.0					9.4				
			95% Queue (m)	0.0				0.0					0.1				
		2021 Base	Volumes	0	74			71	5				15		14	A	Okay.
			Delay	7.5				0.0					9.4				
			95% Queue (m)	0.0				0.0					0.1				
		2026 Base	Volumes	0	81			78	5				16		15	A	Okay.
			Delay	7.5				0.0					9.5				
			95% Queue (m)	0.0				0.0					0.1				
		2021 Base + Site	Volumes	2	74			71	7				16		15	A	Okay.
			Delay	7.5				0.0					9.5				
			95% Queue (m)	0.0				0.0					0.1				
		2026 Base + Site	Volumes	2	81			78	7				17		16	A	Okay.
			Delay	7.5				0.0					9.6				
			95% Queue (m)	0.0				0.0					0.1				

Delay = Average Delay (seconds/vehicle)

Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

UNSIGNALIZED QUEUE IS PER VEHICLE

From **TABLE 5**, the following observations can be made:

**George Lane at Russell Avenue:**

- During the weekday morning peak hour:
  - The intersection is forecast to continue to operate at LOS A (Excellent) for all horizon years and scenarios.
- During the weekday afternoon peak hour:
  - The intersection is forecast to continue to operate at LOS A (Excellent) for all horizon years and scenarios.

**TABLE 6**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTION**  
**LEE ST AT SITE ACCESS**

INTERSECTION	TIME OF DAY	SCENARIO	PERFORMANCE MEASURE	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND			LOS	NOTES
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Lee Street (N/S) & Site Access (E/W)	Weekday Morning Peak Hour	2021 Base + Site	Volumes				4		40		19	2	11	37		A	Okay
			Delay					8.7			0.0			7.3			
			95% Queue (m)					0.2			0.0			0.0			
		2026 Base + Site	Volumes				4		40		19	2	11	40		A	Okay
			Delay					8.7			0.0			7.3			
			95% Queue (m)					0.2			0.0			0.0			
	Weekday Afternoon Peak Hour	2021 Base + Site	Volumes				2		26		7	4	38	32		A	Okay
			Delay					8.6			0.0			7.3			
			95% Queue (m)					0.1			0.0			0.1			
		2026 Base + Site	Volumes				2		26		7	4	38	35		A	Okay
			Delay					8.6			0.0			7.3			
			95% Queue (m)					0.1			0.0			0.1			

Delay = Average Delay (seconds/vehicle)

Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

UNSIGNALIZED QUEUE IS PER VEHICLE

From **TABLE 6**, the following observations can be made:

**Lee Street at Site Access**

- During the weekday morning peak hour:
  - The intersection is forecast to continue to operate at LOS A (Excellent) for all horizon years and scenarios.
- During the weekday afternoon peak hour:
  - The intersection is forecast to continue to operate at LOS A (Excellent) for all horizon years and scenarios.

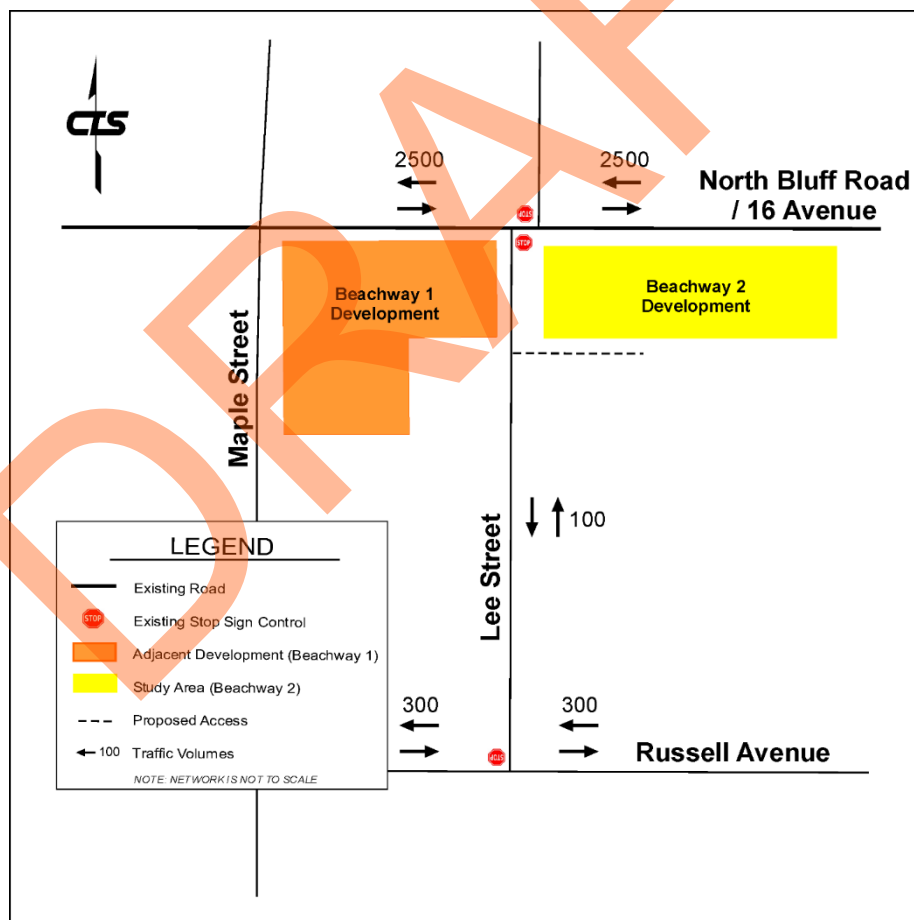
## 6.0 2045 LINK VOLUMES

The City of White Rock requested that estimates for the 2045 vehicle traffic volumes within the study network be made in order to provide a point of reference for the City of White Rock 2045 OCP.

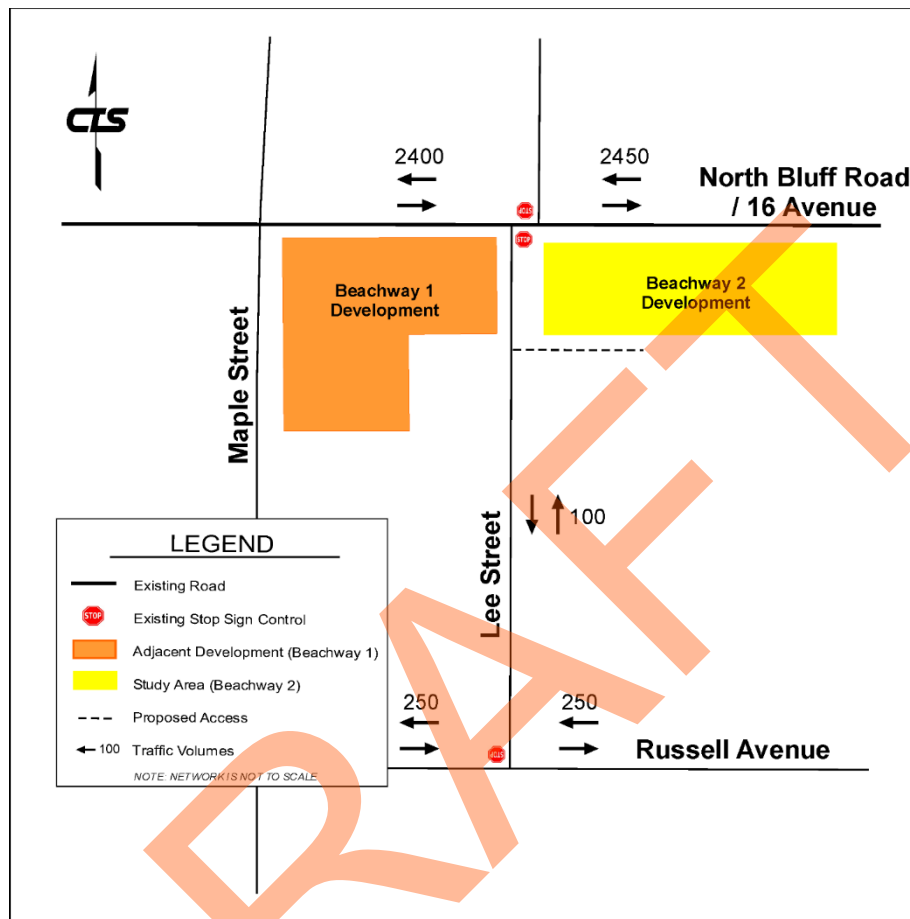
As this scenario is 26 years into the future, it is difficult to accurately forecast vehicle volumes in the context of intersection analysis. Therefore, peak hour road link volumes were determined to provide an estimated magnitude of vehicle volumes.

**FIGURE 16** and **FIGURE 17** show the estimated 2-way link volumes for the morning and afternoon peak hour based on an approved growth rate of 2.0% per annum (simple-straight line) factored up from the 2019 turning movement counts with the proposed site traffic included.

**FIGURE 16**  
**2045 WEEKDAY MORNING PEAK HOUR LINK VOLUMES**



**FIGURE 17**  
**2045 WEEKDAY AFTERNOON PEAK HOUR LINK VOLUMES**



In the morning peak hour, the estimated 2-way link volume on North Bluff Road, Lee Street, and Russell Avenue, are 2500, 100, and 300 vehicles, respectively.

In the afternoon peak hour, the estimated 2-way link volume on North Bluff Road, Lee Street, and Russell Avenue, are 2450, 100, and 250 vehicles, respectively.

As the theoretical capacity for North Bluff Road is 3200 vehicles per hour (two-way), the road network is deemed to have sufficient capacity for the forecasted traffic volumes in the year 2045.

## 7.0 TRANSPORTATION DEMAND MANAGEMENT

In support of the requested 30% parking variance, the proposed land uses, existing nearby amenities and infrastructure, and opportunities for alternative modes of travel were considered.

### 7.1 City of White Rock Policy

With reference to the City of White Rock 2045 OCP, Objective 11.2 is “to support rental housing and a range of non-market housing options and needs along the housing spectrum”. Building 1 of the three buildings is proposed to be a non-market affordable rental development which aligns with the City’s OCP objectives and a parking relaxation should be considered given Policy 11.2.1 g) recommends “reviewing parking requirements to determine the extent to which they can be relaxed for non-market and rental housing within walking distance of frequent transit service and / or commercial areas.

The proposed residential development is a 15 minute walk to Semiahmoo Shopping Centre and White Rock Centre transit exchange, which connects to Translink’s Frequent Transit Network.

### 7.2 Adjacent Land Uses and Amenities

As previously noted in **Section 1.0**, the site is conveniently located near amenities and public transit. The following attractions and destinations are all approximately a five (5) to fifteen (15) minute walk from the study site:

- Semiahmoo Shopping Centre
- Semiahmoo Public Library
- Peace Arch Hospital
- Commercial / retail developments all along Johnston Road
- White Rock Centre transit exchange
- Earl Marriott Secondary School
- Peach Arch Elementary
- Kent Street Activity Centre
- Maccaud Park

### 7.3 Alternative Modes of Travel

The study area has good connectivity to transit, as well as cycling and pedestrian infrastructure. The alternative modes of travel are illustrated in **FIGURE 18** below.

**FIGURE 18**  
**ALTERNATIVE MODES OF TRAVEL WITHIN 400 METRES**



#### **Transit Network**

The study area has good connectivity to transit with several options for regular busses and community shuttles. The White Rock Centre transit exchange, located at 152<sup>nd</sup> Street at North Bluff Road, is within a fifteen (15) minute walk from the site and 152<sup>nd</sup> Street is part of Translink's Frequent Transit Network.

The following bus route are within a five (5) minute walk from the proposed development:

- Route #375 White Rock South - Guildford – During peak travel times, this bus operates in half hour intervals. Bus stop is on North Bluff Road.
- Route #321 Surrey Central Station – Newton Exchange/White Rock Centre/White Rock South – During peak travel times, this bus operates in fifteen-minute intervals. Bus Stop is on North Bluff Road.

The following route is serviced on Russell Avenue to the south.



- Route #361 White Rock Centre - Ocean Park – During weekday peak travel times, this bus operates in half hour intervals. On the weekend peak travel times, this bus operates in one-hour intervals. Bus Stop is on Thrift Avenue.

The above bus routes can be used to connect to the nearby Frequent Transit Network at White Rock Centre, which provides connections to Surrey, Richmond, and Langley. Routes along the Frequent Transit Network have headway times of 15 minutes or better throughout the day, seven days a week.

The following routes are accessible just west of Finlay Street on either North Bluff Road or Russell Avenue. These bus stops are located adjacent to the Peace Arch Hospital, which is within a 5-minute walking distance of the proposed development.

- Route #360 Ocean Park - Peace Arch Hospital – During weekday peak travel times, this bus operates in half hour intervals. On the weekend peak travel times, this bus operates in one-hour intervals. Bus Stop is on Thrift Avenue, west of Finlay Street.
- Route #363 South Point - Peace Arch Hospital – During peak travel times, this bus operates in half hour intervals. Bus Stop is on Thrift Avenue, west of Finlay Street.

The bus stop locations within a 400 metre radius (or five (5) minute walking distance) are illustrated in **FIGURE 18** above.

The City of Surrey is in discussion with Translink to bring B-Line rapid bus service to North Bluff Road between Johnston Road and Finlay Street. The addition of a B-Line would upgrade this section of North Bluff Road to part of the Frequent Transit Network which has headway times of 15 minutes or better throughout the day, seven days a week.

### **Bicycle Network**

According to the *City of White Rock Strategic Transportation Plan*:

- North Bluff Road is proposed in the future to be designated as a bicycle route;
- Finlay Street is currently designated as a shared use lane; and
- Thrift Avenue is currently designated as a shared use lane.

The proposed development is exceeding the bylaw requirement in its provision of 156 secured Class I parking spaces and 26 publically accessible bike share parking spaces within the proposed shared mobility hub, yielding a total of 182 bicycle parking spaces. This provision encourages residents and visitors to utilise the existing bicycle infrastructure in the study network.

The bicycle routes within the study area are illustrated in **FIGURE 18** above.

### **Pedestrian Network**

It is noted in the *City of White Rock Strategic Transportation Plan*, that walking in the City is the most popular form of transportation aside from the use of motor vehicles. This is attributed to the dense and walkable built form within the City. With the City of White Rock Town Centre and Semiahmoo Town Centre being located within a 12-minute walk of the proposed development, there is significant opportunity for residents to take advantage of the pedestrian infrastructure that is offered.

The study area is well connected with sidewalks. All arterial and collector roads have a sidewalk on at least one side. Some local roads also have sidewalks on one side. Currently, there are no sidewalks on Maple Street or Lee Street.

The proposed development will be including enhanced sidewalks on the frontage and also a greenway through the property.

In consideration of the intended land use and the available nearby amenities and infrastructure, the proposed development is anticipated to have a good utilization of alternative modes of travel, particularly walking.

The existing sidewalks are illustrated in **FIGURE 18** above.

## 7.4 Transportation Demand Management Initiatives

### 7.4.1 Pedestrian Facilities and Initiatives

Walking is the primary mode of transportation for nearly everyone whether linking with cycling, transit or vehicle modes. People will generally walk for up to fifteen minutes or within a distance of 400 to 800 meters (five to ten minute walk) to connect with another mode or access local amenities.

To encourage transportation by walking, the following initiatives may be considered:

- Directional signage within the lobby or at the main entrance for the nearest bus stops and estimated walking times to popular destinations

### 7.4.2 Bicycle Facilities and Initiatives

People will generally travel by bicycle up to five kilometers to their place of work, for recreation, or personal reasons.

To encourage transportation by bicycling, the applicant has committed to providing the following initiatives:

- Residents will receive a welcome package containing transit and cycling information.
- A car and bike share hub
  - Public access will be granted by security code access via the Building 2 stairs and elevators.
  - Equipped with 26 bicycles and bicycle spaces will be located within the parkade on P1.
  - A bicycle wash station will be provided within the bicycle share hub located within parkade level 1.
- The bicycle space bylaw requirement of 176 bicycle spaces is exceeded via the provision of 182 bicycle spaces.
- All 156 secured Class I bicycle parking spaces and all 26 bicycle share spaces are conveniently located close to elevators within the parkade on P1.
- Gently sloped ramps leading up to the main entrance for cyclist comfort.

### 7.4.3 Transit Facilities and Initiatives

To encourage the use of public transit, the provision of the following initiatives may be considered:

- Directional signage within the lobby or at the main entrance for the nearest bus stops and estimated walking times to popular destinations.
- A pre-loaded compass card (e.g. \$100) for each dwelling unit.
- Residents will receive a welcome package containing transit and cycling information.
- A live screen within the lobby displaying current bus route schedules

#### 7.4.4 Vehicle Facilities and Initiatives

To encourage more sustainable transportation, the applicant has committed to providing the following initiatives:

- Electrical vehicle charging parking spaces
  - Four (4) non-market residential EV parking spaces
  - Two (2) non-market visitor EV parking spaces
  - 20 market residential EV parking spaces
- Car and bike share hub consisting of:
  - 17 EV car share parking spaces
    - 100% electric vehicle fleet
  - Public access will be granted by security code access via the Building 2 stairs and elevators.
  - Exit via the two vehicular gates in the parkade will be granted via the same access code

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## 8.0 PARKING ANALYSIS

### 8.1 Parking Requirements and Provision

#### 8.1.1 Vehicle Parking Requirements

The required parking rates and spaces for the proposed development are summarized in **TABLE 7** and are based on meetings the applicant has had with the City of White Rock.

**TABLE 7**  
**CITY OF WHITE ROCK VEHICLE PARKING SPACE REQUIREMENTS**

Land Use Description	Parking Space Type	CoWR Required Parking Rate	# of Units	Parking Stalls Required
Non-Market Units	Residential Spaces	1 space per Dwelling Unit	46	46
Market Units	Residential Spaces	1.2 per Dwelling Unit	101	121
	Visitor Spaces	0.3 per Dwelling Unit		30
Total Required Parking Spaces				198

As shown in **TABLE 11** above, the total number of required parking spaces for the proposed development is 198 parking spaces. The proposed development is providing a total of 138 parking spaces as per the project summary page in **APPENDIX A**, resulting in a variance of 60 parking spaces, or 30.3%.

It should be noted that the City of White Rock visitor parking rate of 0.3 spaces per dwelling unit is higher than other municipalities' rate of 0.2 spaces per dwelling unit.

With reference to the Information Data sheet in **APPENDIX A**, the proposed development is providing 46 non-market residential parking spaces, two (2) non-market visitor parking spaces, 63 market residential parking spaces, 10 market visitor parking spaces, 12 market car share spaces, and 5 market visitor car share spaces, resulting in a total of 138 parking spaces.

With reference to the *City of White Rock Zoning Bylaw Section 4.17.1*, "a minimum of 1 of every 10 off-street parking spaces shall feature an energized outlet capable of providing Level 2 charging...[and] an additional 1 of every 10 off-street parking spaces shall feature roughed-in electric vehicle charging infrastructure, including an electrical outlet box located within 3 metres of the parking space". The proposed development will be exceeding the bylaw requirement in its provision of 43 electrical vehicle (EV) charging parking spaces – four (4) non-market EV parking spaces, two (2) non-market visitor EV parking spaces, 20 market EV parking spaces, and 17 EV car share parking spaces.

### 8.1.2 Car Share Provision

The proposed residential development is providing 17 electric vehicle car share spaces through the car and bicycle share hub located on P1 of the parkade as per the architectural drawings attached as **APPENDIX A**. While the City of White Rock does not have direction in the bylaw with regards to the provision of shared vehicles, the City of Surrey Zoning Bylaw 12000 states that the “required residential parking spaces may be reduced by 5 parking spaces for each shared vehicle that is provided for multiple unit residential buildings with underground parking on lots located within City Centre.” Additionally, “required residential parking spaces may be reduced by 1 additional parking space for each shared vehicle parking space provided that features an energized outlet capable of providing Level 2 charging, as defined by SAE International’s 11772 standard, as amended or higher, and where an electric vehicle and electric vehicle supply equipment are provided in accordance with the shared vehicle development permit requirements.”

To summarize the above City of Surrey bylaw, five (5) parking spaces may be reduced for each car share space, plus one (1) additional parking space may be reduced for electric vehicle car share space, for a total ratio of one (1) electric vehicle car share space equating to six (6) regular parking spaces. Since the proposed residential development is providing 17 electric vehicle charging car share spaces, this is the City of Surrey bylaw equivalent of 102 regular parking spaces.

If the car share ratio of one (1) to six (6) parking spaces is applied, the proposed development is providing a bylaw equivalent of a total of 223 parking spaces, which is in excess of the City of White Rock requirement of 198 parking spaces.

### 8.1.3 Bicycle Parking Requirements

The required bicycle parking spaces for the proposed development are summarized in **TABLE 8** with reference to the *City of White Rock Zoning Bylaw Section 4: General Provisions & Regulations*.

**TABLE 8**  
**BYLAW BICYCLE PARKING SPACE REQUIREMENTS**

Bylaw Land Use Classification	Bicycle Space Type	Required Bicycle Space Rate	# of Units	Bicycle Space Required
Table 4.16.3 - Apartment, Townhouse	Class I	1 per Dwelling Unit	147	147
	Class II	0.2 per Dwelling Unit		29
Total Required Parking Spaces				176

As summarized in **TABLE 8** above, the total number of required bicycle parking spaces for the proposed development is 176 bicycle parking spaces – 147 Class I parking spaces and 29 Class II parking spaces. The proposed development is exceeding the bylaw

requirement in its provision of 156 secured Class I bicycle parking spaces and 26 publically accessible bicycle share parking spaces within the proposed shared mobility hub, yielding a total of 182 bicycle parking spaces.

#### 8.1.4 Loading Space Requirements

With reference to the *City of White Rock Zoning Bylaw Section 4.15.2*, “one (1) off-street loading space shall be provided for every apartment complex...Where the apartment complex...is provided in more than one principal building with separate elevators for each building, one (1) off-street loading space shall be provided for each principal building containing more than ten (10) dwelling units”. **TABLE 9** below summarizes the bylaw requirement.

**TABLE 9  
BYLAW LOADING SPACE REQUIREMENTS**

Bylaw Land Use Classification	Bylaw Required Loading Bay Rate	# of Buildings	Loading Bays Required
Residential	1 per Building	3	3
Total Required Loading Bays			3

The proposed development is providing one (1) loading space for the non-market dwelling units in building 1 and one (1) loading space for the market units in building 2 and 3. The proposed development is not able to provide a loading space exclusively for building 3 because of the City's request that no access be provided off of North Bluff Road.

#### 8.2 Average Parking Demand

In order to consider the peak parking demand of the proposed development, the Institute of Transportation Engineers (ITE) Parking Generation Manual 5<sup>th</sup> Edition is referenced.

The parking generation manual contains observed data for common land uses, along with an average peak parking demand based on variables such as gross floor area, number of dwelling units, or number of bedrooms.

Lane Use Code 221 – Multifamily Housing (Mid-Rise), provides data that represents multifamily developments, that include apartments, townhouses, and condominiums located within the same building, and are between three and ten levels (floor). This land use describes the proposed market dwelling units in Building 2 and Building 3 of the proposed residential development.

Land Use Code 223 – Affordable Housing, provides data that represents all kinds of multifamily housing that is rented at below market rate. The land use describes the non-market affordable rental dwelling units in Building 1 of the proposed residential development.

For the parking demand analysis, CTS considered data only in the general urban/sub-urban scenario, and data according to the number of dwelling units.

General urban/sub-urban areas are associated with almost homogenous vehicle centered access. Although the proposed development is located in an area with good alternative transportation infrastructure, this setting is applied as it is more applicable than other settings, and will provide a conservative analysis.

**TABLE 10** summarizes the average peak parking demand for each of the two considered land uses. It is noted that for both of these land uses, the peak period is between 10:00 PM and 5:00 AM, for a weekday.

**TABLE 10  
AVERAGE PEAK PARKING DEMAND**

Land Use Description	Setting/Location	Period	Average Peak Period Parking Demand	Applicable To:	Number of Units	Average Peak Parking Demand
Land Use: 222 Multi Family (Mid-Rise)	General Urban/Suburban	Weekday	1.31 Per Dwelling Unit	Market Dwelling Units	101	132.3
Land Use: 223 Affordable Housing (Income Limits)	General Urban/Suburban	Weekday	0.99 Per Dwelling Unit	Non-Market Dwelling Units	46	45.5
Total					147	178

As summarized in **TABLE 10** above, the average peak parking demand expected for mid-rise (market) land uses is 1.31 parked vehicles per dwelling unit, and for affordable (non-market) land uses is 0.99 parked vehicles per dwelling unit. The average peak parking demand for the proposed development is forecasted to be approximately 178 parked vehicles, which is 10% (or 20 parking spaces) lower than the City of White Rock parking requirements summarized previously in **TABLE 7**. This does not consider site specific conditions that may reduce parking demand, such local data trends, requirements for non-market rental, or available alternative modes of transportation.

### 8.3 Parking Supply in Metro Vancouver

The data collected as part of *The 2018 Regional Parking Study*, was also considered for its representation of local data. The key findings of this report emphasize that generally within the Metro Vancouver area, parking is typically oversupplied for strata sites in the range of 32 percent to 58 percent. For rental sites, the oversupply of parking ranges from 24 percent to 44 percent.

This study also provides some data specifically for non-market (affordable) rental units in the region. Data was observed at one site showing that for non-market rental units, a parking demand of 0.14 vehicles per dwelling unit was observed via a parkade facility survey. A household questionnaire style survey was conducted that received 28 responses for non-market rental units, which determined the number of parked vehicles per dwelling unit to be 0.43. Although these sample sizes are small, they are consistent



with the expectation for affordable rental units to generally have significantly less parking demand.

#### 8.4 Parking Space Allocation

Based on the above analysis, it is determined that non-market (affordable) rental dwelling units require less than one parking space per unit. The site plan attached as **APPENDIX A** show that 46 residential parking spaces and 2 visitor parking spaces are being provided to the non-market dwelling units. The reallocation of half (or 23) of the non-market residential parking spaces and the two (2) non-market visitor parking spaces to the market dwelling units should be considered to aid in meeting the parking demand of the market dwelling units.

#### 8.5 Parking Space Summary and Recommendation

Based on the above analysis, CTS recommends that the proposed residential development provide one (1) parking space for every two (2) non-market (affordable) rental dwelling units, one (1) parking spaces for every market dwelling unit, and 0.2 visitor parking spaces for every market dwelling. This would result in a provision of 23 non-market residential parking spaces, 101 market residential parking spaces, and 20 market visitor parking spaces, for a total of 144 parking spaces.

## 9.0 LOADING SWEPT PATH ANALYSIS

Two (2) loading bays are proposed to be provided accessed off Lee Street and the proposed east-west lane as per the architectural drawings included in **APPENDIX A**.

Swept path analysis was conducted to test the viability of the loading bays using an MSU-TAC as the design vehicle. This is a standard medium single unit vehicle described by the Transportation Association of Canada, and is what would typically be expected for basic deliveries or people moving in and out. It has an overall length of 10 metres and a width of 2.6 meters.

It is recommended that any vehicles using the loading bay always reverse in and drive forward out. This will be a safer combination of maneuvers as drivers will have clear vision while exiting, driving forward. Drivers will also have clear vision of the driveway and adjacent sidewalks before reversing in.

**FIGURE 19** illustrates the MSU-TAC reversing into loading bay 1 without any conflicts.

**FIGURE 20** illustrates the MSU-TAC exiting from loading bay 1 without any conflicts.

**FIGURE 21** illustrates the MSU-TAC reversing into loading bay 2 without any conflicts. There is not sufficient space for the MSUTAC to turn-around on-site. Therefore, trucks should reverse into the east-west laneway, into loading bay 2, in order to forward exit.

**FIGURE 22** illustrates the MSU-TAC exiting from loading bay 2 without any conflicts.

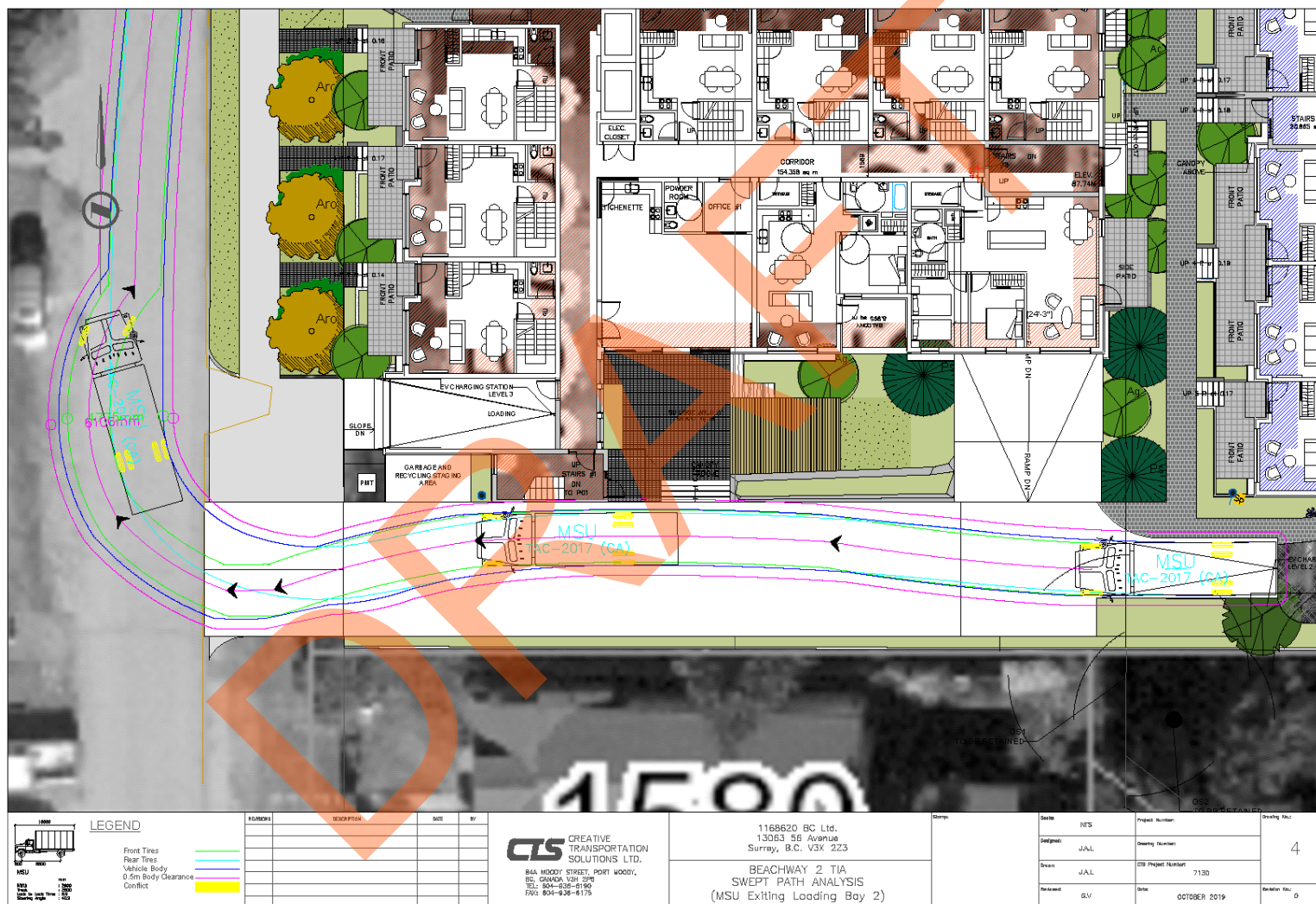






**FIGURE 21**  
**MSU ENTERING LOADING BAY 2**





## 10.0 CONCLUSIONS & RECOMMENDATIONS

### 10.1 Conclusions

- 1) 1168620 BC Ltd is proposing to build a residential development, Beachway 2, at 15704, 15724, 15728, 15738, 15748, 15758, 15770 North Bluff Road in the City of White Rock. The proposed development is to consist of 34 city homes and 113 condominium units for a total of 147 dwelling units. Of the 147 units, 46 are designated as non-market (affordable) rental units with seven (7) of them being city homes and 39 of them being condominium units.
- 2) CTS staff performed weekday traffic volume surveys on Thursday, November 8<sup>th</sup>, 2018 in order to document existing conditions. Future base traffic volumes were projected using a 2.0% annual traffic volumes growth rate (simple straight line) and then the proposed development traffic was superimposed on top to estimate future baseline conditions. The design hours of analysis were the weekday morning and afternoon peak hours.
- 3) Upon the full build-out, the overall development is forecasted to generate a total of 57 vehicle trips (13 inbound, 44 outbound) during the weekday morning peak hour and 70 vehicle trips (42 inbound, 28 outbound) during the weekday afternoon peak hour.
- 4) The capacity analysis for the unsignalized intersections and the site accesses determined that the road network can accommodate the projected increase in traffic volumes without any operational and/or geometrical improvements.
- 5) 2045 peak hour link volumes are estimated using collected turning movement counts. This is provided to give an estimated magnitude of vehicle volumes in the context of the City of White Rock 2045 OCP.
- 6) The City of White Rock parking requirements of 1 space per non-market dwelling unit and 1.5 spaces per market dwelling unit results in a total requirement of 198 parking spaces. The proposed residential development is providing 138 parking spaces, resulting in a 30% or 60 parking space variance.
- 7) In support of a 30% parking variance, reference was made to the intended land use, nearby amenities and infrastructure to encourage alternative modes of travel:
  - Proposed development will have 46 non-market (affordable) rental units
  - Within a 10-15 minute walk of Semiahmoo Shopping Centre and White Rock Centre where the Frequent Transit Network connects
  - Within a 5 minute walk of 5 different bus routes
  - Nearby destinations include Peach Arch Hospital, Earl Marriott Secondary School, Peach Arch Elementary School, Kent Street Activity Centre in Maccaud Park
  - Provision of a car and bike share hub on P1 of the parkade
  - Provision of 186 bicycle spaces, exceeding the 176 bicycle space bylaw requirement
  - Provision of a total of 43 electric vehicle charging parking spaces

- Proposed development will include enhanced sidewalks on the frontage and a greenway through the property.
- 8) The proposed loading bay was reviewed to assess its viability and impact on the adjacent road and curb. The swept path analysis shows that a design vehicle of a MSUTAC can be accommodated without any conflicts. Impacts on the adjacent road way can be minimized and truck turning maneuvering can be safer, if vehicles enter by reversing in while traveling northbound and by exiting forward to travel southbound.

## 10.2 Recommendations

Based on this transportation impact assessment, CTS recommends the following:

- 1) The applicant work with the City to ensure any improvements to the fronting sidewalks align with the City of White Rock *Strategic Transportation Plan*;
- 2) That the proposed residential development provide one (1) parking space for every two (2) non-market (affordable) rental dwelling units, one (1) parking spaces for every market dwelling unit, and 0.2 visitor parking spaces for every market dwelling. This would result in a provision of 23 non-market residential parking spaces, 101 market residential parking spaces, and 20 market visitor parking spaces, for a total of 144 parking spaces.
- 3) That trucks using the loading bay be instructed to reverse into the east-west lane, and forward exit out from the loading bay.



We would like to take this opportunity to thank you for this unique project and we look forward to working with you again in the future. Please call the undersigned should you have any questions or comments.

Yours truly,

**CREATIVE TRANSPORTATION SOLUTIONS LTD.**

*Reviewed by:*

*Prepared by:*

**Gary Vlieg, P.Eng.**  
Engineering Group Manager

**Jacqueline Lee, EIT**  
Junior Traffic Engineer

Attachment

DRAFT

DRAFT

## Appendix A Architectural Drawing



# BEACHWAY 2 - ISSUED FOR DP APPLICATION

2019.10.24



STREET VIEW FROM NORTH BLUFF ROAD & LEE STREET INTERSECTION



STREET VIEW FROM NORTH BLUFF ROAD LOOKING SOUTH

## PROJECT TEAM

ARCHITECTURAL:  
**URBAN ARTS ARCHITECTURE**  
#300-111 WATER STREET  
VANCOUVER, BC V6B 1A7  
604-683-5060  
PARTNER-IN-CHARGE: SHELLEY CRAIG

LANDSCAPE:  
**ETA LANDSCAPE ARCHITECTURE**  
1690 WEST 2ND AVENUE  
VANCOUVER, BC V6J 1H4  
604-683-1456  
CONTACT: DARYL TYACKE

ARBORIST:  
**VDZ+A**  
102-355 KINGSWAY  
VANCOUVER, BC V5T 3J7  
604-882-0024  
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TRAFFIC:  
**CREATIVE TRANSPORTATION SOLUTIONS LTD**  
84A MOODY STREET  
PORT MOODY, BC V3H 2P5  
604-936-6190  
CONTACT: GARY VLIEG/JACQUELINE LEE

SURVEYOR:  
**H.Y. ASSOCIATES LAND SURVEYING LTD.**  
#200, 9126 - 152ND STREET  
SURREY, B.C. V3R 4E7  
604-583-1616  
CONTACT: EUGENE WONG

GEOTECH:  
**GEOWEST ENGINEERING.**  
#200, 34425 - MCCONNELL ROAD  
ABBOTSFORD, B.C. V2S 7P1  
604-852-9088  
CONTACT: JOHN CARTER

DRAWING LIST				
SHEET NO	SHEET NAME	SCALE	DATE	
A000	Cover Page	NTS	2019.10.24	
A001	Information Data 1	NTS	2019.10.24	
A002	Information Data 2 FAR per building	NTS	2019.10.24	
A101	Site Plan	1:200	2019.10.24	
A102	Parkade LVL 01	1:200	2019.10.24	
A103	Parkade LVL 02.0	1:200	2019.10.24	
A105	Preliminary slab plan	1:200	2019.10.24	
A106	Site Plan Coverage	1:200	2019.10.24	
A107	Average Natural Grade Calculation	1:200	2019.10.24	
A201	Non-Market LVL 01 (Building#1)	1:100	2019.10.24	
A201 area	Non-Market LVL 01 (Building#1)	1:100	2019.10.24	
A202	Non-Market LVL 02 (Building#1)	1:100	2019.10.24	
A202 area	Non-Market LVL 02 (Building#1)	1:100	2019.10.24	
A203	Non-Market LVL 03 (Building#1)	1:100	2019.10.24	
A203 area	Non-Market LVL 03 (Building#1)	1:100	2019.10.24	
A204	Non-Market LVL 04 (Building#1)	1:100	2019.10.24	
A204 area	Non-Market LVL 04 (Building#1)	1:100	2019.10.24	
A205	Non-Market LVL 05 (Building#1)	1:100	2019.10.24	
A205 area	Non-Market LVL 05 (Building#1)	1:100	2019.10.24	
A206	Non-Market LVL 06 (Building#1)	1:100	2019.10.24	
A206 area	Non-Market LVL 06 (Building#1)	1:100	2019.10.24	
A207	Non-Market Roof (Building#1)	1:100	2019.10.24	
A208	Market LVL 01 (Building#2)	1:100	2019.10.24	
A208 area	Market LVL 01 (Building#2)	1:100	2019.10.24	
A209	Market LVL 1.5 Mezzanine (Building#2)	1:100	2019.10.24	
A210	Market LVL 02 (Building#2)	1:100	2019.10.24	
A210 area	Market LVL 02 (Building#2)	1:100	2019.10.24	
A211	Market LVL 03 (Building#2)	1:100	2019.10.24	
A211 area	Market LVL 03 (Building#2)	1:100	2019.10.24	
A212	Market LVL 04 (Building#2)	1:100	2019.10.24	
A212 area	Market LVL 04 (Building#2)	1:100	2019.10.24	
A213	Market LVL 05 (Building#2)	1:100	2019.10.24	
A213 area	Market LVL 05 (Building#2)	1:100	2019.10.24	
A214	Market LVL 06/Roof (Building#2)	1:100	2019.10.24	
A214 area	Market LVL 06 (Building#2)	1:100	2019.10.24	
A215	Roof (Building#2)	1:100	2019.10.24	
A216	Market LVL 01 (Building#3)	1:100	2019.10.24	
A216 area	Market LVL 01 (Building#3)	1:100	2019.10.24	
A217	Market LVL 1.5 (Building#3)	1:100	2019.10.24	
A217 area	Market LVL 1.5 (Building#3)	1:100	2019.10.24	
A218	Market LVL 02 (Building#3)	1:100	2019.10.24	
A218 area	Market LVL 02 (Building#3)	1:100	2019.10.24	
A219	Market LVL 03 (Building#3)	1:100	2019.10.24	
A219 area	Market LVL 03 (Building#3)	1:100	2019.10.24	
A220	Market LVL 04 (Building#3)	1:100	2019.10.24	
A220 area	Market LVL 04 (Building#3)	1:100	2019.10.24	
A221	Market LVL 05 (Building#3)	1:100	2019.10.24	
A221 area	Market LVL 05 (Building#3)	1:100	2019.10.24	
A222	Market LVL 06 (Building#3)	1:100	2019.10.24	
A222 area	Market LVL 06 (Building#3)	1:100	2019.10.24	
A223	Roof (Building#3)	1:100	2019.10.24	
A400	Elevation	1:200	2019.10.24	
A401	Elevation	1:200	2019.10.24	
A402	Streetscapes	NTS	2019.10.24	
A403	Bird's Eye Views 1	NTS	2019.10.24	
A404	Bird's Eye Views 2	NTS	2019.10.24	
A405	3D Perspective Views	NTS	2019.10.24	
A406	3D Perspective Views	NTS	2019.10.24	
A407	3D Perspective Views	NTS	2019.10.24	
A408	Car & Bike Share Hub	NTS	2019.10.24	
A501	Section	1:200	2019.10.24	
A502	Section	1:200	2019.10.24	
A503	Section	1:100	2019.10.24	
A504	Section	1:100	2019.10.24	

**Urban Arts**  
Architecture Urban Design

300-111 Water Street  
Vancouver, BC  
Canada V6B 1A7  
t: 604-683-5060  
e: info@urban-arts.ca

SEAL:

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Do not scale drawings.

Consultant Name  
  
**BEACHWAY**

A 2019-10-23 Issued for DP Application  
REV. DATE ISSUE

WR-NBR-2

BEACHWAY 2

Cover Page

A000

PLOT DATE: 2019.10.24SCALE: NTS

DRAWN BY: OEMCHECK BY: SC



SEAL:

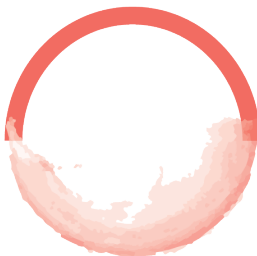
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Do not scale drawings.

Consultant Name



BEACHWAY

SITE DATA:											
CIVIC ADDRESS:	15704 North Bluff Road, White Rock, BC (Lot 1), 15724 North Bluff Road, White Rock, BC (Lot 2) 15728 North Bluff Road, White Rock, BC (Lot Rem1),15738 North Bluff Road, White Rock, BC (Lot Rem2) 15748 North Bluff Road, White Rock, BC (Lot 305),15758 North Bluff Road, White Rock, BC (Lot 3) 15770 North Bluff Road, White Rock, BC (Lot 4)										
LEGAL ADDRESS:	Lots 1 to 2, New Westminster District, Plan 18697; Lots Rem 1 & Rem 2, New Westminster District, Plan 13659 Lots 305, New Westminster District, Plan 35289; Lots 3 & 4 New Westminster District, Plan 17402										
LOT AREA:	5,366.241 sq.m.	57761.684 sq ft									
LOT COVERAGE:	2,788.209 sq.m.	30012 sq ft	51.958%								
DEVELOPMENT STATISTICS:											
ZONING:	Multi-Residential										
USES:											
NUMBER OF UNITS:	NON-MARKET 46 (31.3%)	MARKET 101 (68.7%)	TOTAL 147 (100%)								
FAR SUMMARY:											
MAX. FAR	GROSS AREA SQ.M. 13,415.603 sq.m.	GROSS AREA SQ.FT. sq ft 144,404.209 sq.ft.	FAR 2.5	RESIDENTIAL SQ.M.	RESIDENTIAL SQ.FT.	FAR					
PROPOSED FAR:											
BUILDING #1 (NON-MARKET)	3,783.70 sq.m.	40,727.390 sq ft	0.705 FAR	2,918.26 sq.m.	31411.809 sq ft	0.544 FAR					
BUILDING #2 (MARKET)	3,897.22 sq.m.	41,949.299 sq ft	0.726 FAR	3,321.59 sq.m.	35753.314 sq ft	0.619 FAR					
BUILDING #3 (MARKET)	5,732.43 sq.m.	61,703.292 sq ft	1.068 FAR	4,699.92 sq.m.	50,918.9 sq.ft.	0.882 FAR					
TOTAL:	13,413.4 sq.m.	144,380.0 sq.ft.	2.5 FAR	10,939.8 sq.m.	118,084.0 sq.ft.	2.044 FAR					
EFFICIENCY (RESIDENTIAL/GROSS):	82%										
PROPOSED UNIT AREAS:	(Refer to A004)										
INDOOR AMENITY											
BUILDING #1 (NON-MARKET)	54.17 sq.m.	583.049 sq ft									
BUILDING #2 (MARKET)	49.24 sq.m.	530.006 sq ft									
BUILDING #3 (MARKET)	163.05 sq.m.	1755.099 sq ft									
TOTAL:	266.46 sq.m.	2,868.153 sq ft									
PARKING:											
PARKING AREA LEVEL 1	4,224 sq.m.	45464.657 sq ft									
PARKING AREA LEVEL 2	1,057 sq.m.	11376.312 sq ft									
TOTAL:	5,281 sq.m.	56,840.969 sq ft									
PARKING SPACES REQUIRED:											
	NON-MARKET (1 per 46 units)	46									
	MARKET (1.2 per 101 units)	121.2									
	MARKET VISITORS (0.3 per 101 units)	30.3									
	TOTAL:	197.5									
PARKING SPACES PROPOSED:											
	NON-MARKET	46	RELAXATION RATIONALE	GRAND TOTAL							
	NON-MARKET VISITOR	2	-	46							
	MARKET	63	-	2							
	MARKET VISITOR	10	-	63							
	MARKET CAR SHARE	12	5 Parking Spaces = 1 car share	10							
	MARKET VISITOR CAR SHARE	5	5 Parking Spaces = 1 car share	60							
	TOTAL:	138		25							
				206							
BIKES:											
	NON-MARKET (CLASS 1)	51									
	MARKET (CLASS 1)	105									
	MARKET BIKE SHARE	26	Added to relax the number of parking								
	TOTAL:	182									
UNIT DISTRIBUTION BY TYPE OF UNIT:											
	2 BED TOWNHOUSE	3 BED TOWNHOUSE	1 BED APARTMENT	2 BED APARTMENT	TOP UNIT (3 BED)	TOP UNIT (2 BED)	TOP UNIT (1 BED)	STUDIO			
BUILDING #1 (NON-MARKET)	6	1	31	8	0	0	0	0			
BUILDING #2 (MARKET)	8	4	17	4	5	1	1	1			
BUILDING #3 (MARKET)	6	9	16	23	6	0	0	0			
TOTAL:	20	14	64	35	11	1	1	1			
PERCENTAGE:	(13.6%)	(9.5%)	(43.5%)	(23.8%)	(7.5%)	(0.7%)	(0.7%)	(0.7%)			
UNIT DISTRIBUTION BY BEDROOM:											
	TOTAL	PERCENTAGE									
ONE BEDROOM:	65	(44.2%)									
TWO BEDROOMS:	56	(38.1%)									
THREE BEDROOMS:	25	(17.0%)									
STUDIO:	1	(0.7%)									
Σ TOTAL UNITS:	147										

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BEACHWAY 2

Information Data 1

A001

PLOT DATE: 2019.10.24SCALE: NTS

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FAR CALCULATION BUILDING #1

# OF BUILDING	# UNIT	TYPE UNIT	LEVEL OF UNIT	AREA OF UNIT SQ M	AREA OF UNIT SQ F	
BUILDING #1 (NON-MARKET)	101	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	102	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	103	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	104	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	108	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	109	UNIT A (2 BED)	Level 1 B1	42.951 sq m	462.321 sq ft	
	TOTAL:			257.706 sq m	2773.923 sq ft	
	101	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	102	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	103	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	104	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	108	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	109	UNIT A (2 BED) 2ND FLOOR	Level 2 B1	34.889	375.543 sq ft	
	TOTAL NUMBER OF UNITS:			6	2253.26 sq ft	
	107	UNIT A1 (3 BED) 1ST FLOOR	Level 1 B1	42.951	462.321 sq ft	
	107	UNIT A1 (3 BED) 2ND FLOOR	Level 2 B1	52.617	566.36 sq ft	
	TOTAL NUMBER OF UNITS:			1	1028.681 sq ft	
	106	UNIT B (1 BED)	Level 1 B1	57.033	613.901 sq ft	
	202	UNIT B (1 BED)	Level 2 B1	57.033	613.901 sq ft	
	203	UNIT B (1 BED)	Level 2 B1	57.033	613.901 sq ft	
	301	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft	
	302	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft	
	303	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft	
	305	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft	
	306	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft	
307	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft		
308	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft		
309	UNIT B (1 BED)	Level 3 B1	57.033	613.901 sq ft		
401	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
402	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
403	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
405	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
406	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
407	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
408	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
409	UNIT B (1 BED)	Level 4 B1	57.033	613.901 sq ft		
501	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
502	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
503	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
505	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
506	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
507	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
508	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
509	UNIT B (1 BED)	Level 5 B1	57.033	613.901 sq ft		
601	UNIT B (1 BED)	Level 6 B1	57.033	613.901 sq ft		
602	UNIT B (1 BED)	Level 6 B1	57.033	613.901 sq ft		
603	UNIT B (1 BED)	Level 6 B1	57.033	613.901 sq ft		
605	UNIT B (1 BED)	Level 6 B1	57.033	613.901 sq ft		
TOTAL NUMBER OF UNITS:			31	1768.034 sq m		
105	TYPE C2 (2BED)	Level 1 B1	78.585	845.876 sq ft		
201	UNIT C (2 BED)	Level 2 B1	71.206	766.453 sq ft		
304	UNIT C (2 BED)	Level 3 B1	71.206	766.453 sq ft		
404	UNIT C (2 BED)	Level 4 B1	71.206	766.453 sq ft		
504	UNIT C (2 BED)	Level 5 B1	71.206	766.453 sq ft		
604	UNIT C (2 BED)	Level 6 B1	71.206	766.453 sq ft		
TOTAL NUMBER OF UNITS:			6	434.614 sq m		
606	UNIT D (2 BED)	Level 6 B1	76.5	823.433 sq ft		
607	UNIT D (2 BED)	Level 6 B1	76.5	823.433 sq ft		
TOTAL NUMBER OF UNITS:			2	152.999 sq m		
Σ TOTAL NUMBER OF UNITS:	46					
100-A	CIRCULATION LEVEL 1	Level 1 B1	186.994 sq m	2012.779 sq ft		
	CIRCULATION LEVEL 2	Level 2 B1	124.268 sq m	1337.607 sq ft		
300	CIRCULATION	Level 3 B1	124.015 sq m	1334.89 sq ft		
400	CIRCULATION	Level 4 B1	124.015 sq m	1334.89 sq ft		
500	CIRCULATION	Level 5 B1	124.015 sq m	1334.89 sq ft		
600	CIRCULATION LEVEL 06	Level 6 B1	127.972 sq m	1377.475 sq ft		
TOTAL:			811.28 sq m	8732.532 sq ft		
100-B	INDOOR AMENITY	Level 1 B1	54.167 sq m	583.049 sq ft		
TOTAL:			54.167 sq m	583.049 sq ft		
Σ TOTAL AREA:			3783.702 sq m	40727.39 sq ft		
GROSS FLOOR AREA:			3783.702 sq m	40727.39 sq ft		
GROSS FLOOR FAR:			0.71	0.71		
RESIDENTIAL FLOOR AREA:			2918.255 sq m	31411.809 sq ft		
GROSS RESIDENTIAL FLOOR FAR (LOTS 1 & 2):			0.54	0.54		

FAR CALCULATION BUILDING #2

# OF BUILDING	# UNIT	TYPE UNIT	LEVEL OF UNIT	AREA OF UNIT SQ M	AREA OF UNIT SQ F
BUILDING #2 (MARKET)					
	101A	TYPE 2A (2BED)	Level 1 B2	49.11 sq m	528.619 sq ft
	102A	TYPE 2A3 (2BED)	Level 1 B2	50.862 sq m	547.47 sq ft
	103A	TYPE 2A3 (2BED)	Level 1 B2	50.862 sq m	547.47 sq ft
	108A	TYPE 2A3 (2BED)	Level 1 B2	50.862 sq m	547.47 sq ft
	109A	TYPE 2A3 (2BED)	Level 1 B2	50.862 sq m	547.47 sq ft
	110A	TYPE 2A (2BED)	Level 1 B2	49.11 sq m	528.619 sq ft
	111A	TYPE 2A (2BED)	Level 1 B2	49.11 sq m	528.619 sq ft
	112A	TYPE 2A (2BED)	Level 1 B2	49.11 sq m	528.619 sq ft
	TOTAL:			399.888 sq m	4304.356 sq ft
	101A	TYPE 2A2	Level 2 B2	54.705 sq m	588.84 sq ft
	102A	TYPE 2A3 LEVEL 2	Level 2 B2	46.15 sq m	496.757 sq ft
	103A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
	108A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
	109A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
	110A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
	111A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
	112A	TYPE 2A LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft
TOTAL NUMBER OF UNITS:	8	TOTAL:		370.368 sq m	3986.6 sq ft
104A	TYPE 2A2 (2BED+MEZZ)	Level 1 B2	50.862 sq m	547.47 sq ft	
105A	TYPE 2A1 (2BED+MEZZ)	Level 1 B2	50.862 sq m	547.47 sq ft	
106A	TYPE 2A2 (2BED+MEZZ)	Level 1 B2	50.862 sq m	547.47 sq ft	
107A	TYPE 2A2 (2BED+MEZZ)	Level 1 B2	50.862 sq m	547.47 sq ft	
TOTAL:			203.447 sq m	2189.879 sq ft	
105A	TYPE 2A1 MEZZANINE	Level 1.5 B2	17.904 sq m	192.717 sq ft	
107A	TYPE 2A2 MEZZANINE	Level 1.5 B2	17.48 sq m	188.158 sq ft	
106A	TYPE 2A2 MEZZANINE	Level 1.5 B2	17.48 sq m	188.158 sq ft	
104A	TYPE 2A2 MEZZANINE	Level 1.5 B2	17.48 sq m	188.158 sq ft	
TOTAL:			70.345 sq m	757.19 sq ft	
105A	TYPE 2A1 LEVEL 2	Level 2 B2	65.233 sq m	702.159 sq ft	
106A	TYPE 2A2 LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft	
107A	TYPE 2A2 LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft	
104A	TYPE 2A2 LEVEL 2	Level 2 B2	44.919 sq m	483.501 sq ft	
TOTAL NUMBER OF UNITS:	4	TOTAL:		199.989 sq m	2152.66 sq ft
302A	TYPE 2B (1 BED TYP.)	Level 3 B2	54.44 sq m	585.986 sq ft	
303A	TYPE 2B (1 BED TYP.)	Level 3 B2	54.44 sq m	585.986 sq ft	
304A	TYPE 2B1 (1BED & DEN)	Level 3 B2	71.767 sq m	772.49 sq ft	
305A	TYPE 2B (1 BED TYP.)	Level 3 B2	54.44 sq m	585.986 sq ft	
306A	TYPE 2B (1 BED TYP.)	Level 3 B2	54.44 sq m	585.986 sq ft	
307A	TYPE 2B (1 BED TYP.)	Level 3 B2	54.44 sq m	585.986 sq ft	
308A	TYPE 2C (1 BED)	Level 3 B2	42.981 sq m	462.643 sq ft	
402A	TYPE 2B (1 BED TYP.)	Level 4 B2	54.44 sq m	585.986 sq ft	
403A	TYPE 2B (1 BED TYP.)	Level 4 B2	54.44 sq m	585.986 sq ft	
404A	TYPE 2B2 (1 BED+DEN)	Level 4 B2	70.755 sq m	761.601 sq ft	
405A	TYPE 2B (1 BED TYP.)	Level 4 B2	54.44 sq m	585.986 sq ft	
406A	TYPE 2B (1 BED TYP.)	Level 4 B2	54.44 sq m	585.986 sq ft	
407A	TYPE 2B (1 BED TYP.)	Level 4 B2	54.44 sq m	585.986 sq ft	
408A	TYPE 2C (1 BED)	Level 4 B2	42.981 sq m	462.643 sq ft	
507A	TYPE 2B (1 BED TYP.)	Level 5 B2	54.44 sq m	585.986 sq ft	
508A	TYPE 2B (1 BED TYP.)	Level 5 B2	54.44 sq m	585.986 sq ft	
509A	TYPE 2B (1 BED TYP.)	Level 5 B2	54.44 sq m	585.986 sq ft	
TOTAL NUMBER OF UNITS:	17	TOTAL:		936.204 sq m	10077.202 sq ft
301A	TYPE 2D (2BED)	Level 3 B2	70.666	760.639 sq ft	
309A	TYPE 2E (2BED)	Level 3 B2	84.629	910.942 sq ft	
401A	TYPE 2D (2BED)	Level 4 B2	70.666	760.639 sq ft	
409A	TYPE 2E (2BED)	Level 4 B2	84.629	910.942 sq ft	
TOTAL NUMBER OF UNITS:	4	TOTAL:		310.59 sq m	3343.163 sq ft
502A	TYPE 2F1 (3BED)	Level 5 B2	46.241	497.736 sq ft	
502A	TYPE 2F LEVEL 2	Level 6 B2	73.012	785.892 sq ft	
503A	TYPE 2F	Level 5 B2	45.008	484.465 sq ft	
503A	TYPE 2F LEVEL 2	Level 6 B2	73.012	785.892 sq ft	
504A	TYPE 2F	Level 5 B2	45.008	484.465 sq ft	
504A	TYPE 2F LEVEL 2	Level 6 B2	73.012	785.892 sq ft	
505A	TYPE 2F	Level 5 B2	45.008	484.465 sq ft	
505A	TYPE 2F LEVEL 2	Level 6 B2	73.012	785.892 sq ft	
511A	TYPE 2J (3BED)	Level 5 B2	62.927	677.339 sq ft	
511A	TYPE 2J LEVEL 2	Level 6 B2	62.855	676.566 sq ft	
TOTAL NUMBER OF UNITS:	5	TOTAL:		599.095 sq m	6448.602 sq ft
501A	TYPE 2H (2BED)	Level 5 B2	42.226	454.512 sq ft	
501A	TYPE 2H LEVEL 2	Level 6 B2	69.928	752.698 sq ft	
508A	TYPE 2J (1BED)	Level 5 B2	32.296	347.63 sq ft	
508A	TYPE 2J LEVEL 2	Level 6 B2	47.501	511.294 sq ft	
TOTAL NUMBER OF UNITS:	2	TOTAL:		191.95 sq m	2066.133 sq ft
510A	TYPE 2C1 (STUDIO)	Level 5 B2	39.719	427.529 sq ft	
TOTAL NUMBER OF UNITS:	1	TOTAL:		39.719 sq m	427.529 sq ft
Σ TOTAL NUMBER OF UNITS:	41				
100A	LEVEL01 B2 CIRCULATION	Level 1 B2	99.874 sq m	1075.036 sq ft	
200A	LEVEL02 B2 CIRCULATION	Level 2 B2	40.726 sq m	438.373 sq ft	
300A	LEVEL03 B2 CIRCULATION	Level 3 B2	125.236 sq m	1348.024 sq ft	
400A	LEVEL 04 B2 CIRCULATION	Level 4 B2	125.033 sq m	1345.845 sq ft	
500A	LEVEL 5 B2 CIRCULATION	Level 5 B2	135.516 sq m	1458.701 sq ft	
TOTAL:			526.387 sq m	5665.979 sq ft	
100B	LEVEL 1 GUEST ROOM	Level 1 B2	34.753 sq m	374.074 sq ft	
100B	GUEST ROOM MEZZ	Level 1.5 B2	14.487 sq m	155.932 sq ft	
TOTAL:			49.239 sq m	530.006 sq ft	
Σ TOTAL AREA:				3897.221 sq m	41949.299 sq ft
GROSS FLOOR AREA:				3897.221 sq m	41949.299 sq ft
GROSS FLOOR FAR:				0.73	0.73
RESIDENTIAL FLOOR AREA:				3321.595 sq m	35753.314 sq ft
GROSS RESIDENTIAL FLOOR FAR:				0.62	0.62



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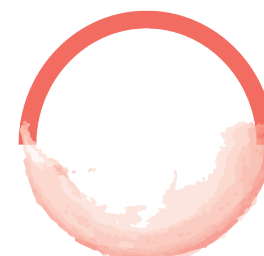
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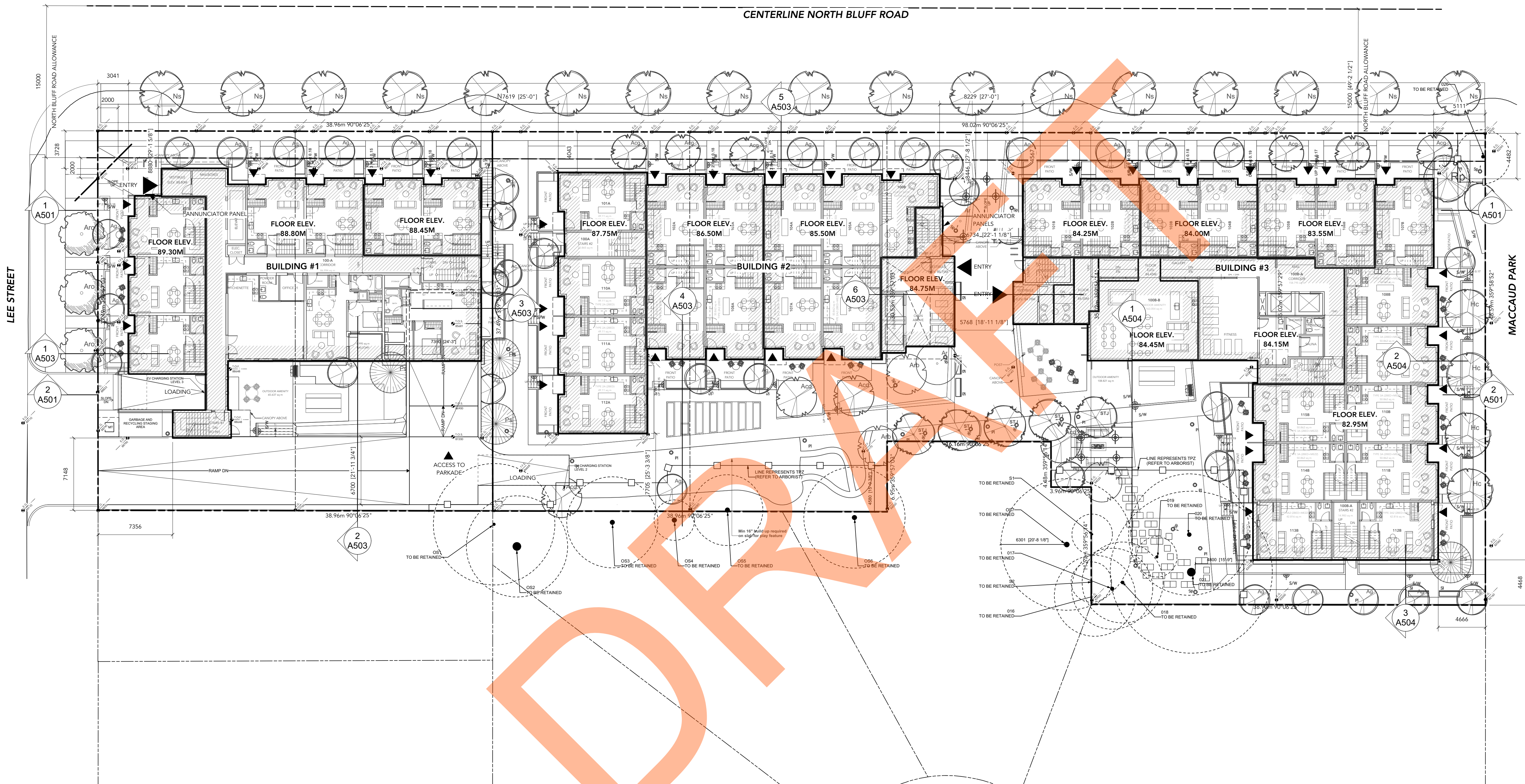
WR-NBR-2  
BEACHWAY 2

Site Plan

A101

PLOT DATE: 2019.10.24 SCALE: 1:200

DRAWN BY: OEM CHECK BY: SC



TREE LEGEND:

TREES TO BE RETAINED\*

TREE BARRIER PROTECTION\*

TRUNK SIZE AND LOCATION\*

(REFER TO ARBORIST REPORT)

GRADING LEGEND:

E.G. — EXISTING GRADE\*

P.G. — PROPOSED GRADE

T.O.S. — TOP OF SLAB

F.F.E. — FINISHED FLOOR ELEVATION

(REFER TO SURVEY PLAN)  
ALL ELEVATIONS IN MILLIMETRES





SEAL:

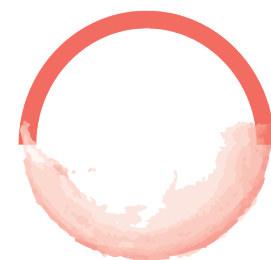
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BEACHWAY 2

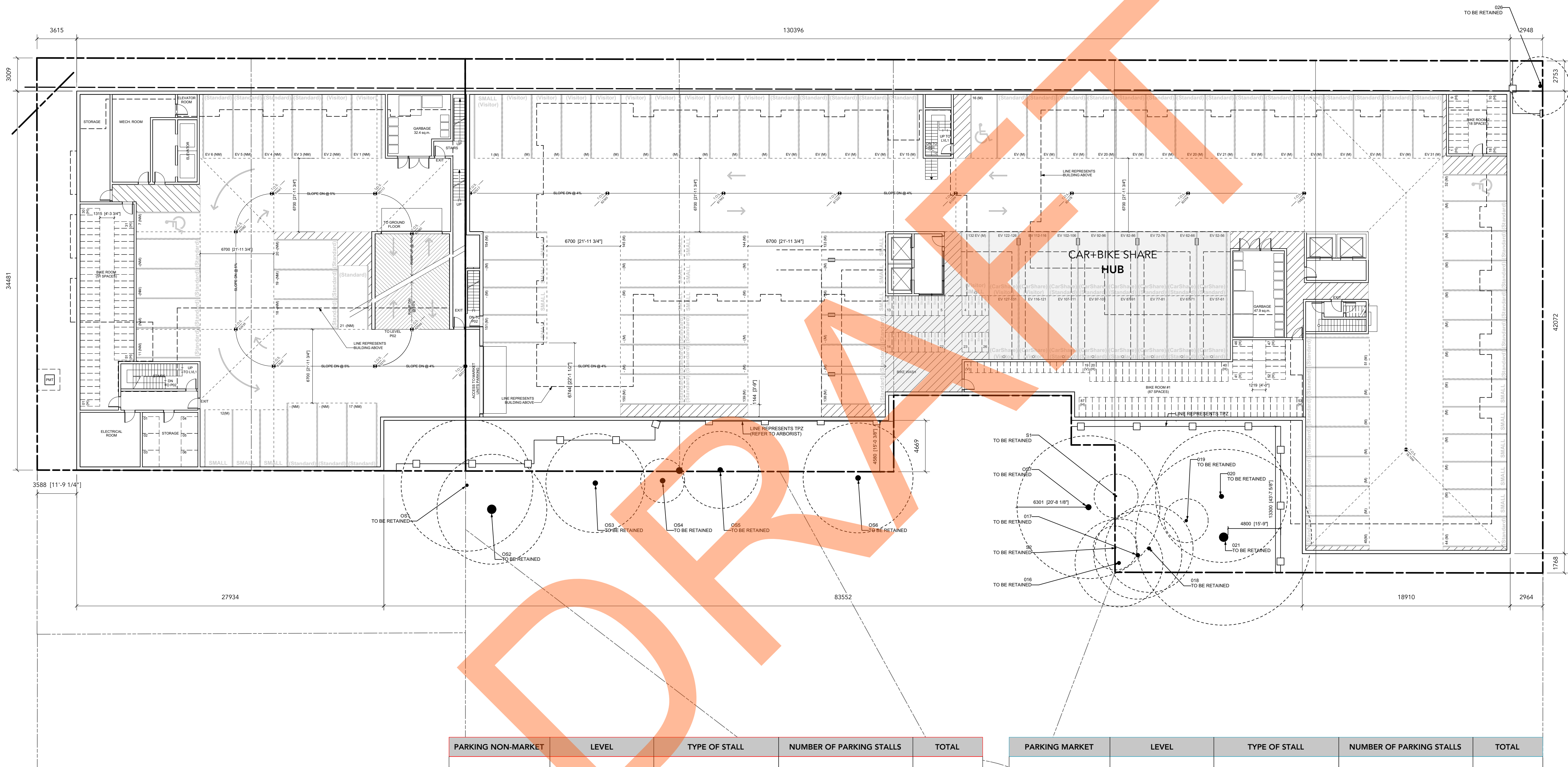
Parkade LVL 01

A102

PLOT DATE: 2019.10.24 SCALE: 1:200

DRAWN BY: OEM CHECK BY: SC

NORTH BLUFF ROAD



TREE LEGEND:

TREES TO BE RETAINED\*

TREE BARRIER PROTECTION\*

TRUNK SIZE AND LOCATION\*

(REFER TO ARBORIST REPORT)

GRADING LEGEND:

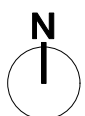
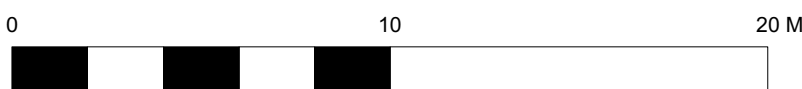
E.G. — EXISTING GRADE\*

P.G. — PROPOSED GRADE

T.O.S. — TOP OF SLAB

F.F.E. — FINISHED FLOOR ELEVATION

(REFER TO SURVEY PLAN)  
ALL ELEVATIONS IN MILLIMETRES



PARKING NON-MARKET	LEVEL	TYPE OF STALL	NUMBER OF PARKING STALLS	TOTAL
BUILDING #1	PARKADE LEVEL 01	STANDARD SPACE (2.7X5.8)	17	21
		SMALL SPACE (2.5X5.8)	0	
		SMALL SPACE (2.5X5.2)	3	
		HANDICAPPED SPACE (4.0X5.8)	1	
		TOTAL		
	PARKADE LEVEL 02	STANDARD SPACE	17	27
		SMALL SPACE (2.5 X 5.8)	6	
		SMALL SPACE (2.5X5.2)	4	
		HANDICAPPED SPACE	0	
		TOTAL		
Σ TOTAL SPACES:			48	

PARKING MARKET	LEVEL	TYPE OF STALL	NUMBER OF PARKING STALLS	TOTAL
BUILDING #2 & 3	PARKADE LEVEL 01	STANDARD SPACE (2.7X5.8)	52	90
		SMALL SPACE (2.5X5.8)	19	
		SMALL SPACE (2.5X5.2)	0	
		HANDICAPPED SPACE (4.0X5.8)	2	
		CAR SHARE STANDARD	16	
		CAR SHARE SMALL (2.5X5.8)	1	
		Σ TOTAL SPACES:		

SEAL:

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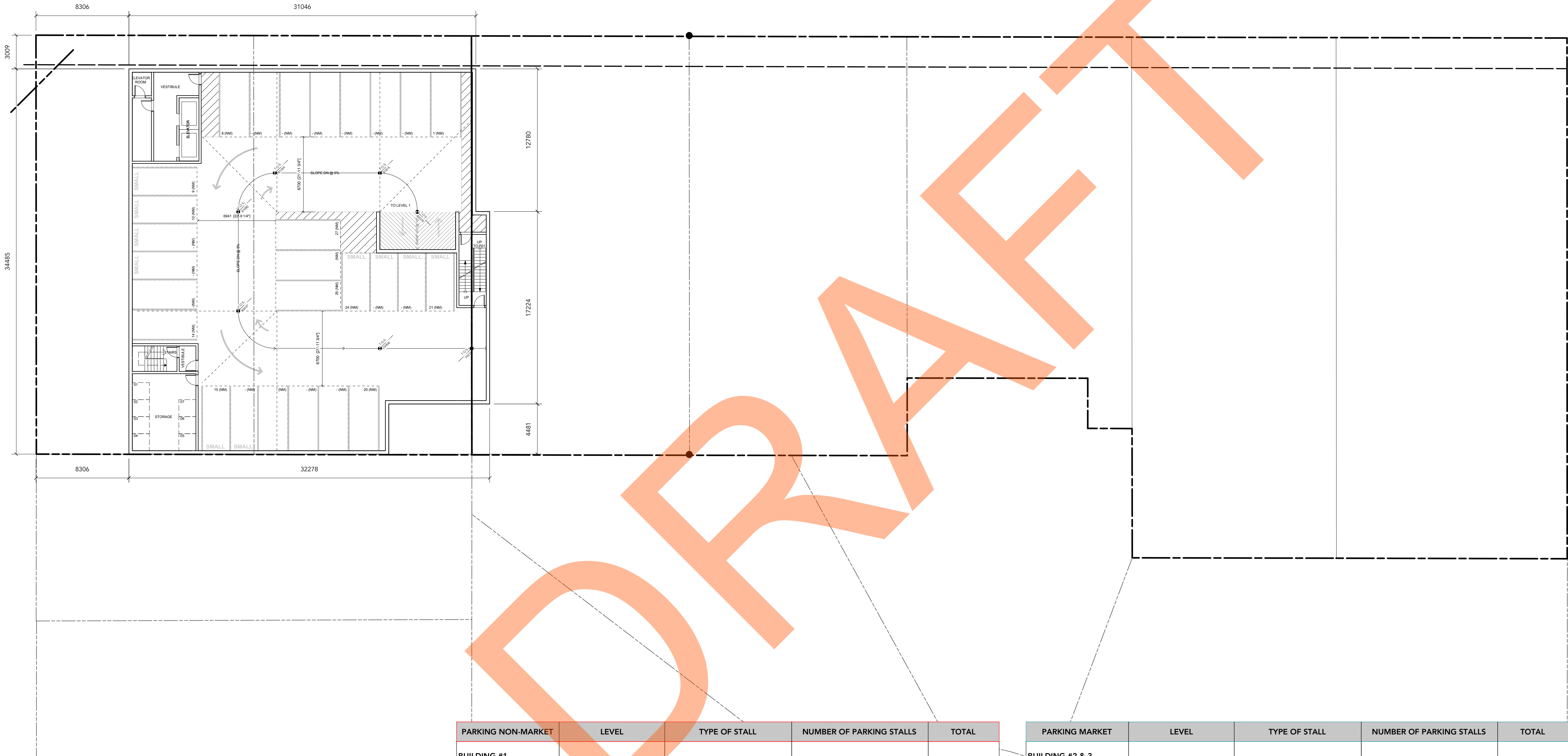
A	2019-10-23	Issued for DP Application
REV.	DATE	ISSUE

WR-NBR-2  
BEACHWAY 2

Parkade LVL 02.0

A103

PLOT DATE: 2019.10.24	SCALE: 1:200
DRAWN BY: OEM	CHECK BY: SC



GRADING LEGEND:

- E.G. EXISTING GRADE\*
  - P.G. PROPOSED GRADE
  - T.O.S. TOP OF SLAB
  - F.F.E. FINISHED FLOOR ELEVATION
- \*REFER TO SURVEY PLAN  
ALL ELEVATIONS IN MILLIMETRES



PARKING NON-MARKET	LEVEL	TYPE OF STALL	NUMBER OF PARKING STALLS	TOTAL
BUILDING #1	PARKADE LEVEL 01	STANDARD SPACE (2.7X5.8)	17	21
		SMALL SPACE (2.5X5.8)	0	
		SMALL SPACE (2.5X5.2)	3	
		HANDICAPPED SPACE (4.0X5.8)	1	
		TOTAL		
	PARKADE LEVEL 02	STANDARD SPACE	17	27
		SMALL SPACE (2.5 X 5.8)	6	
		SMALL SPACE (2.5X5.2)	4	
		HANDICAPPED SPACE	0	
		TOTAL		
Σ TOTAL SPACES:			48	

PARKING MARKET	LEVEL	TYPE OF STALL	NUMBER OF PARKING STALLS	TOTAL
BUILDING #2 & 3	PARKADE LEVEL 01	STANDARD SPACE (2.7X5.8)	52	90
		SMALL SPACE (2.5X5.8)	19	
		SMALL SPACE (2.5X5.2)	0	
		HANDICAPPED SPACE (4.0X5.8)	2	
		CAR SHARE STANDARD	16	
		CAR SHARE SMALL (2.5X5.8)	1	
		Σ TOTAL SPACES:		



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BEACHWAY

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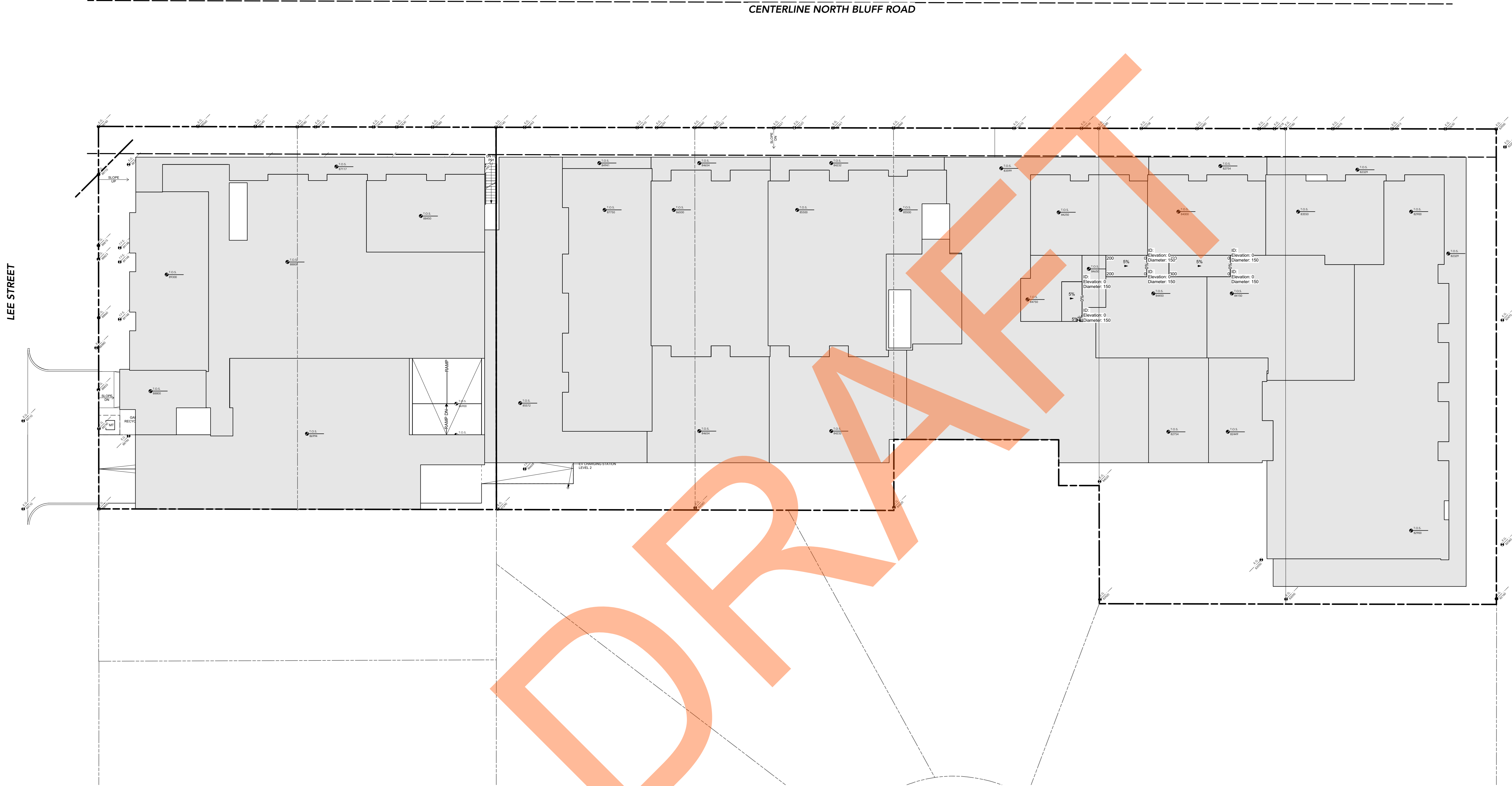
WR-NBR-2  
BEACHWAY 2

Preliminary slab plan

A105

PLOT DATE: 2019.10.24 SCALE: 1:200

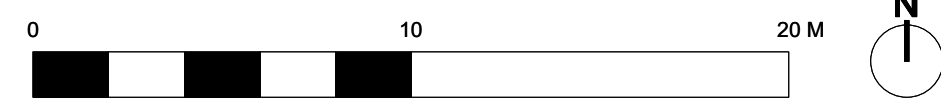
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GRADING LEGEND:

- E.G. EXISTING GRADE\*
- P.G. PROPOSED GRADE
- T.O.S. TOP OF SLAB
- F.F.E. FINISHED FLOOR ELEVATION

\*REFER TO SURVEY PLAN  
ALL ELEVATIONS IN MILLIMETRES



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Consultant Name



BEACHWAY

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REV. DATE ISSUE

WR-NBR-2  
BEACHWAY 2

Site Plan Coverage

A106

PLOT DATE: 2019.10.24 SCALE: 1:200

DRAWN BY: OEM CHECK BY: SC

CENTERLINE NORTH BLUFF ROAD

LEE STREET

MACCAUD PARK

SITE DATA:

CIVIC ADDRESS:

15704 North Bluff Road, White Rock, BC (Lot 1), 15724 North Bluff Road, White Rock, BC (Lot 2)  
15728 North Bluff Road, White Rock, BC (Lot Rem1), 15738 North Bluff Road, White Rock, BC (Lot Rem2)  
15748 North Bluff Road, White Rock, BC (Lot 305), 15758 North Bluff Road, White Rock, BC (Lot 3)  
15770 North Bluff Road, White Rock, BC (Lot 4)

LEGAL ADDRESS:

Lots 1 to 2, New Westminster District, Plan 18697; Lots Rem 1 & Rem 2, New Westminster District, Plan 13659  
Lots 305, New Westminster District, Plan 35289; Lots 3 & 4 New Westminster District, Plan 17402

LOT AREA:

5,366.241 sq.m. 57761.684 sq ft

LOT COVERAGE:

BUILDING 1	747.368 sq.m.	8044.6 sq ft	13.927%
BUILDING 2&3	2,040.840 sq.m.	21967.4 sq ft	38.031%
TOTAL:	2,788.209 sq.m.	30012 sq ft	51.958%

**Appendix B**  
**Beachway 1 Draft Traffic Impact Assessment**

Date: 19 December 2018  
Our File No: 5935-01

**BY EMAIL**

**Mr. Raghbir Gurm**  
1168620 BC Limited  
13063 56 Ave  
Surrey BC  
V3X2Z3

Dear Mr. Gurm,

**Re: Traffic Impact Assessment Study – Beachway Residential Development  
White Rock, BC**

Creative Transportation Solutions Ltd. (CTS) is pleased to submit this **DRAFT** report summarising our work on the above study. CTS was retained by **Mr. Raghbir Gurm** on 9 October 2018 to undertake a traffic impact study for a residential townhouse and condominium development at Maple Street, Lee Street, and North Bluff Road in the City of White Rock, BC. The primary objectives of this study are as follows:

1. To conduct a traffic impact assessment of the proposed development; and,
2. To document the analyses, findings and recommendations in a report that satisfies that requirements of the City of White Rock.

This report documents our analyses and findings.

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## 1.0 BACKGROUND

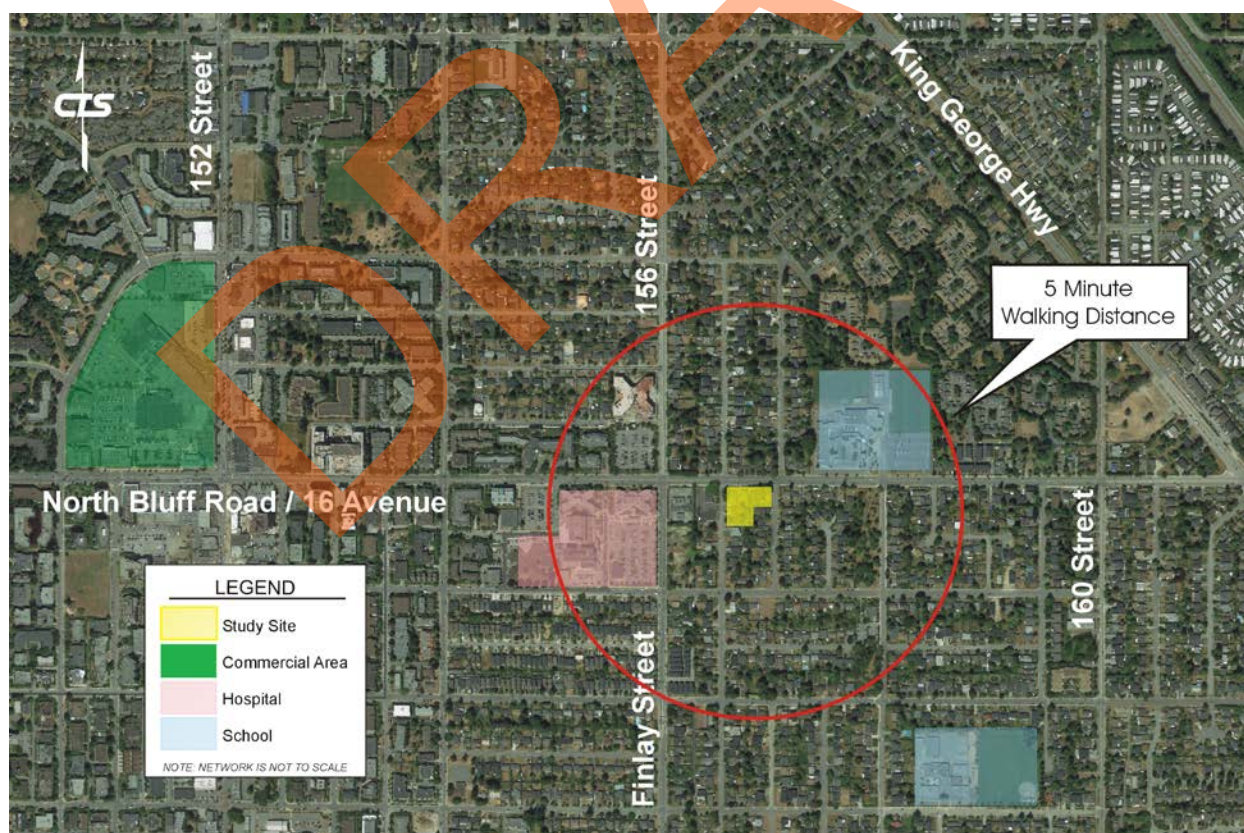
### 1.1 The Site

It is being proposed to build a residential development at the following addresses in White Rock, BC:

- 15654 North Bluff Road
- 15664 North Bluff Road
- 15674 North Bluff Road
- 1593 Lee Street
- 1580 Maple Street
- 1570 Maple Street

The current zoning is RS-1 (One Unit Residential Zone) and the site is located in the east side large-lot infill redevelopment area (Please see **FIGURE 1**). The development area is noted in the City of White Rock OCP as a potential affordable market housing. A section of the property is noted as suitable for Small Lot & Street-Front Townhouse, and the remaining section is noted as suitable for Multi-Unit Residential (Low Density)..

**FIGURE 1**  
**SITE CONTEXT**

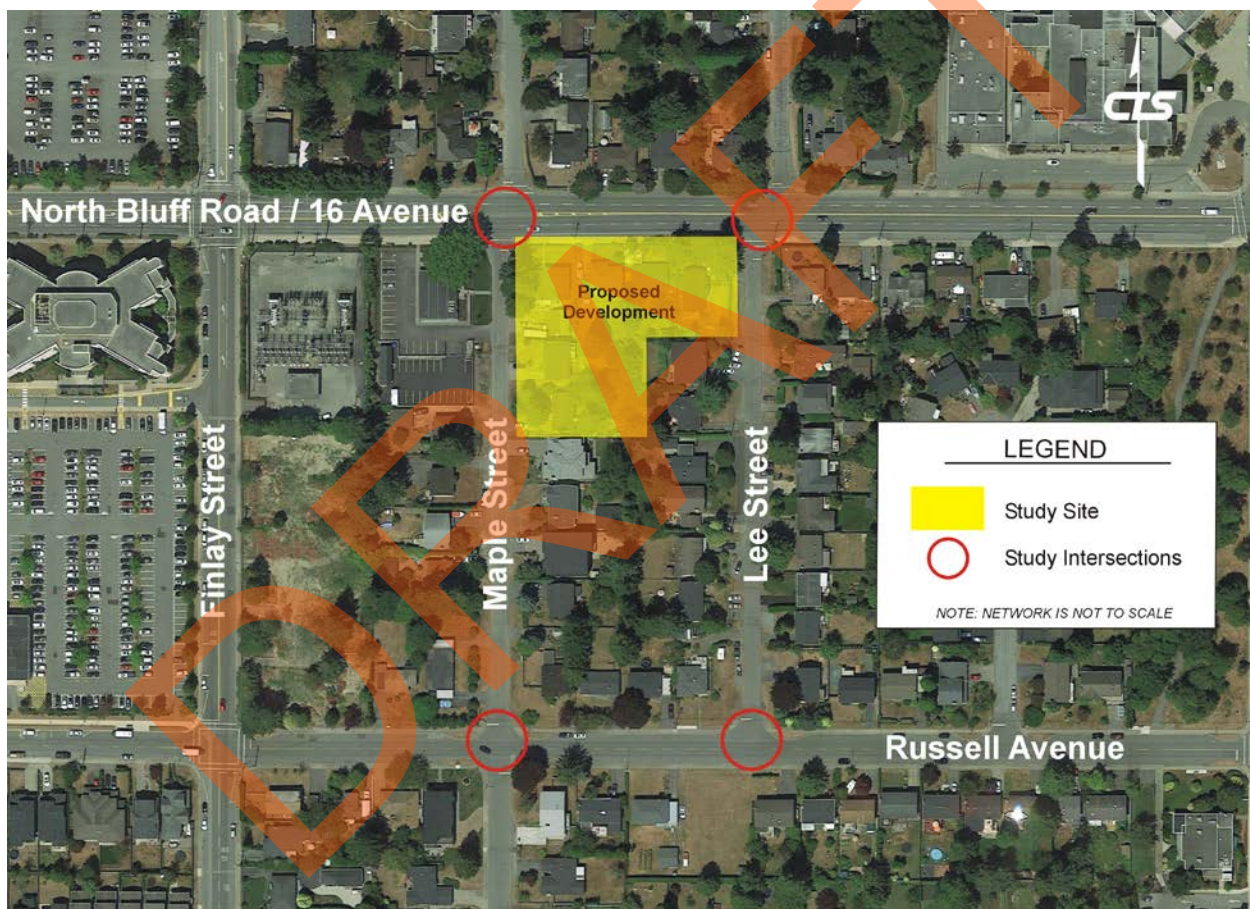


The residential development is proposed to be rezoned as a comprehensive development and will have 14 townhouse units and 76 condominium units for a total of 90 dwelling units. 25 of the condominium units will be non-market rental.

Access to the site is proposed via a driveway on Maple Street and a driveway on Lee Street. For the purposes of this study, development was assumed to be completed and fully occupied by 2020.

The study area and the existing roadways are illustrated in **FIGURE 2**. The referenced site plan is included in **APPENDIX A**.

**FIGURE 2  
STUDY AREA AND INTERSECTIONS**





## 1.2 Site Visit / Road Network

A site visit was conducted in order to document current conditions. The following road network characteristics were confirmed.

### North Bluff Road / 16th Avenue

- East-west arterial
- Centerline forms the municipal boundary between City of White Rock and City of Surrey.
- Four lanes.
- Truck Route.
- No Stopping on north side. 'Permit Parking Only' on south side
- Concrete curb and gutter along both sides of the road.
- Street lighting.

### Russell Avenue

- East / west primary collector
- Two lanes – two through lanes with two parking lanes.
- 'Permit parking Only' on both sides
- Concrete curb and gutter along both sides of the road.
- Street lighting.

### Lee Street

- North / south neighborhood local road.
- Two lanes.
- 'Permit parking Only' on both sides
- No curb or gutter.
- Street Lighting.

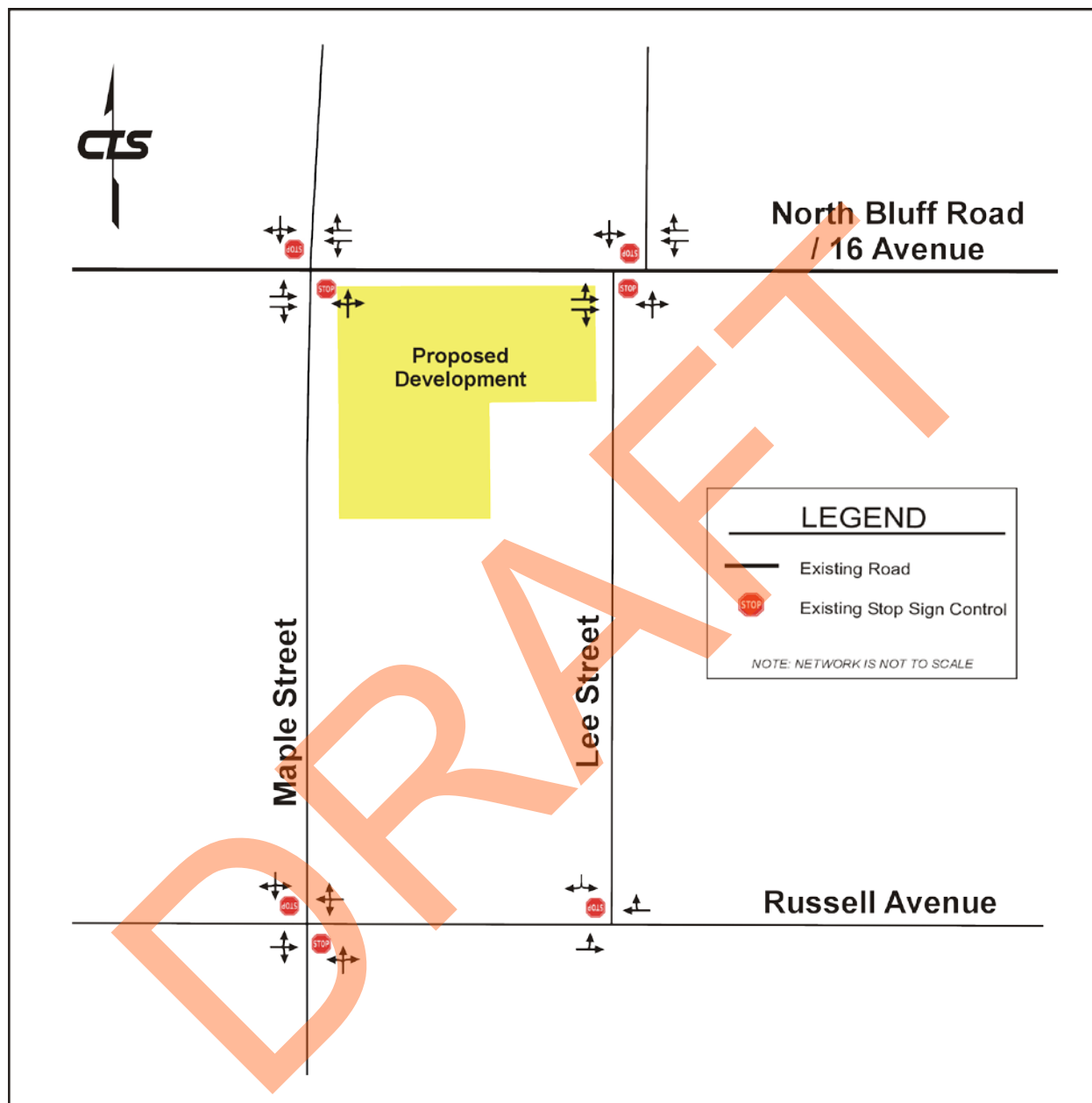
### Maple Street

- North / south neighborhood local road.
- Two lanes.
- 'Permit parking Only' on both sides
- No curb or gutter.
- Street Lighting.

The laning configuration for the study intersections are illustrated in **FIGURE 3**.

It should be noted that due to the proximity of Peace Arch Hospital, on-street parking management is a key traffic management element for the City of White Rock.

**FIGURE 3  
LANING CONFIGURATION**



### 1.3 Scope of Work

CTS selected the weekday morning and afternoon peak hours as the design hours of analysis for this study as they represent the peak trip generation period for a residential development.

The following scenarios were used in this traffic impact assessment:

1. 2018 (i.e. existing base)
2. 2020 (future base)
3. 2030 (future base)
4. 2020 (future base + site generated)
5. 2030 (future base + site generated)

DRAFT

## 2.0 BASE TRAFFIC VOLUMES

### 2018 Base Traffic Volumes

CTS conducted turning movement counts from 07:00 to 09:00, and 15:00 to 18:00 to document the typical weekday peak hour traffic volume for the following intersections on the following dates:

- Lee Street and North Bluff Road (Thursday, November 8th, 2018);
- Lee Street and Russell Avenue (Thursday, November 8th, 2018);
- Maple Street and North Bluff Road (Friday, September 22th, 2017); and
- Maple Street and Russell Avenue (Friday, September 22th, 2017)

The traffic count data was summarized and reviewed to ensure data integrity and validity. The summarized traffic data sheets are included in **APPENDIX B**.

The 2017 base traffic volumes were factored up by a traffic volume growth rate of 2.0% to represent base year 2018 volumes.

From the collected data, the weekday morning peak hour was determined to occur from 7:45 to 8:45 and the afternoon peak hour was determined to occur from 15:00 to 16:00.

The 2018 base traffic volumes for the weekday morning and afternoon peak hours are illustrated in **FIGURE 4** and **FIGURE 5** respectively.

### 2020 Future Base Traffic Volumes

2020 is anticipated to be the year of full buildout for the proposed development. The 2018 base traffic volumes were factored up by a traffic volume growth rate of 2.0% per annum (simple straight line) to represent base year 2020 volumes.

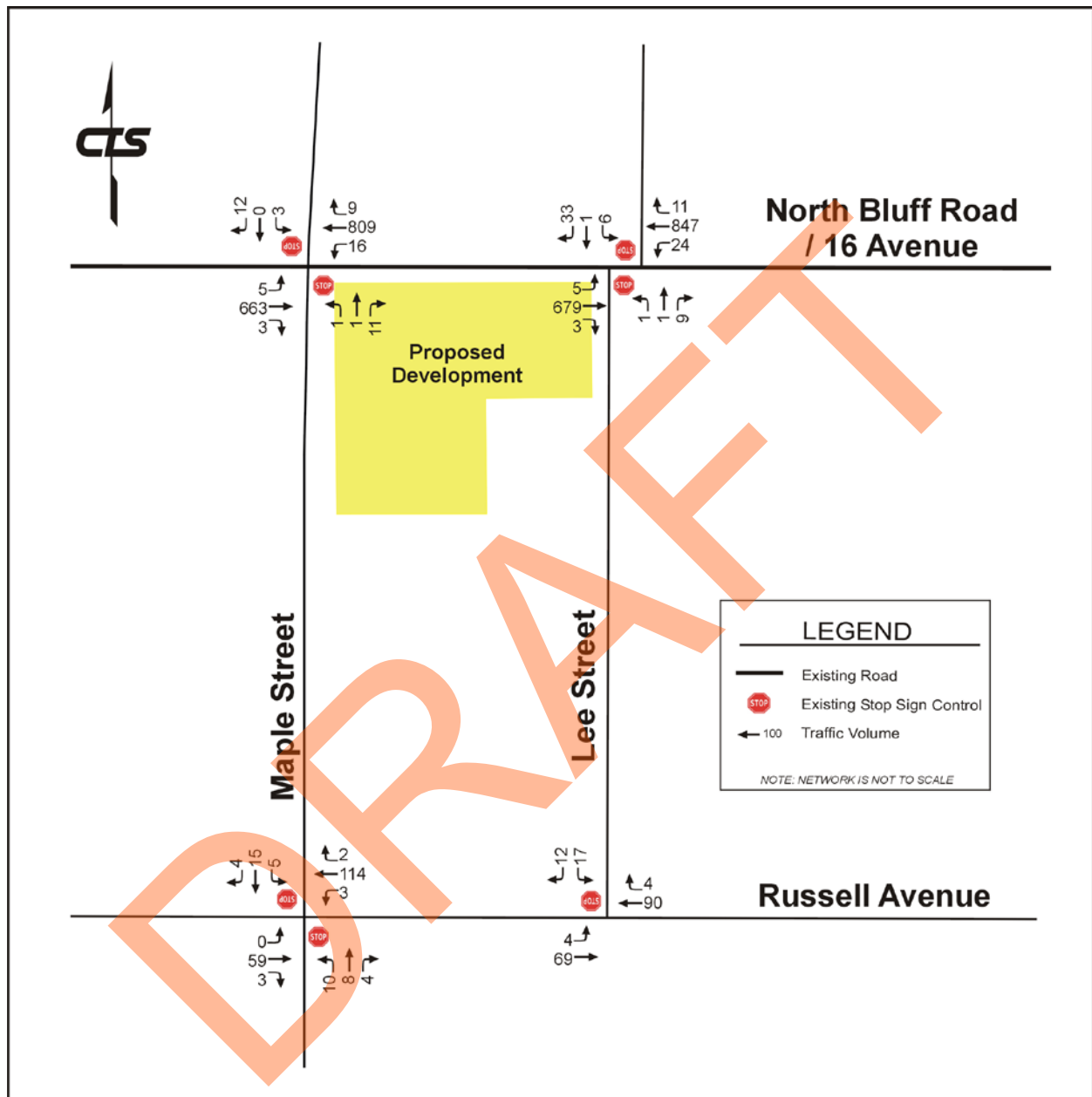
**FIGURE 6** and **FIGURE 7** illustrate the weekday morning and afternoon peak hour vehicle volumes, respectively.

### 2030 Future Base Traffic Volumes

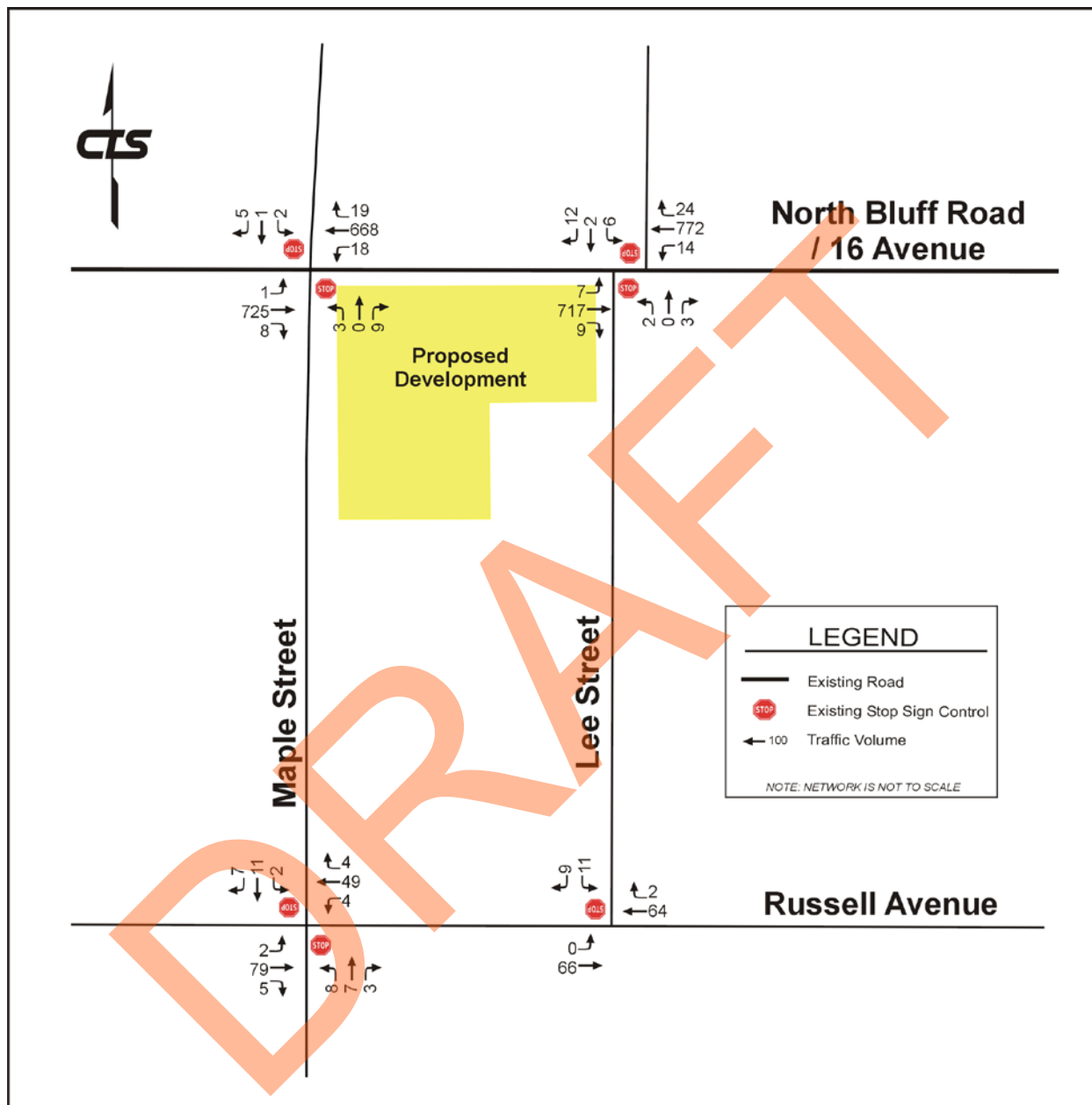
2030 is ten years after the anticipated year of full buildout for the proposed development, and is a scenario requested by the City of White Rock. The 2018 base traffic volumes were factored up by a traffic volume growth rate of 2.0% per annum (simple straight line) to represent base year 2030 volumes.

**FIGURE 8** and **FIGURE 9** illustrate the weekday morning and afternoon peak hour vehicle volumes, respectively.

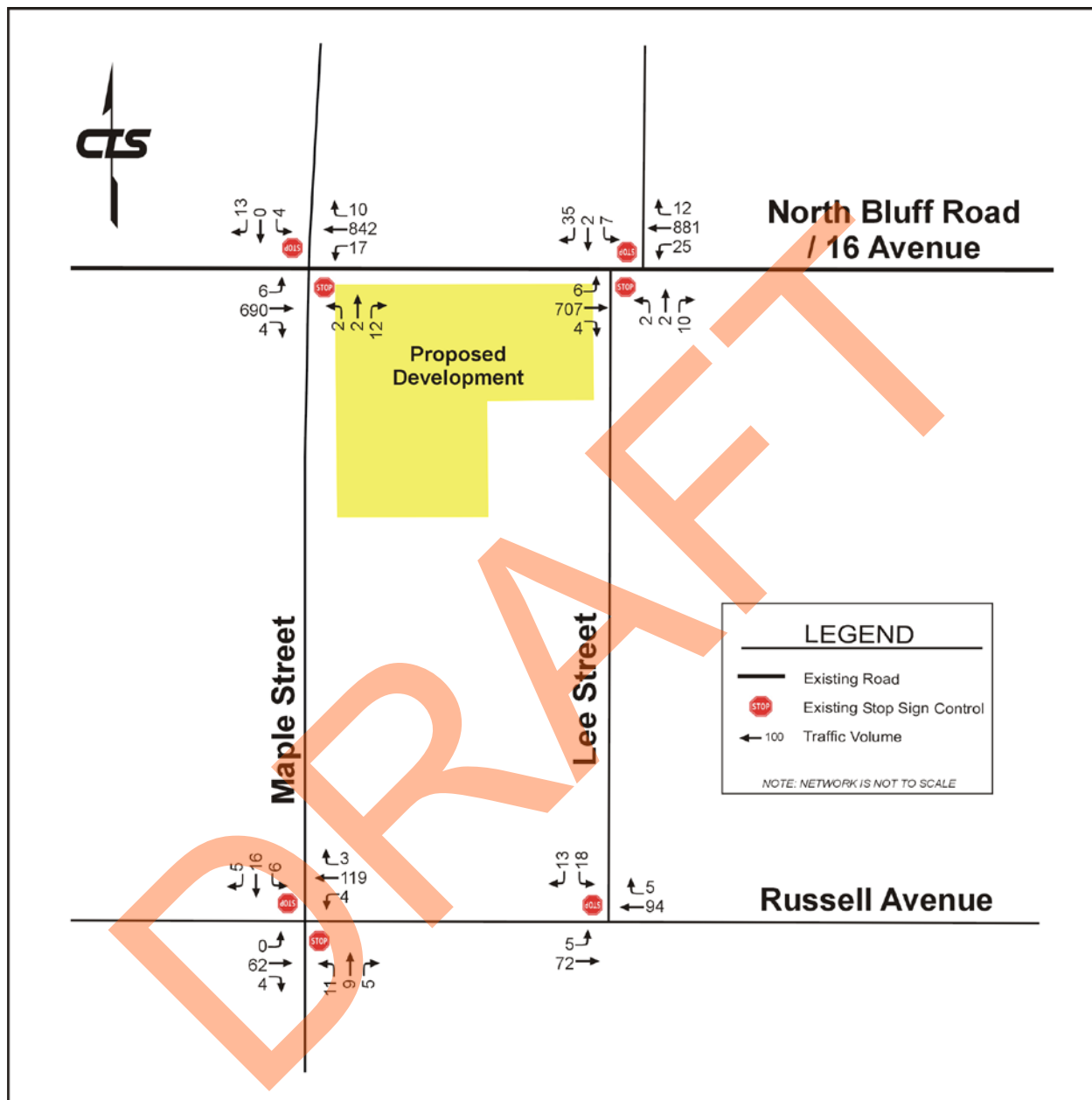
**FIGURE 4**  
**2018 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**



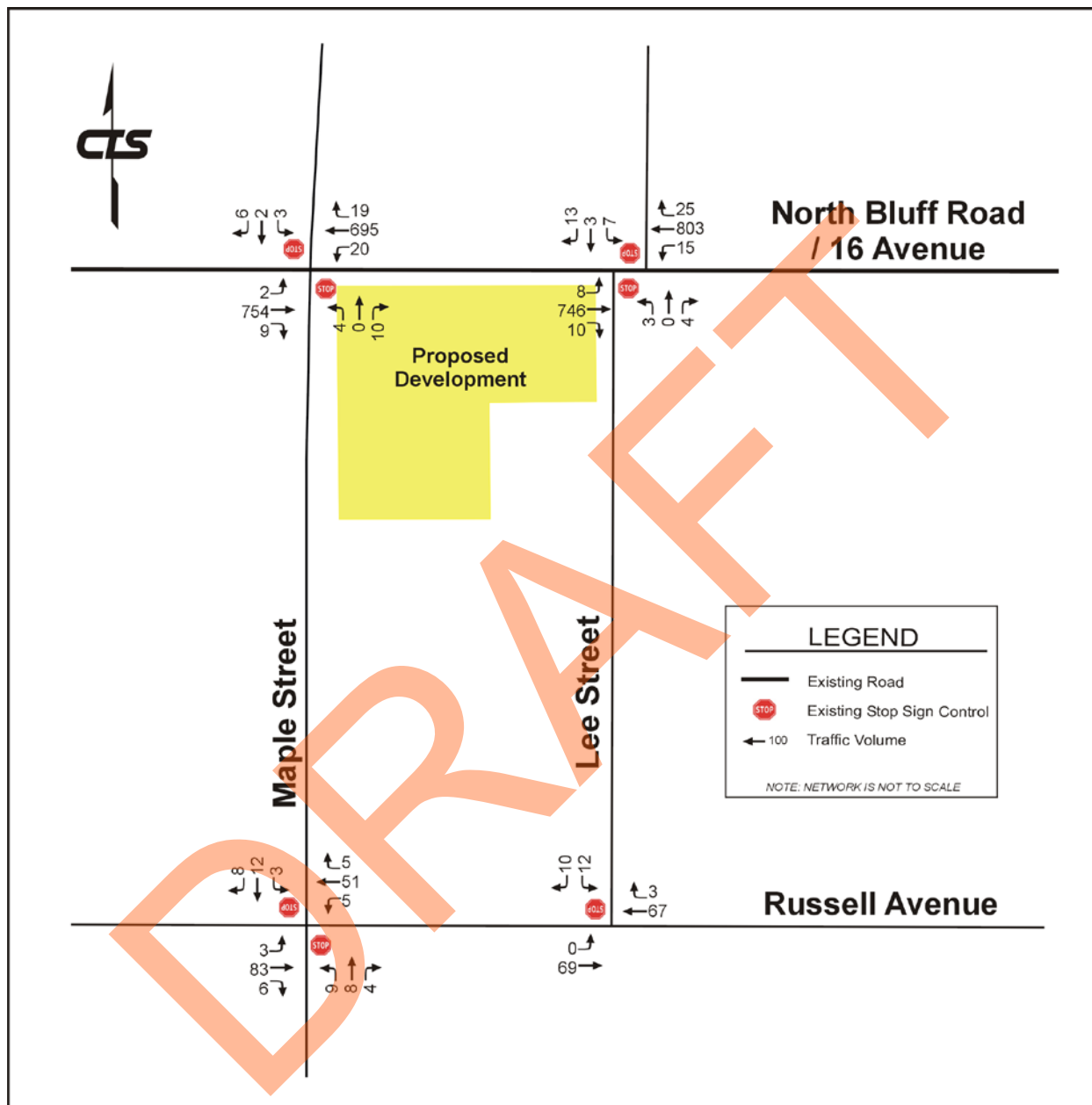
**FIGURE 5**  
**2018 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**



**FIGURE 6**  
**2020 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**

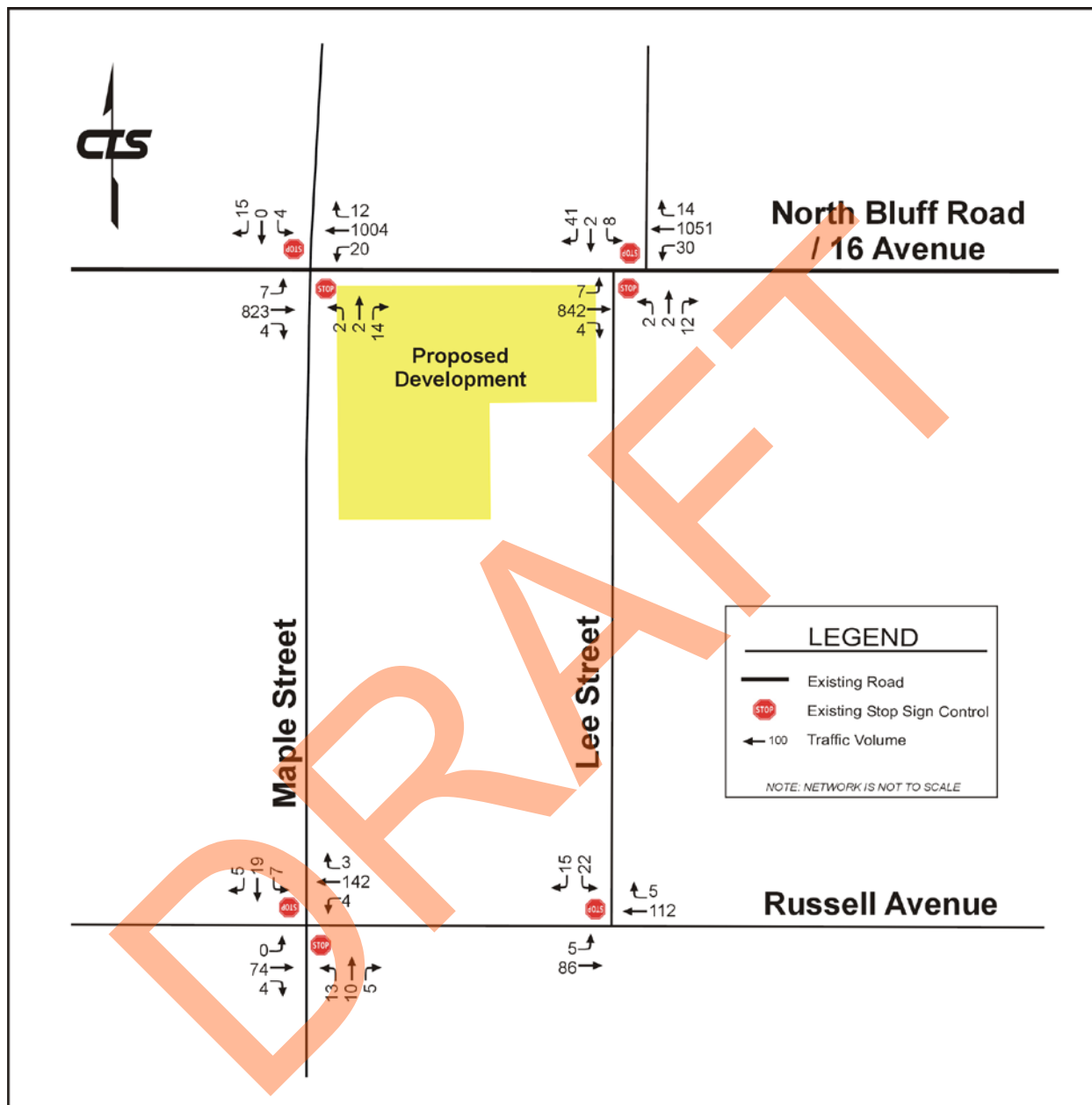


**FIGURE 7**  
**2020 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**

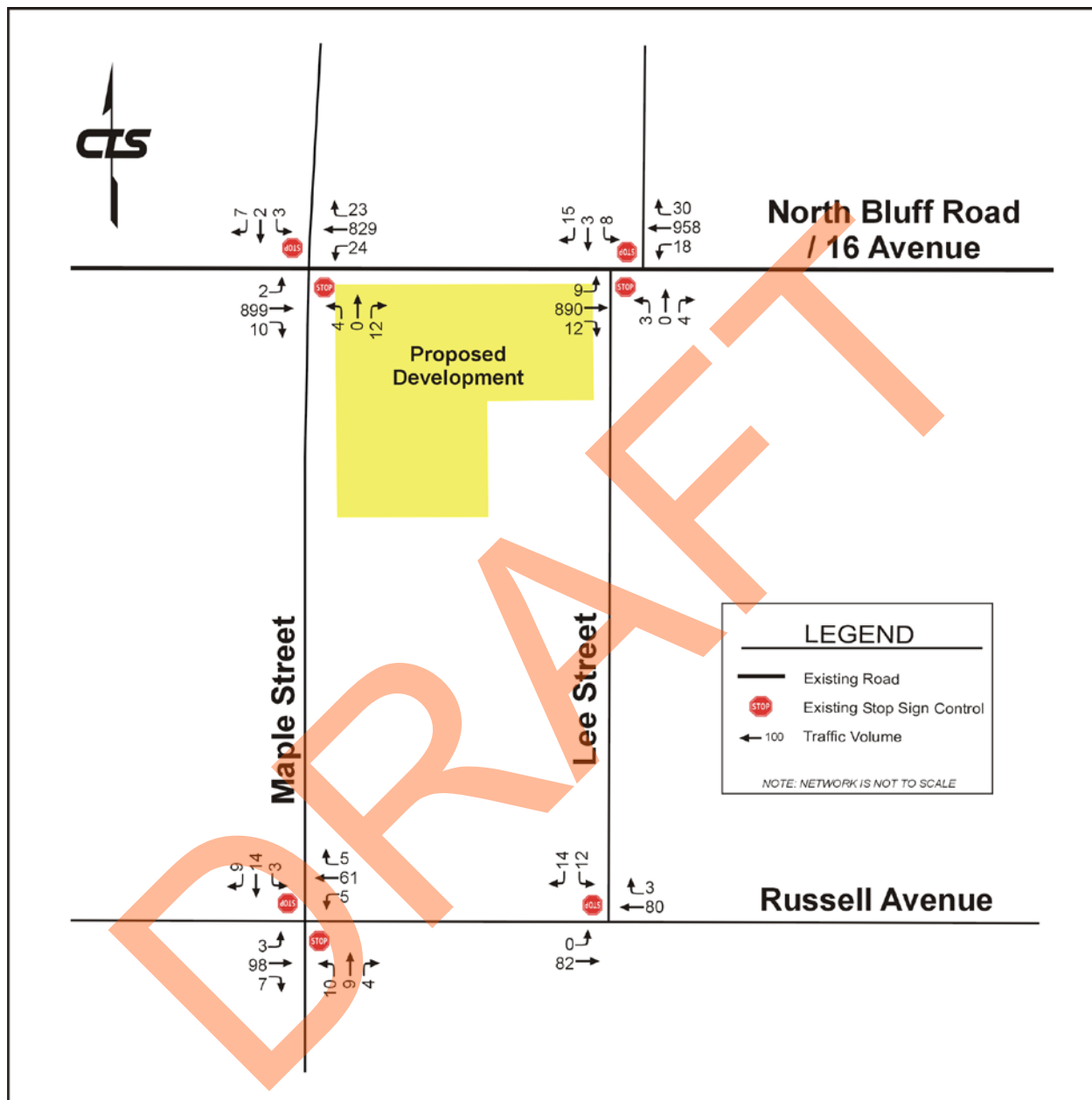




**FIGURE 8**  
**2030 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES**



**FIGURE 9**  
**2030 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES**



### 3.0 SITE TRAFFIC VOLUMES

#### 3.1 Trip Generation

The published vehicle trip rates from the *Institute of Transportation Engineers (ITE) 10th Edition* were used to forecast the site generated traffic volumes. **TABLE 1** summarizes the forecast site generated traffic for the proposed residential development.

**TABLE 1**  
**SUMMARY OF SITE GENERATED TRAFFIC**

Land Use	Peak Hour	Trip Generation Variable	Scope of Development	Vehicle Trip Generation Rate	Trip Rate Source	Directional Split		Peak Hour Volumes (vph)		
						% in	% out	in	out	total
Multifamily Housing (Mid-Rise) Townhomes	Morning Peak	Dwelling Units	14.00	0.36	ITE 10th Edition - Code 221	26%	74%	1	4	5
	Afternoon Peak			61%		39%	3	3	6	
Multifamily Housing (Mid-Rise) Condominium	Morning Peak	Dwelling Units	76.00	0.36	ITE 10th Edition - Code 221	26%	74%	7	21	28
	Afternoon Peak			61%		39%	20	14	34	
Total	Morning Peak Hour					26%	74%	8	25	33
	Afternoon Peak Hour					61%	39%	23	17	40

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). The Vehicle Trip Generation Rate was selected using the General Urban/Suburban setting.

From **TABLE 1**, the site is forecasted to generate a total of 33 vehicle trips (8 inbound, and 25 outbound) during the weekday morning peak hour and 40 vehicle trips (23 inbound and 17 outbound) during the weekday afternoon peak hour.

The morning peak hour volume is equivalent to 1 vehicle movement approximately every 2.8 minutes. The afternoon peak hour volume is equivalent to 1 vehicle movement approximately every 1.5 minutes.

For reference, the Ministry of Transportation and Infrastructure threshold for undertaking traffic impact assessments is site vehicle trip generation in excess of 100 vehicle trips in any hour.

#### 3.2 Trip Distribution

The trip distribution parameters for distributing site generated vehicle trips to / from the site were developed from existing traffic patterns entering and exiting the study area for the afternoon peak hour. The traffic volume assignment is summarized in **TABLE 2**.

**TABLE 2**  
**TRIP DISTRIBUTION VEHICLE VOLUMES**  
**FOR SITE GENERATED TRAFFIC**

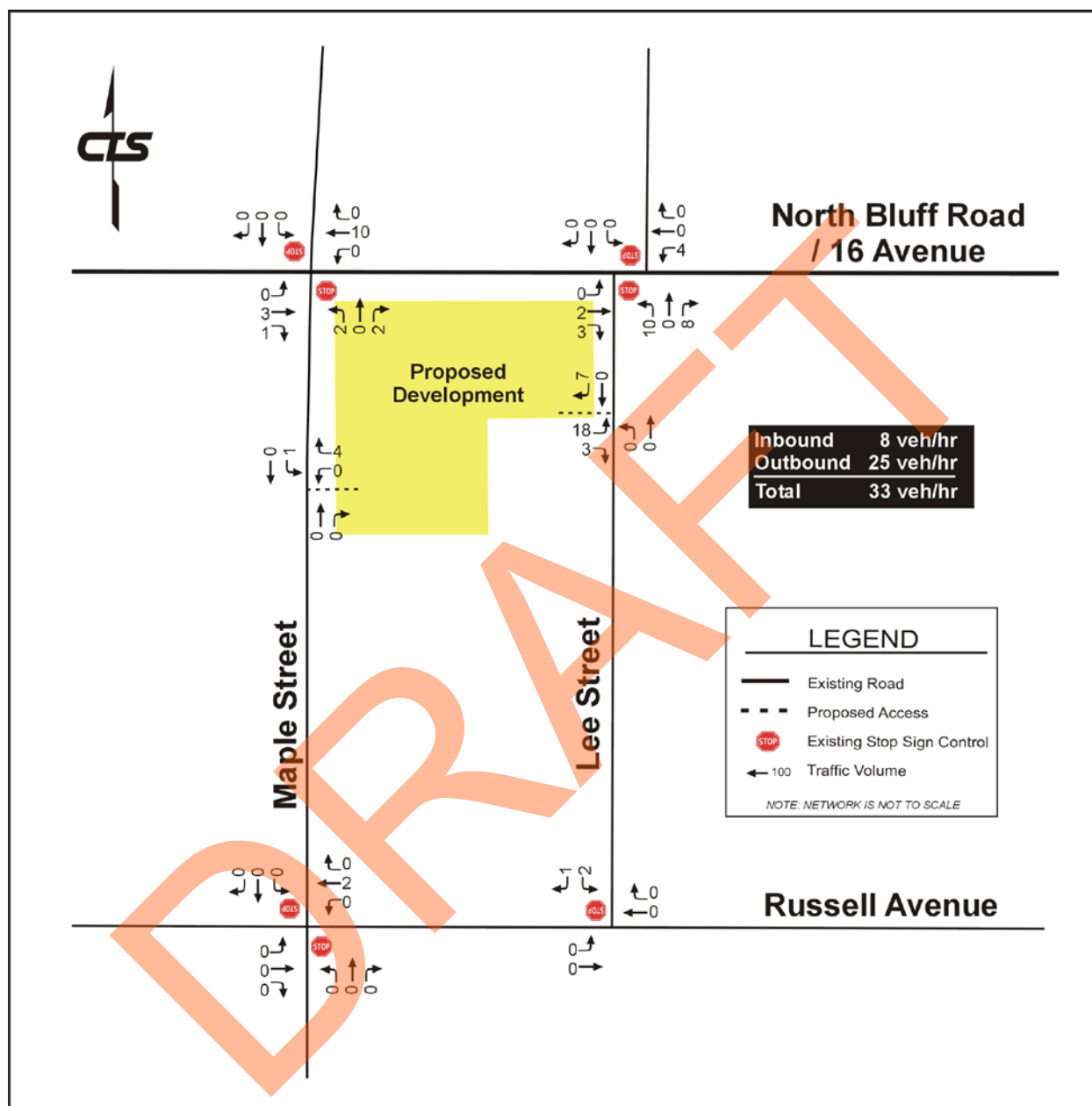
FROM / TO	WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
Lee St (N)	0	0	0	0
Maple St (N)	0	0	0	0
Maple St (S)	0	0	0	0
North Bluff Rd (E)	4	10	11	8
North Bluff Rd (W)	4	12	10	7
Russell Ave (E)	0	1	1	1
Russell Ave (W)	0	2	1	1
<b>TOTAL</b>	<b>8</b>	<b>25</b>	<b>23</b>	<b>17</b>
	<b>33</b>		<b>40</b>	

### 3.3 Traffic Assignment

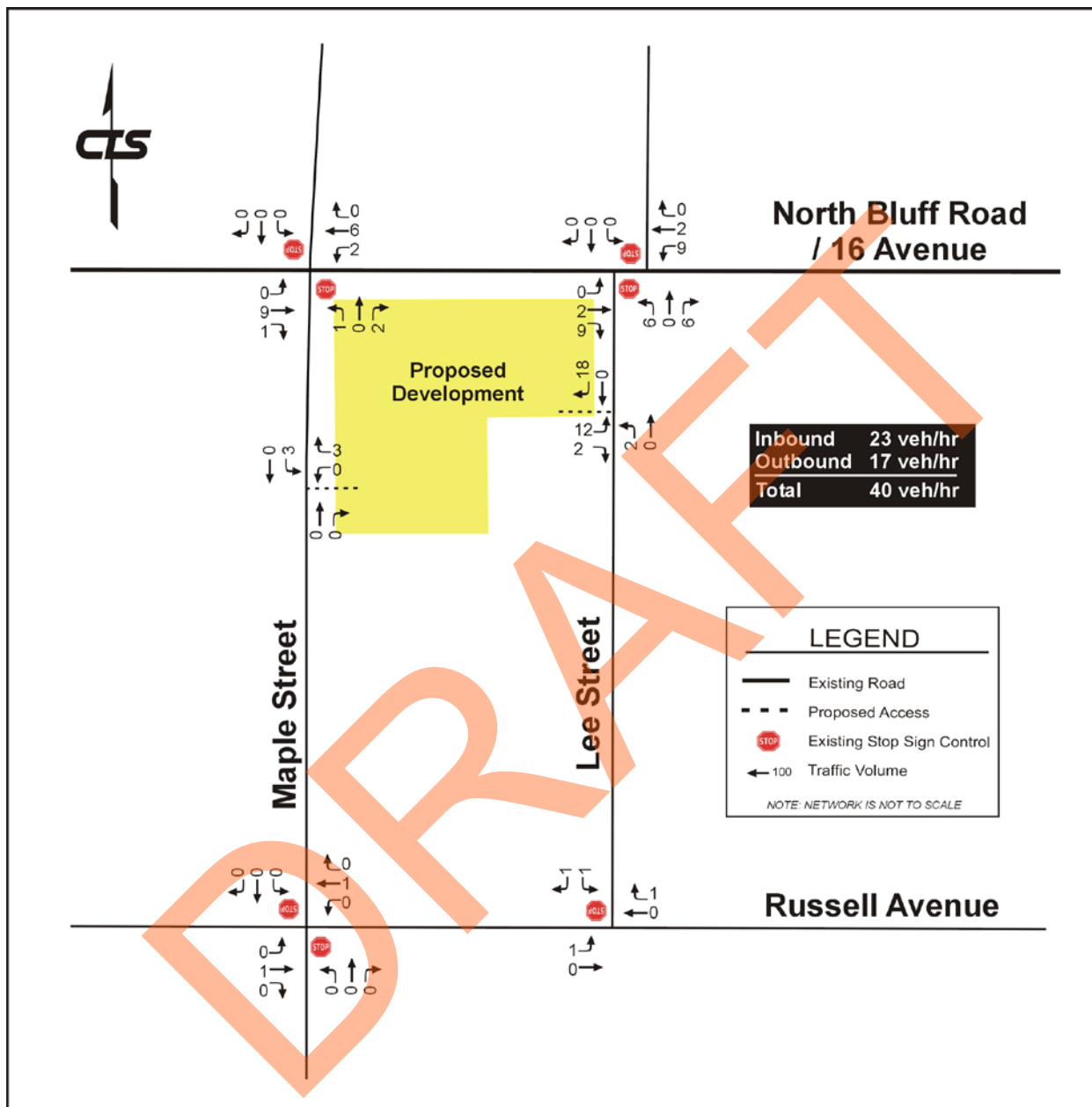
The additional vehicle trips generated from the development were subsequently assigned to the road network using the trip distribution parameters in **TABLE 2**. **FIGURE 10** and **FIGURE 11** illustrate the site generated traffic volumes on the road network for the weekday morning and afternoon peak hours.

It is noted that the access off of Maple Street is for parking for the townhouses, and access off of Lee Street is for parking in the condominiums. Driveway usage is based on the proportional trip generation of each of these land uses as previously noted in **TABLE 1**.

**FIGURE 10**  
**SITE TRAFFIC VOLUMES FOR THE WEEKDAY MORNING PEAK HOUR**



**FIGURE 11**  
**SITE TRAFFIC VOLUMES FOR THE WEEKDAY AFTERNOON PEAK HOUR**



## 4.0 TOTAL PROJECTED TRAFFIC VOLUMES

**FIGURE 12** illustrates the total projected traffic for the year 2020 weekday morning peak hour consisting of both future base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 10** onto **FIGURE 6**.

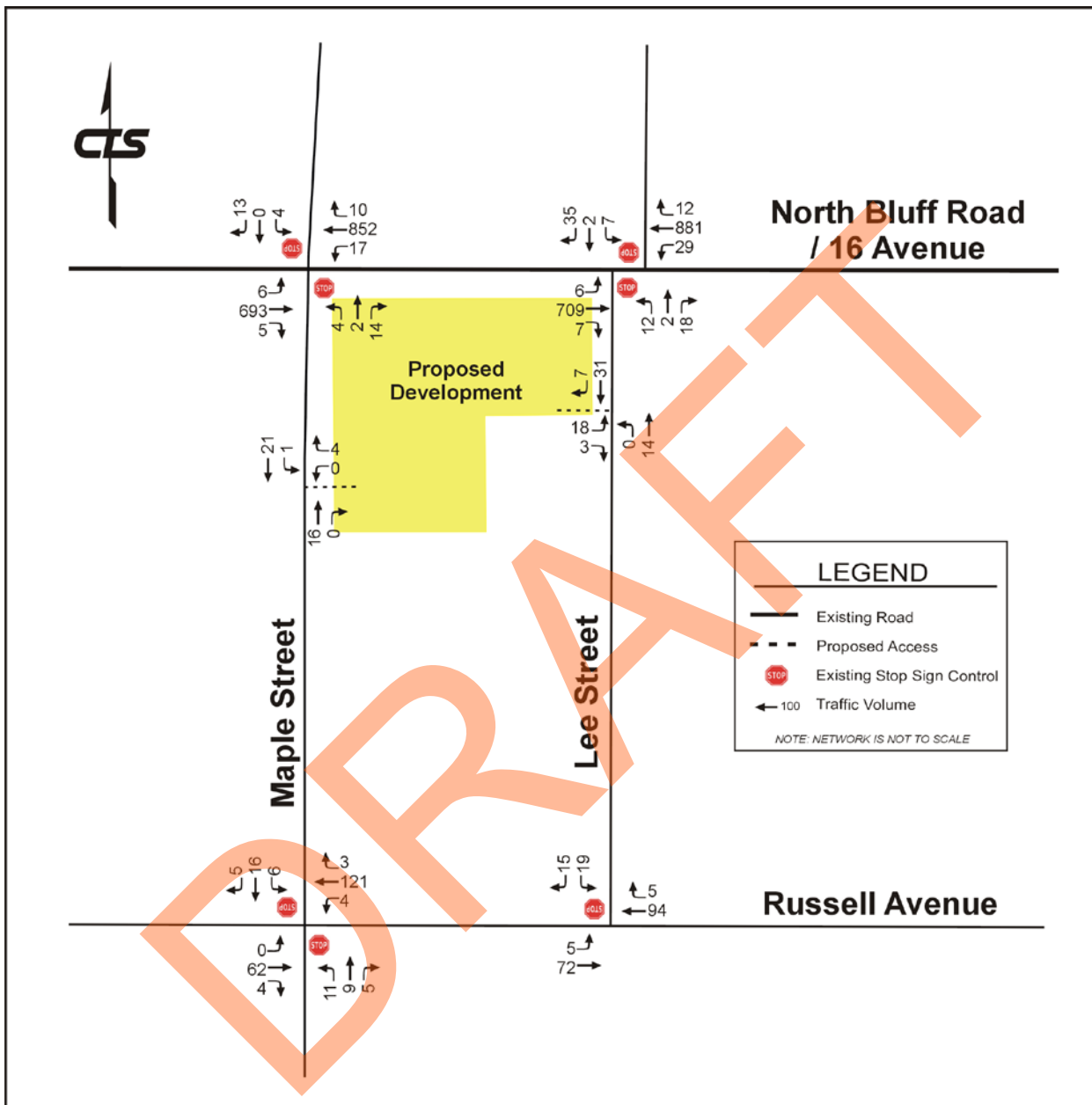
**FIGURE 13** illustrates the total projected traffic for the year 2020 weekday afternoon peak hour consisting of both future base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 11** onto **FIGURE 7**.

**FIGURE 14** illustrates the total projected traffic for the year 2030 weekday morning peak hour consisting of both future base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 10** onto **Figure 8**.

**FIGURE 15** illustrates the total projected traffic for the year 2030 weekday afternoon peak hour consisting of both future base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 11** onto **Figure 9**.

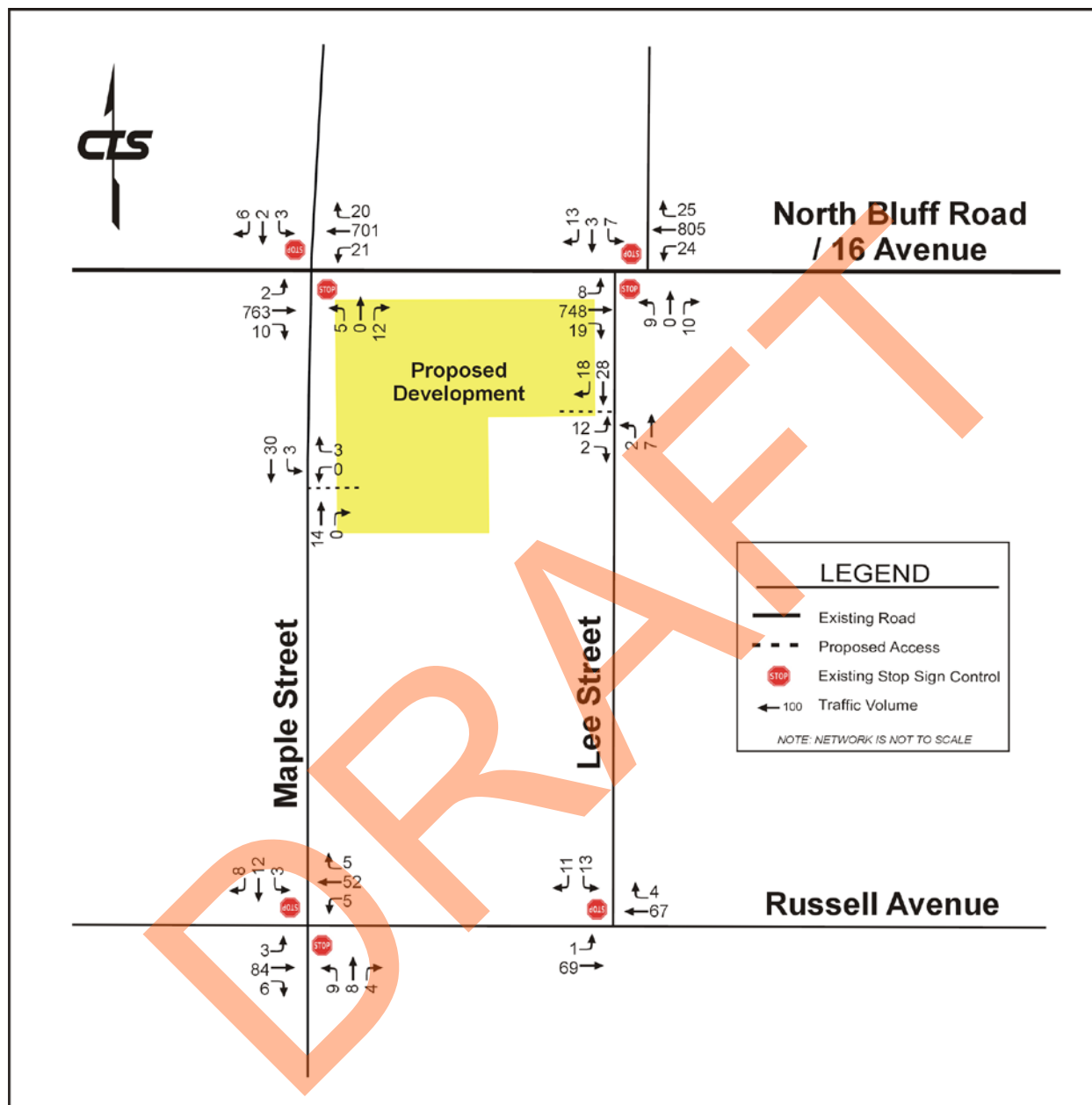
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**FIGURE 12**  
**2020 MORNING PEAK HOUR BASE + SITE TRAFFIC VOLUMES**

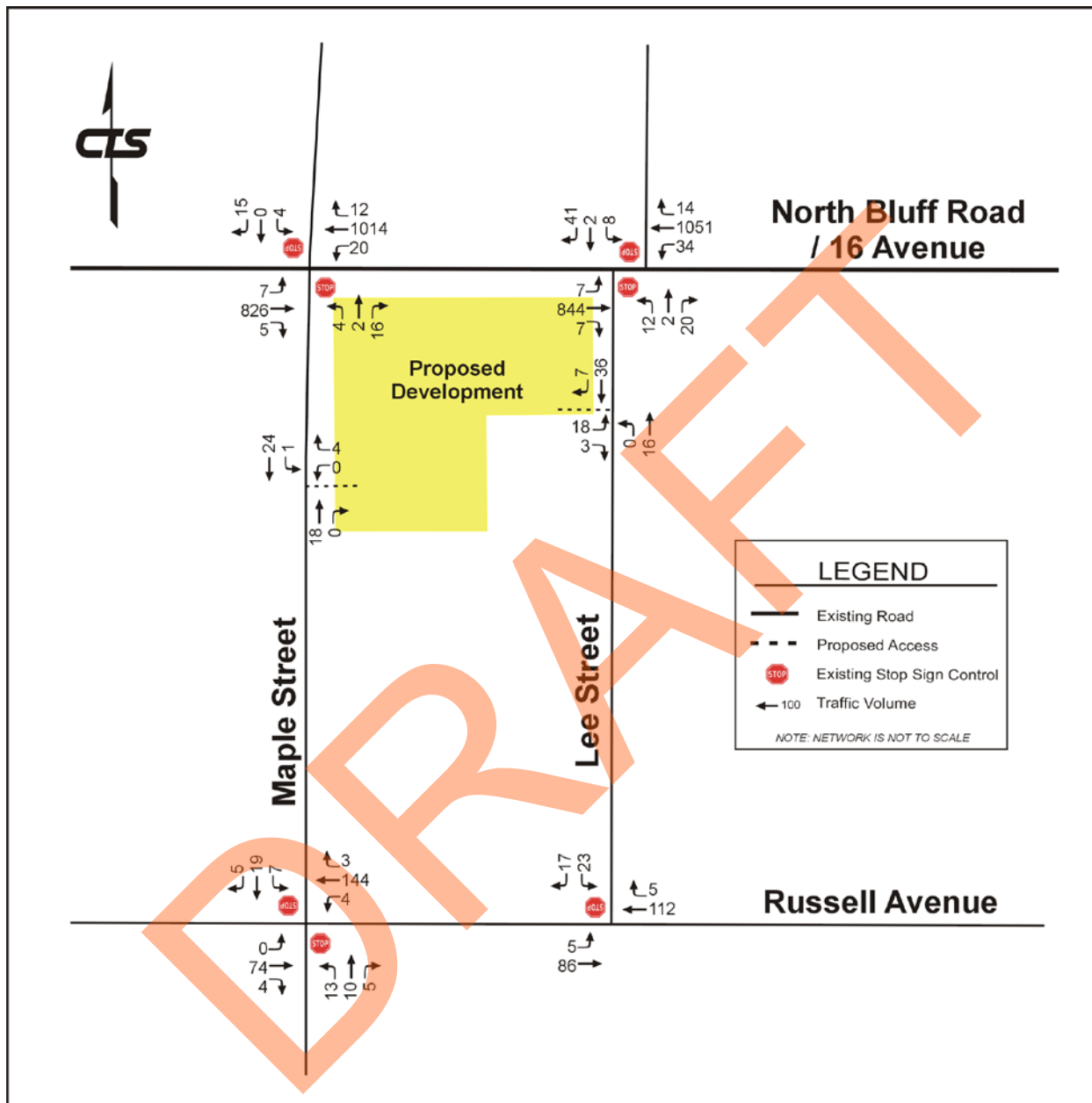




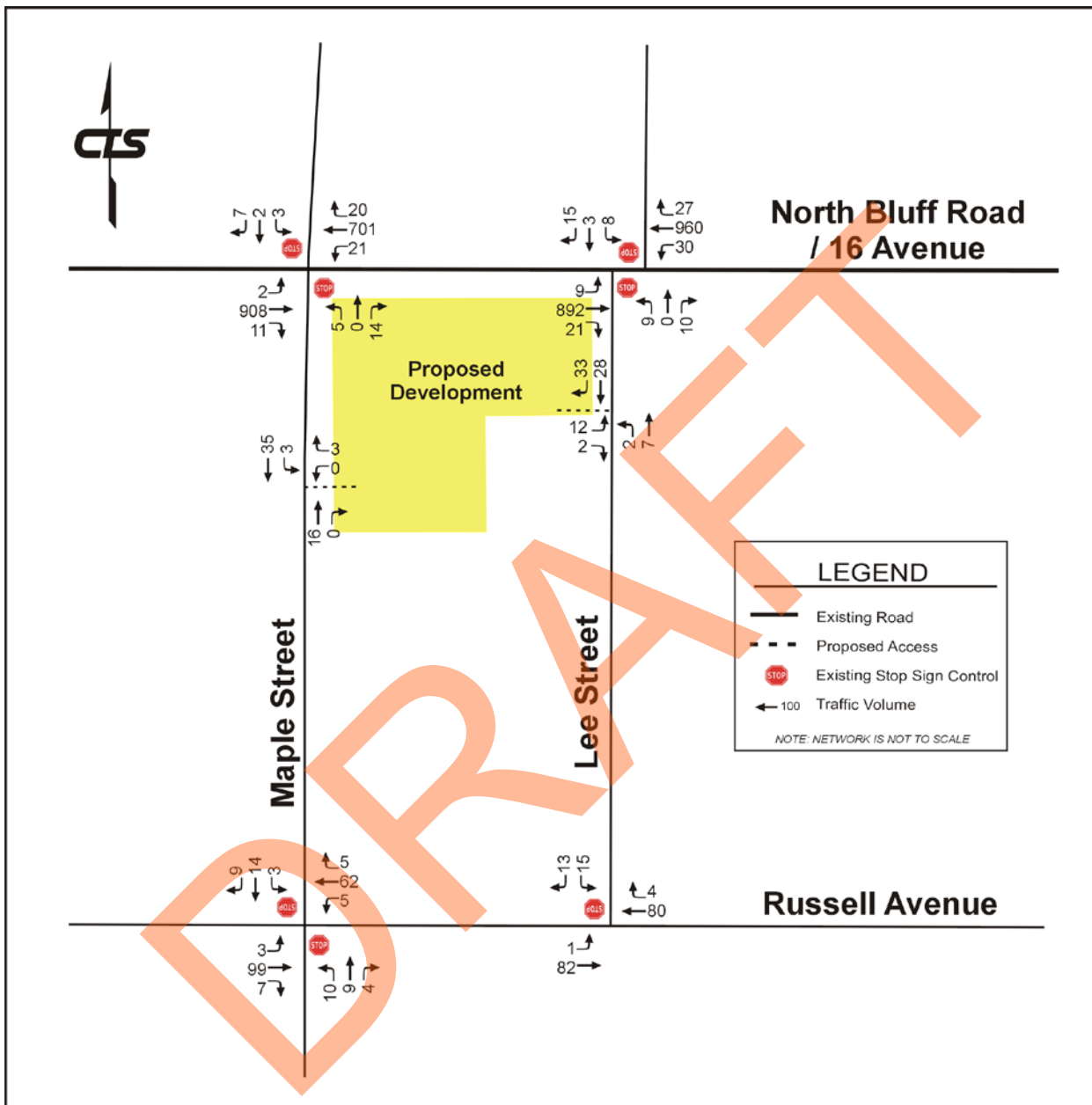
**FIGURE 13**  
**2020 AFTERNOON PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



**FIGURE 14**  
**2030 MORNING PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



**FIGURE 15**  
**2030 AFTERNOON PEAK HOUR BASE + SITE TRAFFIC VOLUMES**



## 5.0 TRAFFIC ENGINEERING ANALYSIS

### 5.1 Capacity Analysis

Capacity analysis was performed at each of the locations in order to determine the intersection levels of service (LOS) that is provided to motorists. The LOS for intersections and movements is defined in terms of delay (seconds per vehicle), which is a measure of driver discomfort and frustration, fuel consumption and lost travel time.

An intersection or movement LOS can range from "A" (Excellent) to "F" (Fail). See **Table 3**. A LOS of "F" (Fail) indicates that an intersection or movement is failing because the intersection or movement is over capacity and delays are excessive. A LOS of "D" during the critical peak hours is considered acceptable by many public agencies in large urban areas for overall intersection operation and a LOS of "E" or better is considered acceptable for left turn movements as it recognizes that the intersections normally perform much better the remaining 90% of the day.

**TABLE 3  
LEVEL OF SERVICE DESCRIPTIONS**

Level of Service	Description
A	Excellent
B	Good
C	Fair
D	Poor
E	Very Poor
F	Fail

Highway Capacity Software (HCS 7) was used for the analysis of the unsignalized intersections.

The following assumptions were made with respect to the intersection capacity analysis:

- *Saturation flow rate* = 1,900 passenger cars/hour of green time/lane (pcphgpl)
- *Peak hour factor* (PHF) = 0.80 (morning peak) and 0.91 (afternoon peak), which is the average factor observed from the surveyed intersections on North Bluff Road.
- Heavy vehicle percentage for roads = 2%

*Saturation flow rate* is the equivalent hourly rate at which previously queued vehicles can traverse an intersection approach under prevailing conditions, assuming that the green signal is available at all times and no lost times are experienced.

*Peak Hour Factor* is a measure of traffic demand fluctuation within the analysis hour.

**TABLE 4** summarizes and compares the main performance parameters of the intersection capacity analysis for unsignalized intersections.

For unsignalized intersections, the delay time in seconds for each lane group is summarized. Delay is additional travel time experienced by a driver, passenger, bicyclist, or pedestrian beyond that required to travel at the desired speed.

Wherever necessary, attempts at improvements have been made to maintain intersection and approach movement level of service standards for each of the post-development scenarios. The capacity analysis worksheets with level of services for each individual movement are included in **APPENDIX C**.

This analysis does not include the effects of upstream signals. In addition, it is assumed that all of through movements travelling eastbound and westbound on North Bluff Road will experience the same delay as the eastbound and westbound left turn movements. The results of this analysis are more conservative.

**TABLE 4**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTIONS**

INTERSECTION	TIME OF DAY	SCENARIO	PERFORMANCE MEASURE	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND			LOS	NOTES
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Maple Street (N/S) and North Bluff Road (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	5	663	3	16	809	9	1	1	11	3	0	12	B	Okay.
			Delay	11.1	11.1	0.0	9.7	9.7	0.0	19.6							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.1	0.2							
		2020 Base	Volumes	6	690	4	17	842	10	2	2	12	4	0	13	B	Northbound and southbound approach will experience medium delay
			Delay	11.4	11.4	0.0	9.9	9.9	0.0	28.0							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.4							
		2030 Base	Volumes	7	823	4	20	1004	12	2	2	14	4	0	15	B	Northbound and southbound approach will experience medium delay
			Delay	12.7	12.7	0.0	10.7	10.7	0.0	43.2							
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	0.7							
		2020 Base + Site	Volumes	6	693	5	17	852	10	4	2	14	4	0	13	B	Northbound and southbound approach will experience medium delay
			Delay	11.5	11.5	0.0	9.9	9.9	0.0	30.7							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.5							
		2030 Base+ Site	Volumes	7	826	5	20	1014	12	4	2	16	4	0	15	B	Northbound approach will experience high delays. Southbound approach will experience medium delay
			Delay	12.8	12.8	0.0	10.7	10.7	0.0	50.2							
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	1.0							
	Weekday Afternoon Peak Hour	2018 Base	Volumes	1	725	8	18	668	19	3	0	9	2	1	5	A	Okay.
			Delay	9.4	9.4	0.0	9.6	9.6	0.0	17.3							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.1							
		2020 Base	Volumes	2	754	9	19	695	20	4	0	10	3	2	6	A	Southbound approach will experience medium delay
			Delay	9.6	9.6	0.0	9.8	9.8	0.0	19.5							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.2							
		2030 Base	Volumes	2	899	10	23	829	24	4	0	12	3	2	7	B	Southbound approach will experience medium delay
			Delay	10.2	10.2	0.0	10.5	10.5	0.0	24.6							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.3							
		2020 Base + Site	Volumes	2	763	10	21	701	20	5	0	12	3	2	6	A	Southbound approach will experience medium delay
			Delay	9.6	9.6	0.0	9.8	9.8	0.0	20.3							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.2							
		2030 Base+ Site	Volumes	2	908	11	25	835	24	5	0	14	3	2	7	B	Northbound and southbound approach will experience medium delay
			Delay	10.2	10.2	0.0	10.6	10.6	0.0	26.3							
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.4							

Delay = Average Delay (seconds/vehicle)

Yellow = Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Red = Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

**TABLE 4 CONTINUED**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTIONS**

Intersection	Time of Day	Scenario	Performance Measure	Eastbound			Westbound			Northbound			Southbound			LOS	Notes
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Maple Street (N/S) and Russell Avenue (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	0	59	3	3	114	2	10	8	4	5	15	4	A	Okay.
			Delay	7.6			7.4			10.4			10.6				
			95% Queue (m)	0.0			0.0			0.1			0.1				
		2020 Base	Volumes	0	62	4	4	119	3	11	9	5	6	16	5	A	Okay.
			Delay	7.6			7.4			10.5			10.7				
			95% Queue (m)	0.0			0.0			0.1			0.2				
		2030 Base	Volumes	0	74	4	4	142	3	13	10	5	7	19	5	A	Okay.
			Delay	7.6			7.4			10.9			11.1				
			95% Queue (m)	0.0			0.0			0.2			0.2				
		2020 Base + Site	Volumes	0	62	4	4	121	3	11	9	5	6	16	5	A	Okay.
			Delay	7.6			7.4			10.5			10.7				
			95% Queue (m)	0.0			0.0			0.1			0.2				
		2030 Base+ Site	Volumes	0	74	4	4	144	3	13	10	5	7	19	5	A	Okay
			Delay	7.6			7.4			10.9			11.1				
			95% Queue (m)	0.0			0.0			0.2			0.2				
	Weekday Afternoon Peak Hour	2018 Base	Volumes	2	79	5	4	49	4	8	7	3	2	11	7	A	Okay.
			Delay	7.4			7.4			9.9			9.8				
			95% Queue (m)	0.0			0.0			0.1			0.1				
		2020 Base	Volumes	3	83	6	5	51	5	9	8	4	3	12	8	A	Okay.
			Delay	7.4			7.4			10.0			9.8				
			95% Queue (m)	0.0			0.0			0.1			0.1				
		2030 Base	Volumes	3	98	7	5	61	5	10	9	4	3	14	9	A	Okay.
			Delay	7.4			7.5			10.2			10.0				
			95% Queue (m)	0.0			0.0			0.1			0.1				
		2020 Base + Site	Volumes	3	84	6	5	52	5	9	8	4	3	12	8	A	Okay.
			Delay	7.4			7.4			10.0			9.9				
			95% Queue (m)	0.0			0.0			0.1			0.1				
		2030 Base+ Site	Volumes	3	99	7	5	62	5	10	9	4	3	14	9	A	Okay
			Delay	7.4			7.5			10.3			10.0				
			95% Queue (m)	0.0			0.0			0.1			0.1				
Lee Street (N/S) and North Bluff Road (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	5	679	3	24	847	11	1	1	9	6	1	33	B	Southbound approach will experience medium delay
			Delay	11.5	11.5	0.0	9.9	9.9	0.0	24.0			31.6				
			95% Queue (m)	0.0	0.0	0.0	1.0	1.0	0.0	0.2			0.9				
		2020 Base	Volumes	6	707	4	25	881	12	2	2	10	7	2	35	B	Northbound and southbound approach will experience medium delay
			Delay	11.8	11.8	0.0	10.1	10.1	0.0	36.6			42.9				
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.4			1.6				
		2030 Base	Volumes	7	842	4	30	1051	14	2	2	12	8	2	41	B	Northbound and southbound approach will experience high delay
			Delay	13.2	13.2	0.0	11.0	11.0	0.0	66.4			118.9				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	0.9			3.7				
		2020 Base + Site	Volumes	6	709	7	29	881	12	12	2	18	7	2	35	B	Northbound approach will experience high delays. Southbound approach will experience medium delay
			Delay	11.8	11.8	0.0	10.2	10.2	0.0	57.8			45.1				
			95% Queue (m)	0.0	0.0	0.0	0.2	0.2	0.0	1.5			1.6				
		2030 Base+ Site	Volumes	7	844	7	34	1051	14	12	2	20	8	2	41	C	Northbound and southbound approach will experience high delay
			Delay	13.2	13.2	0.0	11.1	11.1	0.0	164.8			133.1				
			95% Queue (m)	0.1	0.1	0.0	0.2	0.2	0.0	3.2			3.9				
	Weekday Afternoon Peak Hour	2018 Base	Volumes	7	717	9	14	772	24	2	0	3	6	2	12	A	Southbound approach will experience medium delay
			Delay	10.1	10.1	0.0	9.5	9.5	0.0	21.8			27.4				
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.1			0.4				
		2020 Base	Volumes	8	746	10	15	803	25	3	0	4	7	3	13	B	Southbound approach will experience medium delay
			Delay	10.3	10.3	0.0	9.7	9.7	0.0	24.7			32.6				
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.1			0.6				
		2030 Base	Volumes	9	890	12	18	958	30	3	0	4	8	3	15	B	Northbound approach will experience medium delays. Southbound approach will experience high delay
			Delay	11.2	11.2	0.0	10.4	10.4	0.0	36.3			53.1				
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	0.2			1.0				
		2020 Base + Site	Volumes	8	748	19	24	805	25	9	0	10	7	3	13	B	Northbound and southbound approach will experience medium delay
			Delay	10.3	10.3	0.0	9.8	9.8	0.0	29.5			34.6				
			95% Queue (m)	0.0	0.0	0.0	0.1	0.1	0.0	0.4			0.6				
		2030 Base+ Site	Volumes	9	892	21	27	960	30	9	0	10	8	3	15	B	Northbound approach will experience medium delays. Southbound approach will experience high delay
			Delay	11.2	11.2	0.0	10.5	10.5	0.0	47.4			58.2				
			95% Queue (m)	0.1	0.1	0.0	0.1	0.1	0.0	0.7			1.1				

Delay = Average Delay (seconds/vehicle)

Yellow = Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to &lt;50sec)

Red = Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (&gt;= 50sec)

**TABLE 4 CONTINUED**  
**CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTIONS**

INTERSECTION	TIME OF DAY	SCENARIO	PERFORMANCE MEASURE	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND			LOS	NOTES
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Lee Street (N/S) and Russell Avenue (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	4	69			90	4				17		12	A	Okay.
			Delay	7.5				0.0					9.6				
			95% Queue (m)	0.0				0.0					0.1				
		2020 Base	Volumes	5	72			94	5				18		13	A	Okay.
			Delay	7.5				0.0					9.7				
			95% Queue (m)	0.0				0.0					0.2				
		2030 Base	Volumes	5	86			112	5				22		15	A	Okay.
			Delay	7.6				0.0					10.0				
			95% Queue (m)	0.0				0.0					0.2				
		2020 Base + Site	Volumes	5	72			94	5				19		15	A	Okay.
			Delay	7.5				0.0					9.7				
			95% Queue (m)	0.0				0.0					0.2				
		2030 Base+ Site	Volumes	5	86			112	5				23		17	A	Okay.
			Delay	7.6				0.0					10.0				
			95% Queue (m)	0.0				0.0					0.2				
	Weekday Afternoon Peak Hour	2018 Base	Volumes	0	66			64	2				11		9	A	Okay.
			Delay	7.4				0.0					9.2				
			95% Queue (m)	0.0				0.0					0.1				
		2020 Base	Volumes	0	69			67	3				12		10	A	Okay.
			Delay	7.4				0.0					9.3				
			95% Queue (m)	0.0				0.0					0.1				
		2030 Base	Volumes	0	82			80	3				14		12	A	Okay.
			Delay	7.5				0.0					9.4		9.4		
			95% Queue (m)	0.0				0.0					0.1		0.1		
		2020 Base + Site	Volumes	1	69			67	4				13		11	A	Okay.
			Delay	7.4				0.0					9.3		9.3		
			95% Queue (m)	0.0				0.0					0.1		0.1		
		2030 Base+ Site	Volumes	1	82			80	4				15		13	A	Okay.
			Delay	7.5				0.0					9.5		9.5		
			95% Queue (m)	0.0				0.0					0.1		0.1		
Maple Street (N/S) & Site Access (E/W)	Weekday Morning Peak Hour	2020 Base + Site	Volumes				0	0	4		16	0	1	21		A	Okay.
			Delay				8.4	0.0	8.4		0.0	0.0	7.3	7.3			
			95% Queue (m)				0.0	0.0	0.0		0.0	0.0	0.0	0.0			
	Weekday Afternoon Peak Hour	2030 Base+ Site	Volumes				0	0	4		18	0	1	24		A	Okay.
			Delay				8.4	0.0	8.4		0.0	0.0	7.3	7.3			
			95% Queue (m)				0.0	0.0	0.0		0.0	0.0	0.0	0.0			
		2020 Base + Site	Volumes				0	0	3		14	0	3	30		A	Okay.
			Delay				8.4	0.0	8.4		0.0	0.0	7.3	7.3			
			95% Queue (m)				0.0	0.0	0.0		0.0	0.0	0.0	0.0			
		2030 Base+ Site	Volumes				0	0	3		16	0	3	35		A	Okay.
			Delay				8.4	0.0	8.4		0.0	0.0	7.3	7.3			
			95% Queue (m)				0.0	0.0	0.0		0.0	0.0	0.0	0.0			
Lee Street (N/S) & Site Access (E/W)	Weekday Morning Peak Hour	2020 Base + Site	Volumes	18	0	3				0	14			31	7	A	Okay.
			Delay	8.9	0.0	8.9				7.3	7.3			0.0	0.0		
			95% Queue (m)	0.0	0.0	0.0				0.0	0.0			0.0	0.0		
		2030 Base+ Site	Volumes	18	0	3				0	16			36	7	A	Okay.
			Delay	8.9	0.0	8.9				7.3	7.3			0.0	0.0		
			95% Queue (m)	0.0	0.0	0.0				0.0	0.0			0.0	0.0		
	Weekday Afternoon Peak Hour	2020 Base + Site	Volumes	12	0	2				2	7			28	18	A	Okay.
			Delay	8.8	0.0	8.8				7.3	7.3			0.0	0.0		
			95% Queue (m)	0.0	0.0	0.0				0.0	0.0			0.0	0.0		
		2030 Base+ Site	Volumes	12	0	2				2	7			33	18	A	Okay.
			Delay	8.8	0.0	8.8				7.3	7.3			0.0	0.0		
			95% Queue (m)	0.0	0.0	0.0				0.0	0.0			0.0	0.0		

Delay = Average Delay (seconds/vehicle)

Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

From **TABLE 4**, the following observations can be made:

Maple & North Bluff Road

- In the morning peak hour this intersection is forecasted to operate at a LOS B (Good) for all horizon years and scenarios. Starting at the 2020 Base scenario, the northbound approach and southbound approach will experience medium delays. In the 2030 Base + Site scenario, the northbound approach and southbound approach will experience high and medium delays.
- In the afternoon peak hour this intersection is forecasted to operate at a LOS A (Excellent) and LOS B (Good) for all horizon years and scenarios. In the 2020 Base scenario, the southbound approach will experience medium delays. In the 2030 Base + Site scenario, the northbound approach and southbound approach will experience medium delays.
- Note that the northbound and southbound approaches will experience medium and high delays primarily due to the northbound and southbound approach through and left turn movements. The analysis assumes a consistent trip distribution using the existing and observed turning movements. It is expected that as vehicle volumes continue to grow on the major street, North Bluff Road, making through and left movements from the side street will be less desirable during the peak periods. It is anticipated that traffic seeking to make these movements will find alternative routes.
- No operational and/or geometrical improvements are recommended for this location.

Maple Street & Russell Avenue

- In the morning and afternoon peak hour this intersection is forecasted to operate at a LOS A (Excellent) for all horizon years and scenarios. No operational or capacity issues were identified.
- No operational and/or geometrical improvements are recommended for this location.

Lee Street & North Bluff Road

- In the morning peak hour this intersection is forecasted to operate at LOS B (Good) or LOS C (Fair) for all horizon years and scenarios. Starting in the 2020 Base scenario, the northbound approach and southbound approach will experience medium delays. In the 2030 Base + Site scenario, the northbound approach and southbound approach will experience high delays.
- In the afternoon peak hour this intersection is forecasted to operate at LOS A (Excellent) or LOS B (Good) for all horizon years and scenarios. In the 2018 Base scenario, the southbound approach will experience medium delays. In the



2030 Base + Site scenario, the northbound approach and southbound approach will experience medium and high delays.

- Note that the northbound and southbound approaches will experience medium and high delays primarily due to the northbound and southbound approach through and left turn movements. The analysis assumes a consistent trip distribution using the existing turning movements. It is expected that as vehicle volumes continue to grow on the major street, North Bluff Road, making through and left movements from the side street will be less desirable during the peak periods. It is anticipated that traffic seeking to make these movements will find alternative routes.
- No operational and/or geometrical improvements are recommended for this location.

#### Lee Street & Russell Avenue

- In the morning and afternoon peak hour this intersection is forecasted to operate at a LOS A (Excellent) for all horizon years and scenarios. No operational or capacity issues were identified.
- No operational and/or geometrical improvements are recommended for this location.

#### Maple Street & Site Access

- In the morning and afternoon peak hour this intersection is forecasted to operate at a LOS A (Excellent) for all horizon years and scenarios. No operational or capacity issues were identified.
- No operational and/or geometrical improvements are recommended for this location.

#### Lee Street & Site Access

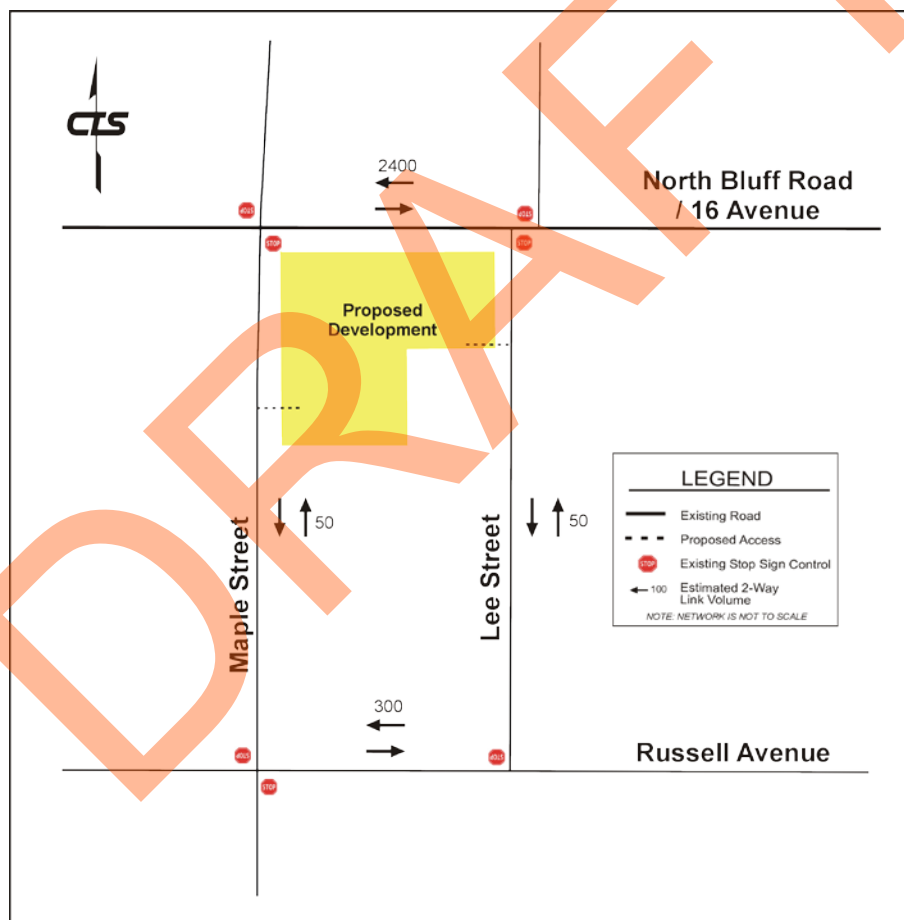
- In the morning and afternoon peak hour this intersection is forecasted to operate at a LOS A (Excellent) for all horizon years and scenarios. No operational or capacity issues were identified.
- No operational and/or geometrical improvements are recommended for this location.

## 6.0 2045 LINK VOLUMES

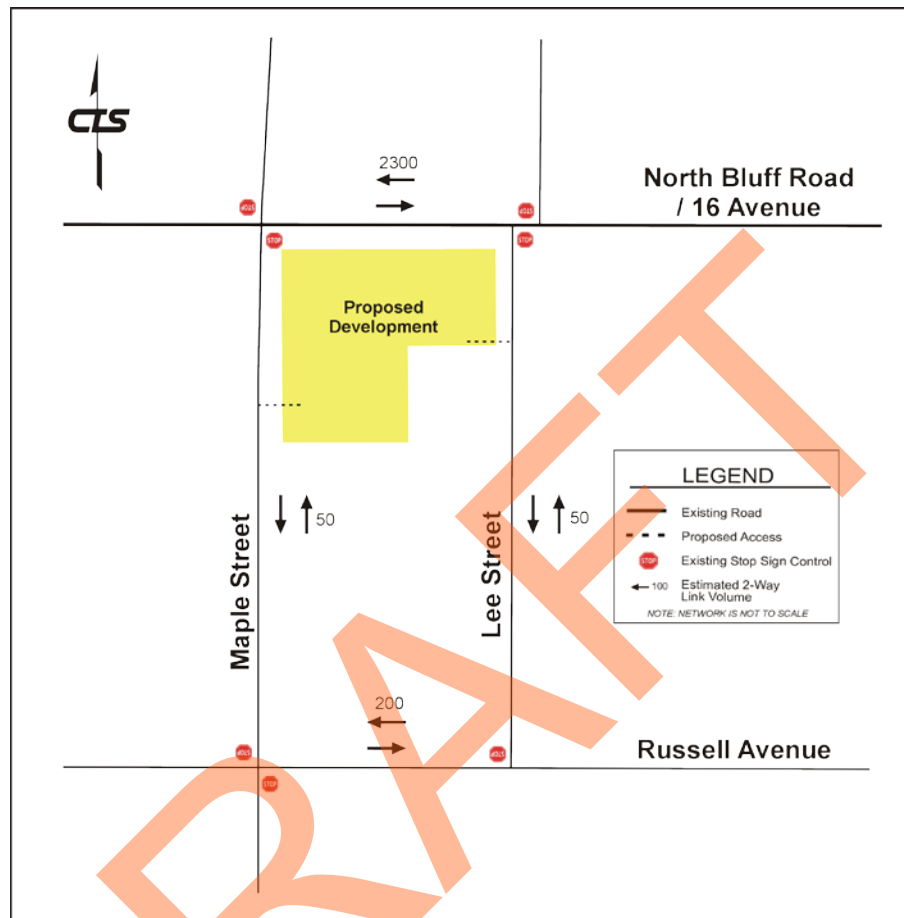
It was requested by the City of White Rock that vehicle link volumes for the year 2045 be considered as part of this Traffic Impact Assessment Study. This is to provide vehicle volume information, relative to the City of White Rock 2045 OCP.

This scenario is 25 years post buildout of the proposed development. It is difficult to accurately forecast vehicle volumes, in the context of intersection analysis. For this reason, peak hour link volumes are determined, to provide an estimated magnitude of vehicle volumes. **FIGURE 16** and **FIGURE 17** show the estimated 2-way link volumes for the morning peak hour and afternoon peak hour.

**FIGURE 16**  
**2045 ESTIMATED VEHICLE LINK VOLUMES FOR MORNING PEAK HOUR**



**FIGURE 17**  
**2045 ESTIMATED VEHICLE LINK VOLUMES FOR AFTERNOON PEAK HOUR**



In the morning peak hour, the estimated 2-way link volume on North Bluff Road, Maple Street, Lee Street, and Russell Avenue, are 2400, 50, 50, and 300 vehicles, respectively.

In the afternoon peak hour, the estimated 2-way link volume on North Bluff Road, Maple Street, Lee Street, and Russell Avenue, are 2300, 50, 50, and 200 vehicles, respectively.

It should be noted that the theoretical capacity for North Bluff Road is 3200 vehicles per hour (two-way).

## 7.0 PARKING REVIEW

### 7.1 Parking Requirements

The required parking spaces are summarized in **TABLE 5** with reference to the *City of White Rock Zoning Bylaw Section 4: General Provisions & Regulations*. The unit descriptions and numbers are based on information provided on architectural drawings.

**TABLE 5**  
**VEHICLE PARKING REQUIREMENTS FOR PROPOSED DEVELOPMENT**

Land Use Description	Land Use Bylaw Classification	Required Parking Rate	# of Units	Parking Stalls Required
Townhouse	Townhouse	2 per Dwelling Unit	14.0	28
Condominium	Apartment	1.5 per Dwelling Unit	76.0	114
<b>Total</b>			<b>90.0</b>	<b>142</b>

The total required amount of parking for the entire development is 142 vehicle parking spaces. The proposed development is planned to provide a total of 129 vehicle parking spaces. It is noted that the townhouse parking is arranged as tandem parking. A parking variance of 10% or 13 parking spaces is required.

The required bicycle parking is noted as 1 Class I bicycle parking space per unit, and 0.2 Class II bicycle parking spaces per unit. The proposed development will be meeting this requirement by providing a total of 90 Class I and 18 Class II bicycle parking spaces.

In addition to these requirements, it is also noted that electric vehicle charging stations are required for any new multi-unit residential developments (4.17.1). It is noted that a minimum of 1 of every 10 off-street parking spaces shall feature an energized outlet capable of providing Level 2 charging and in addition, that 1 of every 10 off-street parking spaces shall feature roughed-in electric vehicle charging infrastructure. The proposed development will be providing this for the condominium units.

### 7.2 Parking Variance

In support of a 10% parking variance, the proposed land uses, existing nearby amenities and infrastructure, and opportunities for alternative modes of travel are considered.

Objective 11.2 of the City of White Rock 2045 OCP notes its policy that new non-market housing be supported by reviewing parking requirements for relaxation, when they are within walking distance of frequent transit service and/or commercial areas. The proposed development will be providing 25 non-market units.

As noted previously in **FIGURE 1**, the Semiahmoo Shopping Centre is within a 10-15 minute walking distance from the proposed development. Also within a 10-15 minute walking distance, at White Rock Centre, is a connection to the Frequent Transit Network along 152<sup>nd</sup> Street. Within a 5 minute walking distance of the proposed development, are bus stops with routes that operate in fifteen minute and half hour intervals.

Other nearby destinations of note include the Peach Arch Hospital, Earl Marriott Secondary School, Peach Arch Elementary School, and the Kent Street Activity Centre in Maccaud Park which is home to the Kent Street Seniors Activity groups.

The study area has good connectivity to transit, as well as cycling and pedestrian infrastructure. The below summarizes these alternative modes of travel:

### Transit Network

The proposed development is well connected to transit with options for regular busses and community shuttles. The site is serviced by the following routes:

- Route #375 White Rock South - Guildford – During peak travel times, this bus operates in half hour intervals. Bus stop is on North Bluff Road.
- Route #321 Surrey Central Station – Newton Exchange/White Rock Centre/White Rock South – During peak travel times, this bus operates in fifteen-minute intervals. Bus Stop is on North Bluff Road.
- Route #361 White Rock Centre - Ocean Park – During weekday peak travel times, this bus operates in half hour intervals. On the weekend peak travel times, this bus operates in one-hour intervals. Bus Stop is on Thrift Avenue.

The above bus routes can be used to connect to the nearby Frequent Transit Network at White Rock Centre.

- Route #360 Ocean Park - Peach Arch Hospital – During weekday peak travel times, this bus operates in half hour intervals. On the weekend peak travel times, this bus operates in one-hour intervals. Bus Stop is on Thrift Avenue, west of Finlay Street.
- Route #363 South Point - Peach Arch Hospital – During peak travel times, this bus operates in half hour intervals. Bus Stop is on Thrift Avenue, west of Finlay Street.

Bus stop locations are illustrated in **FIGURE 4**.

### Bicycle Network

According to the *City of White Rock Strategic Transportation Plan*:

- North Bluff Road is proposed in the future to be designated as a bicycle route;
- Finlay Street is currently designated as a shared use lane; and
- Thrift Avenue is currently designated as a shared use lane.

The proposed development will be providing 90 Class I and 18 Class II bicycle parking spaces, which will help to facilitate this mode of travel for residents or visitors.

The bicycle routes within the study area are illustrated in **FIGURE 4**.

### Pedestrian Network

The study area is well connected with sidewalks. All arterial and collector roads have a sidewalk on at least one side. Some local roads also have sidewalks on one side. Currently, there are no sidewalks on Maple Street or Lee Street.

The proposed development will be including enhanced sidewalks on the frontage and also a greenway through the property.

The existing sidewalks are illustrated in **FIGURE 18**.

**FIGURE 18  
ALTERNATIVE MODES OF TRAVEL**



In consideration of the intended land use and the available nearby amenities and infrastructure to encourage alternative modes of travel, it is expected that the proposed number of off-street vehicle parking stalls is sufficient to fully support the development.



## 8.0 LOADING SWEEP PATH ANALYSIS

A loading bay is proposed to be provided on Maple Street and is shown in the Architectural Drawings included in **APPENDIX A**.

In order to assess the viability of the proposed loading bay, a swept path analysis was conducted to determine the impact on the adjacent road and curb.

The design vehicle used is the MSU-TAC. This is a standard medium single unit vehicle described by the Transportation Association of Canada, and is what would typically be expected for basic deliveries or people moving in and out. It has an overall length of 10 metres and a width of 2.6 meters.

It is recommended that any vehicles using the loading bay always reverse in and drive forward out. This will be a safer combination of maneuvers as drivers will have clear vision while exiting, driving forward. Drivers will also have clear vision of the driveway and adjacent sidewalks before reversing in.

Reversing into the loading bay from the northbound lane is preferred, as it will have a lower overall impact on vehicle traffic on Maple Street. The swept path of a truck travelling northbound, entering the loading bay, is illustrated in **FIGURE 19**.

When a truck is exiting the loading bay, it is recommended that it travel southbound. As a left turn maneuver, it is already expected to cross both lanes. The truck is able to comfortably wait for a safe gap in traffic to exit. This is preferred over making a right turn, and requiring a wider turn that may not be expected. **FIGURE 20** illustrates an MSU exiting the loading bay and travelling southbound.



**FIGURE 19**  
**MSU INGRESSING TRAVELLING NORTHBOUND**



**FIGURE 21**  
**MSU EGRESSING TRAVELLING SOUTHBOUND**





The swept path analysis shows that a design vehicle of a MSUTAC can be accommodated with some widening at the throat of the proposed loading zone.

The truck turning manoeuvres illustrated are one- and two-point turns that are not expected to require a lot of time to complete.

Based on the 2020 Base + Site vehicle volumes forecasted for Maple Street, the two-way vehicle volume is 42 vehicles in the morning peak hour, and 50 vehicles in the afternoon peak hour. This is equivalent to one vehicle every 1.4 minutes in the morning peak hour, and one vehicle every 1.2 minutes in the afternoon peak hour. Both turning maneuvers to enter and exit the loading bay require the northbound and southbound lanes on Maple Street, however, gaps in traffic are not expected to be difficult to find.

Impacts on the adjacent road way can be minimized, and truck turning maneuvering can be safer, if vehicles enter by reversing in while traveling northbound and by exiting forward to travel southbound.

DRAFT

## 9.0 CONCLUSIONS & RECOMMENDATIONS

### 9.1 Conclusions

- 1) The proposed development is to be located at 15654, 15664, 15674 North Bluff Road, 1593 Lee Street, and 1580, 1570 Maple Street, in the City of White Rock. The residential development is proposed to be rezoned as a comprehensive development consisting of 14 townhouse units and 76 condominium units for a total of 90 dwelling units. 25 of the condominium units will be non-market rental.
- 2) CTS staff performed weekday traffic volume surveys on Friday, 22 September 2017 and on Thursday 22 November 2018 in order to document existing conditions. Future base traffic volumes were projected using a 2.0% annual traffic volumes growth rate (simple straight line) and then the proposed development traffic was superimposed on top to estimate future baseline conditions. The design hours of analysis were the weekday morning and afternoon peak hours.
- 3) Upon the full build-out, the overall development is forecasted to generate a total of 33 vehicle trips (8 inbound, and 25 outbound) during the morning peak hour and a total of 40 vehicle trips (23 inbound, and 17 outbound) during the afternoon peak hour.
- 4) The capacity analysis for the unsignalized intersections and the site accesses determined that the road network can accommodate the projected increase in traffic volumes without any operational and/or geometrical improvements.
- 5) 2045 peak hour link volumes are estimated using collected turning movement counts. This is provided to give an estimated magnitude of vehicle volumes in the context of the City of White Rock 2045 OCP.
- 6) As per the City of White Rock Zoning Bylaw, for a development with 14 townhomes and 76 condominium units, the overall required parking is 142 stalls. The proposed development is providing 129 vehicle parking spaces and will require a parking variance of 10% or 13 parking spaces.
- 7) In support of a 10% parking variance, reference was made to the intended land use, nearby amenities and infrastructure to encourage alternative modes of travel:
  - Proposed development will have 25 non-market units
  - Within a 10-15 minute walk of Semiahmoo Shopping Centre and White Rock Centre where the Frequent Transit Network connects
  - Within a 5 minute walk of 5 different bus routes
  - Nearby destinations include Peach Arch Hospital, Earl Marriott Secondary School, Peach Arch Elementary School, Kent Street Activity Centre in Maccaud Park
  - Providing 90 Class I and 18 Class II bicycle parking spaces
  - Proposed development will include enhanced sidewalks on the frontage and a greenway through the property.

- 8) The proposed loading bay was reviewed to assess its viability and impact on the adjacent road and curb. The swept path analysis shows that a design vehicle of a MSUTAC can be accommodated with some widening at the throat of the proposed loading zone. Impacts on the adjacent road way can be minimized and truck turning maneuvering can be safer, if vehicles enter by reversing in while traveling northbound and by exiting forward to travel southbound.

## 9.2 Recommendations

It is recommended that the development consider the following transportation related item for the benefit of the development as well as that of the surrounding community.

- 1) The developer work with the City to ensure any improvements to the fronting sidewalks align with the City of White Rock *Strategic Transportation Plan*;
- 2) That the City grant a vehicle parking variance of 10% or 13 vehicle parking stalls, based on the supporting information provided in this report;
- 3) The driveway for the proposed loading zone throat be widened as noted in this report, to accommodate for a MSUTAC design vehicle;
- 4) That trucks using the loading bay be instructed to enter from the northbound lane via reversing in, and exit to the southbound lane by driving forward out.

We would like to take this opportunity to thank you for this unique project and we look forward to working with you again in the future. Please call the undersigned should you have any questions or comments.

Yours truly,

**CREATIVE TRANSPORTATION SOLUTIONS LTD.**

*Reviewed by:*

*Prepared by:*

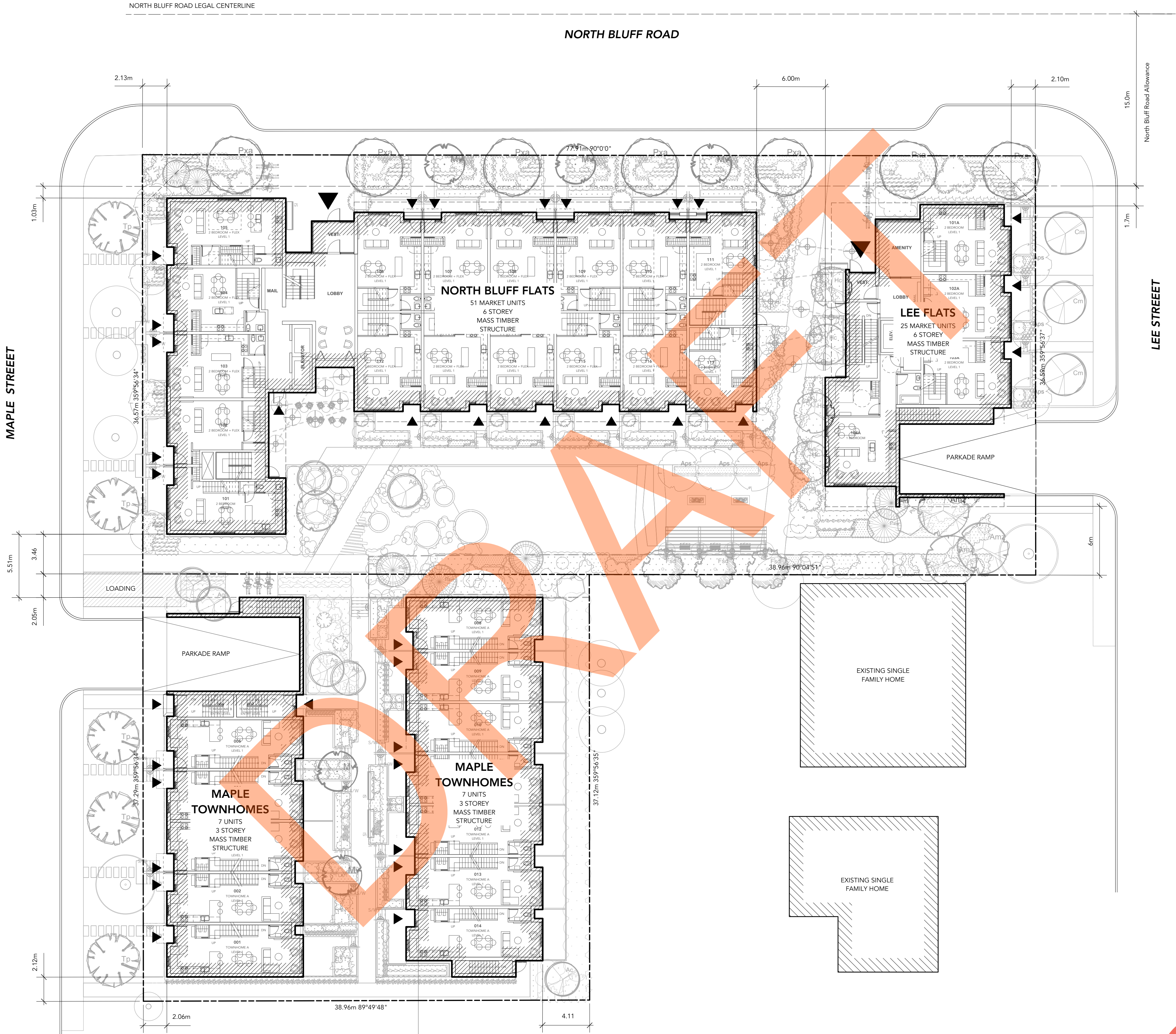
**Gary Vlieg, P.Eng.**  
Engineering Group Manager

**Dominique Bram Guevarra, EIT**  
Junior Traffic Engineer

Attachment

**Appendix A**  
**Architectural Drawing**





issued for DP  
2018.10.15  
Beachway  
White Rock, BC

SITE PLAN

A010

**Appendix B**  
**Turning Movement Counts**





Vehicle Classification Summary

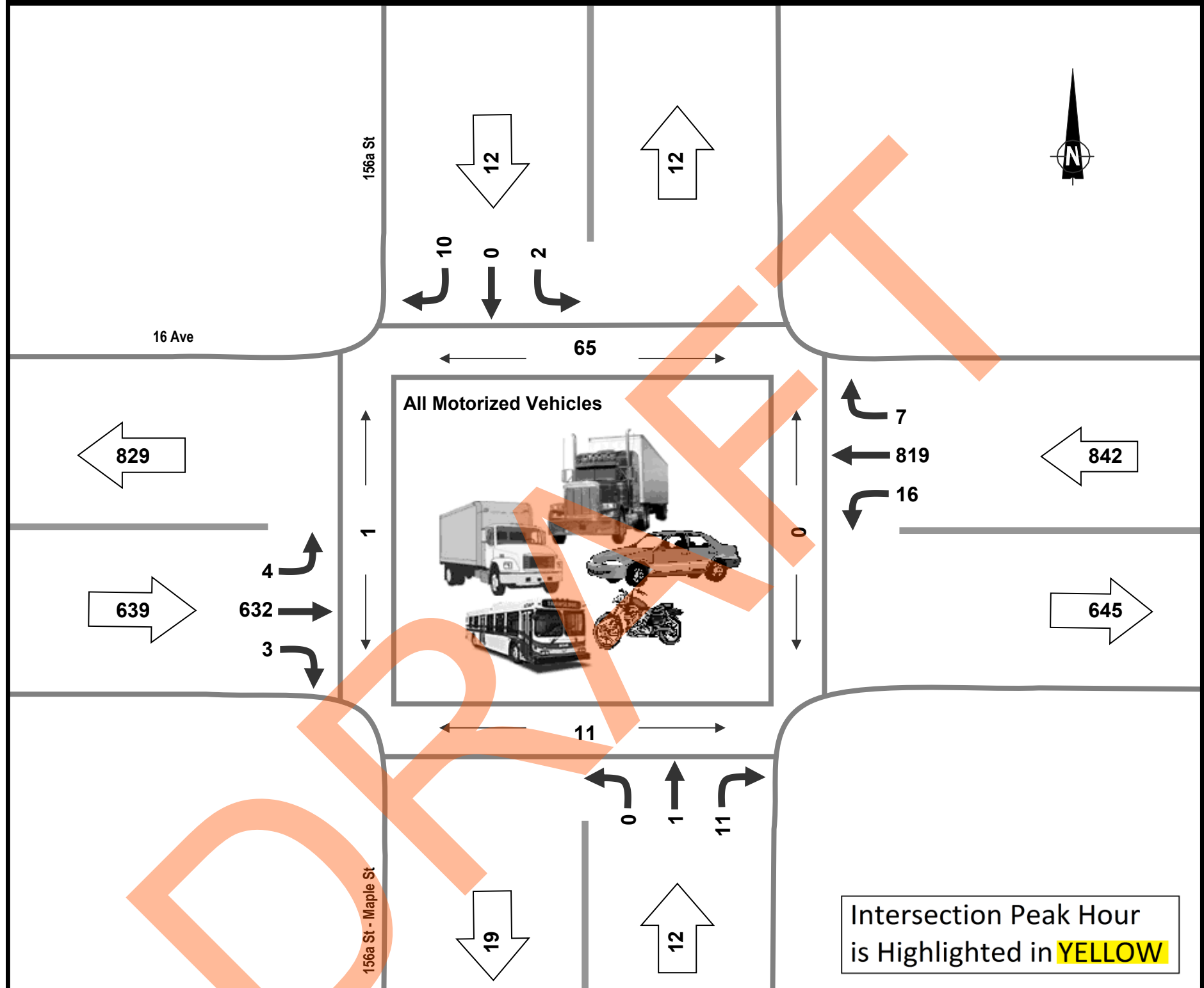
Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	2,264	52				2,316
	%	97.8%	2.2%				100.0%
Midday (00:00 - 00:00)	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	4,006	24				4,030
	%	99.4%	0.6%				100.0%
Total (5 Hours)	Volume	6,270	76				6,346
	%	98.8%	1.2%				100.0%

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny  
Vehicle Class: All Motorized Vehicles

### Peak Hour Traffic by Movement

8:00 AM to 9:00 AM



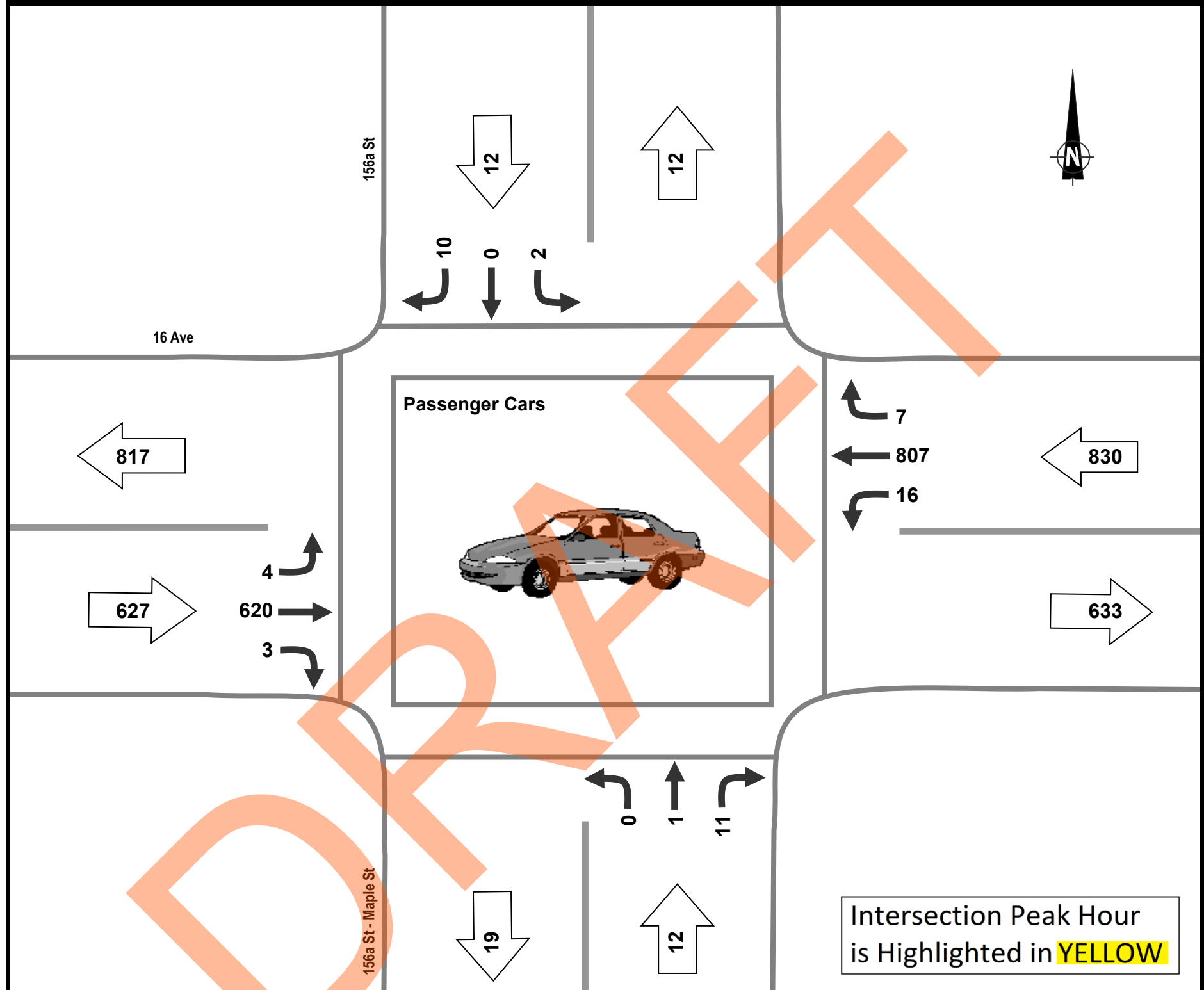
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	0	10	0	1	11	4	632	3	16	819	7	65	11	1	0	1,505
PHF	0.50	0.00	0.63	0.00	0.25	0.34	0.50	0.73	0.75	0.57	0.78	0.35	0.56	0.55	0.25	0.00	0.75
Peak 15 X 4	4	0	16	0	4	32	8	864	4	28	1,044	20	116	20	4	0	2,016
Average Hour	3	1	8	1	1	9	4	529	3	8	589	5	42	8	2	0	1,161
Survey Total	5	1	16	1	2	18	7	1,058	5	16	1,178	9	84	15	3	0	2,316
7:00	2	0	0	0	0	0	0	96	1	0	69	0	2	0	0	0	168
7:15	0	0	1	0	1	2	1	99	0	0	82	0	2	1	0	0	186
7:30	0	1	2	0	0	4	0	111	0	0	78	0	7	2	0	0	196
7:45	1	0	3	1	0	1	2	120	1	0	130	2	8	1	2	0	261
8:00	1	0	3	0	0	1	1	140	1	4	184	0	19	3	1	0	335
8:15	1	0	4	0	0	8	2	216	0	7	261	5	29	5	0	0	504
8:30	0	0	2	0	1	1	0	174	1	5	218	2	14	0	0	0	404
8:45	0	0	1	0	0	1	1	102	1	0	156	0	3	3	0	0	262

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny  
Vehicle Class: Passenger Cars

## Morning Peak Period

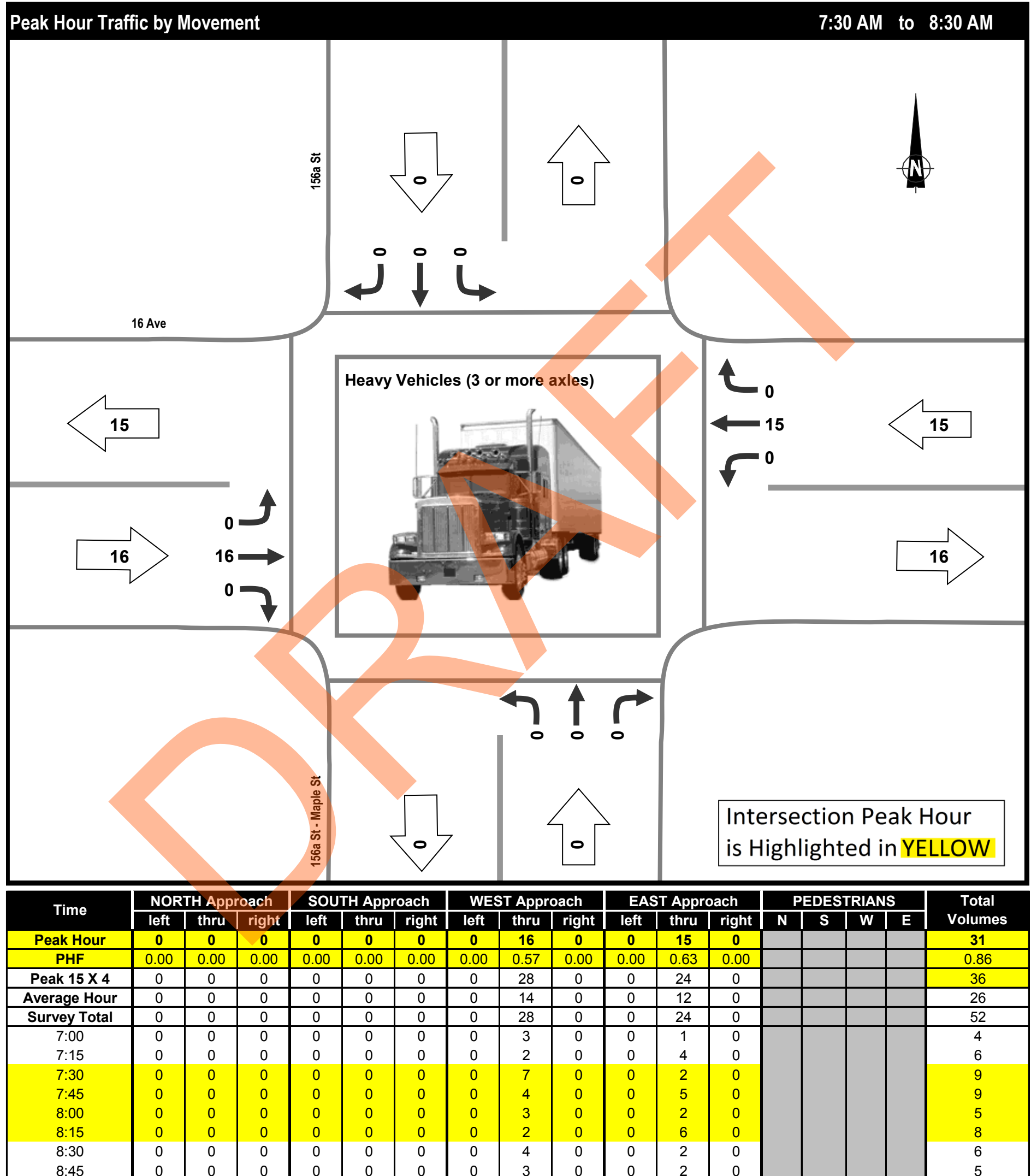
### Peak Hour Traffic by Movement

8:00 AM to 9:00 AM

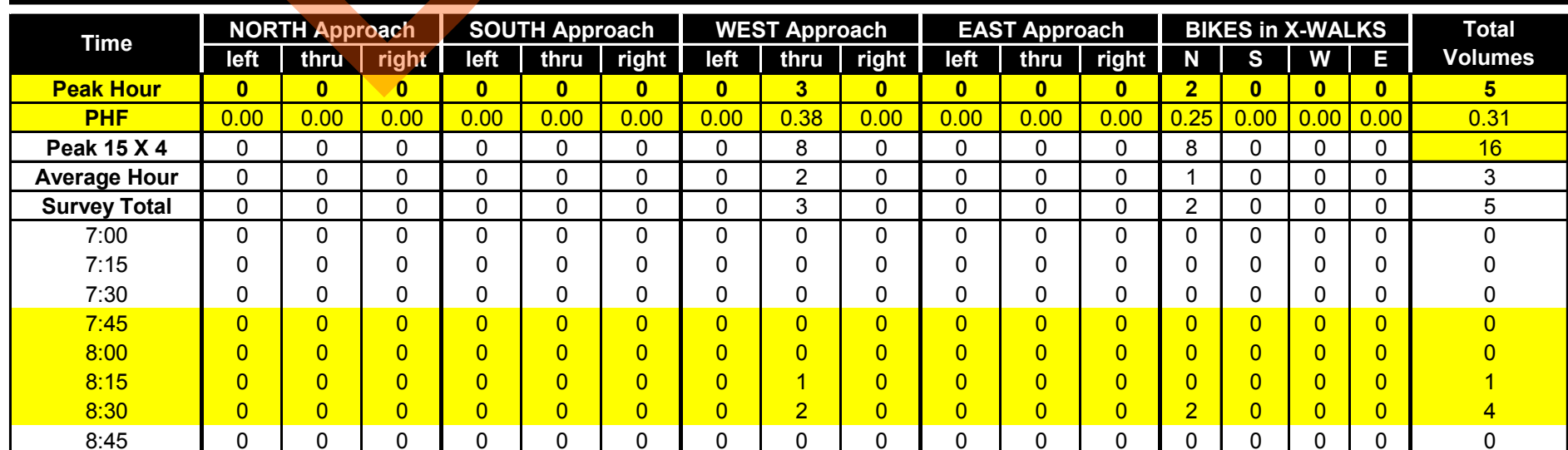


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	0	10	0	1	11	4	620	3	16	807	7					1,481
PHF	0.50	0.00	0.63	0.00	0.25	0.34	0.50	0.72	0.75	0.57	0.79	0.35					0.75
Peak 15 X 4	4	0	16	0	4	32	8	856	4	28	1,020	20					1,984
Average Hour	3	1	8	1	1	9	4	515	3	8	577	5					1,135
Survey Total	5	1	16	1	2	18	7	1,030	5	16	1,154	9					2,264
7:00	2	0	0	0	0	0	0	93	1	0	68	0					164
7:15	0	0	1	0	1	2	1	97	0	0	78	0					180
7:30	0	1	2	0	0	4	0	104	0	0	76	0					187
7:45	1	0	3	1	0	1	2	116	1	0	125	2					252
8:00	1	0	3	0	0	1	1	137	1	4	182	0					330
8:15	1	0	4	0	0	8	2	214	0	7	255	5					496
8:30	0	0	2	0	1	1	0	170	1	5	216	2					398
8:45	0	0	1	0	0	1	1	99	1	0	154	0					257

Project: #5740: Russell Ave TIA  
 Municipality: White Rock  
 Weather: Clear, Sunny  
 Vehicle Class: Heavy Vehicles (3 or more axles)



**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**

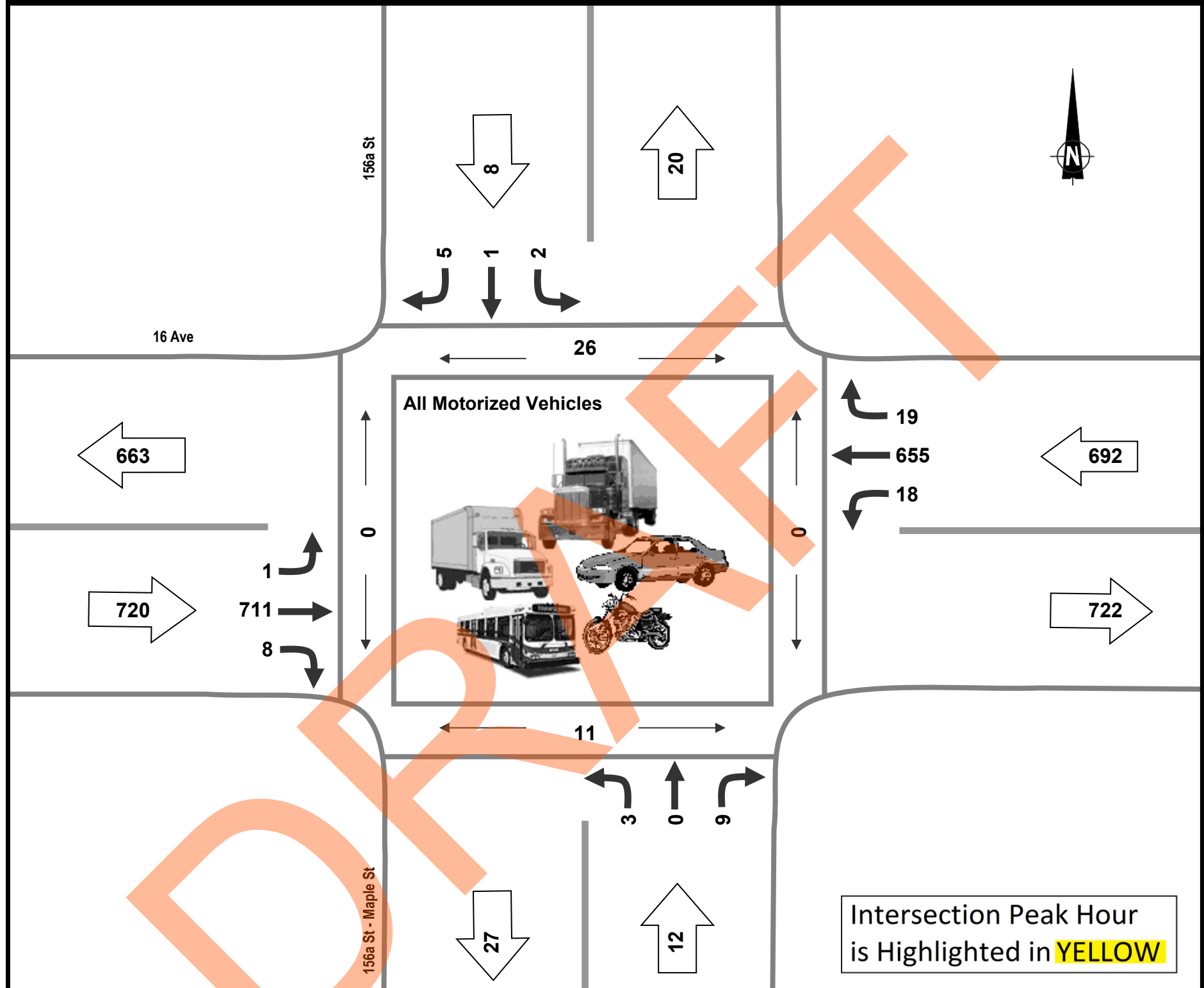


Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny  
Vehicle Class: All Motorized Vehicles

Afternoon Peak Period

## Peak Hour Traffic by Movement

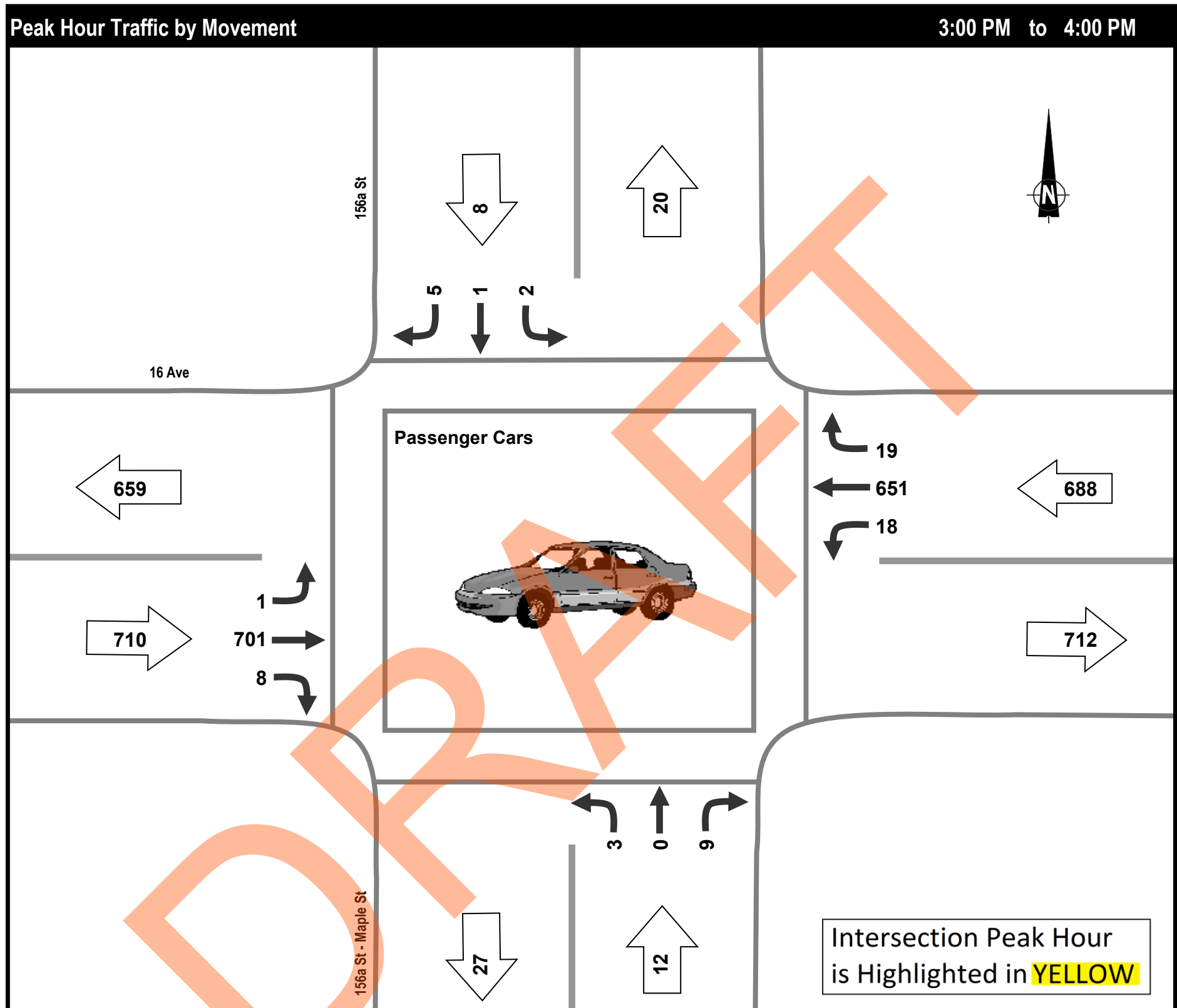
3:00 PM to 4:00 PM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	1	5	3	0	9	1	711	8	18	655	19	26	11	0	0	1,432
PHF	0.50	0.25	0.42	0.38	0.00	0.56	0.25	0.88	0.67	0.75	0.94	0.37	0.50	0.69	0.00	0.00	0.95
Peak 15 X 4	4	4	12	8	0	16	4	812	12	24	700	52	52	16	0	0	1,512
Average Hour	2	1	5	2	2	8	4	649	5	13	641	11	13	9	0	0	1,343
Survey Total	6	2	15	7	5	24	11	1,948	16	40	1,922	34	38	26	1	1	4,030
15:00	0	0	2	0	0	2	0	203	2	4	163	2	13	3	0	0	378
15:15	1	0	0	1	0	4	0	159	2	5	175	13	7	1	0	0	360
15:30	0	1	3	0	0	0	1	180	3	3	162	3	4	3	0	0	356
15:45	1	0	0	2	0	3	0	169	1	6	155	1	2	4	0	0	338
16:00	0	0	0	2	0	2	0	177	0	1	150	1	1	3	0	0	333
16:15	0	0	2	0	0	4	2	165	0	2	192	4	6	1	0	0	371
16:30	1	0	0	0	2	2	1	195	1	0	170	1	3	1	0	0	373
16:45	0	0	2	0	1	2	1	156	1	6	144	4	1	0	0	0	317
17:00	0	0	4	0	0	2	2	176	2	6	131	1	1	1	0	0	324
17:15	1	0	0	0	0	1	1	122	2	3	165	1	0	4	1	0	296
17:30	0	0	2	0	0	0	2	124	0	1	161	3	0	0	0	1	293
17:45	2	1	0	2	2	2	1	122	2	3	154	0	0	5	0	0	291

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny  
Vehicle Class: Passenger Cars

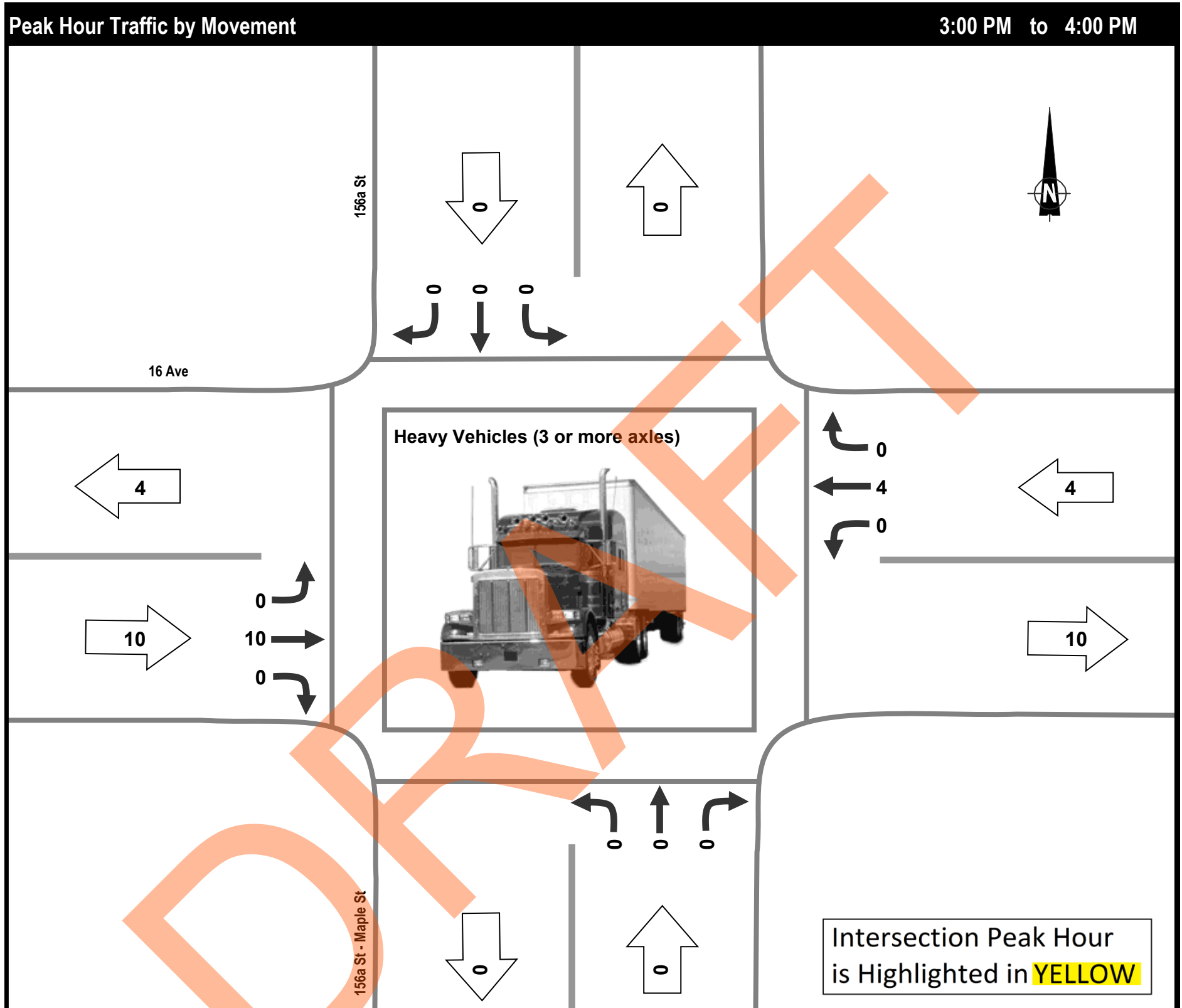
Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	1	5	3	0	9	1	701	8	18	651	19					1,418
PHF	0.50	0.25	0.42	0.38	0.00	0.56	0.25	0.88	0.67	0.75	0.93	0.37					0.95
Peak 15 X 4	4	4	12	8	0	16	4	800	12	24	700	52					1,488
Average Hour	2	1	5	2	2	8	4	645	5	13	637	11					1,335
Survey Total	6	2	15	7	5	24	11	1,935	16	40	1,911	34					4,006
15:00	0	0	2	0	0	2	0	200	2	4	160	2					372
15:15	1	0	0	1	0	4	0	156	2	5	175	13					357
15:30	0	1	3	0	0	0	1	178	3	3	161	3					353
15:45	1	0	0	2	0	3	0	167	1	6	155	1					336
16:00	0	0	0	2	0	2	0	176	0	1	149	1					331
16:15	0	0	2	0	0	4	2	165	0	2	192	4					371
16:30	1	0	0	0	2	2	1	195	1	0	170	1					373
16:45	0	0	2	0	1	2	1	156	1	6	143	4					316
17:00	0	0	4	0	0	2	2	176	2	6	130	1					323
17:15	1	0	0	0	0	1	1	122	2	3	163	1					294
17:30	0	0	2	0	0	0	2	123	0	1	160	3					291
17:45	2	1	0	2	2	2	1	121	2	3	153	0					289

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Sunny  
Vehicle Class: Heavy Vehicles (3 or more axles)

Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0	0	0	0	0	0	0	10	0	0	4	0					14
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.33	0.00					0.58
Peak 15 X 4	0	0	0	0	0	0	0	12	0	0	12	0					24
Average Hour	0	0	0	0	0	0	0	4	0	0	4	0					8
Survey Total	0	0	0	0	0	0	0	13	0	0	11	0					24
15:00	0	0	0	0	0	0	0	3	0	0	3	0					6
15:15	0	0	0	0	0	0	0	3	0	0	0	0					3
15:30	0	0	0	0	0	0	0	2	0	0	1	0					3
15:45	0	0	0	0	0	0	0	2	0	0	0	0					2
16:00	0	0	0	0	0	0	0	1	0	0	1	0					2
16:15	0	0	0	0	0	0	0	0	0	0	0	0					0
16:30	0	0	0	0	0	0	0	0	0	0	0	0					0
16:45	0	0	0	0	0	0	0	0	0	0	1	0					1
17:00	0	0	0	0	0	0	0	0	0	0	1	0					1
17:15	0	0	0	0	0	0	0	0	0	0	2	0					2
17:30	0	0	0	0	0	0	0	1	0	0	1	0					2
17:45	0	0	0	0	0	0	0	1	0	0	1	0					2



[illegible]

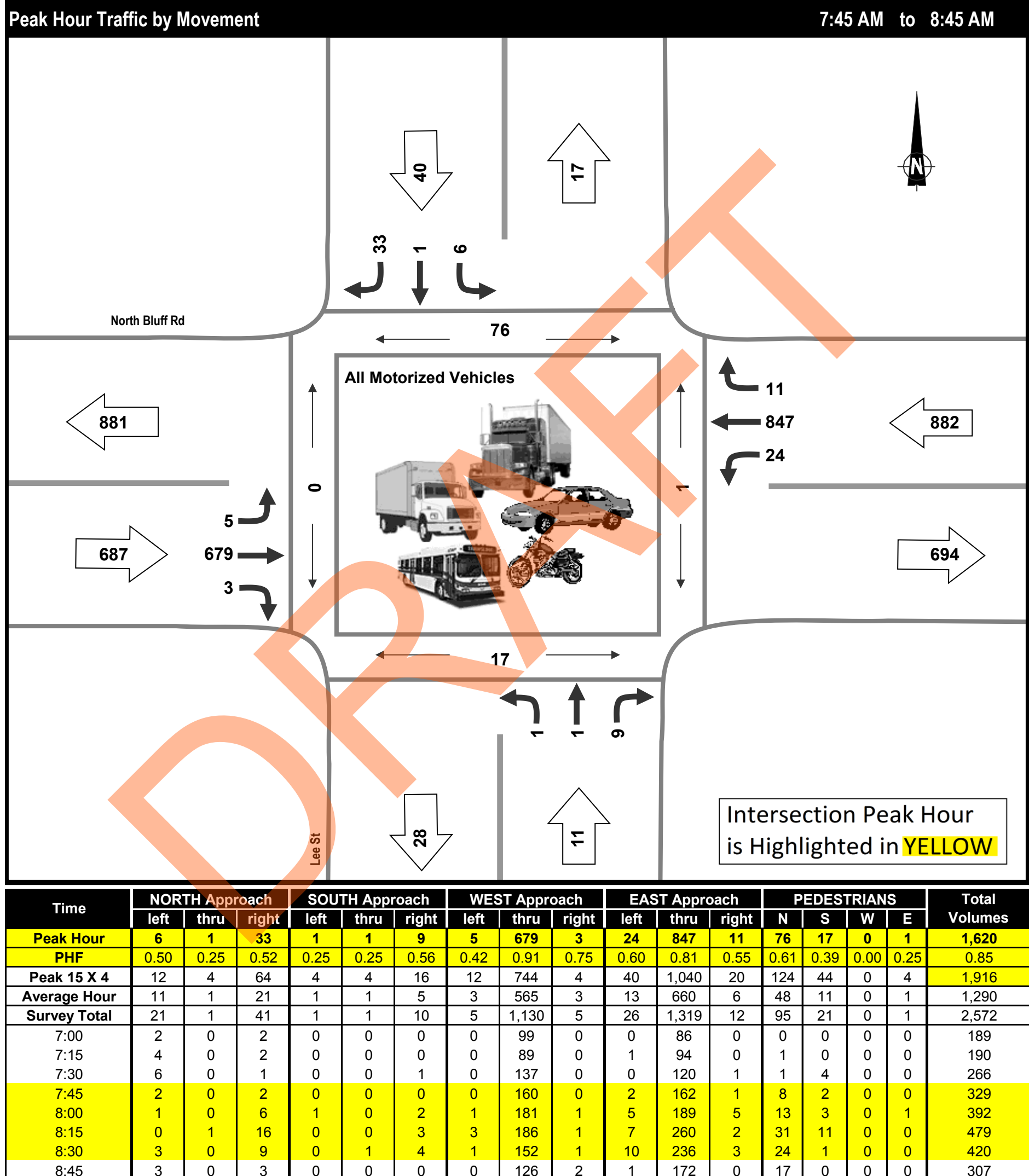


Vehicle Classification Summary

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	2,538	34				2,572
	%	98.7%	1.3%				100.0%
Midday	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	4,528	17				4,545
	%	99.6%	0.4%				100.0%
Total (5 Hours)	Volume	7,066	51				7,117
	%	99.3%	0.7%				100.0%

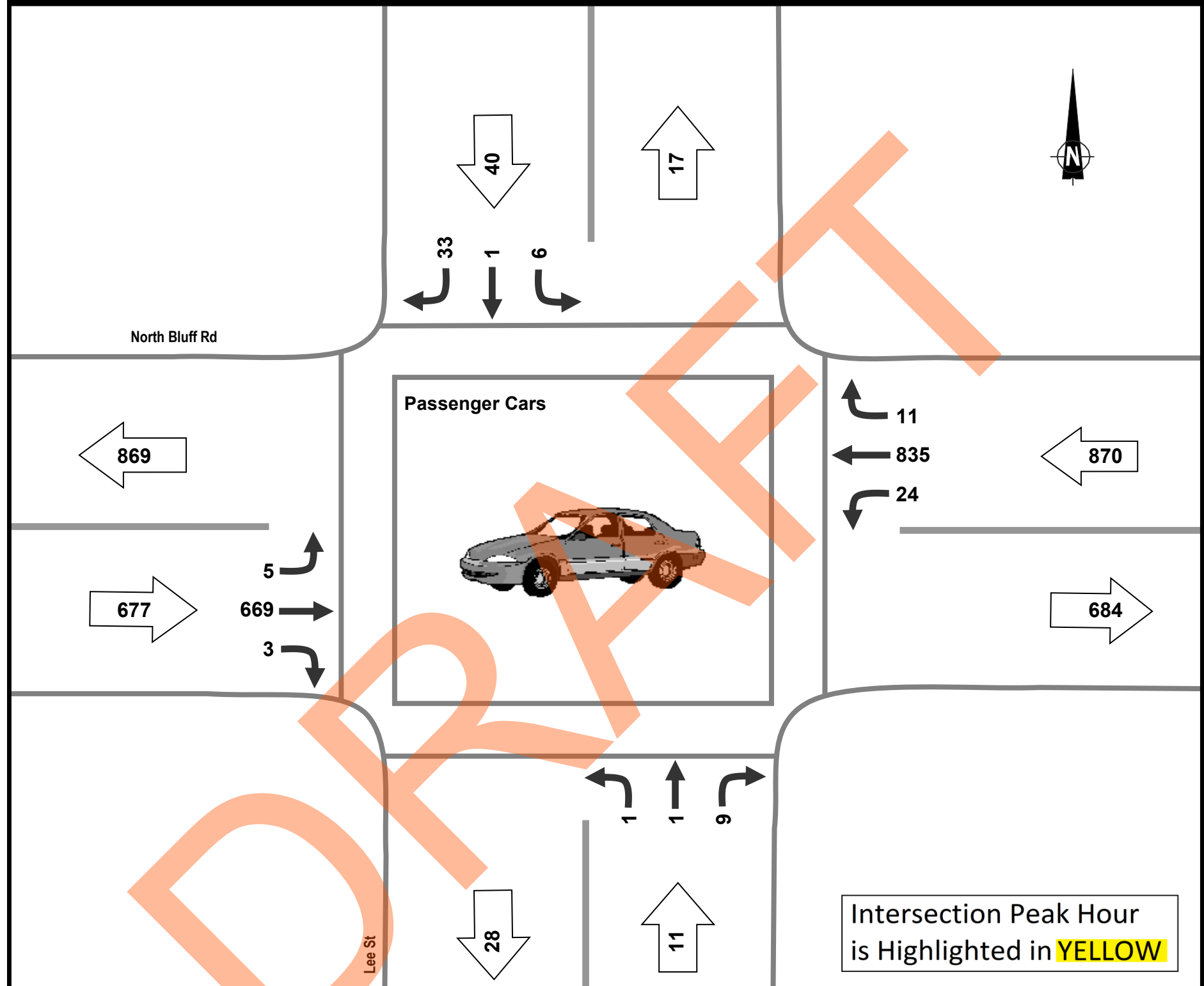
Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Morning Peak Period**


Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Passenger Cars

**Morning Peak Period**
**Peak Hour Traffic by Movement**

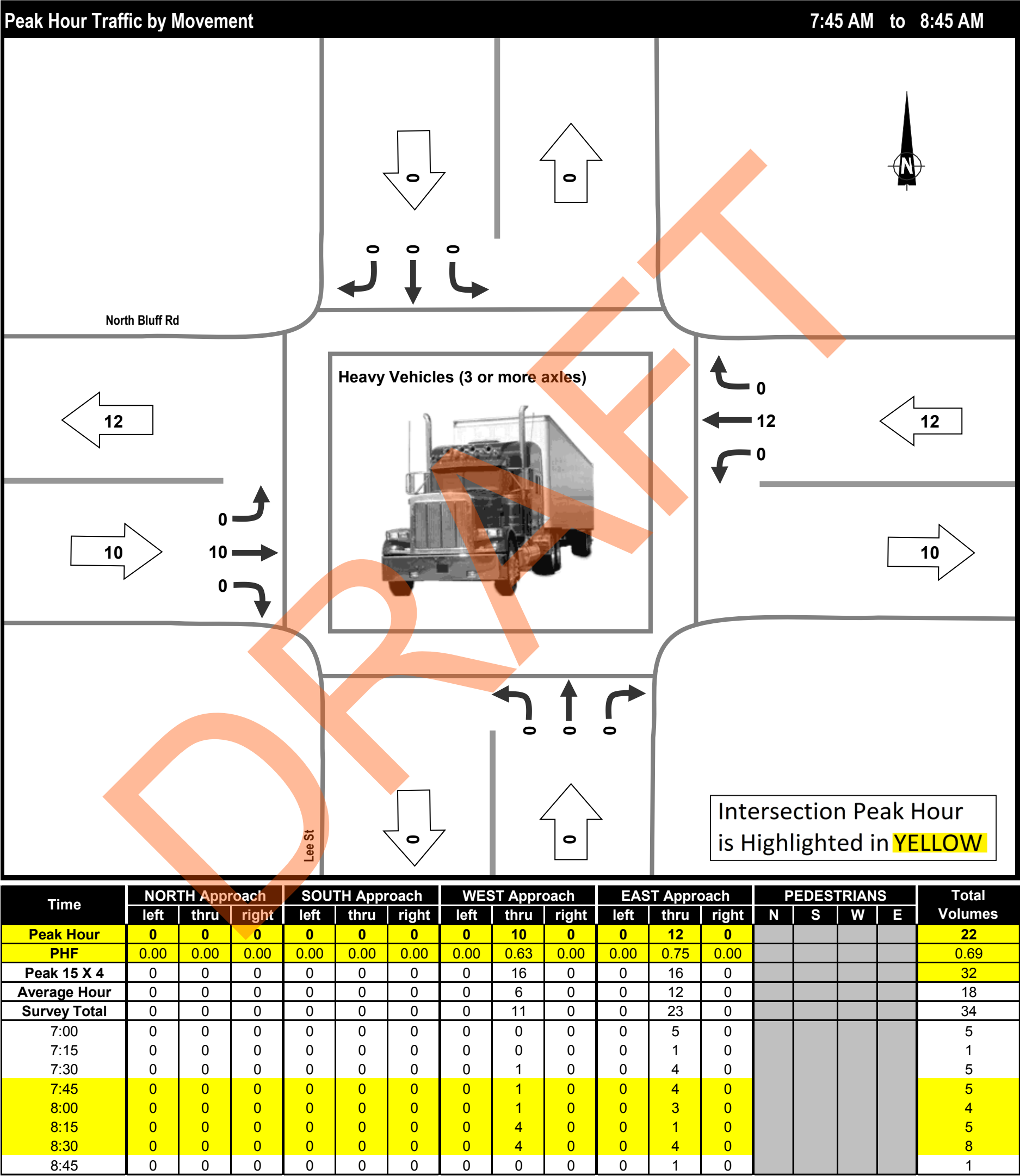
7:45 AM to 8:45 AM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
<b>Peak Hour</b>	<b>6</b>	<b>1</b>	<b>33</b>	<b>1</b>	<b>1</b>	<b>9</b>	<b>5</b>	<b>669</b>	<b>3</b>	<b>24</b>	<b>835</b>	<b>11</b>					<b>1,598</b>
<b>PHF</b>	<b>0.50</b>	<b>0.25</b>	<b>0.52</b>	<b>0.25</b>	<b>0.25</b>	<b>0.56</b>	<b>0.42</b>	<b>0.92</b>	<b>0.75</b>	<b>0.60</b>	<b>0.81</b>	<b>0.55</b>					<b>0.84</b>
<b>Peak 15 X 4</b>	12	4	64	4	4	16	12	728	4	40	1,036	20					1,896
<b>Average Hour</b>	11	1	21	1	1	5	3	560	3	13	648	6					1,273
<b>Survey Total</b>	21	1	41	1	1	10	5	1,119	5	26	1,296	12					2,538
7:00	2	0	2	0	0	0	0	99	0	0	81	0					184
7:15	4	0	2	0	0	0	0	89	0	1	93	0					189
7:30	6	0	1	0	0	1	0	136	0	0	116	1					261
7:45	2	0	2	0	0	0	0	159	0	2	158	1					324
8:00	1	0	6	1	0	2	1	180	1	5	186	5					388
8:15	0	1	16	0	0	3	3	182	1	7	259	2					474
8:30	3	0	9	0	1	4	1	148	1	10	232	3					412
8:45	3	0	3	0	0	0	0	126	2	1	171	0					306

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

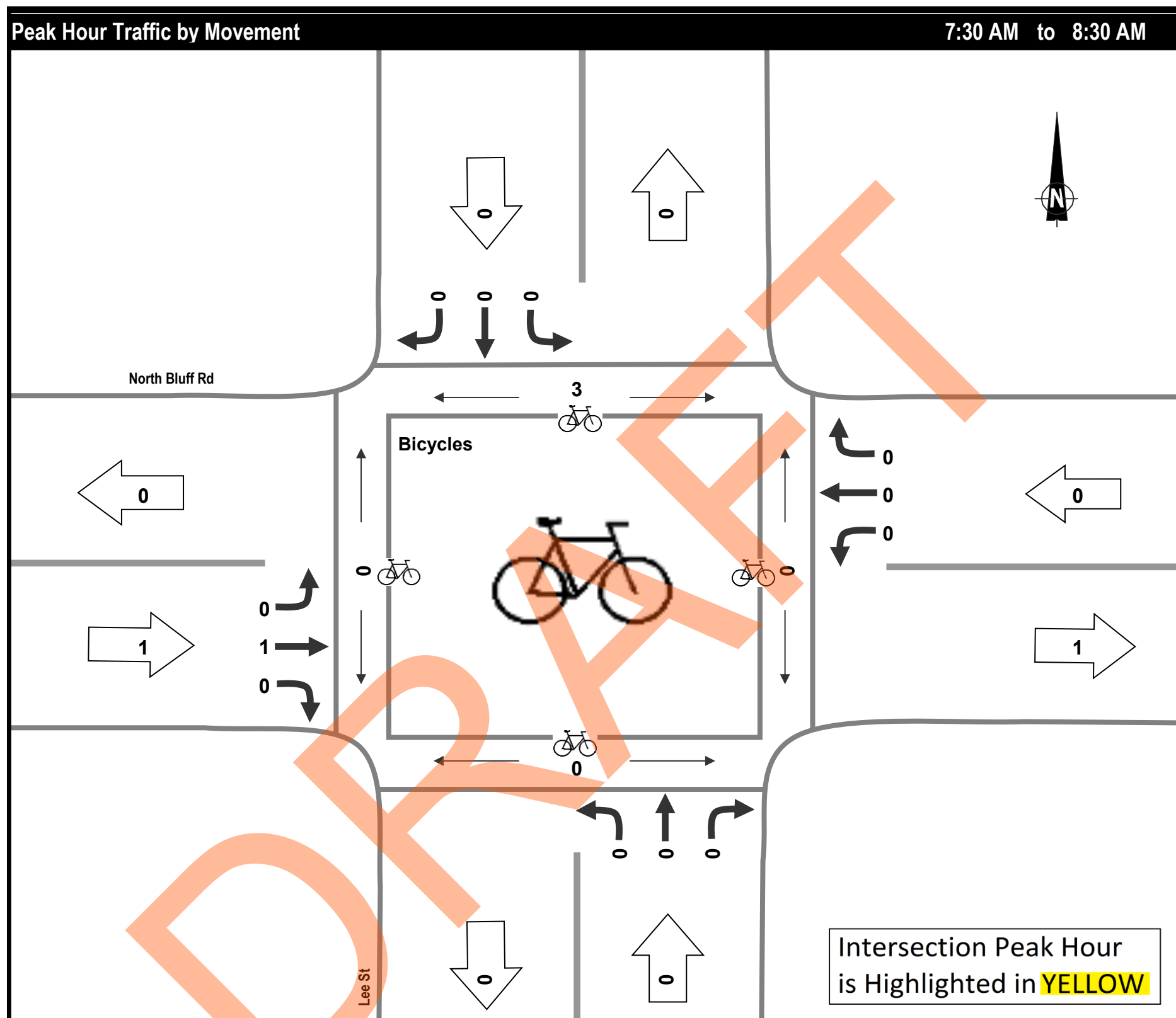
**Morning Peak Period**



**Project:** #5935: Beachway Traffic Impact Assessment  
**Municipality:** White Rock  
**Weather:** Cloudy  
**Vehicle Class:** Bicycles

**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**

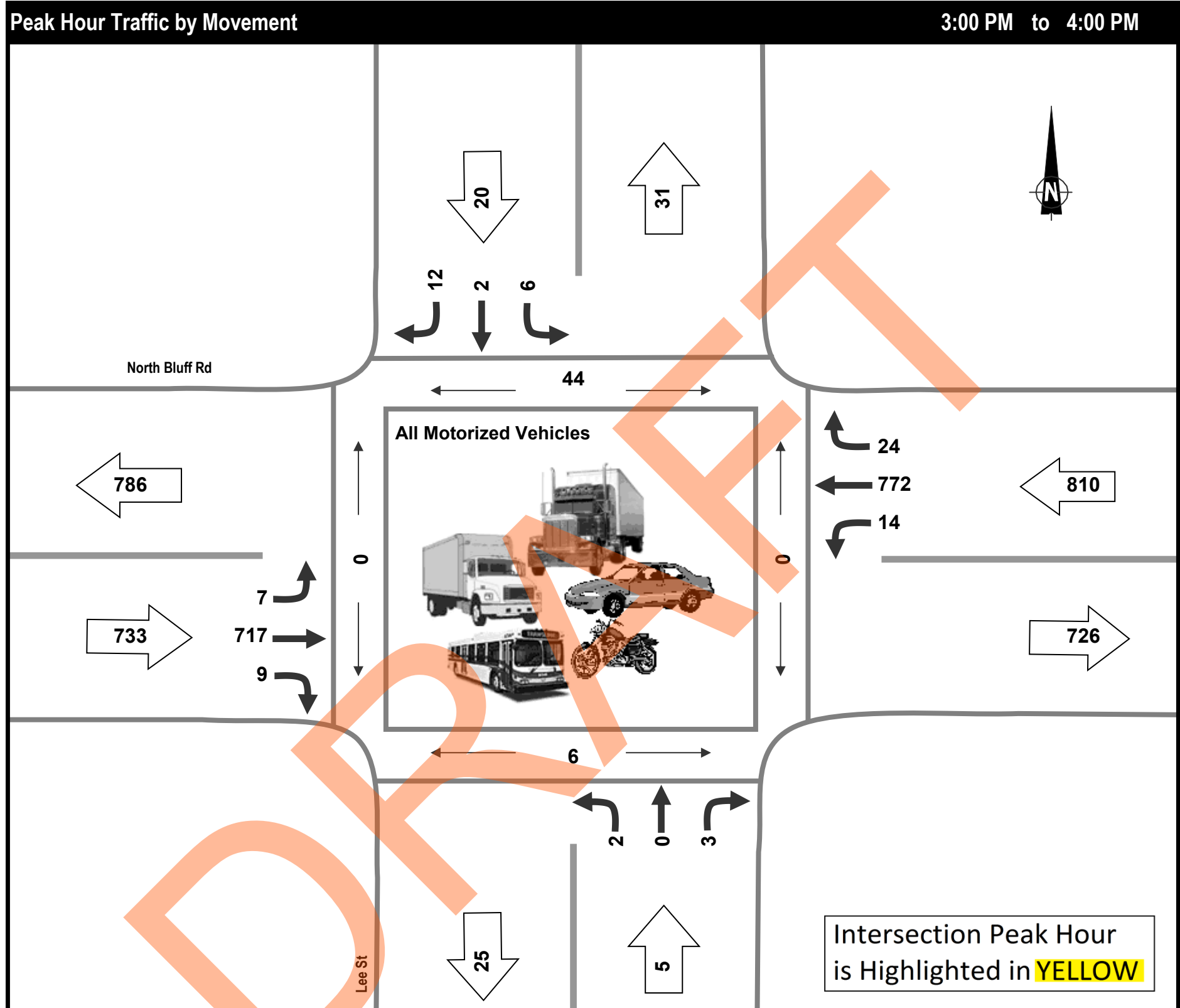
## Morning Peak Period

[illegible]



Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: All Motorized Vehicles

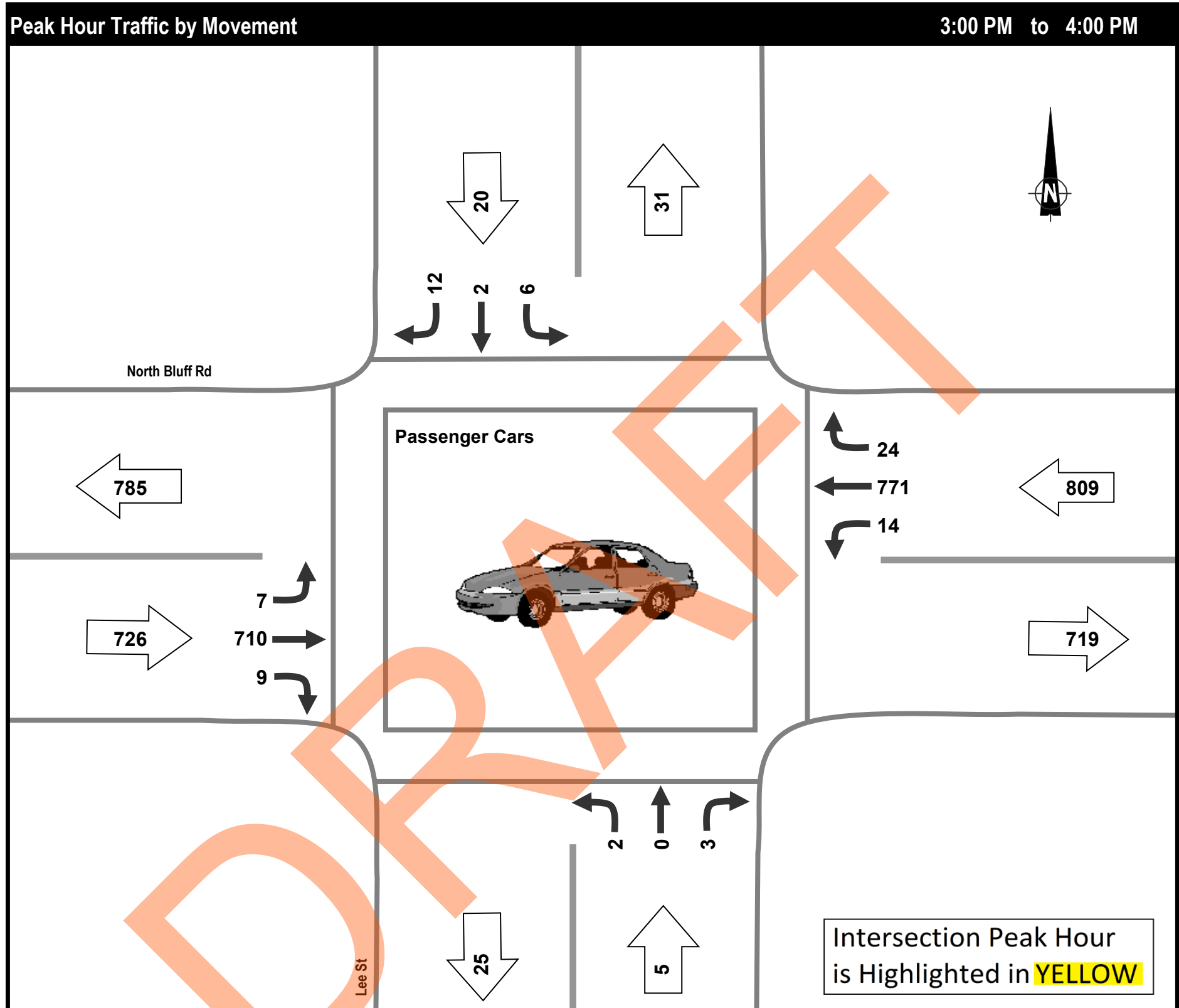
## Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	6	2	12	2	0	3	7	717	9	14	772	24	44	6	0	0	1,568
PHF	0.38	0.25	0.50	0.25	0.00	0.38	0.29	0.86	0.75	0.50	0.94	0.75	0.58	0.50	0.00	0.00	0.88
Peak 15 X 4	16	8	24	8	0	8	24	836	12	28	820	32	76	12	0	0	1,788
Average Hour	9	1	9	3	0	2	6	702	5	9	752	17	20	5	0	0	1,515
Survey Total	26	3	27	8	1	7	18	2,105	15	28	2,257	50	60	15	0	1	4,545
15:00	1	2	6	2	0	2	6	209	2	7	202	8	19	3	0	0	447
15:15	1	0	2	0	0	0	0	163	3	2	194	6	13	3	0	0	371
15:30	0	0	2	0	0	0	0	186	2	3	171	8	5	0	0	0	372
15:45	4	0	2	0	0	1	1	159	2	2	205	2	7	0	0	0	378
16:00	1	0	2	2	0	0	0	195	2	1	186	1	0	1	0	0	390
16:15	2	0	1	0	0	0	2	181	0	3	181	2	5	2	0	1	372
16:30	4	1	2	0	0	1	2	188	0	3	169	2	0	0	0	0	372
16:45	3	0	2	1	0	1	3	184	1	0	212	5	3	0	0	0	412
17:00	2	0	2	1	0	0	0	206	2	2	186	6	2	0	0	0	407
17:15	2	0	2	0	1	2	2	153	1	1	203	1	4	1	0	0	368
17:30	3	0	2	1	0	0	0	147	0	1	171	4	1	1	0	0	329
17:45	3	0	2	1	0	0	2	134	0	3	177	5	1	4	0	0	327

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Passenger Cars

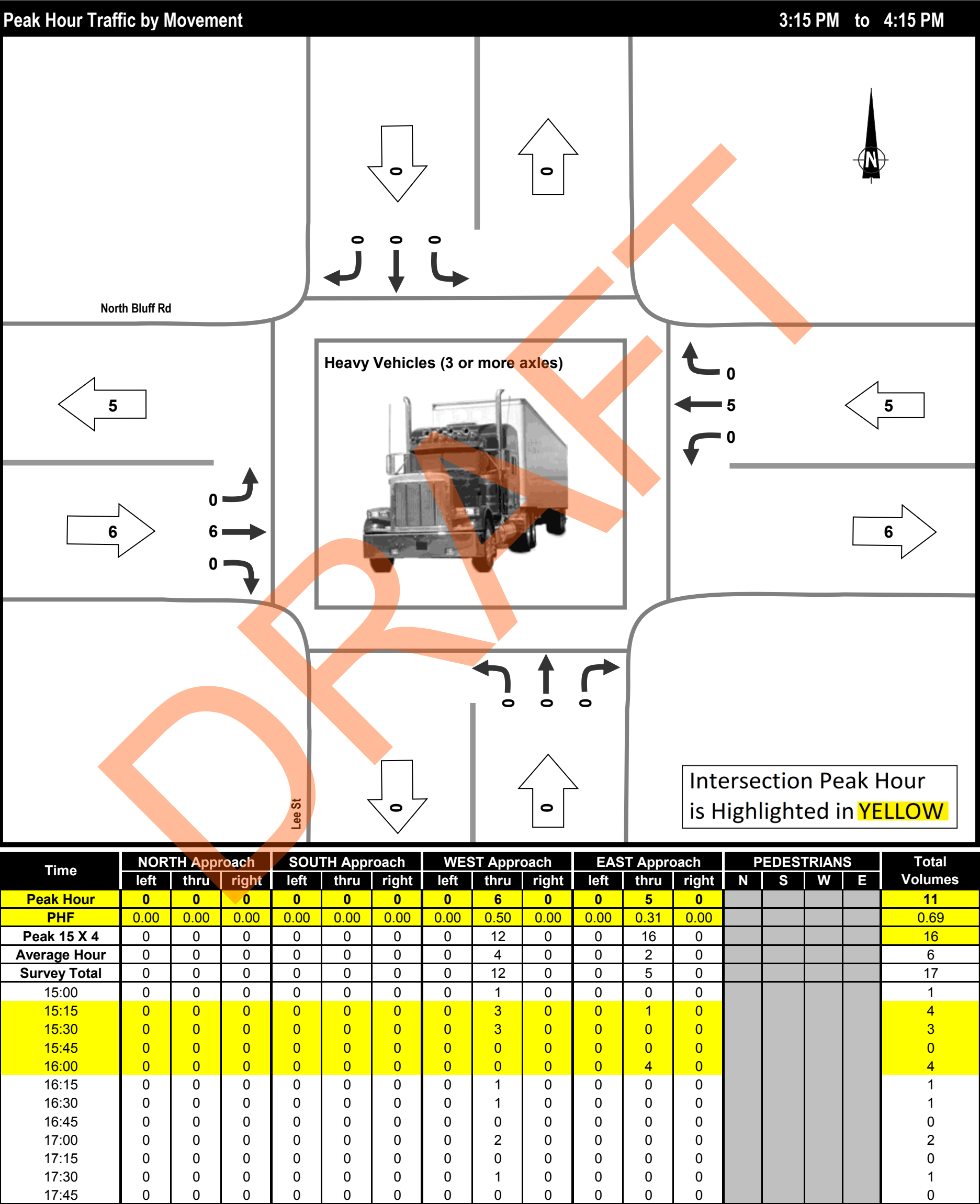
## Afternoon Peak Period



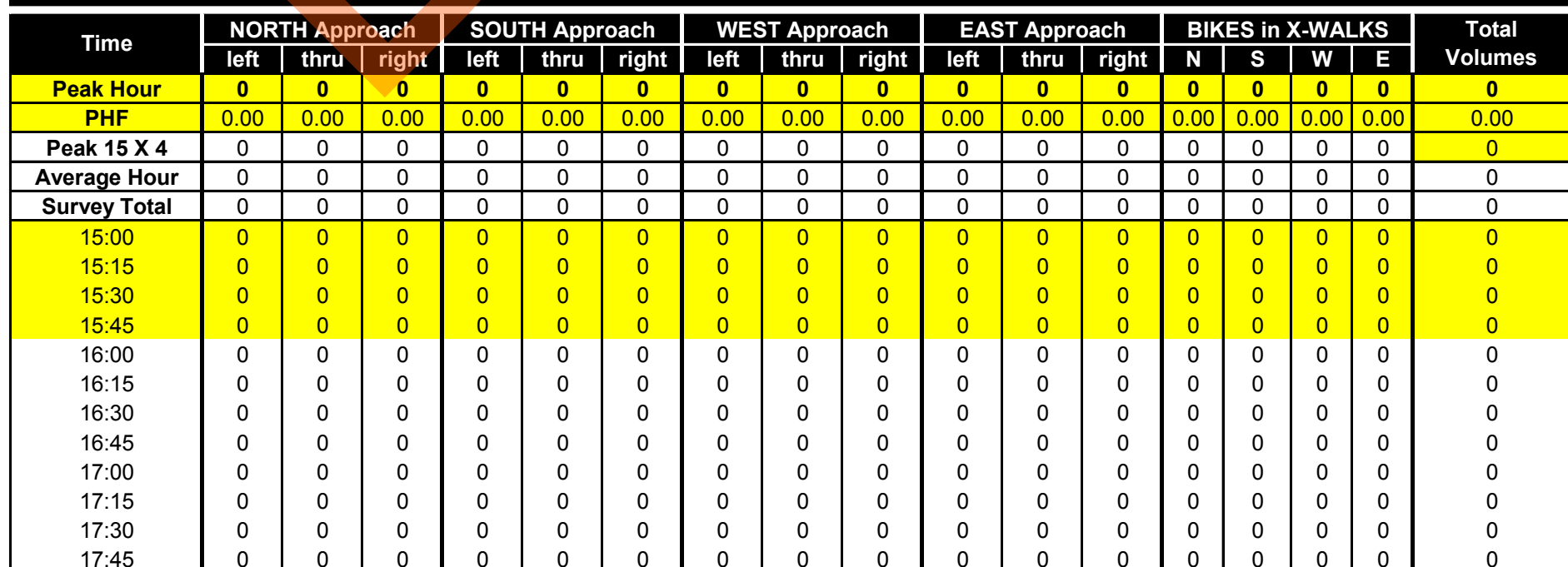
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	6	2	12	2	0	3	7	710	9	14	771	24					1,560
PHF	0.38	0.25	0.50	0.25	0.00	0.38	0.29	0.85	0.75	0.50	0.94	0.75					0.87
Peak 15 X 4	16	8	24	8	0	8	24	832	12	28	820	32					1,784
Average Hour	9	1	9	3	0	2	6	698	5	9	751	17					1,510
Survey Total	26	3	27	8	1	7	18	2,093	15	28	2,252	50					4,528
15:00	1	2	6	2	0	2	6	208	2	7	202	8					446
15:15	1	0	2	0	0	0	0	160	3	2	193	6					367
15:30	0	0	2	0	0	0	0	183	2	3	171	8					369
15:45	4	0	2	0	0	1	1	159	2	2	205	2					378
16:00	1	0	2	2	0	0	0	195	2	1	182	1					386
16:15	2	0	1	0	0	0	2	180	0	3	181	2					371
16:30	4	1	2	0	0	1	2	187	0	3	169	2					371
16:45	3	0	2	1	0	1	3	184	1	0	212	5					412
17:00	2	0	2	1	0	0	0	204	2	2	186	6					405
17:15	2	0	2	0	1	2	2	153	1	1	203	1					368
17:30	3	0	2	1	0	0	0	146	0	1	171	4					328
17:45	3	0	2	1	0	0	2	134	0	3	177	5					327

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

**Afternoon Peak Period**



**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**



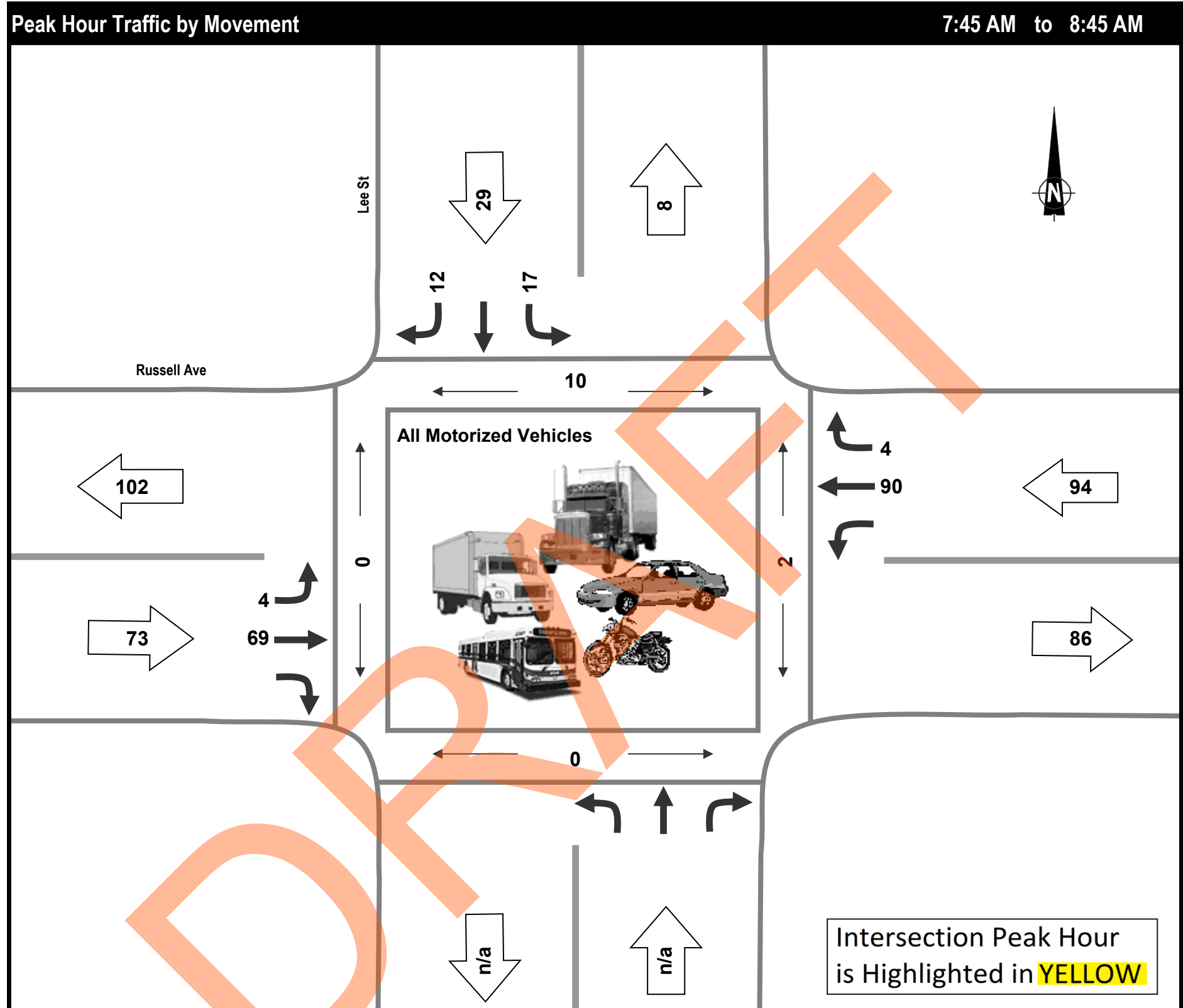


Vehicle Classification Summary

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	259	3				262
	%	98.9%	1.1%				100.0%
Midday	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	374	3				377
	%	99.2%	0.8%				100.0%
Total (5 Hours)	Volume	633	6				639
	%	99.1%	0.9%				100.0%

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Morning Peak Period**


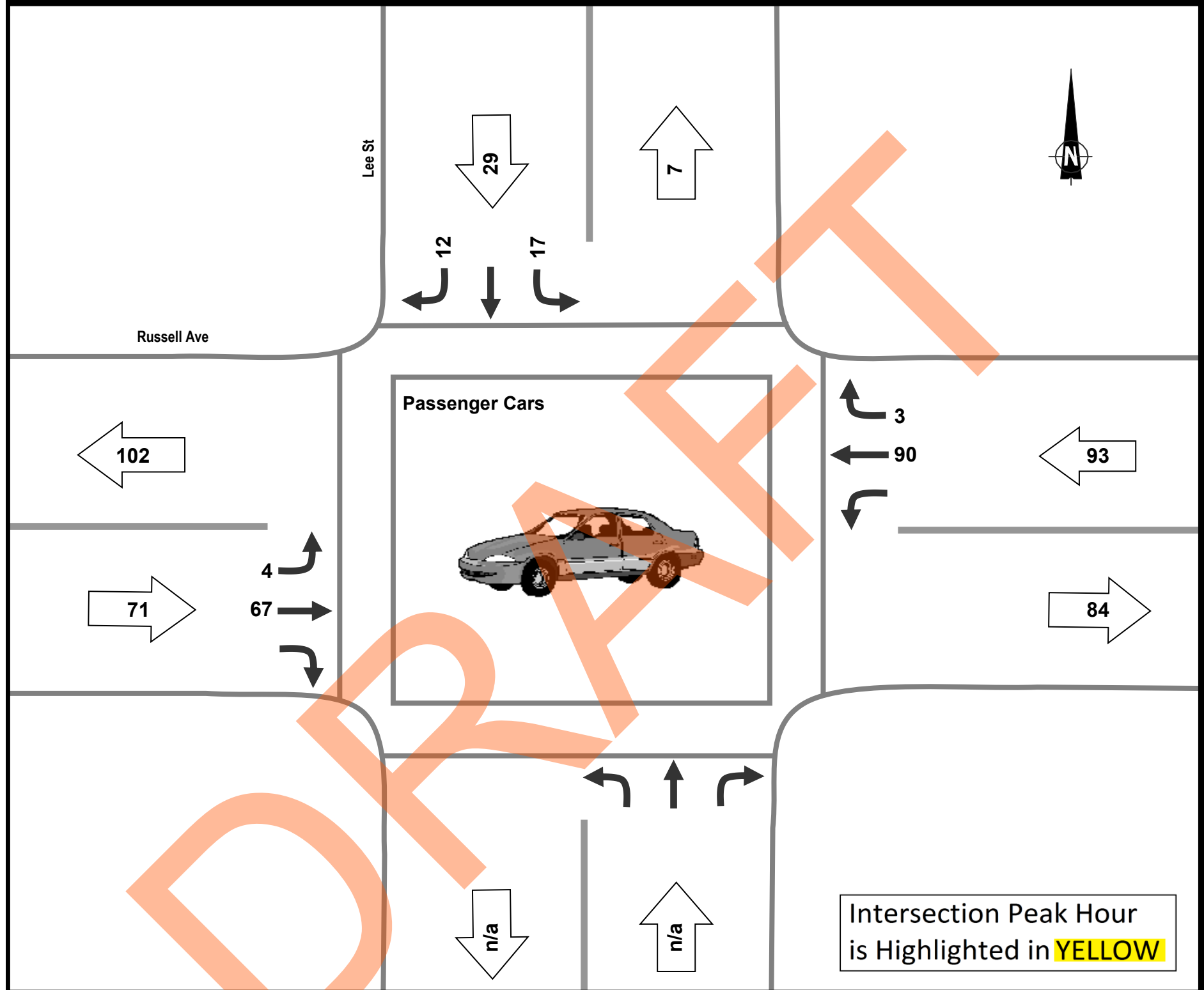
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
<b>Peak Hour</b>	17		12				4	69			90	4	10	0	0	2	196
<b>PHF</b>	0.61		0.60				0.50	0.69			0.56	0.50	0.36	0.00	0.00	0.25	0.63
<b>Peak 15 X 4</b>	28		20				8	100			160	8	28	0	0	8	312
<b>Average Hour</b>	10		8				3	49			60	3	6	0	0	1	133
<b>Survey Total</b>	19		15				5	98			120	5	11	0	0	2	262
7:00	0		0				0	6			3	0	0	0	0	0	9
7:15	0		1				0	13			5	0	0	0	0	0	19
7:30	0		1				1	6			7	0	0	0	0	0	15
7:45	0		1				0	13			18	0	3	0	0	0	32
8:00	4		5				1	13			15	0	0	0	0	0	38
8:15	6		4				1	25			40	2	7	0	0	0	78
8:30	7		2				2	18			17	2	0	0	0	2	48
8:45	2		1				0	4			15	1	1	0	0	0	23



Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Passenger Cars

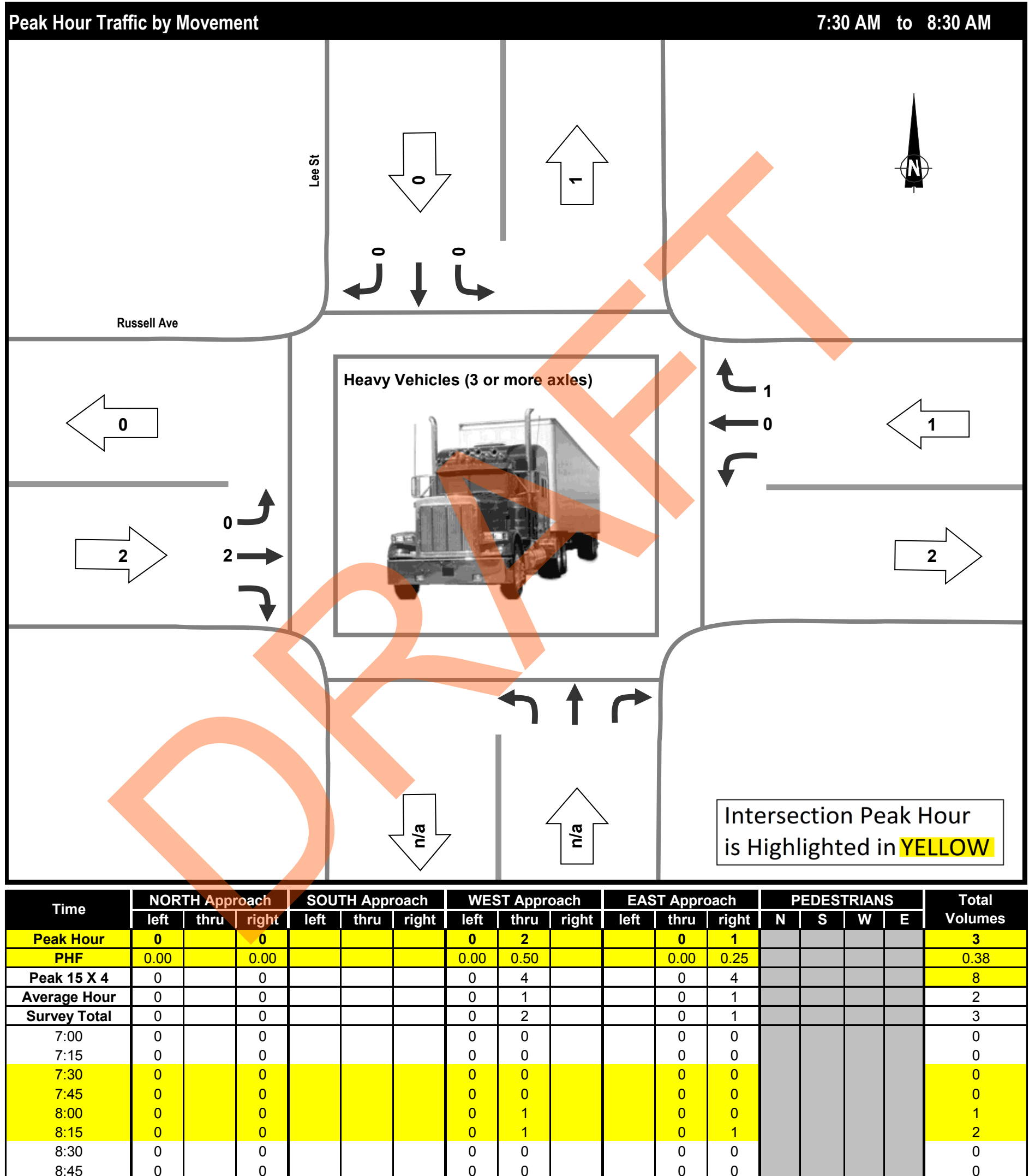
**Morning Peak Period**
**Peak Hour Traffic by Movement**

7:45 AM to 8:45 AM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	17		12				4	67			90	3					193
PHF	0.61		0.60				0.50	0.70			0.56	0.38					0.63
Peak 15 X 4	28		20				8	96			160	8					304
Average Hour	10		8				3	48			60	2					131
Survey Total	19		15				5	96			120	4					259
7:00	0		0				0	6			3	0					9
7:15	0		1				0	13			5	0					19
7:30	0		1				1	6			7	0					15
7:45	0		1				0	13			18	0					32
8:00	4		5				1	12			15	0					37
8:15	6		4				1	24			40	1					76
8:30	7		2				2	18			17	2					48
8:45	2		1				0	4			15	1					23

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Heavy Vehicles (3 or more axles)

**Morning Peak Period**


Project: #5935: Beachway Traffic Impact Assessment

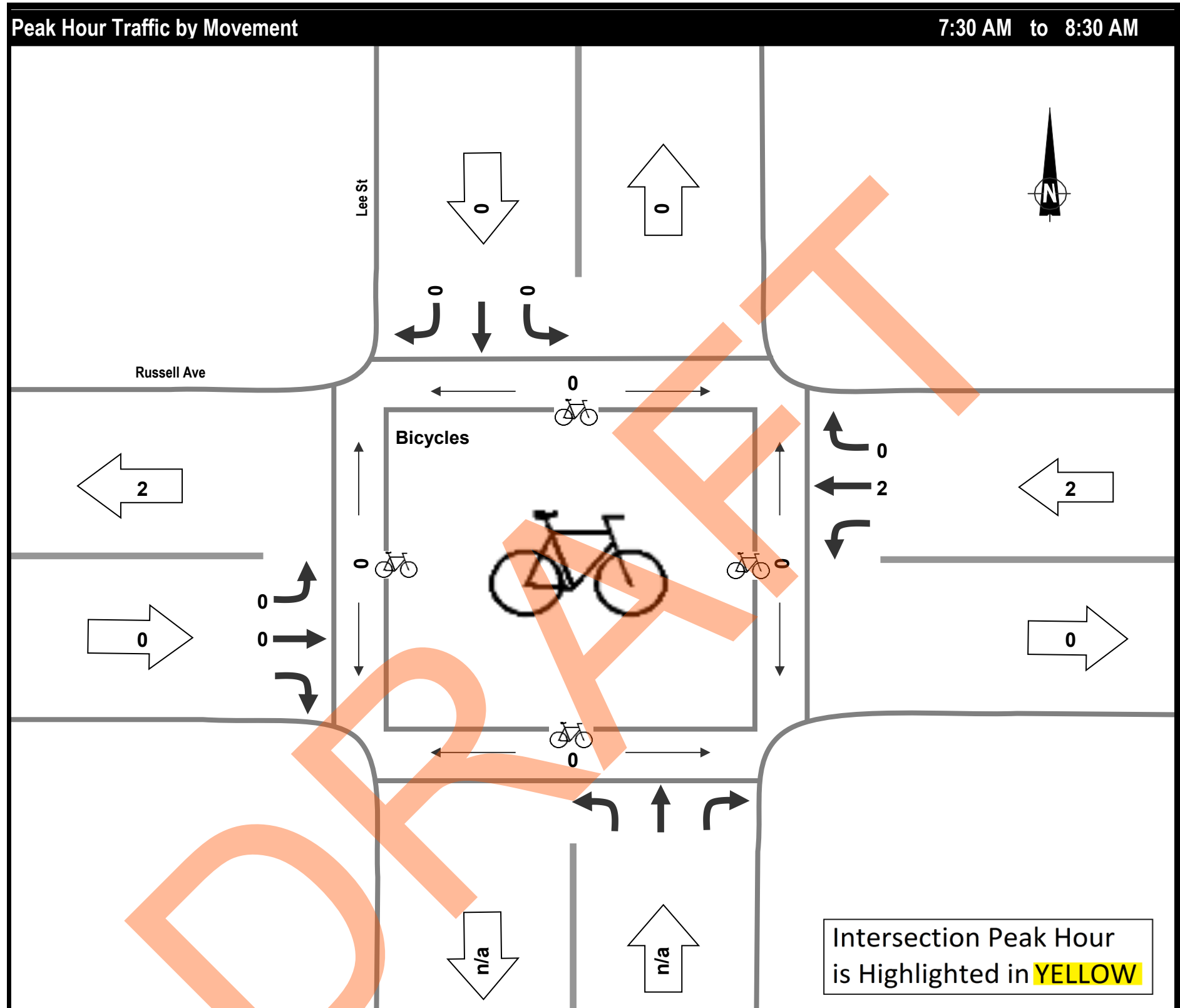
Municipality: White Rock

Weather: Cloudy

Vehicle Class: Bicycles

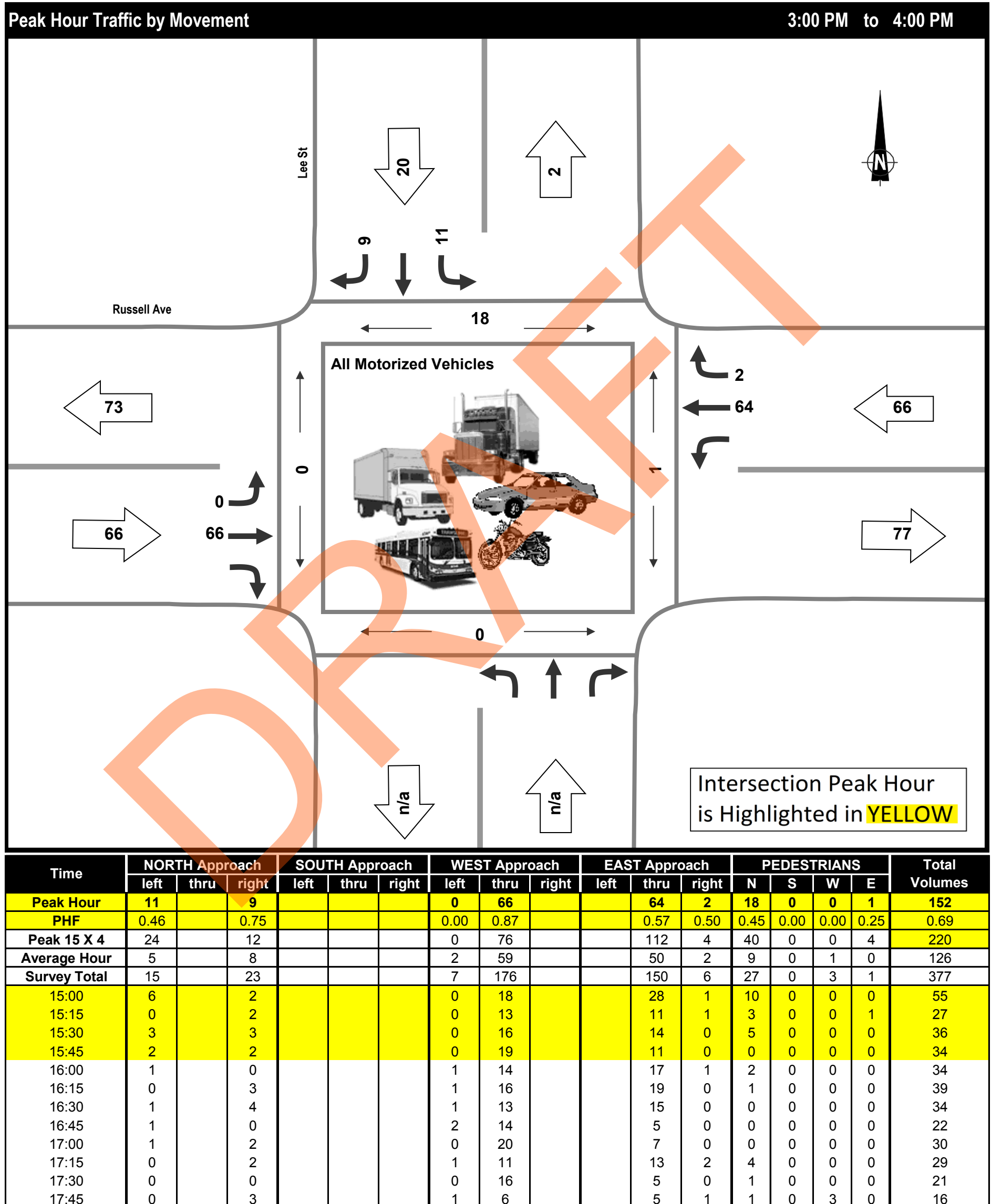
Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals

**Morning Peak Period**

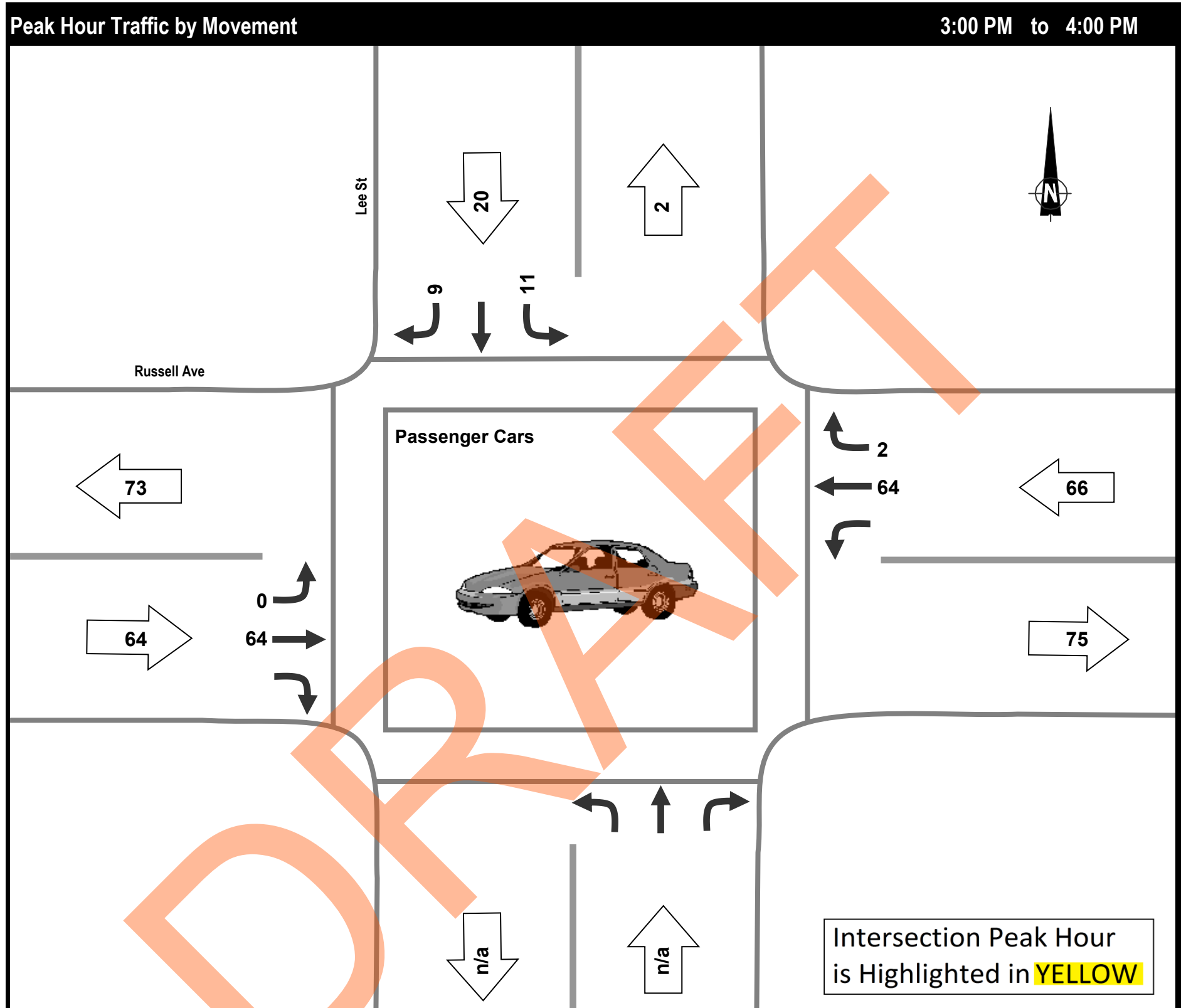


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			BIKES in X-WALKS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0		0				0	0			2	0	0	0	0	0	2
PHF	0.00		0.00				0.00	0.00			0.50	0.00	0.00	0.00	0.00	0.00	0.50
Peak 15 X 4	0		0				0	0			4	0	0	0	0	0	4
Average Hour	0		0				0	0			1	0	0	0	0	0	1
Survey Total	0		0				0	0			2	0	0	0	0	0	2
7:00	0		0				0	0			0	0	0	0	0	0	0
7:15	0		0				0	0			0	0	0	0	0	0	0
7:30	0		0				0	0			0	0	0	0	0	0	0
7:45	0		0				0	0			0	0	0	0	0	0	0
8:00	0		0				0	0			1	0	0	0	0	0	1
8:15	0		0				0	0			1	0	0	0	0	0	1
8:30	0		0				0	0			0	0	0	0	0	0	0
8:45	0		0				0	0			0	0	0	0	0	0	0

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Afternoon Peak Period**


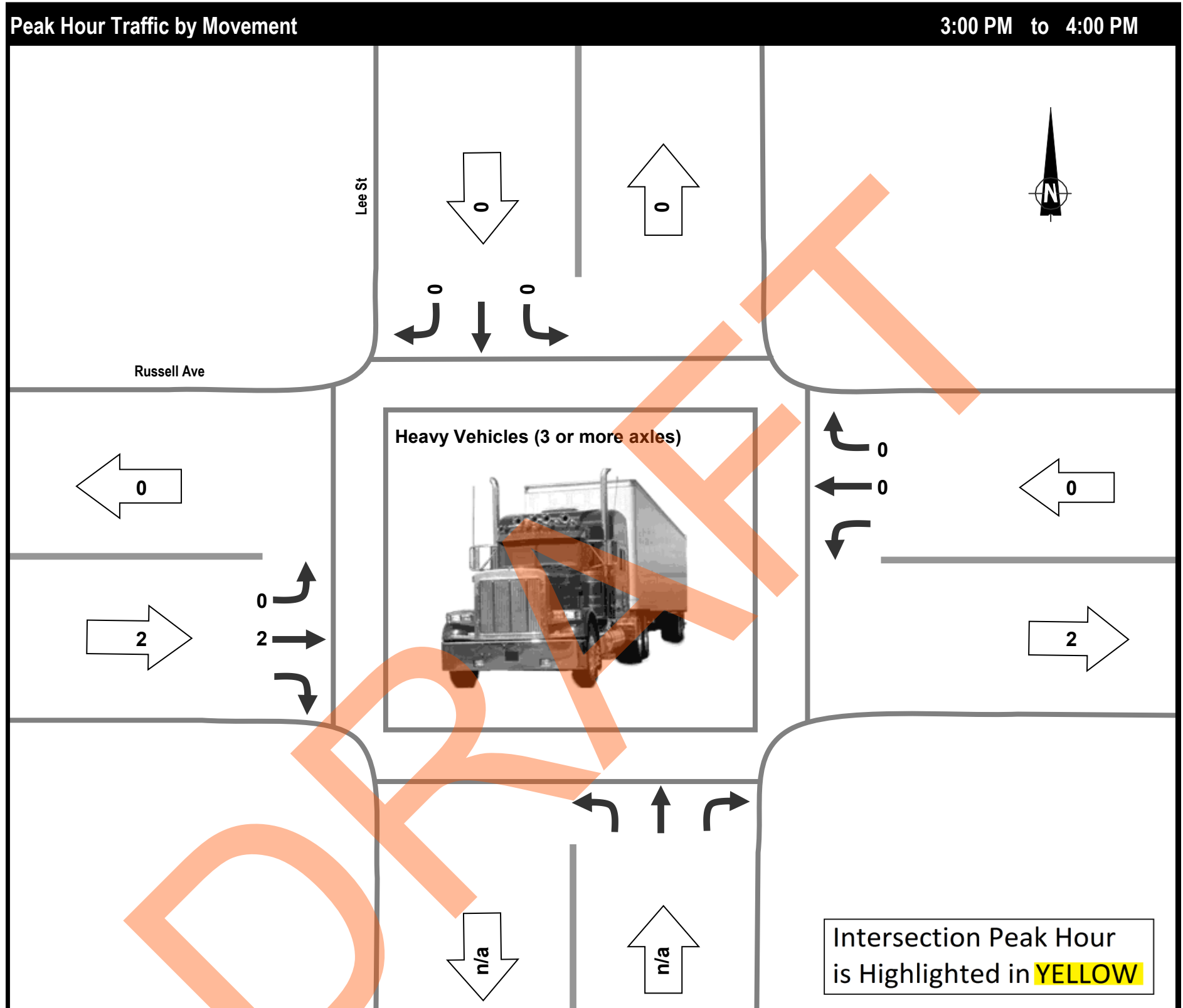
Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Passenger Cars

**Afternoon Peak Period**


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	11		9				0	64			64	2					150
PHF	0.46		0.75				0.00	0.84			0.57	0.50					0.71
Peak 15 X 4	24		12				0	76			112	4					212
Average Hour	5		8				2	58			50	2					125
Survey Total	15		23				7	173			150	6					374
15:00	6		2				0	16			28	1					53
15:15	0		2				0	13			11	1					27
15:30	3		3				0	16			14	0					36
15:45	2		2				0	19			11	0					34
16:00	1		0				1	14			17	1					34
16:15	0		3				1	16			19	0					39
16:30	1		4				1	13			15	0					34
16:45	1		0				2	13			5	0					21
17:00	1		2				0	20			7	0					30
17:15	0		2				1	11			13	2					29
17:30	0		0				0	16			5	0					21
17:45	0		3				1	6			5	1					16

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

**Afternoon Peak Period**



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0		0				0	2			0	0					2
PHF	0.00		0.00				0.00	0.25			0.00	0.00					0.25
Peak 15 X 4	0		0				0	8			0	0					8
Average Hour	0		0				0	1			0	0					1
Survey Total	0		0				0	3			0	0					3
15:00	0		0				0	2			0	0					2
15:15	0		0				0	0			0	0					0
15:30	0		0				0	0			0	0					0
15:45	0		0				0	0			0	0					0
16:00	0		0				0	0			0	0					0
16:15	0		0				0	0			0	0					0
16:30	0		0				0	0			0	0					0
16:45	0		0				0	1			0	0					1
17:00	0		0				0	0			0	0					0
17:15	0		0				0	0			0	0					0
17:30	0		0				0	0			0	0					0
17:45	0		0				0	0			0	0					0



Project: #5935: Beachway Traffic Impact Assessment

Municipality: White Rock

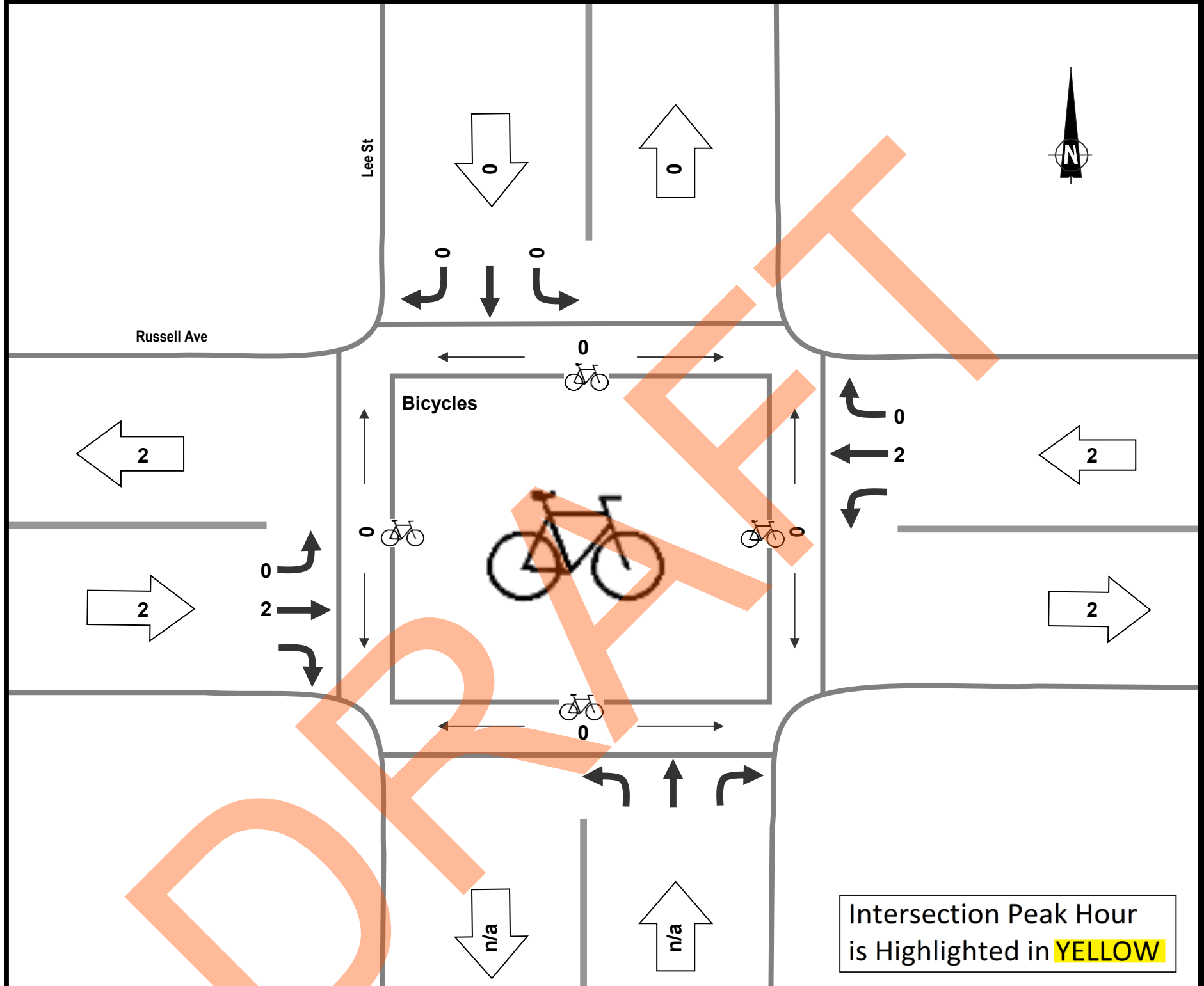
Weather: Cloudy

Vehicle Class: Bicycles

Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals

**Afternoon Peak Period**
**Peak Hour Traffic by Movement**

4:30 PM to 5:30 PM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			BIKES in X-WALKS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0		0				0	2			2	0	0	0	0	0	4
PHF	0.00		0.00				0.00	0.50			0.50	0.00	0.00	0.00	0.00	0.00	0.50
Peak 15 X 4	0		0				0	4			4	0	0	0	0	0	8
Average Hour	0		0				0	1			1	0	0	0	0	0	2
Survey Total	0		0				0	4			2	0	0	0	0	0	6
15:00	0		0				0	0			0	0	0	0	0	0	0
15:15	0		0				0	0			0	0	0	0	0	0	0
15:30	0		0				0	0			0	0	0	0	0	0	0
15:45	0		0				0	2			0	0	0	0	0	0	2
16:00	0		0				0	0			0	0	0	0	0	0	0
16:15	0		0				0	0			0	0	0	0	0	0	0
16:30	0		0				0	0			0	0	0	0	0	0	0
16:45	0		0				0	0			1	0	0	0	0	0	1
17:00	0		0				0	1			1	0	0	0	0	0	2
17:15	0		0				0	1			0	0	0	0	0	0	1
17:30	0		0				0	0			0	0	0	0	0	0	0
17:45	0		0				0	0			0	0	0	0	0	0	0



## Maple St & Russell Ave

Friday, September 22, 2017

### Vehicle Classification Summary

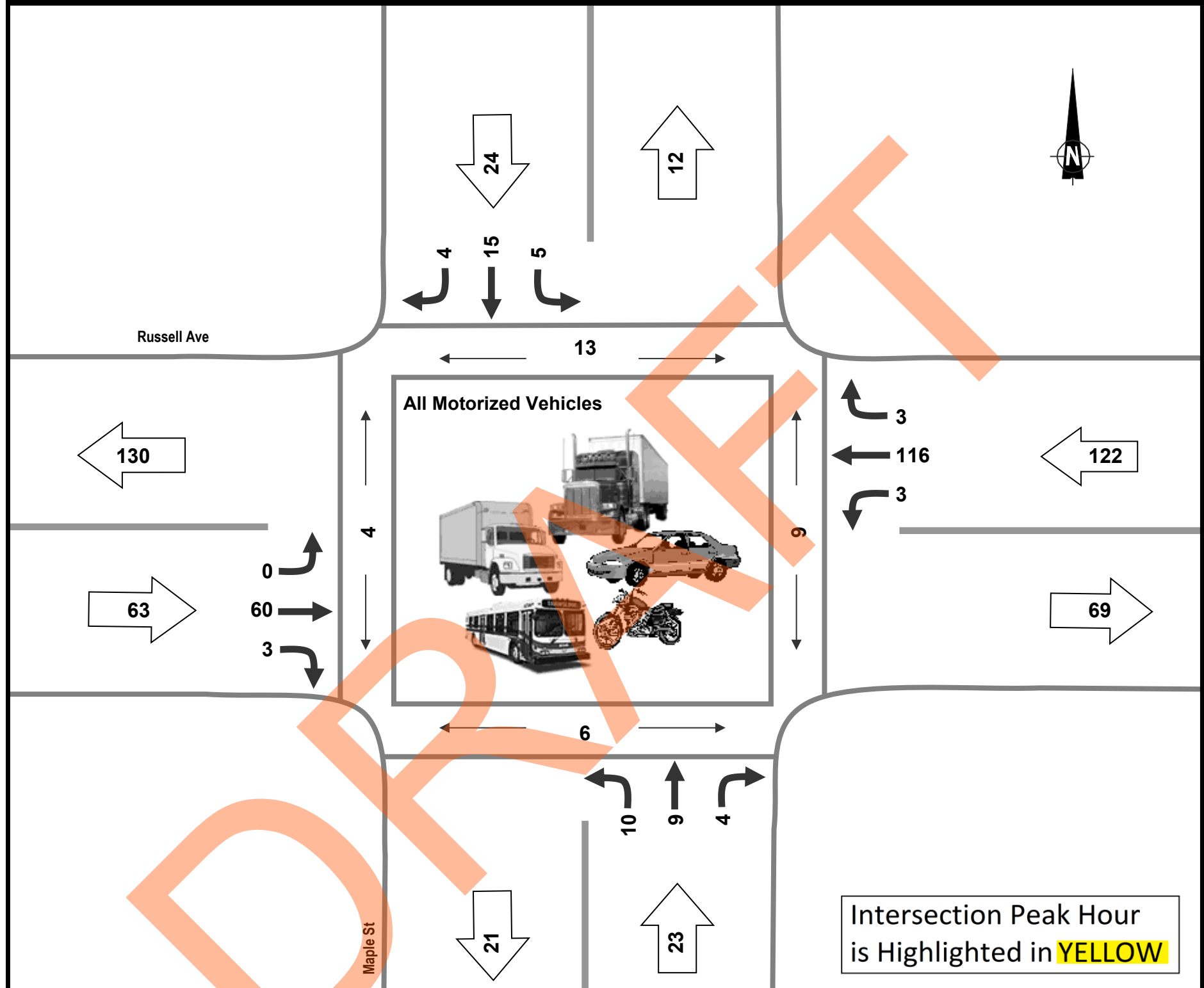
**Project:** #5740: Russell Ave TIA  
**Municipality:** White Rock  
**Weather:** Clear, Cloudy

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	316	0				316
	%	100.0%	0.0%				100.0%
Midday (00:00 - 00:00)	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	448	0				448
	%	100.0%	0.0%				100.0%
Total (5 Hours)	Volume	764	0				764
	%	100.0%	0.0%				100.0%

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: All Motorized Vehicles

### Peak Hour Traffic by Movement

8:00 AM to 9:00 AM



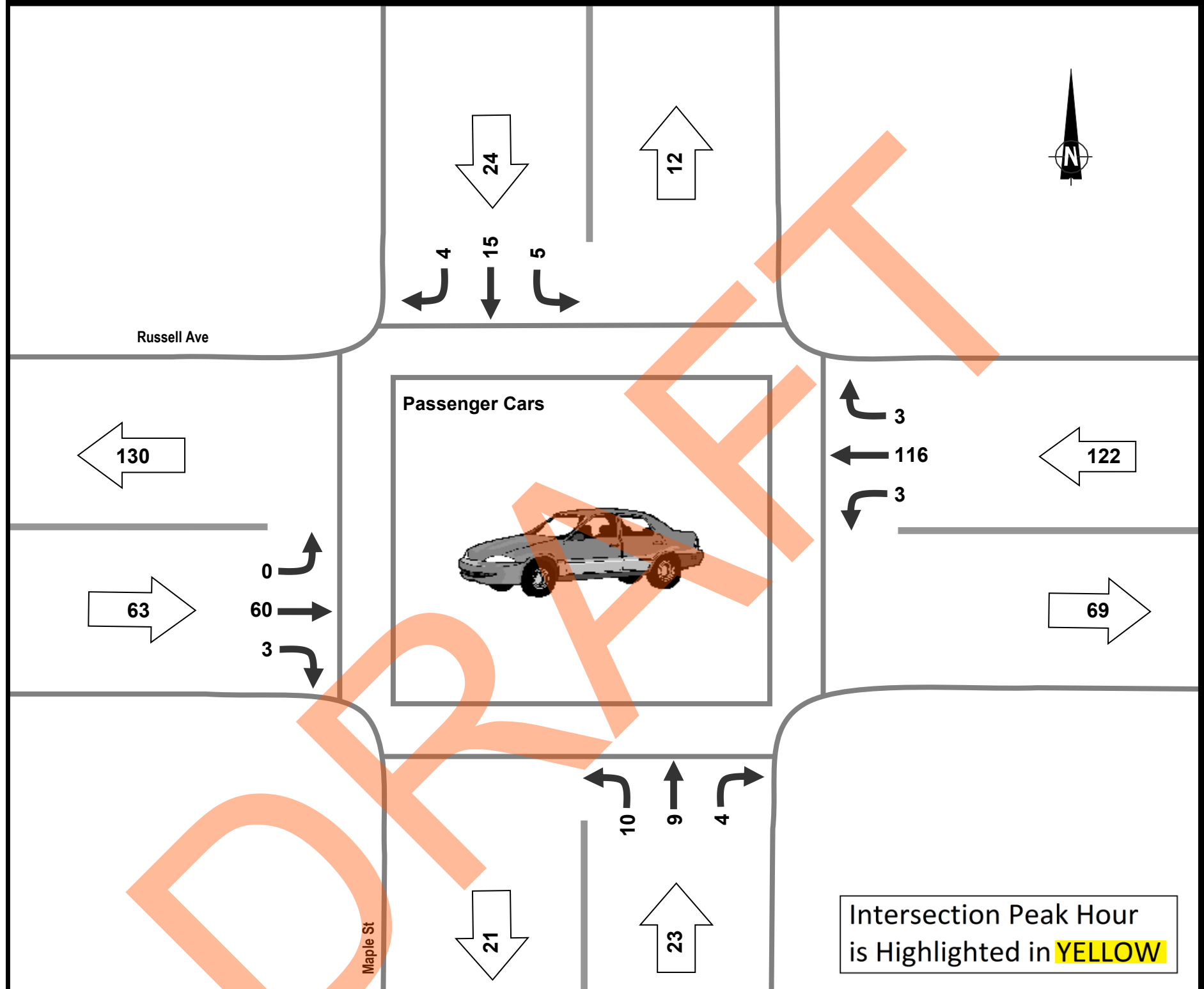
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	5	15	4	10	9	4	0	60	3	3	116	3	13	6	4	9	232
PHF	0.63	0.42	0.33	0.50	0.45	0.50	0.00	0.63	0.75	0.38	0.55	0.75	0.65	0.50	0.33	0.38	0.59
Peak 15 X 4	8	36	12	20	20	8	0	96	4	8	212	4	20	12	12	24	396
Average Hour	3	9	2	9	9	3	0	46	3	3	72	2	9	4	4	5	161
Survey Total	5	18	4	17	17	5	0	92	5	5	144	4	17	8	7	10	316
7:00	0	1	0	1	1	1	0	8	1	0	1	0	0	1	0	0	14
7:15	0	0	0	3	2	0	0	2	0	0	7	1	1	1	0	1	15
7:30	0	1	0	2	5	0	0	10	0	2	11	0	0	0	0	0	31
7:45	0	1	0	1	0	0	0	12	1	0	9	0	3	0	3	0	24
8:00	2	1	3	0	1	2	0	9	1	0	19	0	3	3	0	1	38
8:15	2	4	1	5	5	2	0	24	0	2	53	1	5	2	3	6	99
8:30	1	9	0	4	2	0	0	13	1	1	31	1	2	1	1	1	63
8:45	0	1	0	1	1	0	0	14	1	0	13	1	3	0	0	1	32

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: Passenger Cars

## Morning Peak Period

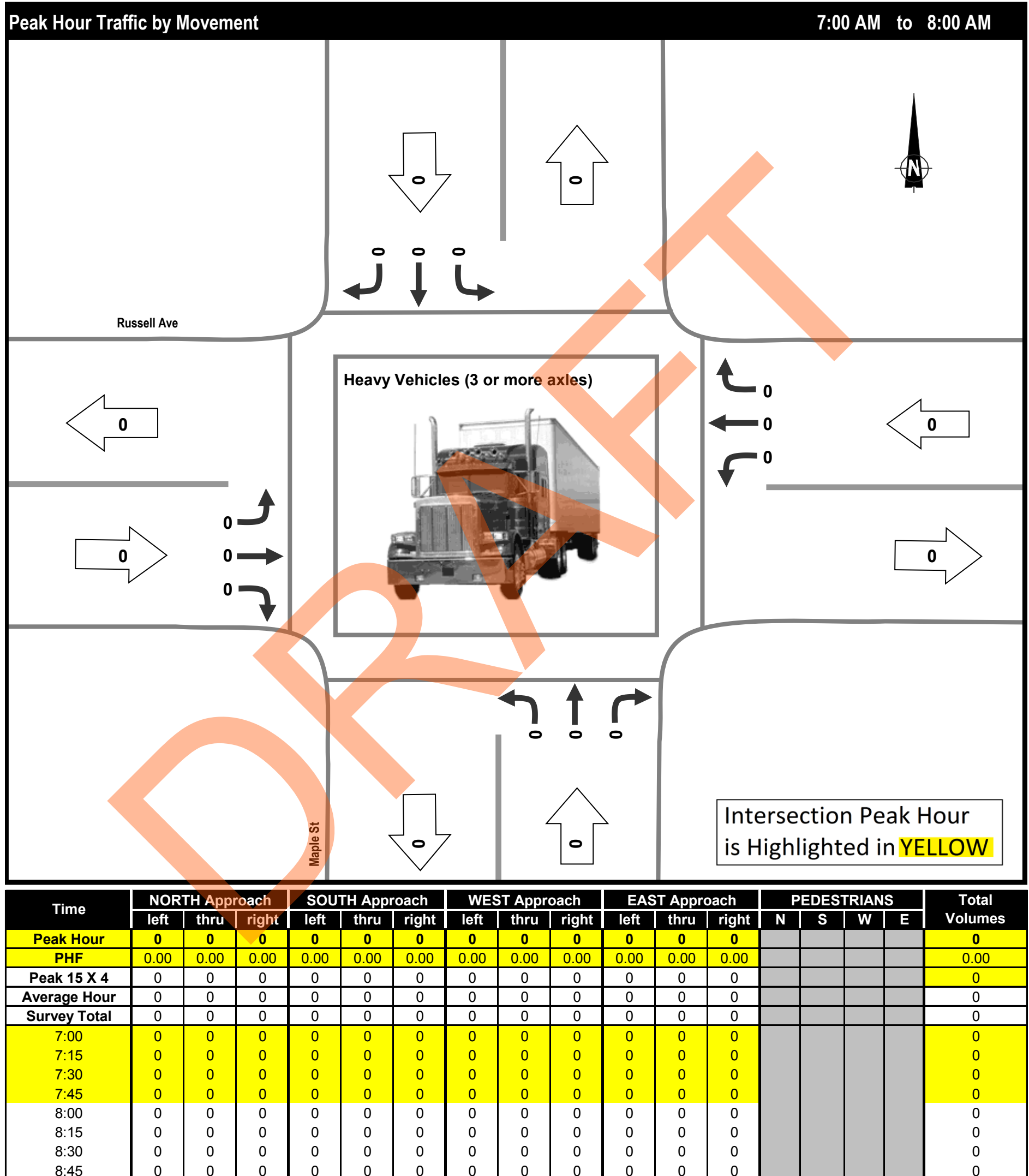
### Peak Hour Traffic by Movement

8:00 AM to 9:00 AM

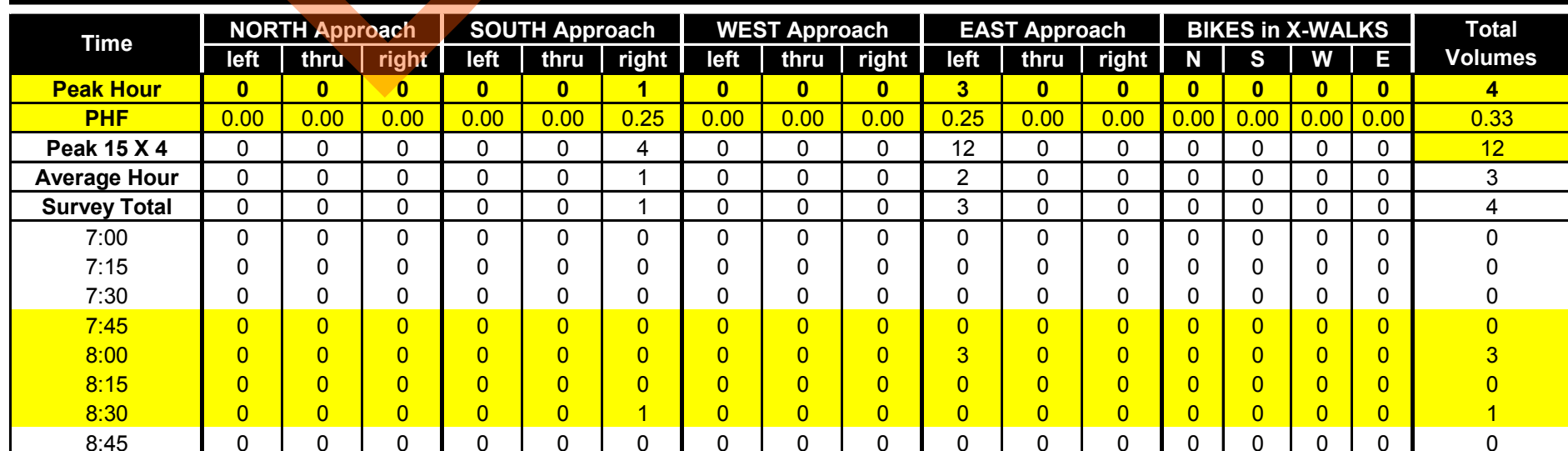


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	5	15	4	10	9	4	0	60	3	3	116	3					232
PHF	0.63	0.42	0.33	0.50	0.45	0.50	0.00	0.63	0.75	0.38	0.55	0.75					0.59
Peak 15 X 4	8	36	12	20	20	8	0	96	4	8	212	4					396
Average Hour	3	9	2	9	9	3	0	46	3	3	72	2					161
Survey Total	5	18	4	17	17	5	0	92	5	5	144	4					316
7:00	0	1	0	1	1	1	0	8	1	0	1	0					14
7:15	0	0	0	3	2	0	0	2	0	0	7	1					15
7:30	0	1	0	2	5	0	0	10	0	2	11	0					31
7:45	0	1	0	1	0	0	0	12	1	0	9	0					24
8:00	2	1	3	0	1	2	0	9	1	0	19	0					38
8:15	2	4	1	5	5	2	0	24	0	2	53	1					99
8:30	1	9	0	4	2	0	0	13	1	1	31	1					63
8:45	0	1	0	1	1	0	0	14	1	0	13	1					32

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)



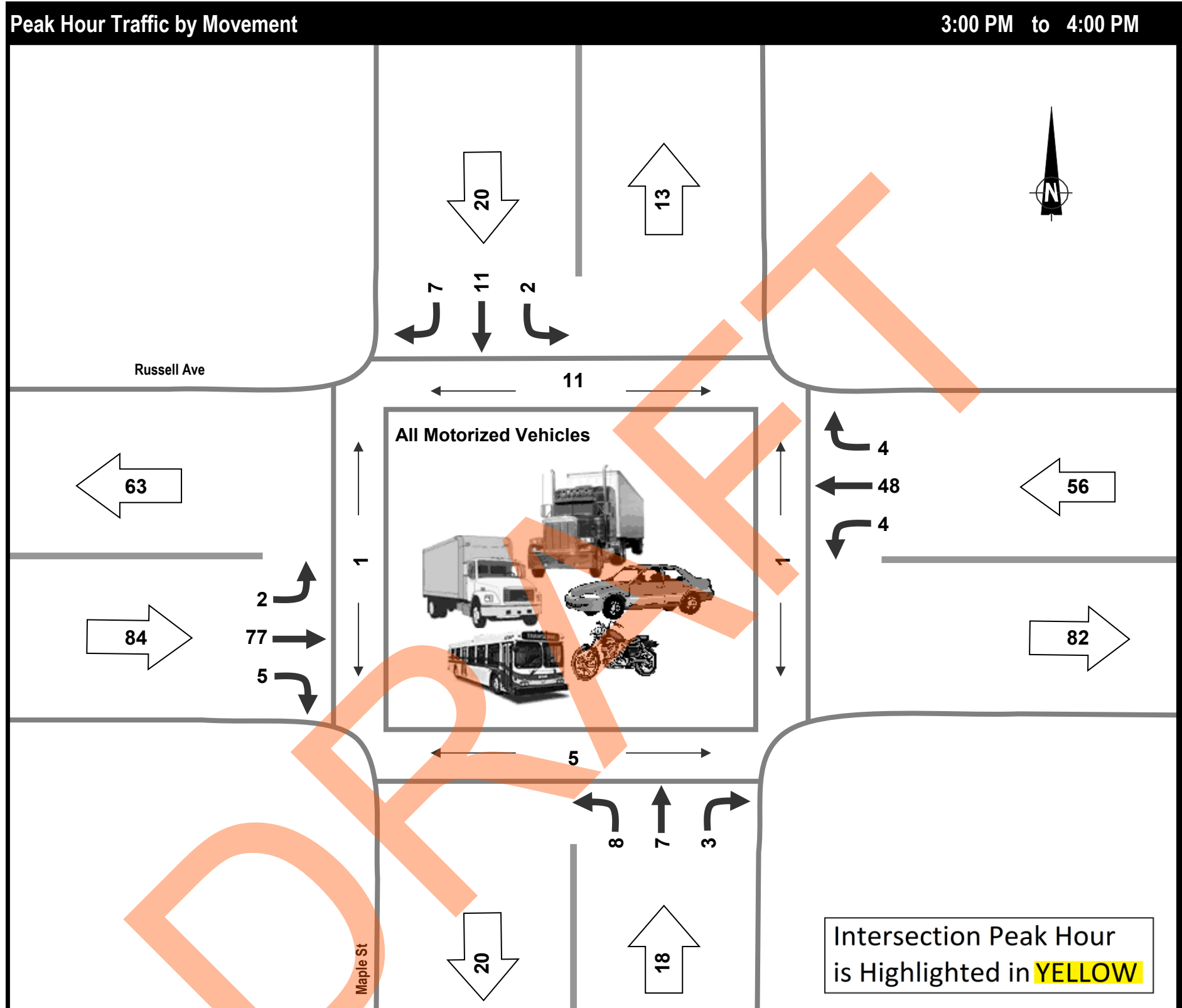
**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**





Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: All Motorized Vehicles

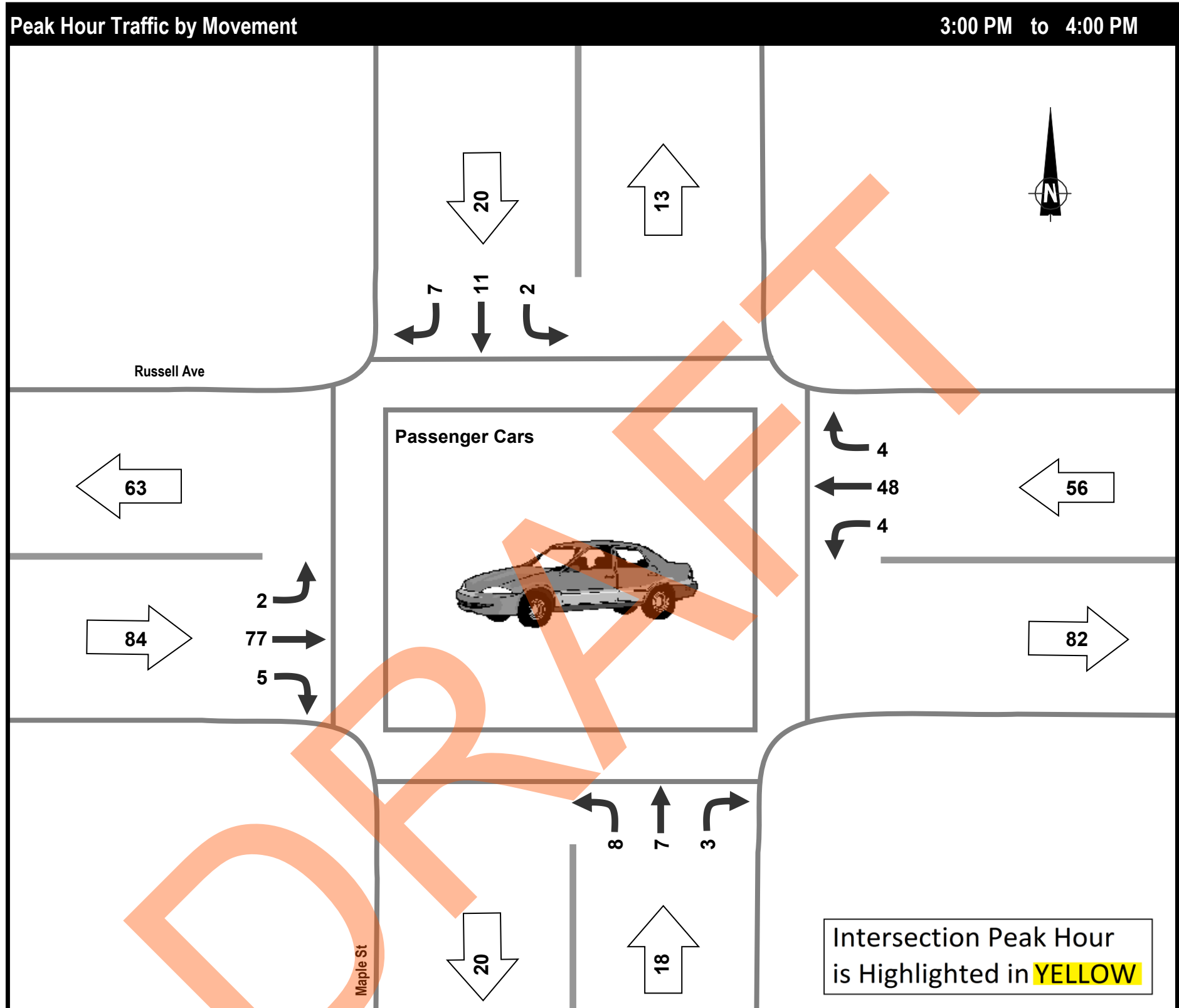
## Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	11	7	8	7	3	2	77	5	4	48	4	11	5	1	1	178
PHF	0.50	0.69	0.58	1.00	0.58	0.38	0.50	0.88	0.63	0.50	0.86	0.50	0.46	0.63	0.25	0.25	0.89
Peak 15 X 4	4	16	12	8	12	8	4	88	8	8	56	8	24	8	4	4	200
Average Hour	1	9	6	7	7	1	2	61	8	2	44	1	6	4	3	2	149
Survey Total	3	28	17	21	20	4	5	184	23	7	132	4	18	11	8	7	448
15:00	1	4	0	2	3	1	0	22	0	1	14	1	1	1	0	1	49
15:15	1	2	1	2	1	2	1	20	2	2	14	2	1	2	0	0	50
15:30	0	2	3	2	0	0	0	19	1	0	11	0	3	1	1	0	38
15:45	0	3	3	2	3	0	1	16	2	1	9	1	6	1	0	0	41
16:00	0	2	2	1	3	1	0	9	4	0	14	0	0	3	3	1	36
16:15	0	1	1	5	2	0	0	11	1	1	6	0	0	0	1	0	28
16:30	0	1	1	3	2	0	1	16	3	0	12	0	0	0	0	0	39
16:45	0	4	2	1	2	0	0	13	2	1	14	0	3	0	0	2	39
17:00	0	6	2	3	2	0	0	21	0	0	10	0	2	0	0	1	44
17:15	0	2	1	0	0	0	1	10	2	0	13	0	0	1	1	1	29
17:30	0	1	0	0	0	0	0	14	2	1	8	0	0	1	0	0	26
17:45	1	0	1	0	2	0	1	13	4	0	7	0	2	1	2	1	29

Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: Passenger Cars

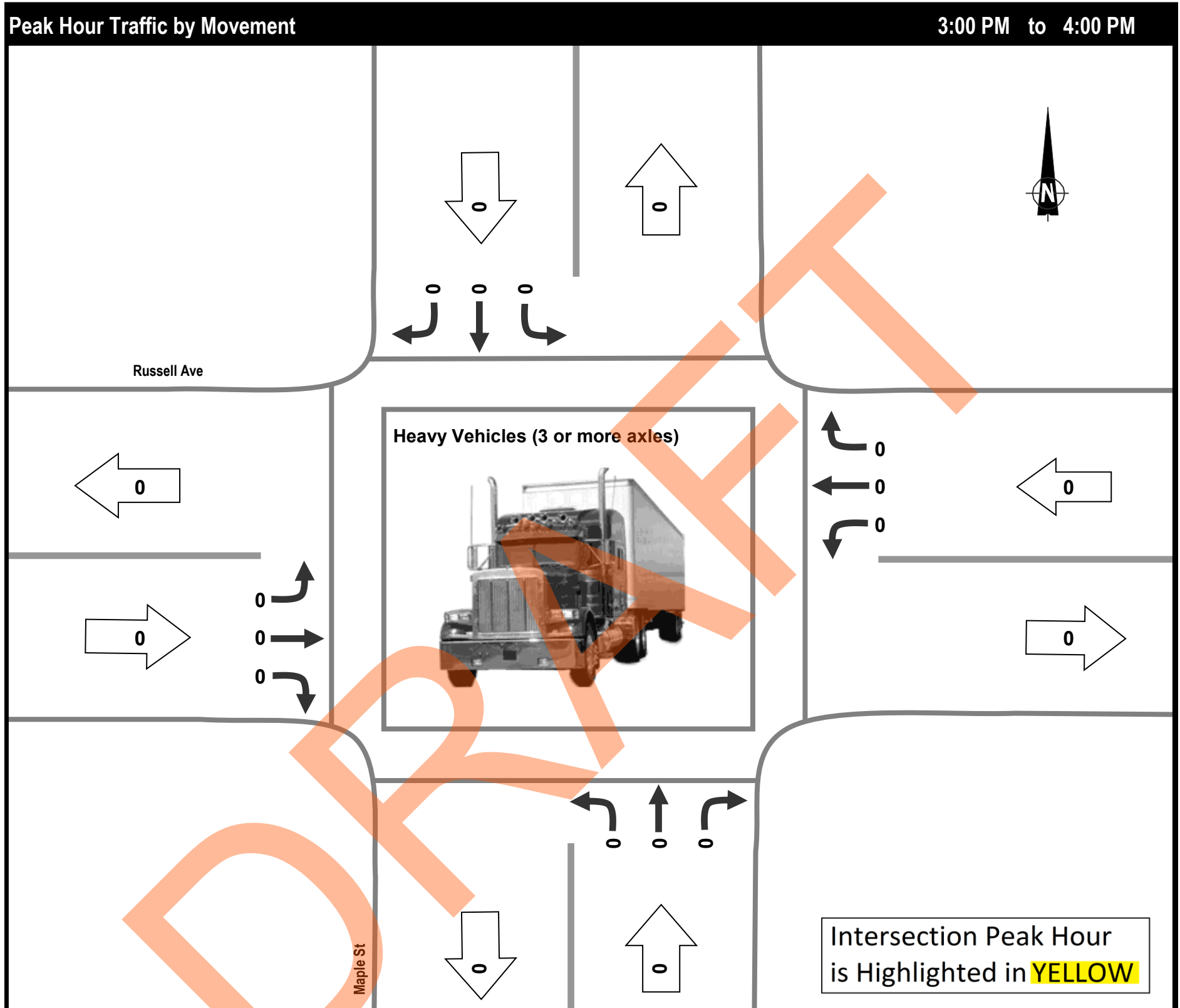
Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	2	11	7	8	7	3	2	77	5	4	48	4					178
PHF	0.50	0.69	0.58	1.00	0.58	0.38	0.50	0.88	0.63	0.50	0.86	0.50					0.89
Peak 15 X 4	4	16	12	8	12	8	4	88	8	8	56	8					200
Average Hour	1	9	6	7	7	1	2	61	8	2	44	1					149
Survey Total	3	28	17	21	20	4	5	184	23	7	132	4					448
15:00	1	4	0	2	3	1	0	22	0	1	14	1					49
15:15	1	2	1	2	1	2	1	20	2	2	14	2					50
15:30	0	2	3	2	0	0	0	19	1	0	11	0					38
15:45	0	3	3	2	3	0	1	16	2	1	9	1					41
16:00	0	2	2	1	3	1	0	9	4	0	14	0					36
16:15	0	1	1	5	2	0	0	11	1	1	6	0					28
16:30	0	1	1	3	2	0	1	16	3	0	12	0					39
16:45	0	4	2	1	2	0	0	13	2	1	14	0					39
17:00	0	6	2	3	2	0	0	21	0	0	10	0					44
17:15	0	2	1	0	0	0	1	10	2	0	13	0					29
17:30	0	1	0	0	0	0	0	14	2	1	8	0					26
17:45	1	0	1	0	2	0	1	13	4	0	7	0					29

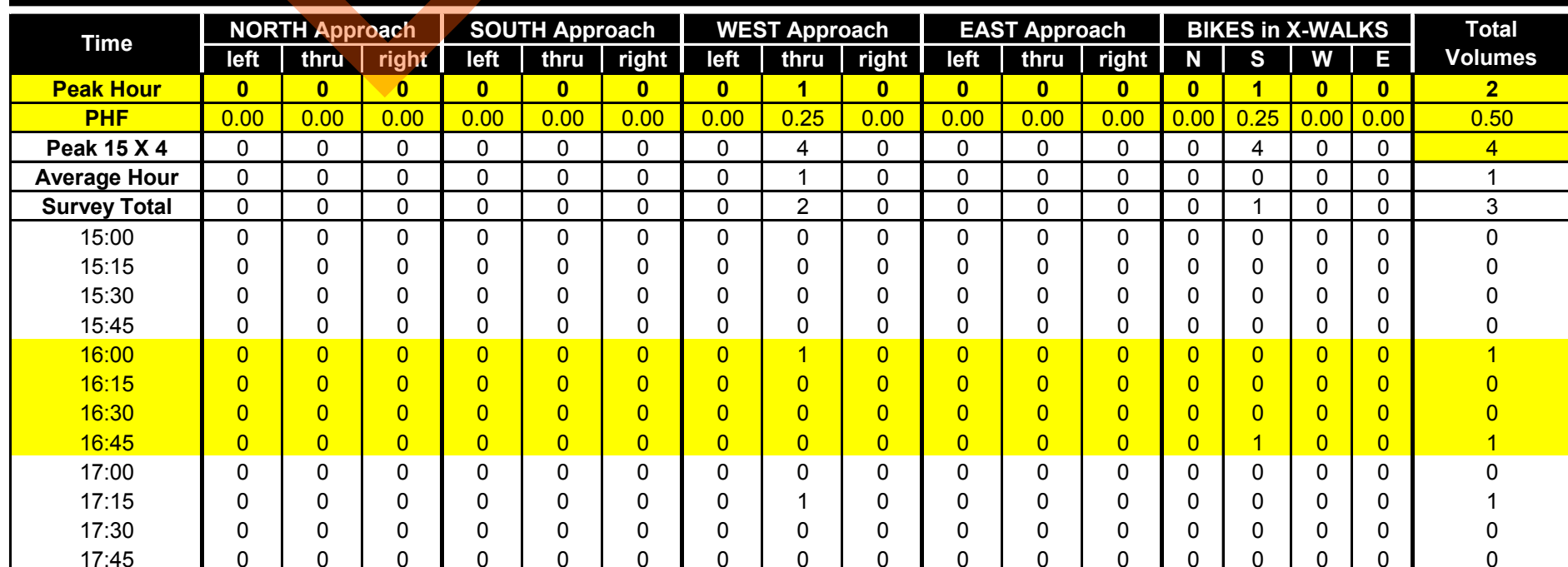
Project: #5740: Russell Ave TIA  
Municipality: White Rock  
Weather: Clear, Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

## Afternoon Peak Period



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0					0
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00
Peak 15 X 4	0	0	0	0	0	0	0	0	0	0	0	0					0
Average Hour	0	0	0	0	0	0	0	0	0	0	0	0					0
Survey Total	0	0	0	0	0	0	0	0	0	0	0	0					0
15:00	0	0	0	0	0	0	0	0	0	0	0	0					0
15:15	0	0	0	0	0	0	0	0	0	0	0	0					0
15:30	0	0	0	0	0	0	0	0	0	0	0	0					0
15:45	0	0	0	0	0	0	0	0	0	0	0	0					0
16:00	0	0	0	0	0	0	0	0	0	0	0	0					0
16:15	0	0	0	0	0	0	0	0	0	0	0	0					0
16:30	0	0	0	0	0	0	0	0	0	0	0	0					0
16:45	0	0	0	0	0	0	0	0	0	0	0	0					0
17:00	0	0	0	0	0	0	0	0	0	0	0	0					0
17:15	0	0	0	0	0	0	0	0	0	0	0	0					0
17:30	0	0	0	0	0	0	0	0	0	0	0	0					0
17:45	0	0	0	0	0	0	0	0	0	0	0	0					0

**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**

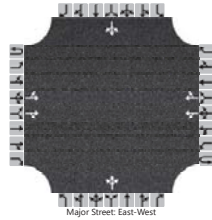


## **Appendix C** **Capacity Analysis Worksheets**

HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection		Lee St & North Bluff Rd		
Agency/Co.	CTS				Jurisdiction		City of White RÖck		
Date Performed	12/18/2018				East/West Street		North Bluff Rd		
Analysis Year	2018				North/South Street		Lee St		
Time Analyzed	AM Base				Peak Hour Factor		0.80		
Intersection Orientation	East-West				Analysis Time Period (hrs)		0.25		
Project Description	Beachview								

Lanes



Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		5	679	3		24	847	11		1	1	9		6	1	33
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		6				30				14					50	
Capacity, c (veh/h)		560				758				203					185	
v/c Ratio		0.01				0.04				0.07					0.27	
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.2					1.0	
Control Delay (s/veh)		11.5				9.9				24.0					31.6	
Level of Service (LOS)		B				A				C					D	
Approach Delay (s/veh)	0.2				0.7				24.0				31.6			
Approach LOS									C				D			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

AM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Lee St & North Bluff Rd

City of White Rock

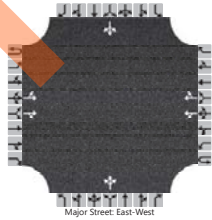
North Bluff Rd

Lee St

0.80

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		6	707	4		25	881	12		2	2	10		7	2	35
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				31				18					55	
Capacity, c (veh/h)		539				735				131					148	
v/c Ratio		0.01				0.04				0.13					0.37	
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.4					1.6	
Control Delay (s/veh)		11.8				10.1				36.6					42.9	
Level of Service (LOS)		B				B				E					E	
Approach Delay (s/veh)	0.2				0.7				36.6				42.9			
Approach LOS									E				E			



# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	DG
Agency/Co.	CTS
Date Performed	12/18/2018
Analysis Year	2020
Time Analyzed	AM Base+S
Intersection Orientation	East-West
Project Description	Beachview

## Site Information

Intersection	Lee St & North Bluff Rd
Jurisdiction	City of White Rock
East/West Street	North Bluff Rd
North/South Street	Lee St
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

## Lanes

The diagram shows a four-way intersection with a central island. The major street is East-West, indicated by a large arrow pointing East. The intersection has four approaches: Eastbound, Westbound, Northbound, and Southbound. Each approach has a through lane and a right-turn lane. The Eastbound and Westbound approaches have a left-turn lane. The Northbound and Southbound approaches have a right-turn lane. The diagram is labeled 'Major Street: East-West' at the bottom.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		6	709	7		29	881	12		12	2	18		7	2	35
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage								Undivided								

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				36				40				55		
Capacity, c (veh/h)		539				731				107				143		
v/c Ratio		0.01				0.05				0.38				0.38		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.2				1.5				1.6		
Control Delay (s/veh)		11.8				10.2				57.8				45.1		
Level of Service (LOS)		B				B				F				E		
Approach Delay (s/veh)		0.2				0.9				57.8				45.1		
Approach LOS										F				E		

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

AM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Lee St & North Bluff Rd

City of White Rock

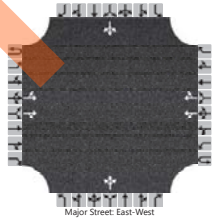
North Bluff Rd

Lee St

0.80

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration	LT		TR		LT		TR		LTR		LTR		LTR		LTR	
Volume (veh/h)		7	842	4		30	1051	14		2	2	12		8	2	41
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

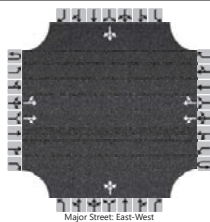
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9				38				20				64		
Capacity, c (veh/h)		446				634				78				87		
v/c Ratio		0.02				0.06				0.26				0.74		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				0.9				3.7		
Control Delay (s/veh)		13.2				11.0				66.4				118.9		
Level of Service (LOS)		B				B				F				F		
Approach Delay (s/veh)	0.4				1.3				66.4				118.9			
Approach LOS									F				F			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Lee St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2030	North/South Street	Lee St
Time Analyzed	AM Base + S	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		7	844	7		34	1051	14		12	2	20		8	2	41
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

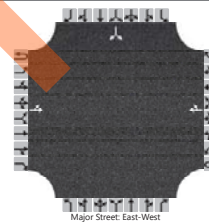
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9				43				43				64			
Capacity, c (veh/h)		446				631				57				82			
v/c Ratio		0.02				0.07				0.74				0.78			
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				3.2				3.9			
Control Delay (s/veh)		13.2				11.1				164.8				133.1			
Level of Service (LOS)		B				B				F				F			
Approach Delay (s/veh)		0.4				1.5				164.8				133.1			
Approach LOS										F				F			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2018	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT					TR								LR	
Volume (veh/h)		4	69				90	4						17		12
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

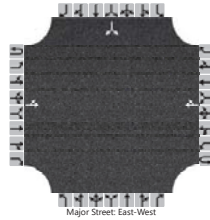
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5													36
Capacity, c (veh/h)		1445													813
v/c Ratio		0.00													0.04
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1
Control Delay (s/veh)		7.5													9.6
Level of Service (LOS)		A													A
Approach Delay (s/veh)	0.4										9.6				
Approach LOS											A				

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2020	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		5	72					94	5				18		13	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1			6.2
Critical Headway (sec)		4.12											6.42			6.22
Base Follow-Up Headway (sec)		2.2											3.5			3.3
Follow-Up Headway (sec)		2.22											3.52			3.32

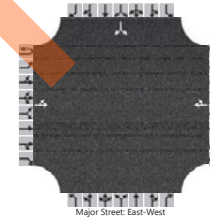
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)	6														39
Capacity, c (veh/h)	1437														804
v/c Ratio	0.00														0.05
95% Queue Length, Q <sub>95</sub> (veh)	0.0														0.2
Control Delay (s/veh)	7.5														9.7
Level of Service (LOS)	A														A
Approach Delay (s/veh)	0.5														9.7
Approach LOS															A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2020	North/South Street	Lee St
Time Analyzed	AM Base +S	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		5	72					94	5				19		15	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

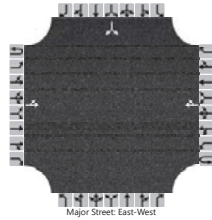
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6														43	
Capacity, c (veh/h)		1437														807	
v/c Ratio		0.00														0.05	
95% Queue Length, Q <sub>95</sub> (veh)		0.0														0.2	
Control Delay (s/veh)		7.5														9.7	
Level of Service (LOS)		A														A	
Approach Delay (s/veh)		0.5												9.7			
Approach LOS														A			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2030	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		5	86					112	5				22		15	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1			6.2
Critical Headway (sec)		4.12											6.42			6.22
Base Follow-Up Headway (sec)		2.2											3.5			3.3
Follow-Up Headway (sec)		2.22											3.52			3.32

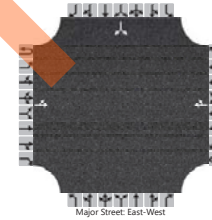
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)	6															46
Capacity, c (veh/h)	1410															767
v/c Ratio	0.00															0.06
95% Queue Length, Q <sub>95</sub> (veh)	0.0															0.2
Control Delay (s/veh)	7.6															10.0
Level of Service (LOS)	A															A
Approach Delay (s/veh)	0.4															10.0
Approach LOS																A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2030	North/South Street	Lee St
Time Analyzed	AM Base+S	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		5	86					112	5				23		17	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6													50		
Capacity, c (veh/h)		1410													770		
v/c Ratio		0.00													0.06		
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2		
Control Delay (s/veh)		7.6													10.0		
Level of Service (LOS)		A													A		
Approach Delay (s/veh)		0.4												10.0			
Approach LOS														A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

DG

Agency/Co.

CTS

Date Performed

12/18/2018

Analysis Year

2020

Time Analyzed

AM Base+S

Intersection Orientation

North-South

Project Description

Beachview

Site Information

Intersection

Lee St & Site Access

Jurisdiction

City of White Rock

East/West Street

Site Access

North/South Street

Lee St

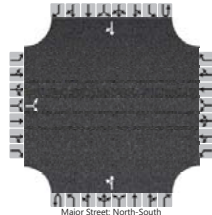
Peak Hour Factor

0.80

Analysis Time Period (hrs)

0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration				LR								LT				TR
Volume (veh/h)		18		3							0	14			31	7
Percent Heavy Vehicles (%)		2		2							2					
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2					4.1							
Critical Headway (sec)		6.42		6.22					4.12							
Base Follow-Up Headway (sec)		3.5		3.3					2.2							
Follow-Up Headway (sec)		3.52		3.32					2.22							

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26						0							
Capacity, c (veh/h)			957						1560							
v/c Ratio			0.03						0.00							
95% Queue Length, Q <sub>95</sub> (veh)			0.1						0.0							
Control Delay (s/veh)			8.9						7.3							
Level of Service (LOS)			A						A							
Approach Delay (s/veh)		8.9							0.0							
Approach LOS		A														

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

AM Base+S

North-South

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Lee St & Site Access

City of White Rock

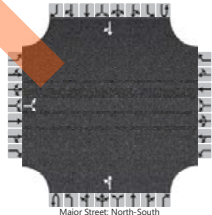
Site Access

Lee St

0.80

0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR								LT					TR
Volume (veh/h)			18								0	16				36
Percent Heavy Vehicles (%)			2								2					
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2					4.1							
Critical Headway (sec)		6.42		6.22					4.12							
Base Follow-Up Headway (sec)		3.5		3.3					2.2							
Follow-Up Headway (sec)		3.52		3.32					2.22							

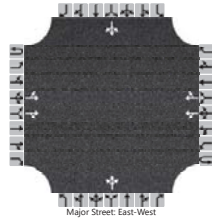
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26					0									
Capacity, c (veh/h)			946					1552									
v/c Ratio			0.03					0.00									
95% Queue Length, Q <sub>95</sub> (veh)			0.1					0.0									
Control Delay (s/veh)			8.9					7.3									
Level of Service (LOS)			A					A									
Approach Delay (s/veh)		8.9								0.0							
Approach LOS		A															

HCS7 Two-Way Stop-Control Report

General Information								Site Information							
Analyst	DG							Intersection				Maple St & North Bluff Rd			
Agency/Co.	CTS							Jurisdiction				City of White Rock			
Date Performed	12/18/2018							East/West Street				North Bluff Rd			
Analysis Year	2018							North/South Street				Maple			
Time Analyzed	AM Base							Peak Hour Factor				0.80			
Intersection Orientation	East-West							Analysis Time Period (hrs)				0.25			
Project Description	Beachview														

Lanes



Major Street: East-West

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		5	663	3		16	809	9		1	1	11		3	0	12
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6				20				16				19		
Capacity, c (veh/h)		592				783				262				201		
v/c Ratio		0.01				0.03				0.06				0.09		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.2				0.3		
Control Delay (s/veh)		11.1				9.7				19.6				24.8		
Level of Service (LOS)		B				A				C				C		
Approach Delay (s/veh)	0.2				0.4				19.6				24.8			
Approach LOS									C				C			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

AM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & North Bluff Rd

City of White Rock

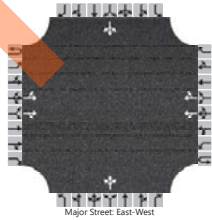
North Bluff Rd

Maple

0.80

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		6	690	4		17	842	10		2	2	12		4	0	13
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

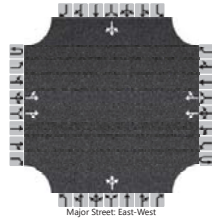
Flow Rate, v (veh/h)		8				21				20				21		
Capacity, c (veh/h)		571				760				177				164		
v/c Ratio		0.01				0.03				0.11				0.13		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.4				0.4		
Control Delay (s/veh)		11.4				9.9				28.0				30.1		
Level of Service (LOS)		B				A				D				D		
Approach Delay (s/veh)	0.2				0.5				28.0				30.1			
Approach LOS									D				D			



HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection	Maple St & North Bluff Rd			
Agency/Co.	CTS				Jurisdiction	City of White Rock			
Date Performed	12/18/2018				East/West Street	North Bluff Rd			
Analysis Year	2020				North/South Street	Maple			
Time Analyzed	AM Base+S				Peak Hour Factor	0.80			
Intersection Orientation	East-West				Analysis Time Period (hrs)	0.25			
Project Description	Beachview								

Lanes



Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		6	693	5		17	852	10		4	2	14		4	0	13
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				21				25				21		
Capacity, c (veh/h)		564				756				165				160		
v/c Ratio		0.01				0.03				0.15				0.13		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.5				0.4		
Control Delay (s/veh)		11.5				9.9				30.7				30.9		
Level of Service (LOS)		B				A				D				D		
Approach Delay (s/veh)	0.2				0.5				30.7				30.9			
Approach LOS									D				D			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

AM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & North Bluff Rd

City of White Rock

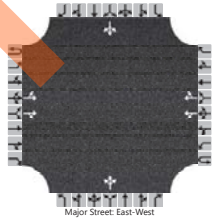
North Bluff Rd

Maple

0.80

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		7	823	4		20	1004	12		2	2	14		4	0	15
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

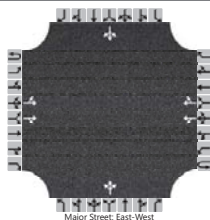
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9				25				23				24		
Capacity, c (veh/h)		476				657				116				108		
v/c Ratio		0.02				0.04				0.19				0.22		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				0.7				0.8		
Control Delay (s/veh)		12.7				10.7				43.2				47.4		
Level of Service (LOS)		B				B				E				E		
Approach Delay (s/veh)	0.4				0.8				43.2				47.4			
Approach LOS									E				E			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White ROCK
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2020	North/South Street	Maple
Time Analyzed	AM Base	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		7	826	5		20	1014	12		4	2	16		4	0	15
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1			7.5	6.5	6.9		7.5	6.5	6.9	
Critical Headway (sec)		4.14				4.14			7.54	6.54	6.94		7.54	6.54	6.94	
Base Follow-Up Headway (sec)		2.2				2.2			3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.22				2.22			3.52	4.02	3.32		3.52	4.02	3.32	

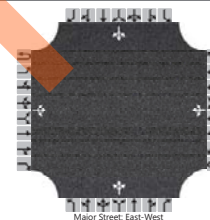
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9				25				28				24			
Capacity, c (veh/h)		471				654				107				105			
v/c Ratio		0.02				0.04				0.26				0.23			
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				1.0				0.8			
Control Delay (s/veh)		12.8				10.7				50.2				49.0			
Level of Service (LOS)		B				B				F				E			
Approach Delay (s/veh)		0.4				0.8				50.2				49.0			
Approach LOS										F				E			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2018	North/South Street	Maple St
Time Analyzed	AM Base	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	1	0	
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	59	3		3	114	2		10	8	4		5	15	4
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1			7.1	6.5	6.2		7.1	6.5	6.2	
Critical Headway (sec)		4.12				4.12			7.12	6.52	6.22		7.12	6.52	6.22	
Base Follow-Up Headway (sec)		2.2				2.2			3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.22				2.22			3.52	4.02	3.32		3.52	4.02	3.32	

### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0			4			28				30	
Capacity, c (veh/h)		1404			1505			698				677	
v/c Ratio		0.00			0.00			0.04				0.04	
95% Queue Length, Q <sub>95</sub> (veh)		0.0			0.0			0.1				0.1	
Control Delay (s/veh)		7.6			7.4			10.4				10.6	
Level of Service (LOS)		A			A			B				B	
Approach Delay (s/veh)	0.0				0.2				10.4				10.6
Approach LOS									B				B

# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	DG
Agency/Co.	CTS
Date Performed	12/18/2018
Analysis Year	2020
Time Analyzed	AM Base
Intersection Orientation	East-West
Project Description	Beachview

## Site Information

Intersection	Maple St & Russell Ave
Jurisdiction	City of White Rock
East/West Street	Russell Ave
North/South Street	Maple St
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

## Lanes

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	62	4		4	119	3		11	9	5		6	16	5
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				5				31					34	
Capacity, c (veh/h)		1395				1498				687					667	
v/c Ratio		0.00				0.00				0.05					0.05	
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1					0.2	
Control Delay (s/veh)		7.6				7.4				10.5					10.7	
Level of Service (LOS)		A				A				B					B	
Approach Delay (s/veh)		0.0				0.3				10.5				10.7		
Approach LOS										B				B		

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

AM Base + S

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & Russell Ave

City of White Rock

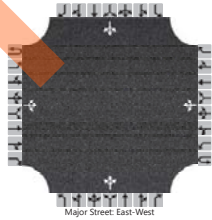
Russell Ave

Maple St

0.80

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	62	4		4	121	3		11	9	5		6	16	5
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

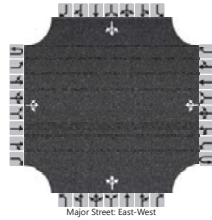
Delay, Queue Length, and Level of Service

		0				5				31				34	
Flow Rate, v (veh/h)		0				5				31				34	
Capacity, c (veh/h)		1392				1498				685				665	
v/c Ratio		0.00				0.00				0.05				0.05	
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1				0.2	
Control Delay (s/veh)		7.6				7.4				10.5				10.7	
Level of Service (LOS)		A				A				B				B	
Approach Delay (s/veh)		0.0				0.3				10.5				10.7	
Approach LOS										B				B	

HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection	Maple St & Russell Ave			
Agency/Co.	CTS				Jurisdiction	City of White Rock			
Date Performed	12/18/2018				East/West Street	Russell Ave			
Analysis Year	2030				North/South Street	Maple St			
Time Analyzed	AM Base				Peak Hour Factor	0.80			
Intersection Orientation	East-West				Analysis Time Period (hrs)	0.25			
Project Description	Beachview								

Lanes



Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	74	4		4	142	3		13	10	5		7	19	5
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				5				35				39		
Capacity, c (veh/h)		1362				1480				642				626		
v/c Ratio		0.00				0.00				0.05				0.06		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.2				0.2		
Control Delay (s/veh)		7.6				7.4				10.9				11.1		
Level of Service (LOS)		A				A				B				B		
Approach Delay (s/veh)	0.0				0.2				10.9				11.1			
Approach LOS									B				B			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

AM Base + S

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & Russell Ave

City of White Rock

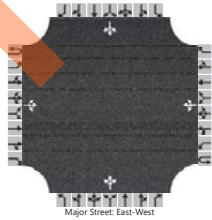
Russell Ave

Maple St

0.80

0.25

Lanes



Vehicle Volumes and Adjustments

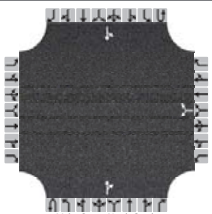
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	74	4		4	144	3		13	10	5		7	19	5
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage	Undivided															

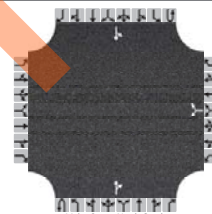
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				5				35					39		
Capacity, c (veh/h)		1359				1480				640					624		
v/c Ratio		0.00				0.00				0.05					0.06		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.2					0.2		
Control Delay (s/veh)		7.6				7.4				10.9					11.1		
Level of Service (LOS)		A				A				B					B		
Approach Delay (s/veh)		0.0				0.2				10.9				11.1			
Approach LOS										B				B			

HCS7 Two-Way Stop-Control Report																
General Information				Site Information												
Analyst	DG			Intersection		Maple & Site Access										
Agency/Co.	CTS			Jurisdiction		City of White Rock										
Date Performed	12/18/2018			East/West Street		Site Access										
Analysis Year	2020			North/South Street		Maple St										
Time Analyzed	AM Base+S			Peak Hour Factor		0.80										
Intersection Orientation	North-South			Analysis Time Period (hrs)		0.25										
Project Description	Beachview															
Lanes																
 Major Street: North-South																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	10	11	12		7	8	9		1U	1	2	3	4U	4	5	6
Number of Lanes	0	0	0		0	1	0		0	0	1	0	0	0	1	0
Configuration						LR					TR			LT		
Volume (veh/h)					0		4				16	0		1		21
Percent Heavy Vehicles (%)					2		2							2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.22							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.32							2.22		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)					5									1		
Capacity, c (veh/h)					1055									1593		
v/c Ratio					0.00									0.00		
95% Queue Length, Q <sub>95</sub> (veh)					0.0									0.0		
Control Delay (s/veh)					8.4									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.4								0.3			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report																
General Information				Site Information												
Analyst	DG			Intersection		Maple & Site Access										
Agency/Co.	CTS			Jurisdiction		City of White Rock										
Date Performed	12/18/2018			East/West Street		Site Access										
Analysis Year	2030			North/South Street		Maple St										
Time Analyzed	AM Base+S			Peak Hour Factor		0.80										
Intersection Orientation	North-South			Analysis Time Period (hrs)		0.25										
Project Description	Beachview															
Lanes																
 Major Street: North-South																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	10	11	12		7	8	9		1U	1	2	3	4U	4	5	6
Number of Lanes	0	0	0		0	1	0		0	0	1	0	0	0	1	0
Configuration						LR					TR			LT		
Volume (veh/h)					0		4				18	0		1		24
Percent Heavy Vehicles (%)					2		2							2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.22							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.32							2.22		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)					5									1		
Capacity, c (veh/h)					1052									1590		
v/c Ratio					0.00									0.00		
95% Queue Length, Q <sub>95</sub> (veh)					0.0									0.0		
Control Delay (s/veh)					8.4									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.4								0.3			
Approach LOS					A											

# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	DG
Agency/Co.	CTS
Date Performed	12/18/2018
Analysis Year	2018
Time Analyzed	PM Base
Intersection Orientation	East-West
Project Description	Beachview

## Site Information

Intersection	Lee St & North Bluff Rd
Jurisdiction	City of White Rock
East/West Street	North Bluff Rd
North/South Street	Lee St
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

## Lanes

The diagram shows a four-way intersection. The major street, East-West, runs horizontally across the top and bottom of the intersection. It has four lanes in each direction: two through lanes and two turn lanes. The minor street, North-South, runs vertically through the center of the intersection. It has two lanes in each direction: one through lane and one turn lane. The diagram is labeled 'Major Street: East-West' at the bottom.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		7	717	9		14	772	24		2	0	3		6	2	12
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage																

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				15				5				22		
Capacity, c (veh/h)		708				811				220				182		
v/c Ratio		0.01				0.02				0.02				0.12		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.1				0.4		
Control Delay (s/veh)		10.1				9.5				21.8				27.4		
Level of Service (LOS)		B				A				C				D		
Approach Delay (s/veh)		0.2				0.3				21.8				27.4		
Approach LOS										C				D		

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

PM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Lee St & North Bluff Rd

City of White Rock

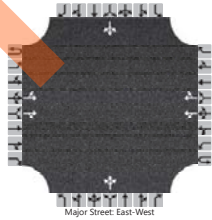
North Bluff Rd

Lee St

0.91

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration	LT		TR		LT		TR		LTR		LTR		LTR		LTR	
Volume (veh/h)		8	746	10		15	803	25		3	0	4		7	3	13
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

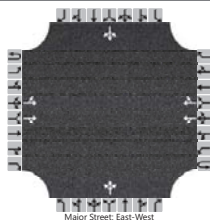
Flow Rate, v (veh/h)		9				16				8				25		
Capacity, c (veh/h)		686				788				191				156		
v/c Ratio		0.01				0.02				0.04				0.16		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.1				0.6		
Control Delay (s/veh)		10.3				9.7				24.7				32.6		
Level of Service (LOS)		B				A				C				D		
Approach Delay (s/veh)	0.2				0.3				24.7				32.6			
Approach LOS									C				D			



## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Lee St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2020	North/South Street	Lee St
Time Analyzed	PM Base+S	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		8	748	19		24	805	25		9	0	10		7	3	13
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1			7.5	6.5	6.9		7.5	6.5	6.9	
Critical Headway (sec)		4.14				4.14			7.54	6.54	6.94		7.54	6.54	6.94	
Base Follow-Up Headway (sec)		2.2				2.2			3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.22				2.22			3.52	4.02	3.32		3.52	4.02	3.32	

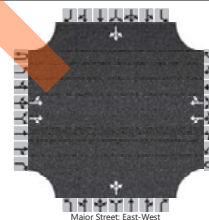
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9				26				21				25			
Capacity, c (veh/h)		685				780				168				146			
v/c Ratio		0.01				0.03				0.12				0.17			
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.4				0.6			
Control Delay (s/veh)		10.3				9.8				29.5				34.6			
Level of Service (LOS)		B				A				D				D			
Approach Delay (s/veh)		0.2				0.6				29.5				34.6			
Approach LOS										D				D			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Lee St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2030	North/South Street	Lee St
Time Analyzed	PM Base	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		9	890	12		18	958	30		3	0	4		8	3	15
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1			7.5	6.5	6.9		7.5	6.5	6.9	
Critical Headway (sec)		4.14				4.14			7.54	6.54	6.94		7.54	6.54	6.94	
Base Follow-Up Headway (sec)		2.2				2.2			3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.22				2.22			3.52	4.02	3.32		3.52	4.02	3.32	

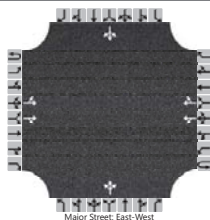
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				20				8				29	
Capacity, c (veh/h)		588				686				123				103	
v/c Ratio		0.02				0.03				0.06				0.28	
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				0.2				1.0	
Control Delay (s/veh)		11.2				10.4				36.3				53.1	
Level of Service (LOS)		B				B				E				F	
Approach Delay (s/veh)	0.3					0.5					36.3				
Approach LOS											E				
											F				

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Lee St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2030	North/South Street	Lee St
Time Analyzed	PM Base+S	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		9	892	21		27	960	30		9	0	10		8	3	15
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

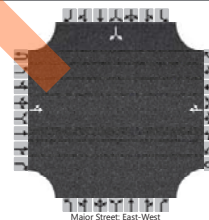
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				30				21				29			
Capacity, c (veh/h)		587				678				105				95			
v/c Ratio		0.02				0.04				0.20				0.30			
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				0.7				1.1			
Control Delay (s/veh)		11.2				10.5				47.4				58.2			
Level of Service (LOS)		B				B				E				F			
Approach Delay (s/veh)		0.3				0.8				47.4				58.2			
Approach LOS										E				F			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2018	North/South Street	Lee St
Time Analyzed	PM Base	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	66				64	2						11		9
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)																0
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

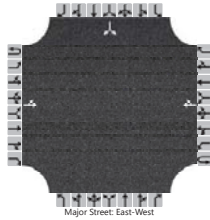
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													22	
Capacity, c (veh/h)		1479													870	
v/c Ratio		0.00													0.03	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1	
Control Delay (s/veh)		7.4													9.2	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.0										9.2					
Approach LOS											A					

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2020	North/South Street	Lee St
Time Analyzed	PM Base	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT					TR								LR	
Volume (veh/h)		0	69				67	3					12		10	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1			6.2
Critical Headway (sec)		4.12											6.42			6.22
Base Follow-Up Headway (sec)		2.2											3.5			3.3
Follow-Up Headway (sec)		2.22											3.52			3.32

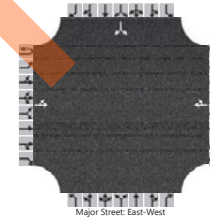
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)	0														24
Capacity, c (veh/h)	1473														864
v/c Ratio	0.00														0.03
95% Queue Length, Q <sub>95</sub> (veh)	0.0														0.1
Control Delay (s/veh)	7.4														9.3
Level of Service (LOS)	A														A
Approach Delay (s/veh)	0.0														9.3
Approach LOS															A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & Russell Ave
Agency/Co.	CTS	Jurisdiction	City of White Rock
Date Performed	12/18/2018	East/West Street	Russell Ave
Analysis Year	2020	North/South Street	Lee St
Time Analyzed	PM Base+S	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT					TR								LR	
Volume (veh/h)		1	69				67	4					13		11	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													26	
Capacity, c (veh/h)		1472													862	
v/c Ratio		0.00													0.03	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1	
Control Delay (s/veh)		7.4													9.3	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)		0.1										9.3				
Approach LOS												A				

# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	DG
Agency/Co.	CTS
Date Performed	12/18/2018
Analysis Year	2030
Time Analyzed	PM Base
Intersection Orientation	East-West
Project Description	Beachview

## Site Information

Intersection	Maple St & Russell Ave
Jurisdiction	City of White Rock
East/West Street	Russell Ave
North/South Street	Lee St
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

## Lanes

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		0	82					80	3					14		12
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													29	
Capacity, c (veh/h)		1456													840	
v/c Ratio		0.00													0.03	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1	
Control Delay (s/veh)		7.5													9.4	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.0												9.4			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

PM Base+S

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & Russell Ave

City of White ROCK

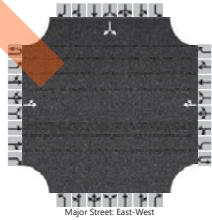
Russell Ave

Lee St

0.91

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			0	0	0		0	1	0
Configuration		LT						TR								LR	
Volume (veh/h)		1	82				80	4							15		13
Percent Heavy Vehicles (%)		2													2		2
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type   Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)	4.1												7.1		6.2
Critical Headway (sec)	4.12												6.42		6.22
Base Follow-Up Headway (sec)	2.2												3.5		3.3
Follow-Up Headway (sec)	2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)	1														31	
Capacity, c (veh/h)	1454														838	
v/c Ratio	0.00														0.04	
95% Queue Length, Q <sub>95</sub> (veh)	0.0														0.1	
Control Delay (s/veh)	7.5														9.5	
Level of Service (LOS)	A														A	
Approach Delay (s/veh)	0.1												9.5			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

DG

Agency/Co.

CTS

Date Performed

12/18/2018

Analysis Year

2020

Time Analyzed

PM Base+S

Intersection Orientation

North-South

Project Description

Beachview

Site Information

Intersection

Lee St & Site Access

Jurisdiction

City of White Rock

East/West Street

Site Access

North/South Street

Lee St

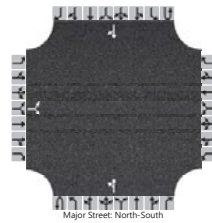
Peak Hour Factor

0.91

Analysis Time Period (hrs)

0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0		0	1	0		0	1	0
Configuration				LR								LT				TR
Volume (veh/h)			12								2	7			28	18
Percent Heavy Vehicles (%)			2								2					
Proportion Time Blocked																
Percent Grade (%)			0													
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)			7.1		6.2						4.1					
Critical Headway (sec)			6.42		6.22						4.12					
Base Follow-Up Headway (sec)			3.5		3.3						2.2					
Follow-Up Headway (sec)			3.52		3.32						2.22					

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				15							2					
Capacity, c (veh/h)				964							1556					
v/c Ratio				0.02							0.00					
95% Queue Length, Q <sub>95</sub> (veh)				0.0							0.0					
Control Delay (s/veh)				8.8							7.3					
Level of Service (LOS)				A							A					
Approach Delay (s/veh)			8.8								1.6					
Approach LOS			A													

HCS7 Two-Way Stop-Control Report

General Information

Analyst

DG

Intersection

Lee St & Site Access

Agency/Co.

CTS

Jurisdiction

City of White Rock

Date Performed

12/18/2018

East/West Street

Site Access

Analysis Year

2030

North/South Street

Lee St

Time Analyzed

PM Base+S

Peak Hour Factor

0.91

Intersection Orientation

North-South

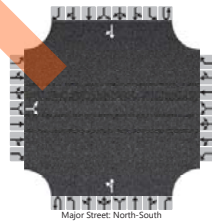
Analysis Time Period (hrs)

0.25

Project Description

Beachview

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR								LT					TR
Volume (veh/h)		12		2							2	7			33	18
Percent Heavy Vehicles (%)		2		2							2					
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type   Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			15							2						
Capacity, c (veh/h)			958							1549						
v/c Ratio			0.02							0.00						
95% Queue Length, Q <sub>95</sub> (veh)			0.0							0.0						
Control Delay (s/veh)			8.8							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)		8.8								1.6						
Approach LOS		A														

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple St & North Bluff Rd
Agency/Co.	CTS	Jurisdiction	City of White RÖck
Date Performed	12/18/2018	East/West Street	North Bluff Rd
Analysis Year	2018	North/South Street	Maple
Time Analyzed	PM Base	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

## Lanes

The diagram illustrates a four-way intersection with a major street running East-West. The Eastbound approach (top) has a single through lane. The Westbound approach (bottom) has a single through lane. The Northbound approach (left) has a single through lane. The Southbound approach (right) has a single through lane. All approaches have a stop line and a stop sign. The intersection is labeled 'Major Street: East-West' at the bottom.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		1	725	8		18	668	19		3	0	9		2	1	5
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				20				13				9		
Capacity, c (veh/h)		812				799				305				227		
v/c Ratio		0.00				0.02				0.04				0.04		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.1				0.1		
Control Delay (s/veh)		9.4				9.6				17.3				21.5		
Level of Service (LOS)		A				A				C				C		
Approach Delay (s/veh)	0.0				0.4				17.3				21.5			
Approach LOS									C				C			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

PM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & North Bluff Rd

City of White Rock

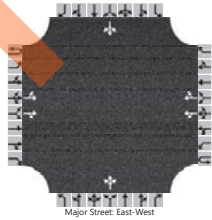
North Bluff Rd

Maple

0.91

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		2	754	9		19	695	20		4	0	10		3	2	6
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

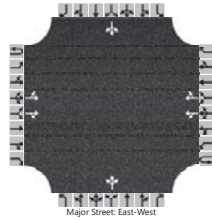
Flow Rate, v (veh/h)		2				21				15				12		
Capacity, c (veh/h)		790				776				264				181		
v/c Ratio		0.00				0.03				0.06				0.07		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.2				0.2		
Control Delay (s/veh)		9.6				9.8				19.5				26.3		
Level of Service (LOS)		A				A				C				D		
Approach Delay (s/veh)	0.0				0.5				19.5				26.3			
Approach LOS									C				D			



HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection	Maple St & North Bluff Rd			
Agency/Co.	CTS				Jurisdiction	City of White Rock			
Date Performed	12/18/2018				East/West Street	North Bluff Rd			
Analysis Year	2020				North/South Street	Maple			
Time Analyzed	PM Base+S				Peak Hour Factor	0.91			
Intersection Orientation	East-West				Analysis Time Period (hrs)	0.25			
Project Description	Beachview								

Lanes



Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		2	763	10		21	701	20		5	0	12		3	2	6
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				23				19				12		
Capacity, c (veh/h)		786				769				253				176		
v/c Ratio		0.00				0.03				0.07				0.07		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.2				0.2		
Control Delay (s/veh)		9.6				9.8				20.3				27.0		
Level of Service (LOS)		A				A				C				D		
Approach Delay (s/veh)	0.0				0.5				20.3				27.0			
Approach LOS									C				D			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

PM Base

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & North Bluff Rd

City of White Rock

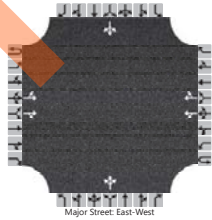
North Bluff Rd

Maple

0.91

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration	LT		TR		LT		TR		LTR		LTR		LTR		LTR	
Volume (veh/h)		2	899	10		23	829	24		4	0	12		3	2	7
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

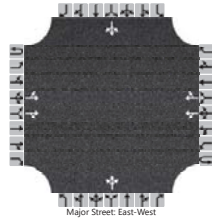
Critical and Follow-up Headways

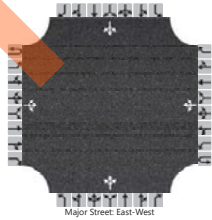
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				25				18				13		
Capacity, c (veh/h)		693				675				201				128		
v/c Ratio		0.00				0.04				0.09				0.10		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.3				0.3		
Control Delay (s/veh)		10.2				10.5				24.6				36.2		
Level of Service (LOS)		B				B				C				E		
Approach Delay (s/veh)	0.1				0.6				24.6				36.2			
Approach LOS									C				E			

HCS7 Two-Way Stop-Control Report

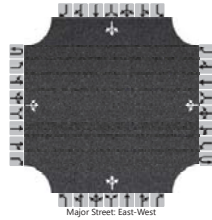
General Information								Site Information								
Analyst	DG							Intersection	Maple St & North Bluff Rd							
Agency/Co.	CTS							Jurisdiction	City of White Rock							
Date Performed	12/18/2018							East/West Street	North Bluff Rd							
Analysis Year	2030							North/South Street	Maple							
Time Analyzed	PM Base+S							Peak Hour Factor	0.91							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Beachview															
Lanes																
																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		2	908	11		25	835	24		5	0	14		3	2	7
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		2				27				21				13		
Capacity, c (veh/h)		689				668				189				124		
v/c Ratio		0.00				0.04				0.11				0.11		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.4				0.3		
Control Delay (s/veh)		10.2				10.6				26.3				37.4		
Level of Service (LOS)		B				B				D				E		
Approach Delay (s/veh)	0.1				0.7				26.3				37.4			
Approach LOS									D				E			

HCS7 Two-Way Stop-Control Report																
General Information									Site Information							
Analyst	DG								Intersection				Maple St & Russell Ave			
Agency/Co.	CTS								Jurisdiction				City of White Rock			
Date Performed	12/18/2018								East/West Street				Russell Ave			
Analysis Year	2018								North/South Street				Maple St			
Time Analyzed	PM								Peak Hour Factor				0.91			
Intersection Orientation	East-West								Analysis Time Period (hrs)				0.25			
Project Description	Beachview															
Lanes																
																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	79	5		4	49	4		8	7	3		2	11	7
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		2				4				20				22		
Capacity, c (veh/h)		1510				1486				754				778		
v/c Ratio		0.00				0.00				0.03				0.03		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1				0.1		
Control Delay (s/veh)		7.4				7.4				9.9				9.8		
Level of Service (LOS)		A				A				A				A		
Approach Delay (s/veh)	0.2				0.5				9.9				9.8			
Approach LOS									A				A			

HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection		Maple St & Russell Ave		
Agency/Co.	CTS				Jurisdiction		City of White RÖck		
Date Performed	12/18/2018				East/West Street		Russell Ave		
Analysis Year	2020				North/South Street		Maple St		
Time Analyzed	PM				Peak Hour Factor		0.91		
Intersection Orientation	East-West				Analysis Time Period (hrs)		0.25		
Project Description	Beachview								

Lanes



Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	83	6		5	51	5		9	8	4		3	12	8
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				5					23				25	
Capacity, c (veh/h)		1506				1479					744				769	
v/c Ratio		0.00				0.00					0.03				0.03	
95% Queue Length, Q95 (veh)		0.0				0.0					0.1				0.1	
Control Delay (s/veh)		7.4				7.4					10.0				9.8	
Level of Service (LOS)		A				A					A				A	
Approach Delay (s/veh)	0.3				0.6				10.0				9.8			
Approach LOS									A				A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2020

PM+5

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & Russell Ave

City of White Rock

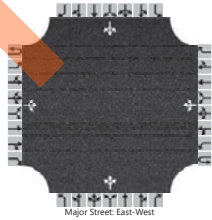
Russell Ave

Maple St

0.91

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	84	6		5	52	5		9	8	4		3	12	8
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

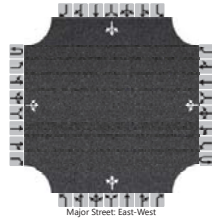
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				5				23				25		
Capacity, c (veh/h)		1505				1478				742				767		
v/c Ratio		0.00				0.00				0.03				0.03		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1				0.1		
Control Delay (s/veh)		7.4				7.4				10.0				9.9		
Level of Service (LOS)		A				A				B				A		
Approach Delay (s/veh)	0.3				0.6				10.0				9.9			
Approach LOS									B				A			

HCS7 Two-Way Stop-Control Report

General Information					Site Information				
Analyst	DG				Intersection	Maple St & Russell Ave			
Agency/Co.	CTS				Jurisdiction	City of White Rock			
Date Performed	12/18/2018				East/West Street	Russell Ave			
Analysis Year	2030				North/South Street	Maple St			
Time Analyzed	PM				Peak Hour Factor	0.91			
Intersection Orientation	East-West				Analysis Time Period (hrs)	0.25			
Project Description	Beachview								

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	98	7		5	61	5		10	9	4		3	14	9
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		3				5				25				29		
Capacity, c (veh/h)		1492				1458				712				744		
v/c Ratio		0.00				0.00				0.04				0.04		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1				0.1		
Control Delay (s/veh)		7.4				7.5				10.2				10.0		
Level of Service (LOS)		A				A				B				B		
Approach Delay (s/veh)	0.2				0.6				10.2				10.0			
Approach LOS									B				B			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

Agency/Co.

Date Performed

Analysis Year

Time Analyzed

Intersection Orientation

Project Description

DG

CTS

12/18/2018

2030

PM+5

East-West

Beachview

Site Information

Intersection

Jurisdiction

East/West Street

North/South Street

Peak Hour Factor

Analysis Time Period (hrs)

Maple St & Russell Ave

City of White Rock

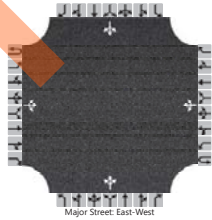
Russell Ave

Maple St

0.91

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	99	7		5	62	5		10	9	4		3	14	9
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

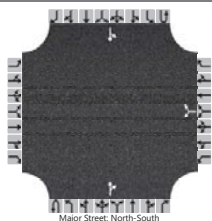
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				5				25				29		
Capacity, c (veh/h)		1491				1456				710				742		
v/c Ratio		0.00				0.00				0.04				0.04		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.0				0.1				0.1		
Control Delay (s/veh)		7.4				7.5				10.3				10.0		
Level of Service (LOS)		A				A				B				B		
Approach Delay (s/veh)	0.2				0.5				10.3				10.0			
Approach LOS									B				B			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple & Site Access
Agency/Co.	CTS	Jurisdiction	City of White ROCK
Date Performed	12/18/2018	East/West Street	Site Access
Analysis Year	2020	North/South Street	Maple St
Time Analyzed	PM Base+S	Peak Hour Factor	0.91
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		3			14	0		3	30	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type   Storage		Undivided														

## Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.22							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.32							2.22		

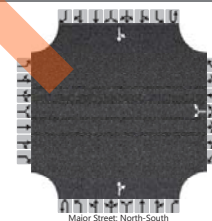
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					3									3		
Capacity, c (veh/h)					1062									1599		
v/c Ratio					0.00									0.00		
95% Queue Length, Q <sub>95</sub> (veh)					0.0									0.0		
Control Delay (s/veh)					8.4									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.4									0.7		
Approach LOS					A											

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DG	Intersection	Maple & Site Access
Agency/Co.	CTS	Jurisdiction	City of White ROkk
Date Performed	12/18/2018	East/West Street	Site Access
Analysis Year	2030	North/South Street	Maple St
Time Analyzed	PM Base+S	Peak Hour Factor	0.91
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Beachview		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		3			16	0		3	35	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.22							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.32							2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					3									3		
Capacity, c (veh/h)					1059									1597		
v/c Ratio					0.00									0.00		
95% Queue Length, Q <sub>95</sub> (veh)					0.0									0.0		
Control Delay (s/veh)					8.4									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.4									0.6		
Approach LOS					A											

DRAFT

## **Appendix C**

### **Traffic Count Data**



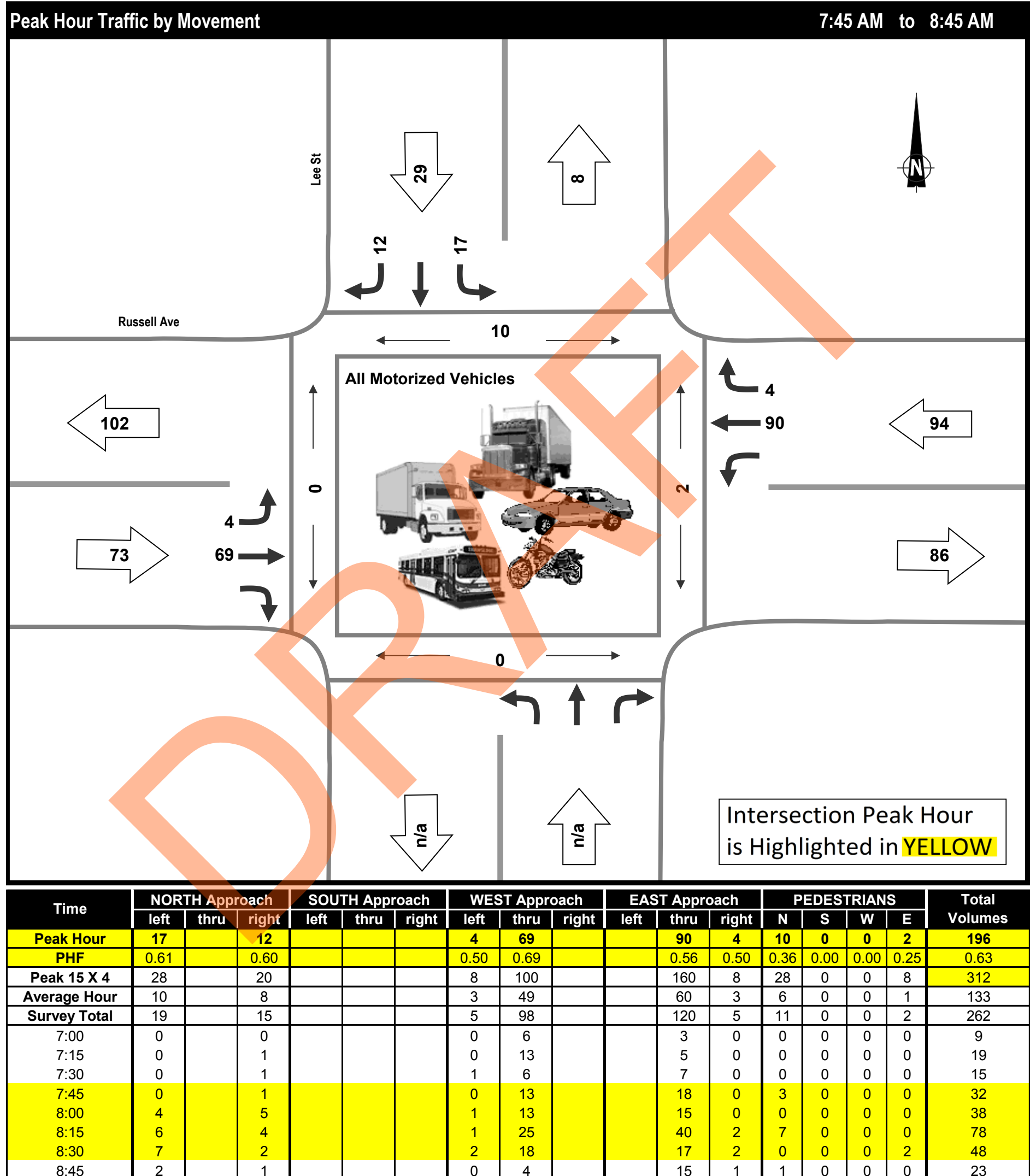


Vehicle Classification Summary

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy

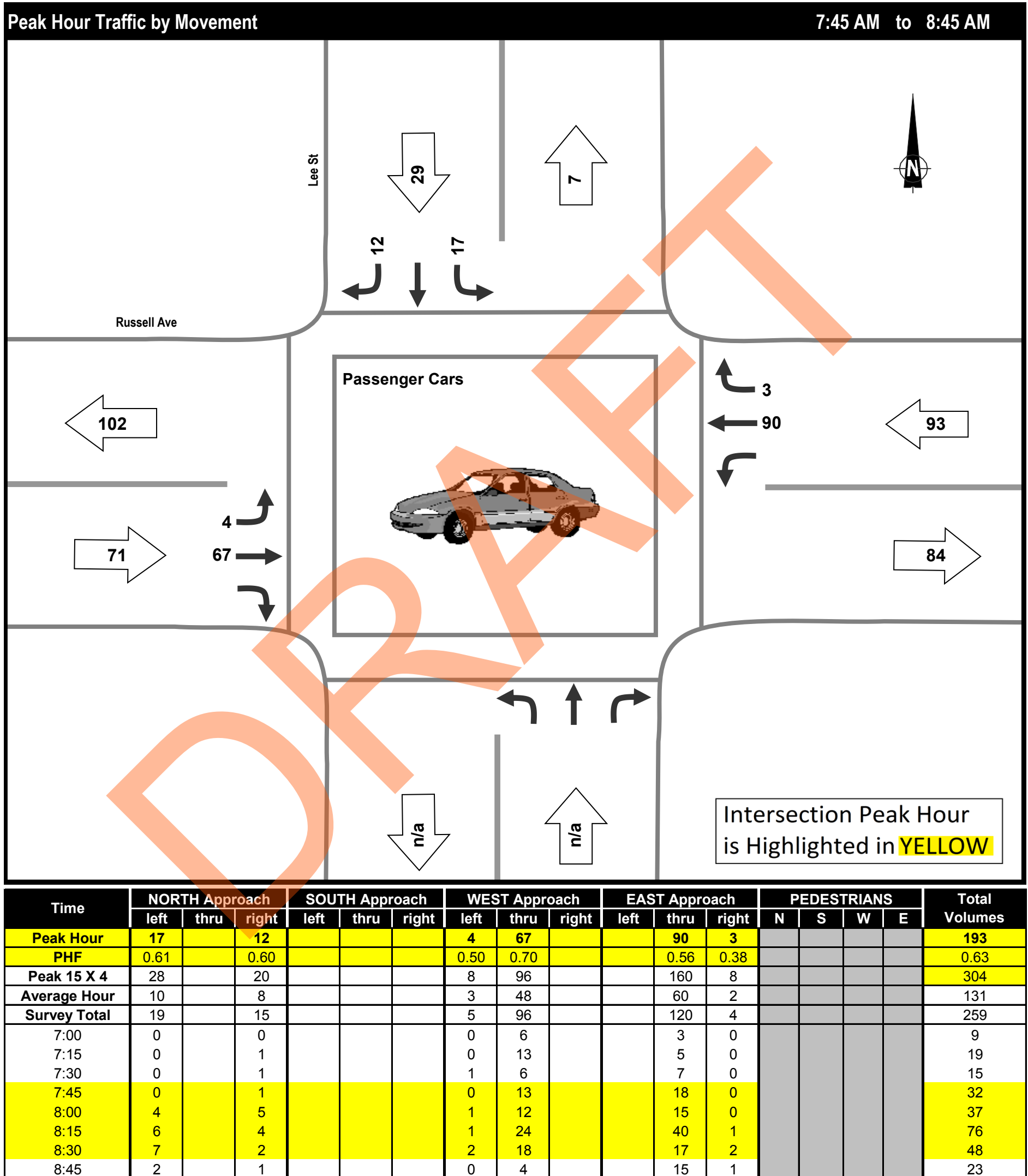
Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	259	3				262
	%	98.9%	1.1%				100.0%
Midday	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	374	3				377
	%	99.2%	0.8%				100.0%
Total (5 Hours)	Volume	633	6				639
	%	99.1%	0.9%				100.0%

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Morning Peak Period**


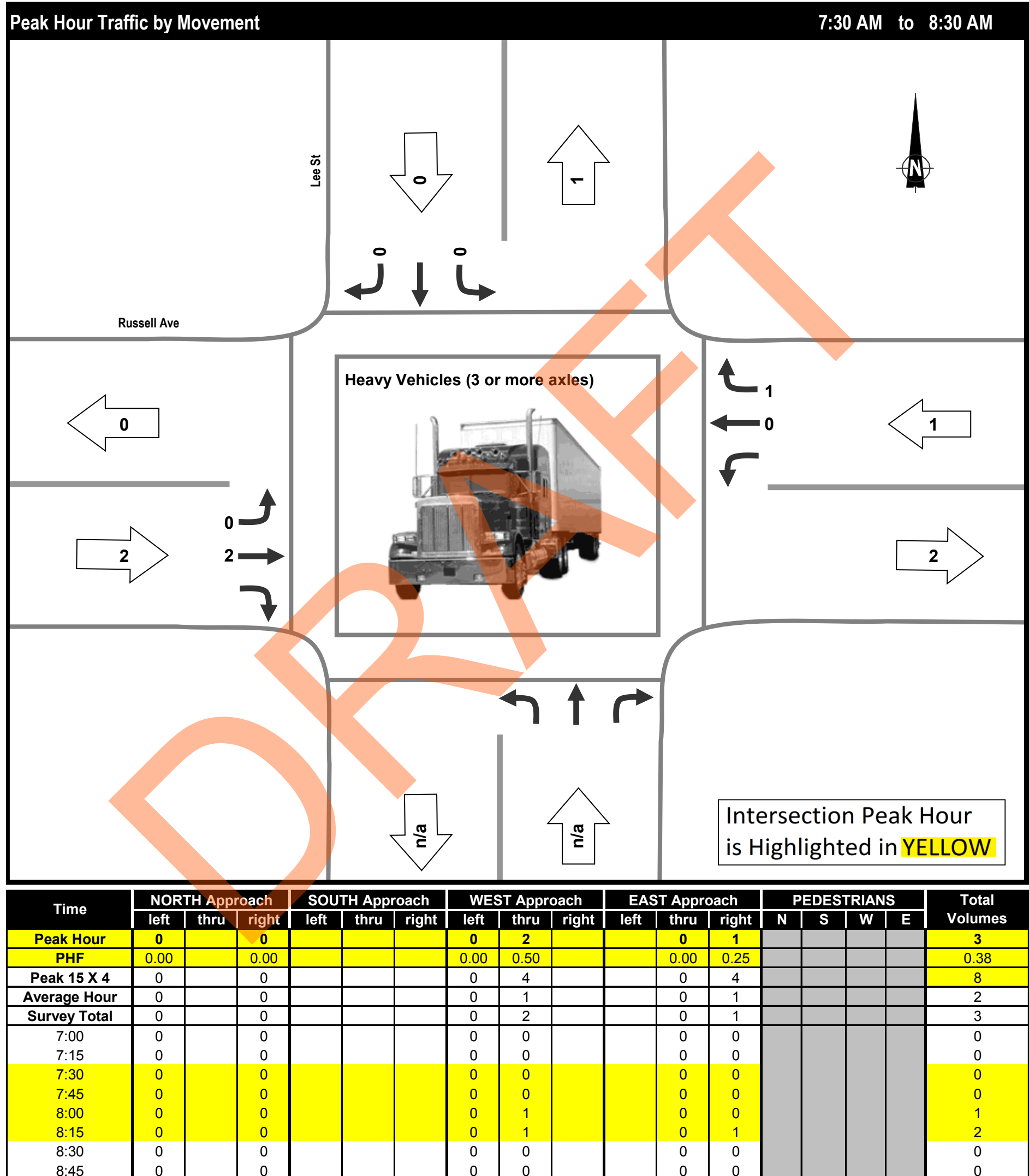
Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Passenger Cars

**Morning Peak Period**



Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

**Morning Peak Period**



Project: #5935: Beachway Traffic Impact Assessment

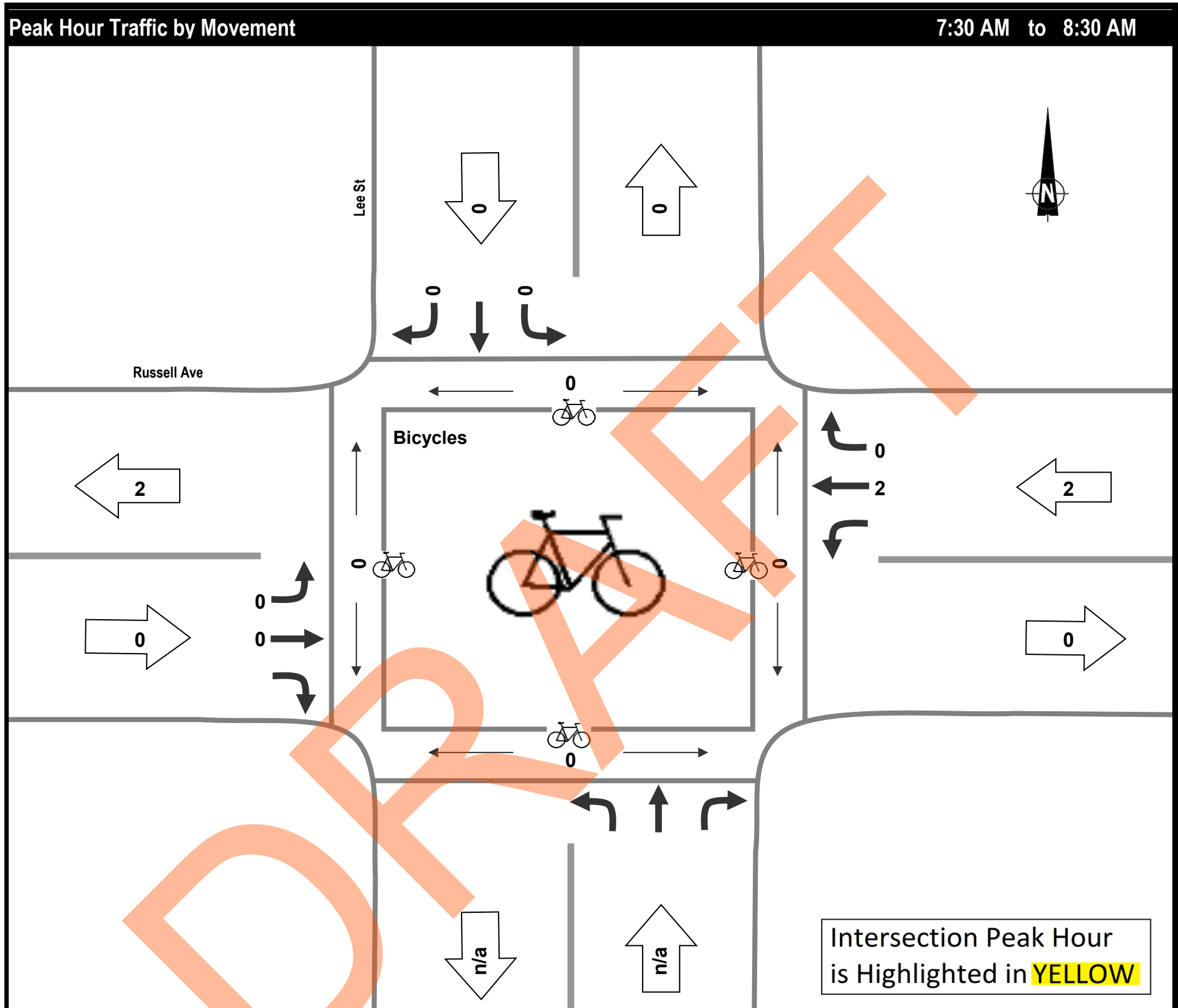
Municipality: White Rock

Weather: Cloudy

Vehicle Class: Bicycles

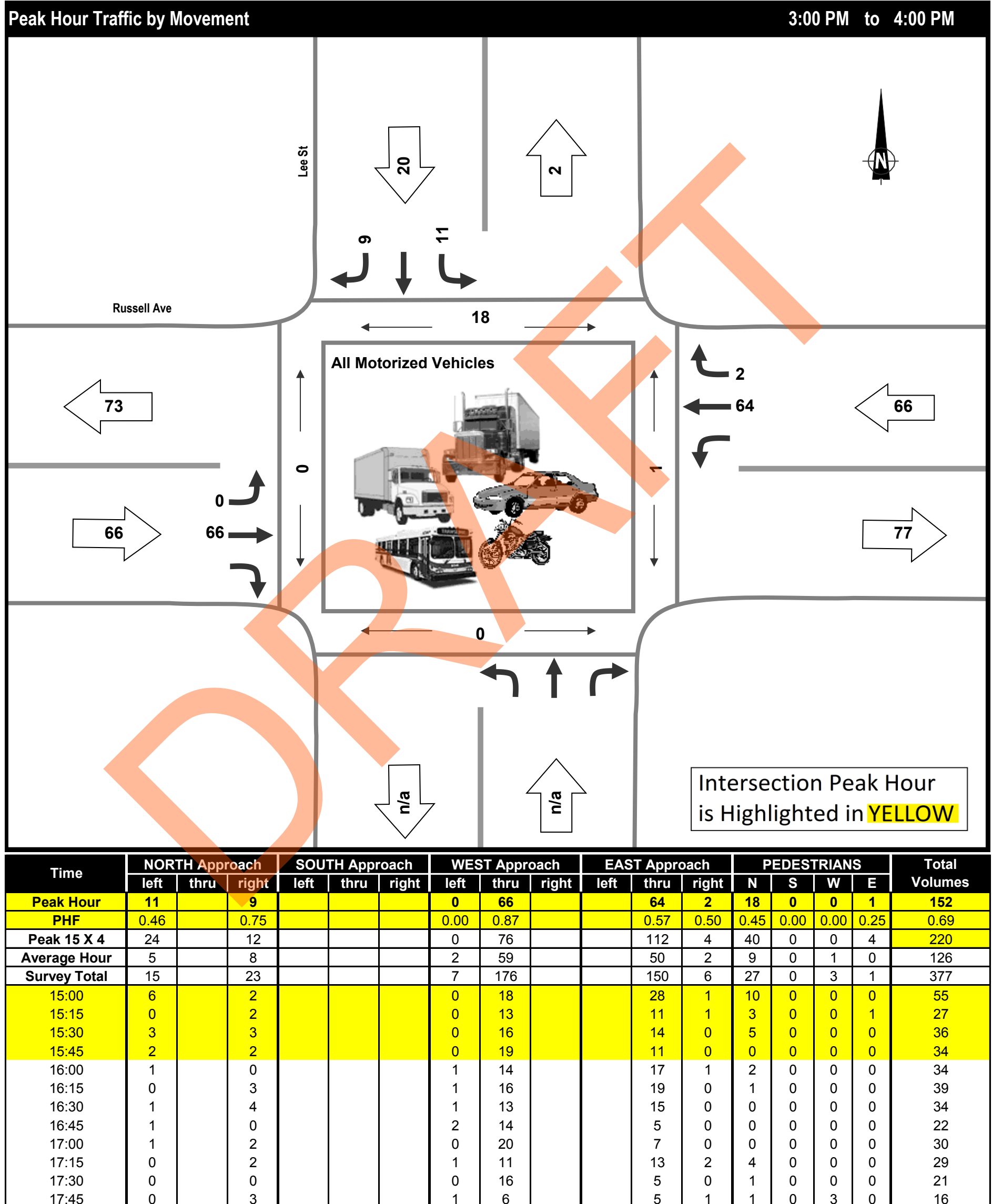
Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals

**Morning Peak Period**



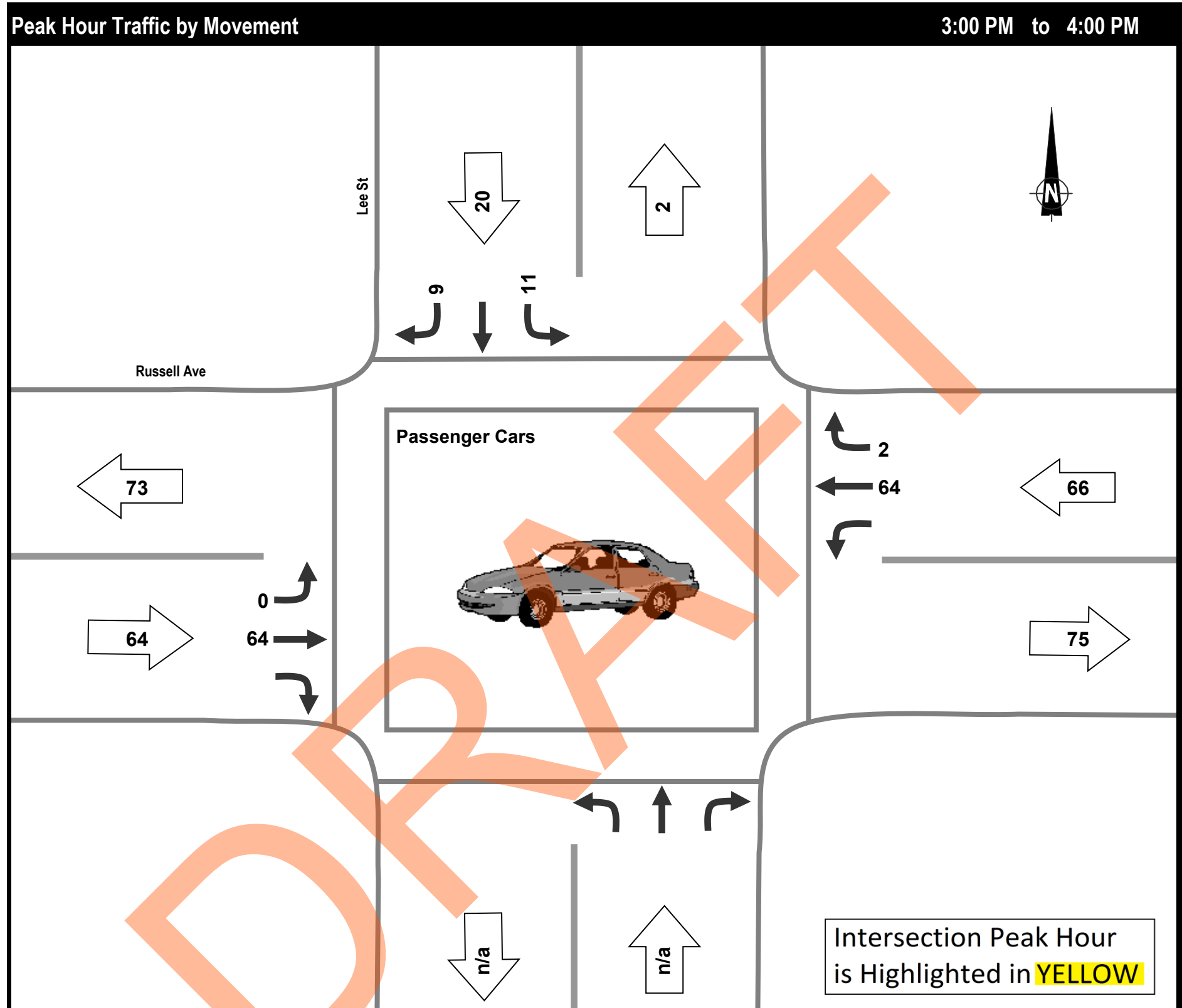
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			BIKES in X-WALKS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0		0				0	0			2	0	0	0	0	0	2
PHF	0.00		0.00				0.00	0.00			0.50	0.00	0.00	0.00	0.00	0.00	0.50
Peak 15 X 4	0		0				0	0			4	0	0	0	0	0	4
Average Hour	0		0				0	0			1	0	0	0	0	0	1
Survey Total	0		0				0	0			2	0	0	0	0	0	2
7:00	0		0				0	0			0	0	0	0	0	0	0
7:15	0		0				0	0			0	0	0	0	0	0	0
7:30	0		0				0	0			0	0	0	0	0	0	0
7:45	0		0				0	0			0	0	0	0	0	0	0
8:00	0		0				0	0			1	0	0	0	0	0	1
8:15	0		0				0	0			1	0	0	0	0	0	1
8:30	0		0				0	0			0	0	0	0	0	0	0
8:45	0		0				0	0			0	0	0	0	0	0	0

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Afternoon Peak Period**




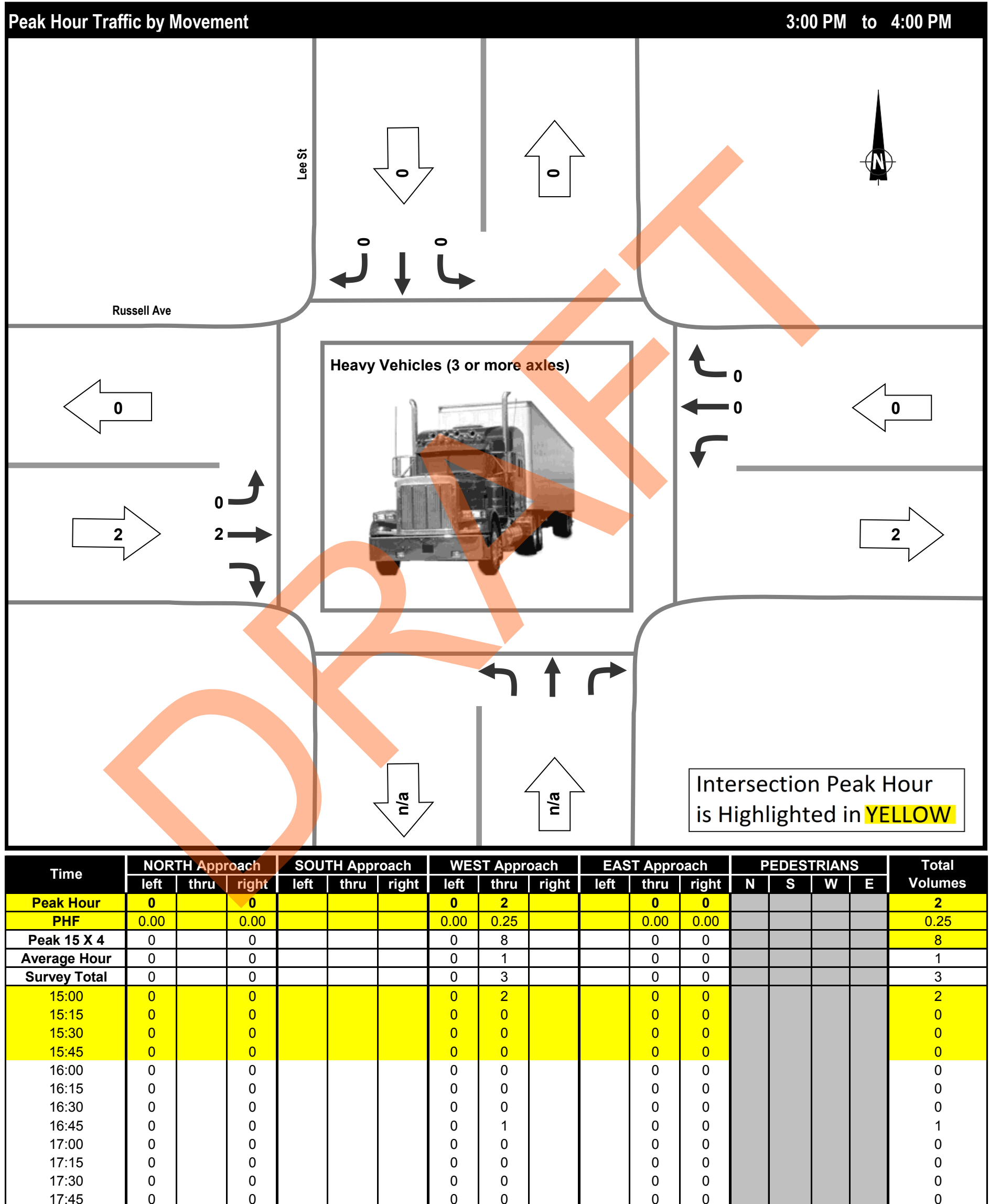
Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Passenger Cars

**Afternoon Peak Period**


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	11		9				0	64			64	2					150
PHF	0.46		0.75				0.00	0.84			0.57	0.50					0.71
Peak 15 X 4	24		12				0	76			112	4					212
Average Hour	5		8				2	58			50	2					125
Survey Total	15		23				7	173			150	6					374
15:00	6		2				0	16			28	1					53
15:15	0		2				0	13			11	1					27
15:30	3		3				0	16			14	0					36
15:45	2		2				0	19			11	0					34
16:00	1		0				1	14			17	1					34
16:15	0		3				1	16			19	0					39
16:30	1		4				1	13			15	0					34
16:45	1		0				2	13			5	0					21
17:00	1		2				0	20			7	0					30
17:15	0		2				1	11			13	2					29
17:30	0		0				0	16			5	0					21
17:45	0		3				1	6			5	1					16

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

**Afternoon Peak Period**



Project: #5935: Beachway Traffic Impact Assessment

Municipality: White Rock

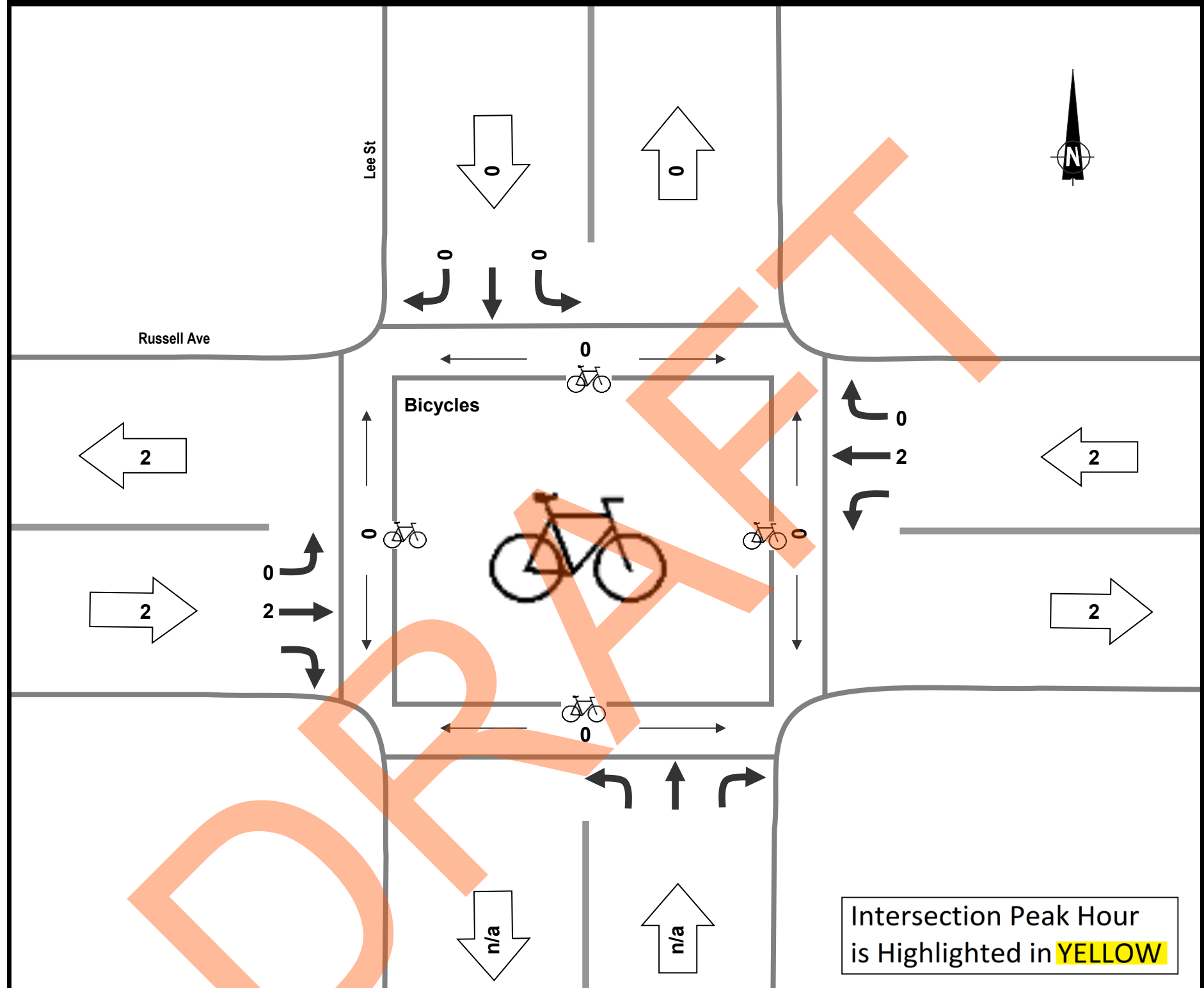
Weather: Cloudy

Vehicle Class: Bicycles

Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals

**Afternoon Peak Period**
**Peak Hour Traffic by Movement**

4:30 PM to 5:30 PM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			BIKES in X-WALKS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0		0				0	2			2	0	0	0	0	0	4
PHF	0.00		0.00				0.00	0.50			0.50	0.00	0.00	0.00	0.00	0.00	0.50
Peak 15 X 4	0		0				0	4			4	0	0	0	0	0	8
Average Hour	0		0				0	1			1	0	0	0	0	0	2
Survey Total	0		0				0	4			2	0	0	0	0	0	6
15:00	0		0				0	0			0	0	0	0	0	0	0
15:15	0		0				0	0			0	0	0	0	0	0	0
15:30	0		0				0	0			0	0	0	0	0	0	0
15:45	0		0				0	2			0	0	0	0	0	0	2
16:00	0		0				0	0			0	0	0	0	0	0	0
16:15	0		0				0	0			0	0	0	0	0	0	0
16:30	0		0				0	0			0	0	0	0	0	0	0
16:45	0		0				0	0			1	0	0	0	0	0	1
17:00	0		0				0	1			1	0	0	0	0	0	2
17:15	0		0				0	1			0	0	0	0	0	0	1
17:30	0		0				0	0			0	0	0	0	0	0	0
17:45	0		0				0	0			0	0	0	0	0	0	0



Vehicle Classification Summary

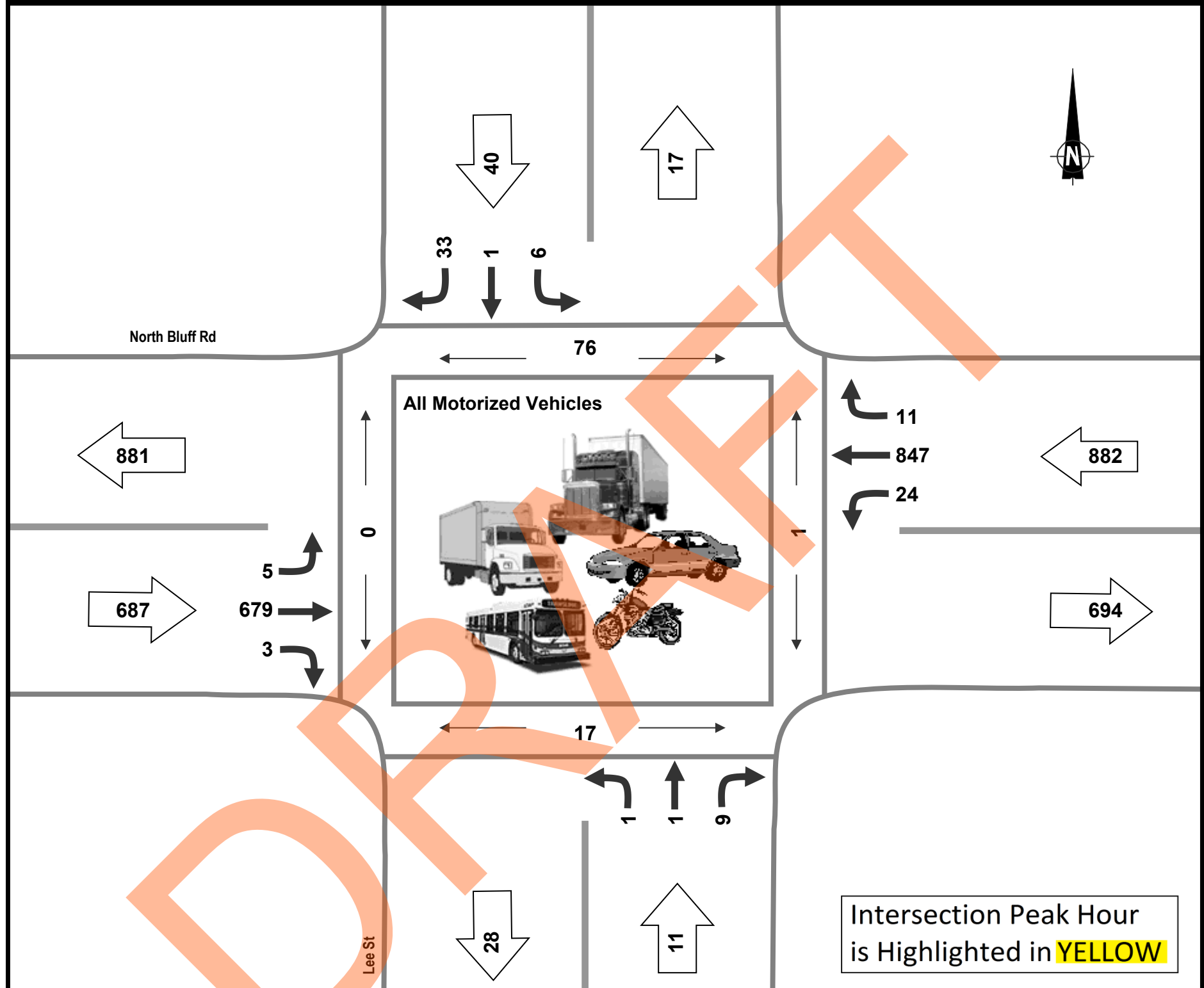
Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	2,538	34				2,572
	%	98.7%	1.3%				100.0%
Midday	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	4,528	17				4,545
	%	99.6%	0.4%				100.0%
Total (5 Hours)	Volume	7,066	51				7,117
	%	99.3%	0.7%				100.0%

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: All Motorized Vehicles

**Morning Peak Period**
**Peak Hour Traffic by Movement**

7:45 AM to 8:45 AM

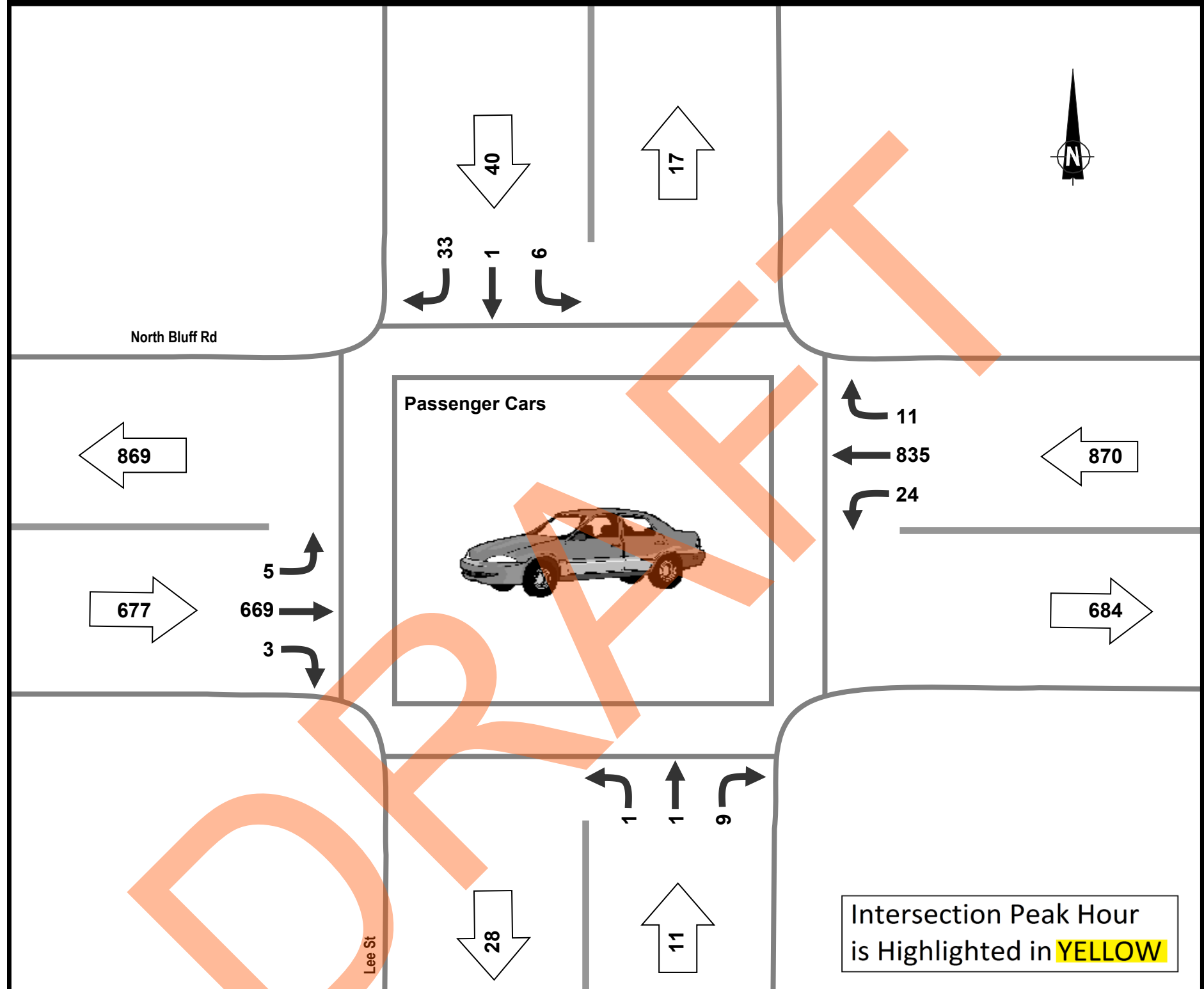


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	6	1	33	1	1	9	5	679	3	24	847	11	76	17	0	1	1,620
PHF	0.50	0.25	0.52	0.25	0.25	0.56	0.42	0.91	0.75	0.60	0.81	0.55	0.61	0.39	0.00	0.25	0.85
Peak 15 X 4	12	4	64	4	4	16	12	744	4	40	1,040	20	124	44	0	4	1,916
Average Hour	11	1	21	1	1	5	3	565	3	13	660	6	48	11	0	1	1,290
Survey Total	21	1	41	1	1	10	5	1,130	5	26	1,319	12	95	21	0	1	2,572
7:00	2	0	2	0	0	0	0	99	0	0	86	0	0	0	0	0	189
7:15	4	0	2	0	0	0	0	89	0	1	94	0	1	0	0	0	190
7:30	6	0	1	0	0	1	0	137	0	0	120	1	1	4	0	0	266
7:45	2	0	2	0	0	0	0	160	0	2	162	1	8	2	0	0	329
8:00	1	0	6	1	0	2	1	181	1	5	189	5	13	3	0	1	392
8:15	0	1	16	0	0	3	3	186	1	7	260	2	31	11	0	0	479
8:30	3	0	9	0	1	4	1	152	1	10	236	3	24	1	0	0	420
8:45	3	0	3	0	0	0	0	126	2	1	172	0	17	0	0	0	307

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Passenger Cars

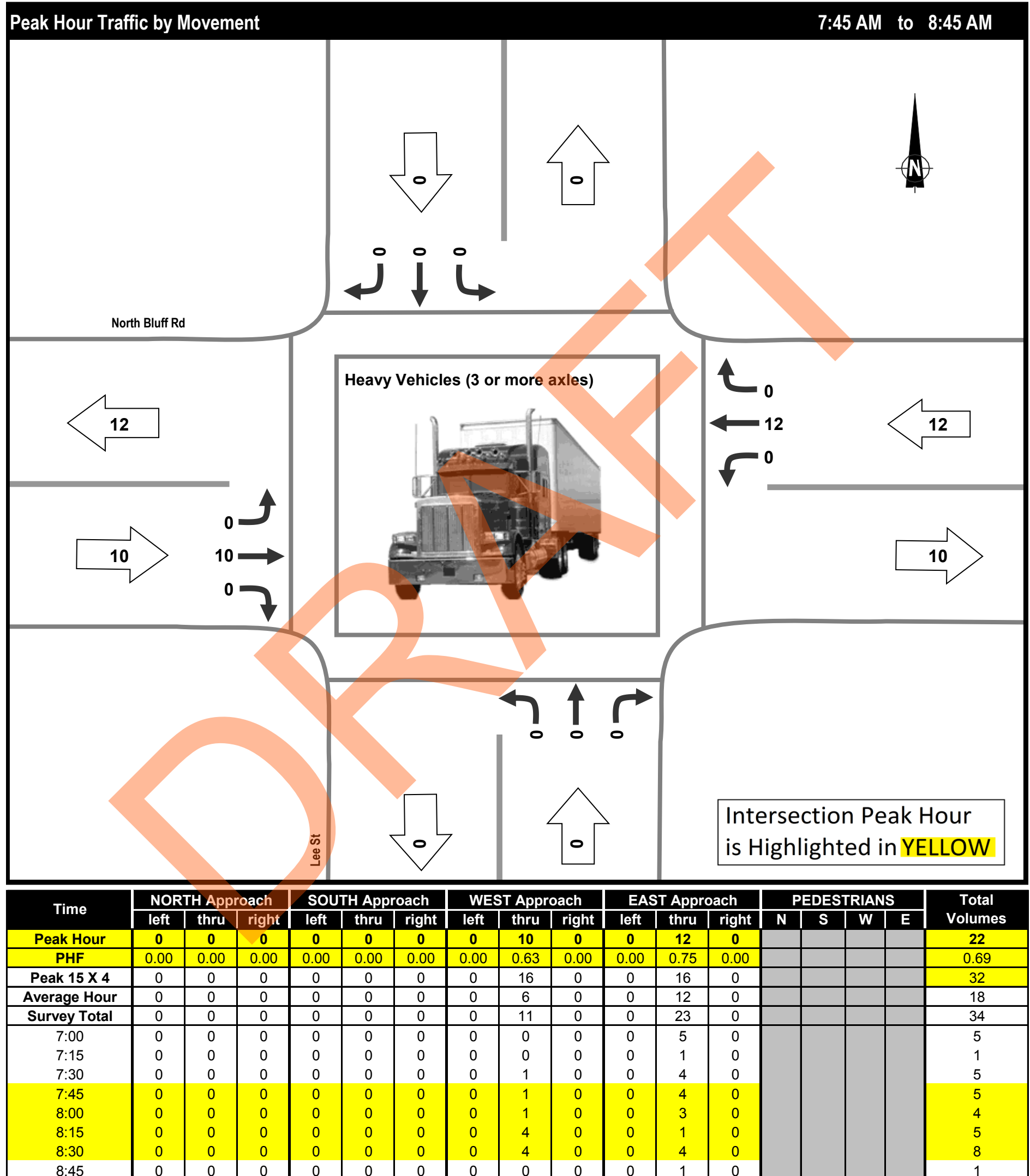
**Morning Peak Period**
**Peak Hour Traffic by Movement**

7:45 AM to 8:45 AM



Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
<b>Peak Hour</b>	6	1	33	1	1	9	5	669	3	24	835	11					1,598
<b>PHF</b>	0.50	0.25	0.52	0.25	0.25	0.56	0.42	0.92	0.75	0.60	0.81	0.55					0.84
<b>Peak 15 X 4</b>	12	4	64	4	4	16	12	728	4	40	1,036	20					1,896
<b>Average Hour</b>	11	1	21	1	1	5	3	560	3	13	648	6					1,273
<b>Survey Total</b>	21	1	41	1	1	10	5	1,119	5	26	1,296	12					2,538
7:00	2	0	2	0	0	0	0	99	0	0	81	0					184
7:15	4	0	2	0	0	0	0	89	0	1	93	0					189
7:30	6	0	1	0	0	1	0	136	0	0	116	1					261
7:45	2	0	2	0	0	0	0	159	0	2	158	1					324
8:00	1	0	6	1	0	2	1	180	1	5	186	5					388
8:15	0	1	16	0	0	3	3	182	1	7	259	2					474
8:30	3	0	9	0	1	4	1	148	1	10	232	3					412
8:45	3	0	3	0	0	0	0	126	2	1	171	0					306

Project: #5935: Beachway Traffic Impact Assessment  
 Municipality: White Rock  
 Weather: Cloudy  
 Vehicle Class: Heavy Vehicles (3 or more axles)

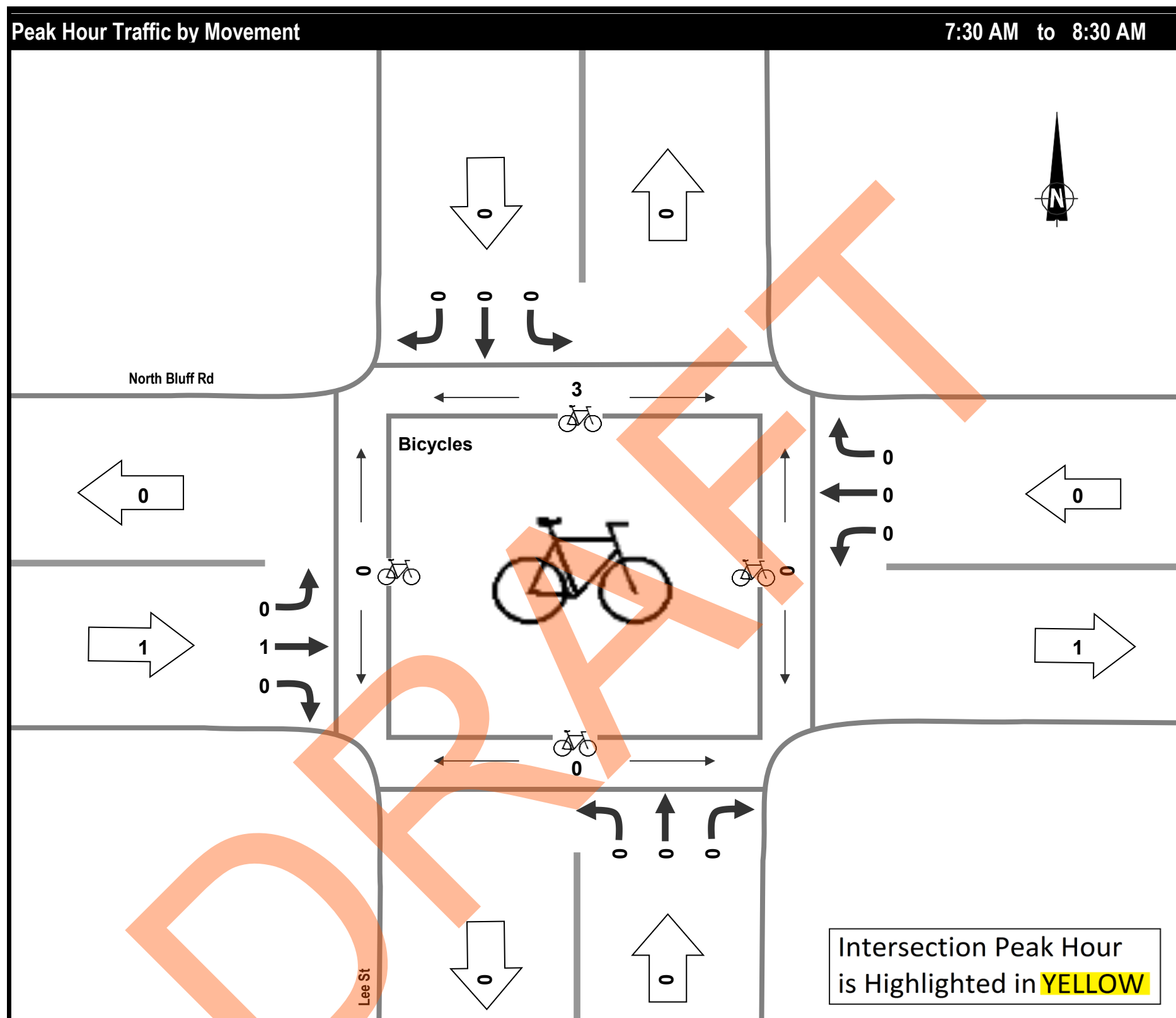
**Morning Peak Period**




**Project:** #5935: Beachway Traffic Impact Assessment  
**Municipality:** White Rock  
**Weather:** Cloudy  
**Vehicle Class:** Bicycles

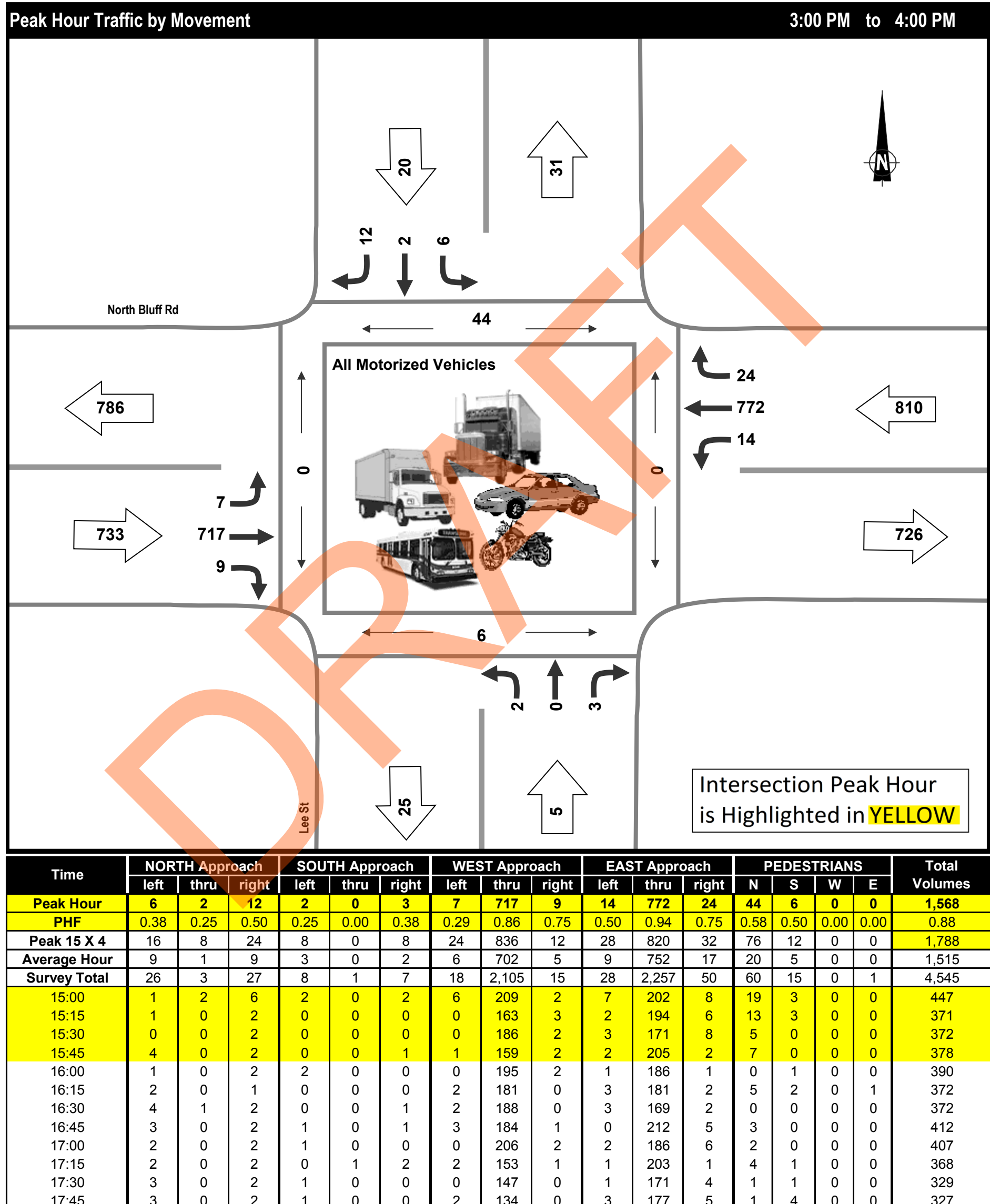
**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**

### Morning Peak Period

[illegible]

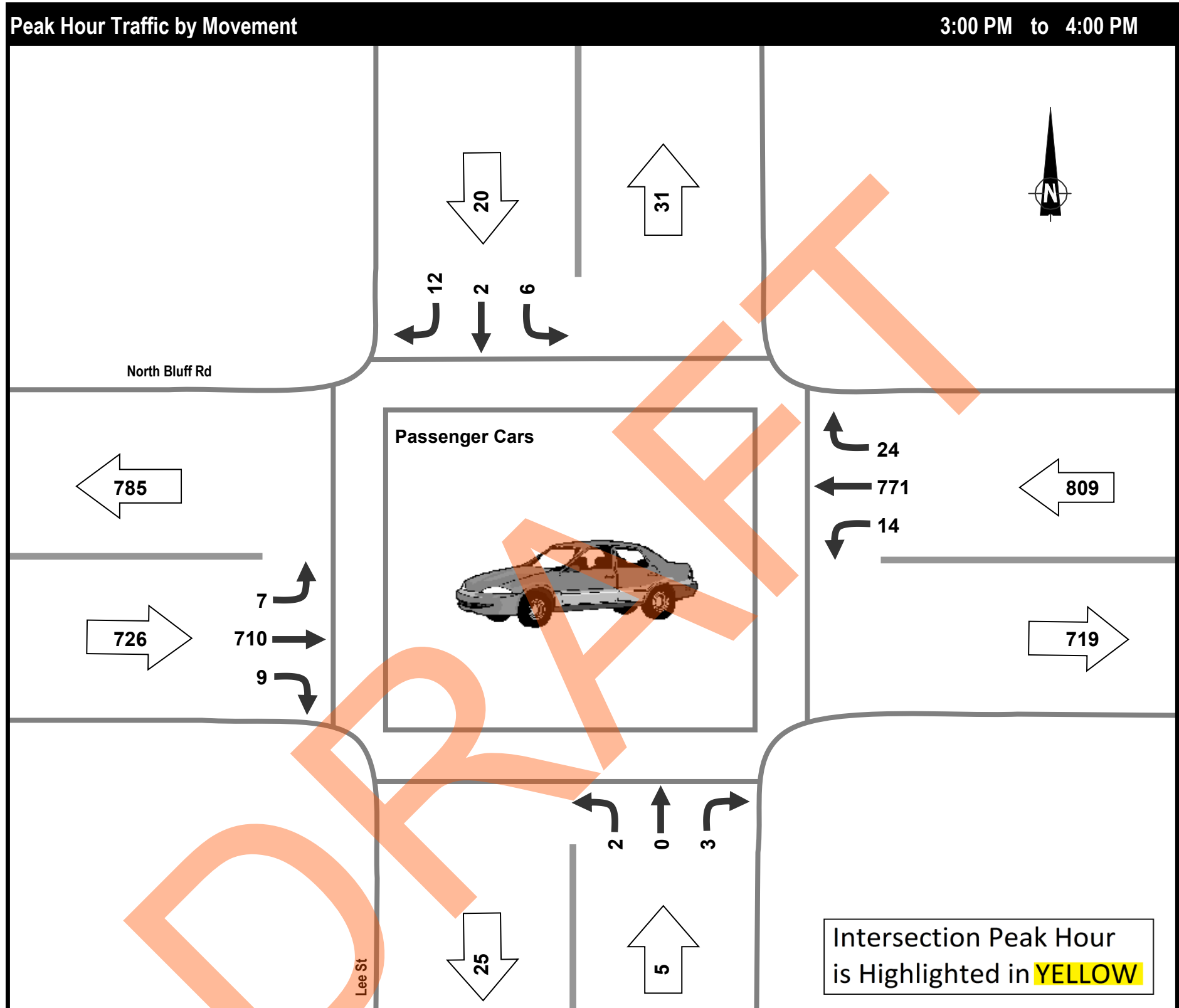
Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: All Motorized Vehicles

**Afternoon Peak Period**



Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Passenger Cars

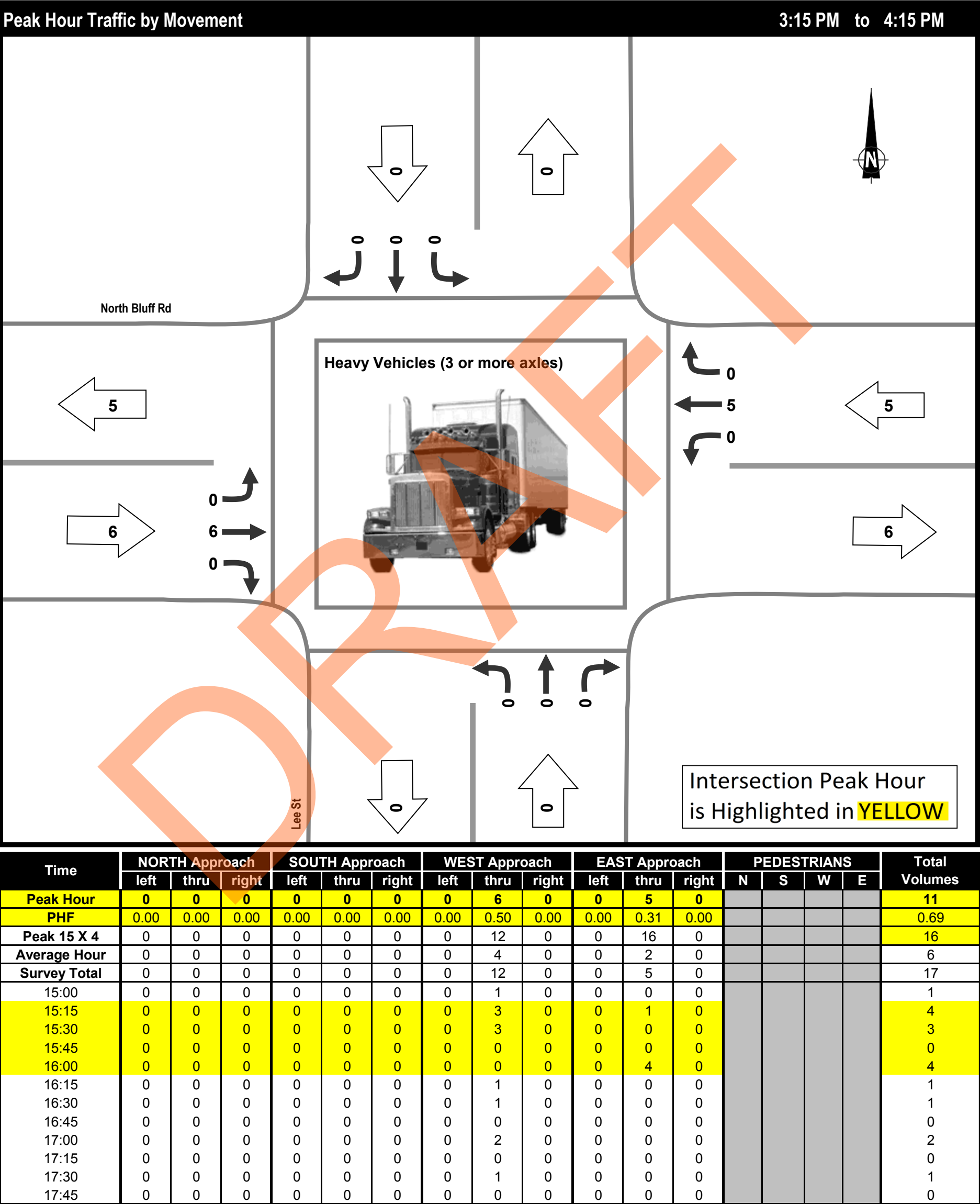
## Afternoon Peak Period



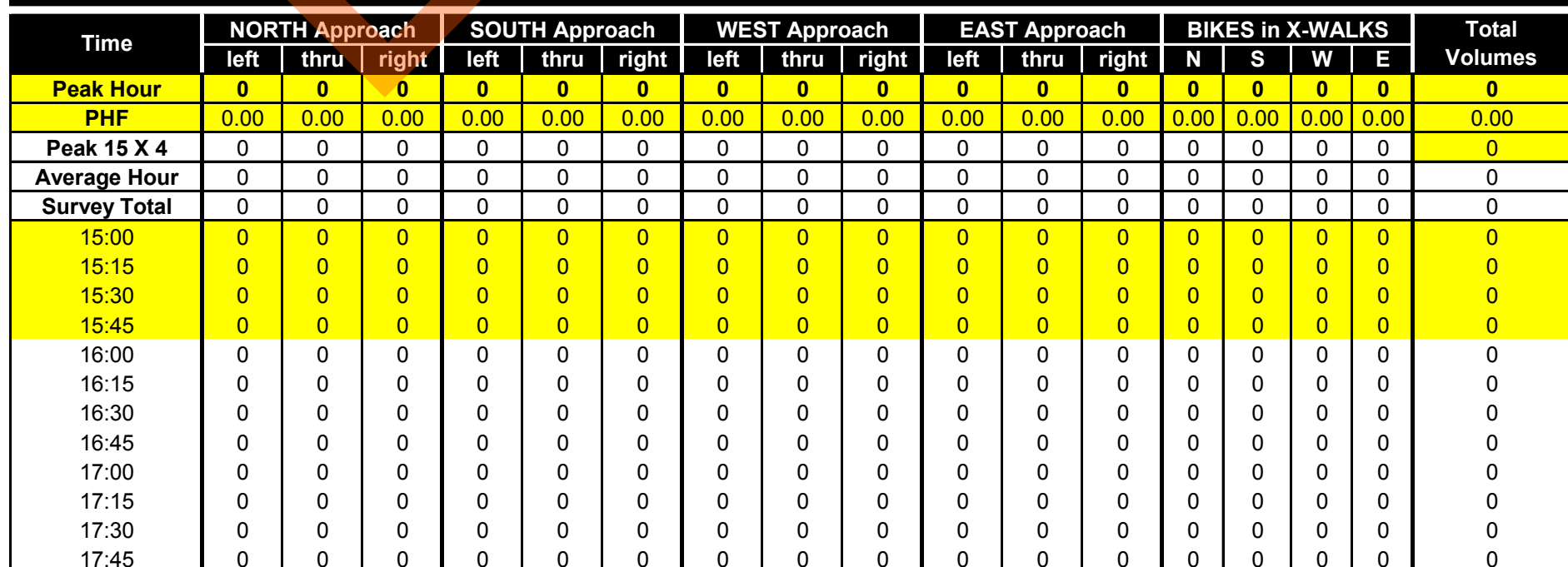
Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	6	2	12	2	0	3	7	710	9	14	771	24					1,560
PHF	0.38	0.25	0.50	0.25	0.00	0.38	0.29	0.85	0.75	0.50	0.94	0.75					0.87
Peak 15 X 4	16	8	24	8	0	8	24	832	12	28	820	32					1,784
Average Hour	9	1	9	3	0	2	6	698	5	9	751	17					1,510
Survey Total	26	3	27	8	1	7	18	2,093	15	28	2,252	50					4,528
15:00	1	2	6	2	0	2	6	208	2	7	202	8					446
15:15	1	0	2	0	0	0	0	160	3	2	193	6					367
15:30	0	0	2	0	0	0	0	183	2	3	171	8					369
15:45	4	0	2	0	0	1	1	159	2	2	205	2					378
16:00	1	0	2	2	0	0	0	195	2	1	182	1					386
16:15	2	0	1	0	0	0	2	180	0	3	181	2					371
16:30	4	1	2	0	0	1	2	187	0	3	169	2					371
16:45	3	0	2	1	0	1	3	184	1	0	212	5					412
17:00	2	0	2	1	0	0	0	204	2	2	186	6					405
17:15	2	0	2	0	1	2	2	153	1	1	203	1					368
17:30	3	0	2	1	0	0	0	146	0	1	171	4					328
17:45	3	0	2	1	0	0	2	134	0	3	177	5					327

Project: #5935: Beachway Traffic Impact Assessment  
Municipality: White Rock  
Weather: Cloudy  
Vehicle Class: Heavy Vehicles (3 or more axles)

**Afternoon Peak Period**



**Note: Crosswalk bike volumes shown are cyclists who rode their bike across the crosswalk and are not included in the pedestrian volume totals**



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**Appendix D**  
**Intersection Capacity Analysis**

# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	JAL
Agency/Co.	CTS
Date Performed	10/10/2019
Analysis Year	2019
Time Analyzed	AM Base
Intersection Orientation	East-West
Project Description	7130 - Beachway 2 TIA

## Site Information

Intersection	Lee St & North Bluff Rd
Jurisdiction	White Rock
East/West Street	North Bluff Rd
North/South Street	Lee St
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

## Lanes

The diagram shows a four-way intersection. The major street, East-West, runs horizontally across the bottom. It has four lanes: two through lanes and two turn lanes. The minor street, North-South, runs vertically. It has two lanes on each side, with turn lanes at the intersection. The diagram is labeled 'Major Street: East-West' at the bottom.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		8	698	6		28	870	15		2	2	12		9	2	37
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				34				19				58		
Capacity, c (veh/h)		636				682				148				175		
v/c Ratio		0.02				0.05				0.13				0.33		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.2				0.4				1.4		
Control Delay (s/veh)		10.7				10.6				33.0				35.4		
Level of Service (LOS)		B				B				D				E		
Approach Delay (s/veh)	0.3				0.9				33.0				35.4			
Approach LOS									D				E			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

JAL

Agency/Co.

CTS

Date Performed

10/10/2019

Analysis Year

2019

Time Analyzed

PM Base

Intersection Orientation

East-West

Project Description

7130 - Beachway 2 TIA

Site Information

Intersection

Lee St & North Bluff Rd

Jurisdiction

White Rock

East/West Street

North Bluff Rd

North/South Street

Lee St

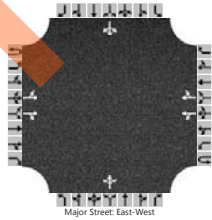
Peak Hour Factor

0.85

Analysis Time Period (hrs)

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		9	737	13		18	791	28		3	0	5		9	3	16
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				21				9				33		
Capacity, c (veh/h)		702				703				161				146		
v/c Ratio		0.02				0.03				0.06				0.22		
95% Queue Length, Q <sub>95</sub> (veh)		0.0				0.1				0.2				0.8		
Control Delay (s/veh)		10.2				10.3				28.7				36.6		
Level of Service (LOS)		B				B				D				E		
Approach Delay (s/veh)	0.3				0.5				28.7				36.6			
Approach LOS									D				E			



# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	JAL
Agency/Co.	CTS
Date Performed	10/10/2019
Analysis Year	2021
Time Analyzed	AM Base
Intersection Orientation	East-West
Project Description	7130 - Beachway 2 TIA

## Site Information

Intersection	Lee St & North Bluff Rd
Jurisdiction	White Rock
East/West Street	North Bluff Rd
North/South Street	Lee St
Peak Hour Factor	0.83
Analysis Time Period (hrs)	0.25

## Lanes

The diagram shows a four-way intersection. The major street, East-West, runs horizontally across the bottom. It has four lanes: two through lanes with arrows pointing left and right, and two turn lanes with arrows pointing left and right. The minor street, North-South, runs vertically through the center. It has two lanes: one through lane with an arrow pointing up and one through lane with an arrow pointing down. The intersection is marked with a central cross and arrows indicating the direction of travel for each lane.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration	LT				TR				LTR				LTR			
Volume (veh/h)		9	726	7		30	905	16		3	3	13		10	3	39
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

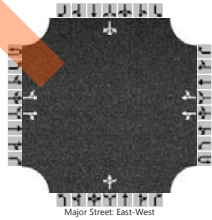
## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				36				23				63		
Capacity, c (veh/h)		613				661				109				143		
v/c Ratio		0.02				0.05				0.21				0.44		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				0.7				2.0		
Control Delay (s/veh)		11.0				10.8				46.6				48.7		
Level of Service (LOS)		B				B				E				E		
Approach Delay (s/veh)	0.3				1.0				46.6				48.7			
Approach LOS									E				E			

HCS7 Two-Way Stop-Control Report

General Information					Site Information											
Analyst	JAL				Intersection				Lee St & North Bluff Rd							
Agency/Co.	CTS				Jurisdiction				White Rock							
Date Performed	10/10/2019				East/West Street				North Bluff Rd							
Analysis Year	2021				North/South Street				Lee St							
Time Analyzed	AM Base + Site				Peak Hour Factor				0.83							
Intersection Orientation	East-West				Analysis Time Period (hrs)				0.25							
Project Description	7130 - Beachway 2 TIA															
Lanes																
																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		9	726	16		31	905	16		22	4	33		10	4	39
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		11				37					71				64	
Capacity, c (veh/h)		613				655					89				128	
v/c Ratio		0.02				0.06					0.80				0.50	
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2					4.2				2.3	
Control Delay (s/veh)		11.0				10.8					129.7				58.6	
Level of Service (LOS)		B				B					F				F	
Approach Delay (s/veh)	0.3				1.0				129.7				58.6			
Approach LOS									F				F			

# HCS7 Two-Way Stop-Control Report

## General Information

Analyst	JAL
Agency/Co.	CTS
Date Performed	10/10/2019
Analysis Year	2021
Time Analyzed	PM Base
Intersection Orientation	East-West
Project Description	7130 - Beachway 2 TIA

## Site Information

Intersection	Lee St & North Bluff Rd
Jurisdiction	White Rock
East/West Street	North Bluff Rd
North/South Street	Lee St
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

## Lanes

The diagram shows a four-way intersection. The major street, East-West, runs horizontally. It has four lanes in each direction: two through lanes and two turn lanes. The minor street, North-South, runs vertically and has two lanes in each direction. The intersection is marked with a central cross and arrows indicating the flow of traffic. The text 'Major Street: East-West' is written below the diagram.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration	LT				TR				LTR				LTR			
Volume (veh/h)		10	767	14		19	823	30		4	0	6		10	4	17
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		12				22				12				36		
Capacity, c (veh/h)		678				681				136				125		
v/c Ratio		0.02				0.03				0.09				0.29		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				0.3				1.1		
Control Delay (s/veh)		10.4				10.5				33.9				45.4		
Level of Service (LOS)		B				B				D				E		
Approach Delay (s/veh)	0.3				0.6				33.9				45.4			
Approach LOS									D				E			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

JAL

Agency/Co.

CTS

Date Performed

10/10/2019

Analysis Year

2021

Time Analyzed

PM Base + Site

Intersection Orientation

East-West

Project Description

7130 - Beachway 2 TIA

Site Information

Intersection

Lee St & North Bluff Rd

Jurisdiction

White Rock

East/West Street

North Bluff Rd

North/South Street

Lee St

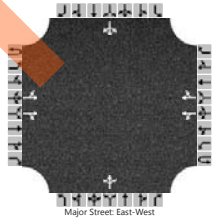
Peak Hour Factor

0.85

Analysis Time Period (hrs)

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		10	767	34		36	823	30		17	1	18		10	5	17
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		12				42				42				38		
Capacity, c (veh/h)		678				667				96				102		
v/c Ratio		0.02				0.06				0.44				0.37		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				1.8				1.5		
Control Delay (s/veh)		10.4				10.8				68.8				59.5		
Level of Service (LOS)		B				B				F				F		
Approach Delay (s/veh)	0.3				1.1				68.8				59.5			
Approach LOS									F				F			

# HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	JAL			Intersection	Lee St & North Bluff Rd		
Agency/Co.	CTS			Jurisdiction	White Rock		
Date Performed	10/10/2019			East/West Street	North Bluff Rd		
Analysis Year	2026			North/South Street	Lee St		
Time Analyzed	AM Base			Peak Hour Factor	0.83		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	7130 - Beachway 2 TIA						

## Lanes

The diagram shows a four-way intersection. The major street, East-West, runs horizontally. It has four lanes in each direction: two through lanes and two turn lanes. The minor street, North-South, runs vertically and has two lanes in each direction. The intersection is marked with a central cross and arrows indicating the flow of traffic. The text 'Major Street: East-West' is written below the diagram.

## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration	LT				TR				LTR				LTR			
Volume (veh/h)		10	796	7		32	992	18		3	3	14		11	3	43
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		12				39				24				69		
Capacity, c (veh/h)		557				614				83				108		
v/c Ratio		0.02				0.06				0.29				0.64		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				1.1				3.2		
Control Delay (s/veh)		11.6				11.3				65.0				84.2		
Level of Service (LOS)		B				B				F				F		
Approach Delay (s/veh)	0.4				1.2				65.0				84.2			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

JAL

Agency/Co.

CTS

Date Performed

10/10/2019

Analysis Year

2026

Time Analyzed

AM Base + Site

Intersection Orientation

East-West

Project Description

7130 - Beachway 2 TIA

Site Information

Intersection

Lee St & North Bluff Rd

Jurisdiction

White Rock

East/West Street

North Bluff Rd

North/South Street

Lee St

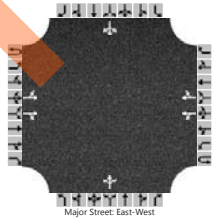
Peak Hour Factor

0.83

Analysis Time Period (hrs)

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		10	796	16		33	992	18		22	4	34		11	4	43
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

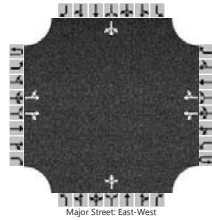
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		12				40				72				70		
Capacity, c (veh/h)		557				609				64				95		
v/c Ratio		0.02				0.07				1.13				0.74		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				5.7				3.8		
Control Delay (s/veh)		11.6				11.3				260.3				110.5		
Level of Service (LOS)		B				B				F				F		
Approach Delay (s/veh)	0.4				1.3				260.3				110.5			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information								Site Information							
Analyst	JAL							Intersection	Lee St & North Bluff Rd						
Agency/Co.	CTS							Jurisdiction	White Rock						
Date Performed	10/10/2019							East/West Street	North Bluff Rd						
Analysis Year	2026							North/South Street	Lee St						
Time Analyzed	PM Base							Peak Hour Factor	0.85						
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25						
Project Description	7130 - Beachway 2 TIA														

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		11	841	15		21	902	32		4	0	6		11	4	19
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		13				25				12				40		
Capacity, c (veh/h)		624				630				104				98		
v/c Ratio		0.02				0.04				0.11				0.41		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.1				0.4				1.7		
Control Delay (s/veh)		10.9				10.9				44.1				64.8		
Level of Service (LOS)		B				B				E				F		
Approach Delay (s/veh)	0.4				0.7				44.1				64.8			
Approach LOS									E				F			

HCS7 Two-Way Stop-Control Report

General Information

Analyst

JAL

Agency/Co.

CTS

Date Performed

10/10/2019

Analysis Year

2026

Time Analyzed

PM Base + Site

Intersection Orientation

East-West

Project Description

7130 - Beachway 2 TIA

Site Information

Intersection

Lee St & North Bluff Rd

Jurisdiction

White Rock

East/West Street

North Bluff Rd

North/South Street

Lee St

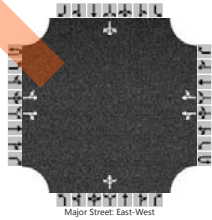
Peak Hour Factor

0.85

Analysis Time Period (hrs)

0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		11	841	35		38	902	32		17	1	18		11	5	19
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.14				4.14				7.54	6.54	6.94		7.54	6.54	6.94
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

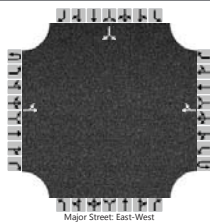
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13				45				42				41		
Capacity, c (veh/h)		624				618				70				79		
v/c Ratio		0.02				0.07				0.60				0.52		
95% Queue Length, Q <sub>95</sub> (veh)		0.1				0.2				2.6				2.2		
Control Delay (s/veh)		10.9				11.3				114.5				93.0		
Level of Service (LOS)		B				B				F				F		
Approach Delay (s/veh)	0.4				1.3				114.5				93.0			
Approach LOS									F				F			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2019	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



Major Street: East-West

### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		7	75				94	7					20		16	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

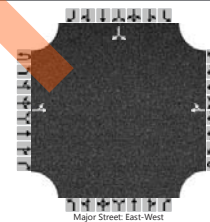
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8													43
Capacity, c (veh/h)		1440													807
v/c Ratio		0.01													0.05
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2
Control Delay (s/veh)		7.5													9.7
Level of Service (LOS)		A													A
Approach Delay (s/veh)		0.7													9.7
Approach LOS														A	

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2019	North/South Street	Lee St
Time Analyzed	PM Base	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



Major Street: East-West

### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	71				68	4					14		13	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

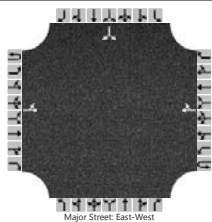
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													32	
Capacity, c (veh/h)		1464													855	
v/c Ratio		0.00													0.04	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1	
Control Delay (s/veh)		7.5													9.4	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.0														9.4	
Approach LOS															A	

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		8	78				98	8					21		17	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

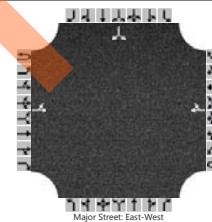
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10													46
Capacity, c (veh/h)		1432													798
v/c Ratio		0.01													0.06
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2
Control Delay (s/veh)		7.5													9.8
Level of Service (LOS)		A													A
Approach Delay (s/veh)		0.7													9.8
Approach LOS															A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	AM Base + Site	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		9	78				98	9					23		19	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

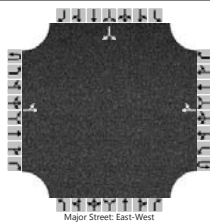
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11													51	
Capacity, c (veh/h)		1431													796	
v/c Ratio		0.01													0.06	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2	
Control Delay (s/veh)		7.5													9.8	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.8										9.8					
Approach LOS											A					

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	PM Base	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		0	74				71	5					15		14	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

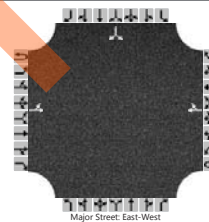
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													34
Capacity, c (veh/h)		1458													849
v/c Ratio		0.00													0.04
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1
Control Delay (s/veh)		7.5													9.4
Level of Service (LOS)		A													A
Approach Delay (s/veh)		0.0													9.4
Approach LOS															A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	PM Base + Site	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0		0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		2	74				71	7					16		15	
Percent Heavy Vehicles (%)		2											2		2	
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

### Delay, Queue Length, and Level of Service

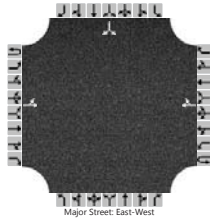
Flow Rate, v (veh/h)		2													36
Capacity, c (veh/h)		1455													844
v/c Ratio		0.00													0.04
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.1
Control Delay (s/veh)		7.5													9.5
Level of Service (LOS)		A												A	
Approach Delay (s/veh)	0.2										9.5				
Approach LOS											A				



## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2026	North/South Street	Lee St
Time Analyzed	AM Base	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration	LT								TR				LR			
Volume (veh/h)		8	86				108	8						23		19
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1											7.1		6.2	
Critical Headway (sec)		4.12											6.42		6.22	
Base Follow-Up Headway (sec)		2.2											3.5		3.3	
Follow-Up Headway (sec)		2.22											3.52		3.32	

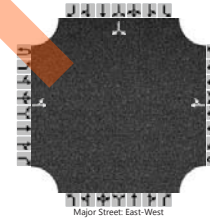
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10													51	
Capacity, c (veh/h)		1418													780	
v/c Ratio		0.01													0.06	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2	
Control Delay (s/veh)		7.6													9.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.7												9.9			
Approach LOS													A			

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Russell Ave
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Russell Ave
Analysis Year	2026	North/South Street	Lee St
Time Analyzed	AM Base + Site	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT							TR						LR	
Volume (veh/h)		9	86				108	9						25		21
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

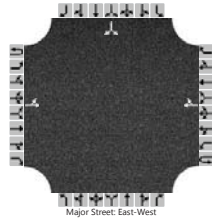
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11													55	
Capacity, c (veh/h)		1416													778	
v/c Ratio		0.01													0.07	
95% Queue Length, Q <sub>95</sub> (veh)		0.0													0.2	
Control Delay (s/veh)		7.6													10.0	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.8												10.0			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information								Site Information							
Analyst	JAL							Intersection	Lee St & Russell Ave						
Agency/Co.	CTS							Jurisdiction	White Rock						
Date Performed	10/10/2019							East/West Street	Russell Ave						
Analysis Year	2026							North/South Street	Lee St						
Time Analyzed	PM Base							Peak Hour Factor	0.85						
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25						
Project Description	7130 - Beachway 2 TIA														

Lanes



Vehicle Volumes and Adjustments																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			0	0	0		0	1	0
Configuration		LT						TR								LR	
Volume (veh/h)		0	81				78	5							16		15
Percent Heavy Vehicles (%)		2													2		2
Proportion Time Blocked																	
Percent Grade (%)															0		
Right Turn Channelized																	
Median Type   Storage	Undivided																

Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1													7.1		6.2
Critical Headway (sec)		4.12													6.42		6.22
Base Follow-Up Headway (sec)		2.2													3.5		3.3
Follow-Up Headway (sec)		2.22													3.52		3.32

Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0														36	
Capacity, c (veh/h)		1448														835	
v/c Ratio		0.00														0.04	
95% Queue Length, Q <sub>95</sub> (veh)		0.0														0.1	
Control Delay (s/veh)		7.5														9.5	
Level of Service (LOS)		A														A	
Approach Delay (s/veh)	0.0												9.5				
Approach LOS													A				

HCS7 Two-Way Stop-Control Report

General Information

Analyst

JAL

Agency/Co.

CTS

Date Performed

10/10/2019

Analysis Year

2026

Time Analyzed

PM Base + Site

Intersection Orientation

East-West

Project Description

7130 - Beachway 2 TIA

Site Information

Intersection

Lee St & Russell Ave

Jurisdiction

White Rock

East/West Street

Russell Ave

North/South Street

Lee St

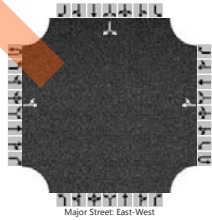
Peak Hour Factor

0.85

Analysis Time Period (hrs)

0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	
Configuration		LT						TR							LR	
Volume (veh/h)		2	81				78	7						17		16
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type   Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)	4.1									7.1			6.2
Critical Headway (sec)	4.12									6.42			6.22
Base Follow-Up Headway (sec)	2.2									3.5			3.3
Follow-Up Headway (sec)	2.22									3.52			3.32

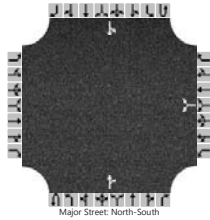
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)	2												39
Capacity, c (veh/h)	1445												830
v/c Ratio	0.00												0.05
95% Queue Length, Q <sub>95</sub> (veh)	0.0												0.1
Control Delay (s/veh)	7.5												9.6
Level of Service (LOS)	A												A
Approach Delay (s/veh)	0.2												9.6
Approach LOS													A

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Access
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Access
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	AM Base + Site	Peak Hour Factor	0.83
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		40				17	2		11	37
Percent Heavy Vehicles (%)						2		3							2	
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.23							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.33							2.22		

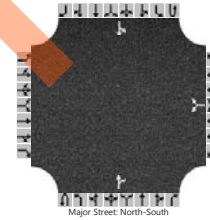
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					53									13		
Capacity, c (veh/h)					1037									1592		
v/c Ratio					0.05									0.01		
95% Queue Length, Q <sub>95</sub> (veh)					0.2									0.0		
Control Delay (s/veh)					8.7									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.7									1.7		
Approach LOS					A											

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Access
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Access
Analysis Year	2021	North/South Street	Lee St
Time Analyzed	PM Base + Site	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR			LT	
Volume (veh/h)						2		26			7	4		38	32	
Percent Heavy Vehicles (%)						2		3						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.23							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.33							2.22		

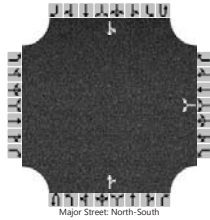
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					33									45		
Capacity, c (veh/h)					1046									1606		
v/c Ratio					0.03									0.03		
95% Queue Length, Q <sub>95</sub> (veh)					0.1									0.1		
Control Delay (s/veh)					8.6									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.6									4.1		
Approach LOS					A											

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Access
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Access
Analysis Year	2026	North/South Street	Lee St
Time Analyzed	AM Base + Site	Peak Hour Factor	0.83
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		40				19	2		11	40
Percent Heavy Vehicles (%)						2		3						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.23							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.33							2.22		

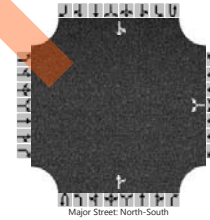
### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					53									13		
Capacity, c (veh/h)					1033									1589		
v/c Ratio					0.05									0.01		
95% Queue Length, Q <sub>95</sub> (veh)					0.2									0.0		
Control Delay (s/veh)					8.7									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.7									1.6		
Approach LOS					A											

## HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	JAL	Intersection	Lee St & Access
Agency/Co.	CTS	Jurisdiction	White Rock
Date Performed	10/10/2019	East/West Street	Access
Analysis Year	2026	North/South Street	Lee St
Time Analyzed	PM Base + Site	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	7130 - Beachway 2 TIA		

### Lanes



### Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR			LT	
Volume (veh/h)						2		26			7	4		38	35	
Percent Heavy Vehicles (%)						2		3						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															

### Critical and Follow-up Headways

Base Critical Headway (sec)					7.1		6.2							4.1		
Critical Headway (sec)					6.42		6.23							4.12		
Base Follow-Up Headway (sec)					3.5		3.3							2.2		
Follow-Up Headway (sec)					3.52		3.33							2.22		

### Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					33									45		
Capacity, c (veh/h)					1046									1606		
v/c Ratio					0.03									0.03		
95% Queue Length, Q <sub>95</sub> (veh)					0.1									0.1		
Control Delay (s/veh)					8.6									7.3		
Level of Service (LOS)					A									A		
Approach Delay (s/veh)					8.6									3.9		
Approach LOS					A											

**The Corporation of the  
CITY OF WHITE ROCK  
BYLAW No. 2435**



A Bylaw to amend the  
"White Rock Zoning Bylaw, 2012, No. 2000" as amended

---

The CITY COUNCIL of the Corporation of the City of White Rock in open meeting assembled  
ENACTS as follows:

1. THAT Schedule C of the *White Rock Zoning Bylaw, 2012, No. 2000* as amended is further amended by rezoning the following lands:

LOT 4, BLOCK 39B, PLAN NWP17402, PART E1/2, SECTION 11, TOWNSHIP 1,  
NEW WESTMINSTER LAND DISTRICT  
PID: 010-289-461

(15770 NORTH BLUFF RD)

LOT 3, PLAN NWP17402, SECTION 11, TOWNSHIP 1, NEW WESTMINSTER LAND  
DISTRICT  
PID: 004-519-043

(15758 NORTH BLUFF RD)

LOT 305, PLAN NWP35289, SECTION 11, TOWNSHIP 1, NEW WESTMINSTER  
LAND DISTRICT  
PID: 007-144-563

(15748 NORTH BLUFF RD)

LOT 2 EXCEPT: PARCEL "K" (REFERENCE PLAN 30172); SECTION 11 TOWNSHIP  
1 NEW WESTMINSTER DISTRICT PLAN 13659  
PID: 009-848-096

(15738 NORTH BLUFF RD)

LOT 1, PLAN NWP13659, PART E1/2, SECTION 11, TOWNSHIP 1, NEW  
WESTMINSTER LAND DISTRICT, EXCEPT PLAN PCL L REF 30172

PID: 009-848-053

(15728 NORTH BLUFF RD)

LOT 2 SECTION 11 TOWNSHIP 1 NEW WESTMINSTER DISTRICT PLAN 18697  
PID:010-427-384

(15724 NORTH BLUFF RD)

LOT 1 SECTION 11 TOWNSHIP 1 NEW WESTMINSTER DISTRICT PLAN 18697  
PID: 010-427-325

(15704 NORTH BLUFF RD)

as shown on Schedule “1” attached hereto, from the ‘RS-1 One Unit Residential Zone’ to the ‘CD-67 Comprehensive Development Zone.’

2. THAT *White Rock Zoning Bylaw, 2012, No. 2000* as amended is further amended:

(1) by adding to the Table of Contents for ‘Schedule B (Comprehensive Development Zones)’, Section 7.62 CD-67 Comprehensive Development Zone’;

(2) by adding the attached Schedule “2” to ‘Schedule B (Comprehensive Development Zones)’ Section 7.62 CD-67 Comprehensive Development Zone’.

3. This bylaw may be cited for all purposes as “*White Rock Zoning Bylaw, 2012, No. 2000, Amendment (CD-67 – 15704, 15724/28/38/48/58/70 North Bluff Road) Bylaw, 2022, No. 2435*”.

Public Information Meeting held this	9 <sup>th</sup> day of September,	, 2020
Read a first time this	day of	, 2022
Read a second time this	day of	, 2022
Considered at a Public Hearing this	day of	, 2022
Read a third time this	day of	, 2022
Adopted this	day of	, 2022

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Mayor

---

Director of Corporate Administration





## Schedule “2”

### 7.62 CD-67 COMPREHENSIVE DEVELOPMENT ZONE

#### INTENT

The intent of this zone is to accommodate the development of multi residential development on a site of approximately 5,366.241 square metres.

1. Permitted Uses:
  - (a) *Townhouse* use
  - (b) *Apartment* use
  - (b) *accessory home occupation* use in accordance with the provisions of section 5.3 and that does not involve clients directly accessing the *principal building*
2. Lot Coverage:
  - (a) *lot coverage* shall not exceed 46%
3. Density:
  - (a) The maximum *gross floor area* shall not exceed 1.5 times the lot area.
  - (b) The maximum number of *dwelling units* must not exceed 87.
5. Building Height:
  - (a) The *principal building* shall not exceed a height of 73.5 metres geodetic.
  - (b) *Ancillary buildings* and *structures* shall not exceed a height of 5.0 metres from the *finished grade*.
6. Siting Requirements:
  - (a) Minimum setbacks are as follows:

(i) Setback from front (east) lot line	= 4.5 metres
(ii) Setback from rear (west) lot line	= 2.4 metres
(iii) Setback from interior side (north) lot line	= 2.0 metres
(iv) Setback from interior side (south) lot line	= 3.5 metres
  - (b) Notwithstanding the above, the following siting exemptions are permitted:
    - (i) *Ancillary buildings* and *structures* may be located on the subject property in accordance with the Plans prepared by Urban Arts Architecture dated June 17, 2022 that are attached hereto and on file at the City of White Rock, with the exception that no *ancillary buildings* or *structures* are permitted within a 2.0 metre distance from the front (east) lot line
7. Parking:

Parking shall be provided in accordance with Sections 4.14 and 4.17, with the minimum number of spaces required as follows:

- (a) A minimum of one hundred and forty-eight (148) spaces shall be provided for the *multi-unit residential development*:
  - (a) Apartments: 1.2 per unit (54 units) 65
  - (b) Townhouses: 2.0 per unit (33 units) 66
  - (c) Visitors 0.3 per unit (54 units) 17
- (d) A minimum of one (1) of the required forty (40) spaces shall be provided as accessible parking spaces and two (2) van accessible shall be clearly marked in accordance with the B.C. Building Code Requirements.
- (e) A minimum of four (15) stalls must have electric charging capacity.
- (f) A minimum of four (15) stalls must be roughed for electric charging capacity.

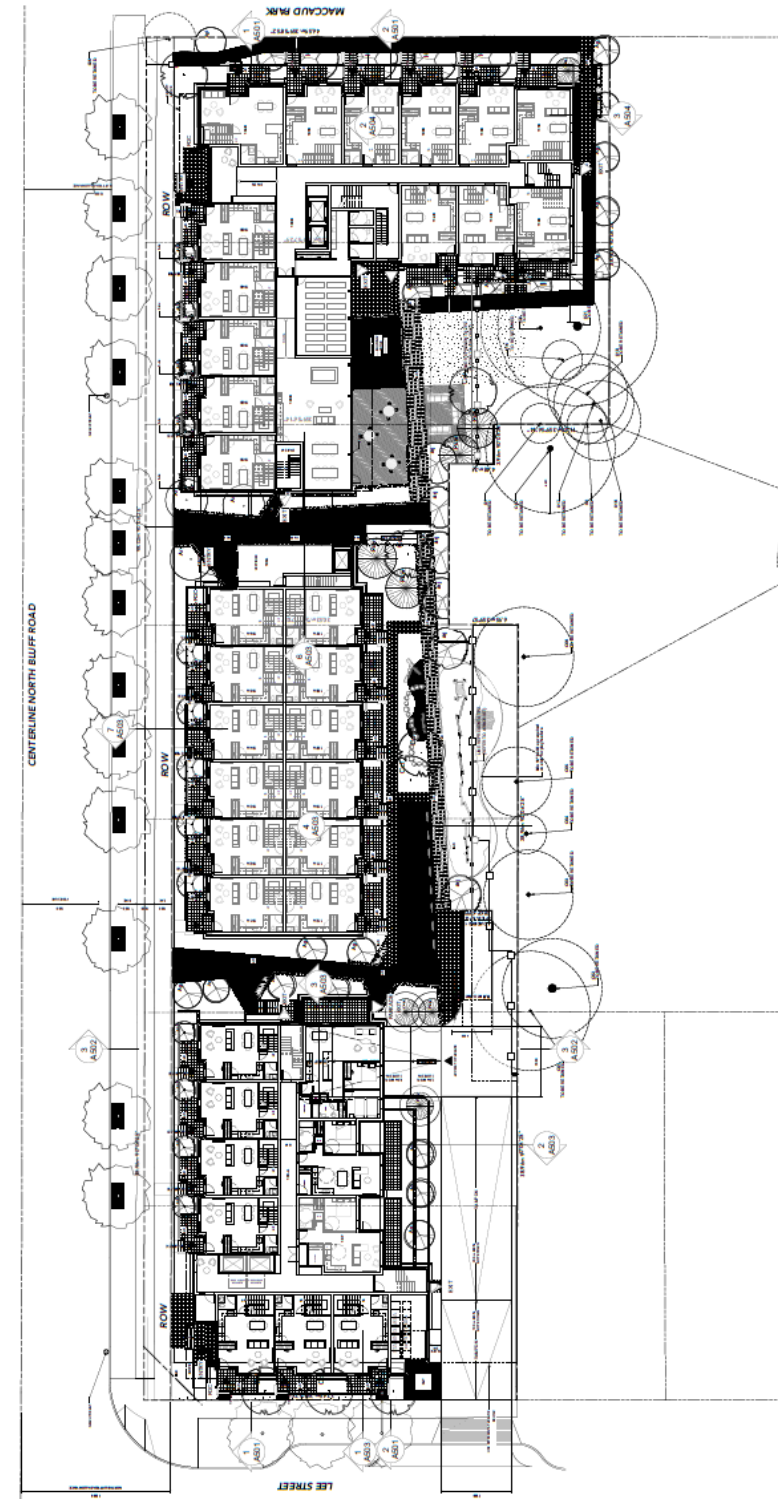
8. Bicycle Parking:

Bicycle parking shall be provided in accordance with Section 4.16, with the minimum number of spaces required as follows:

- (a) A minimum of twenty (89) Class I spaces shall be provided
- (b) A minimum of four (24) Class II spaces shall be provided

9. Loading:

- (a) One loading space shall be provided for the *multi-unit residential use* in accordance with Section 4.15



**NOTES:**

This drawing will provide sufficient information and may not be applicable without their permission and obtain the information to know that this drawing was for use on the specified project only and shall not be used elsewhere without written permission of this office.

The Contractor shall show all utility dimensions and report any discrepancies and discrepancies.

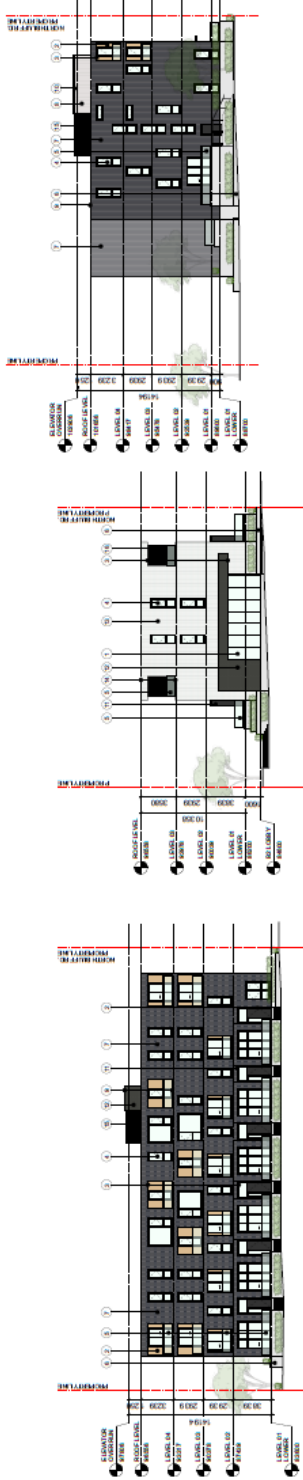
Do not use drawings.

Source: [www.fishbase.org](http://www.fishbase.org)

WORKSHEET COURTYARD COMMONS	Site Plan	<h1>A101</h1>	PLOT DATE: 2021.08.14	SCALE: 1/8"=1'-0"
			DRAWN BY: CSM	CHECK BY: SC

SEAL:

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Consult with Urban Architecture.



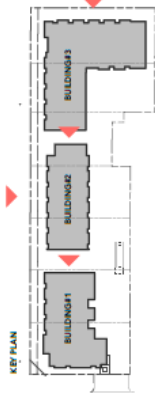
4 BUILDING 1 - EAST ELEVATION  
SCALE: 1:100

3 BUILDING 2 - EAST ELEVATION  
SCALE: 1:100

2 BUILDING 3 - EAST ELEVATION (FACING PARK)  
SCALE: 1:100

D. 2021.05.14  
C. 2021.05.14  
B. 2021.05.14  
A. 2021.05.14  
REV. DATE

URBAN-2	Rev. 01/2021
COURTYARD COMMONS	Rev. 01/2021
Elevation	Rev. 01/2021
A400	Rev. 01/2021
PL. OF DATE: 2021.05.14	SCALE: 1:100
DRAWN BY: CDM	CHECK BY: JCC



- MATERIALS SPECIFIC TO BUILDING 2:**
- (12) FIBER-CEMENT PANELING (DARK GREY)
  - (13) FIBER-CEMENT PANELING (WHITE)
  - (14) METAL FLASHING (WHITE)
  - (15) ROOF TOP MECHANICAL EQUIPMENT ENCLOSURE (WHITE) (MATCH PART 1 TO MATCH CHIMNEY METAL FLASHING)
  - (16) ALUMINUM FINANCY SCREEN

- MATERIALS SPECIFIC TO BUILDING 1+2:**
- (7) MASONRY BRICK CLADDING (DARK GREY)
  - (8) MASONRY BRICK CLADDING (WHITE)
  - (9) METAL FLASHING AT DARK BRICK (CHARCOAL GREY)
  - (10) METAL FLASHING AT WHITE BRICK (WHITE)
  - (11) ALUMINUM COMPOSITE PANEL SQUARE STANCHES

- MATERIALS LEGEND:**
- (1) COMMON MATERIALS:
  - (2) CLEAR GLASS WITH LOW-E COATING
  - (3) WOOD-COLORED FIBER-CEMENT PANELING
  - (4) WOOD SHIRT
  - (5) VINYL GLASSING FRAMES (CHARCOAL GREY)
  - (6) FRAMELESS GLASS RAILING
  - (7) CONCRETE PLANTER

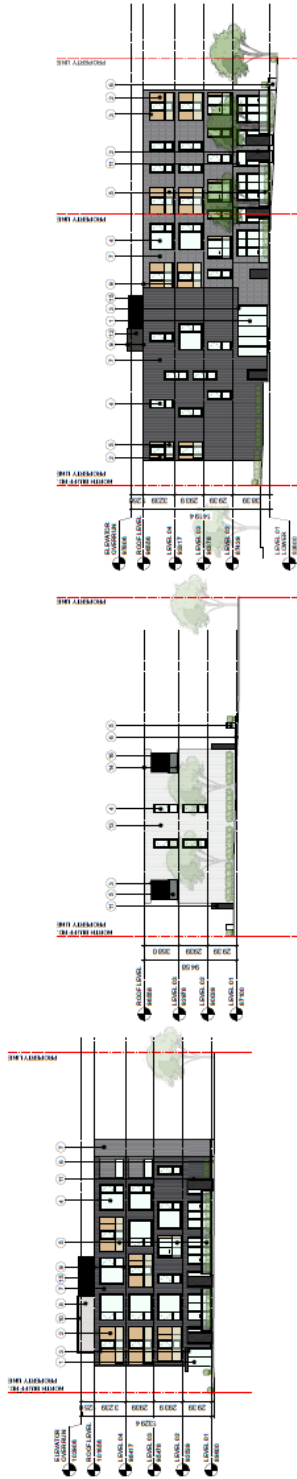
SEAL:

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Drawn by: [Name]  
Checked by: [Name]



1 SOUTH ELEVATION  
Scale: 1:200



2 BUILDING 1 - WEST ELEVATION (LEE STREET)  
Scale: 1:200

**COMMON MATERIALS:**

1. CLEAR GLASS/CL with LOWE CONCRETE
2. WOOD-COLORED FIBRE CONCRETE PANELING
3. WOOD SCOTT
4. VINYL CLADDING FRAMES (CHROMIUM GREY)
5. FRAMED GLASS (PAVING)
6. CONCRETE PANELING

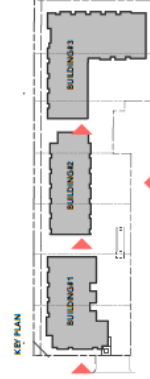
**MATERIALS SPECIFIC TO BUILDING 1A:**

7. MASONRY BRICK CLADDING (DARK GREY)
8. MASONRY BRICK CLADDING (WHITE)
9. METAL CLADDING AT DARK BRICK (CHROMIUM GREY)
10. VINYL CLADDING AT WHITE BRICK (WHITE)
11. ALUMINUM COMPOSITE PANEL (SCAR SHEDS)

**MATERIALS SPECIFIC TO BUILDING 2:**

12. FIBRE-CEMENT PANELING (DARK GREY)
13. FIBRE-CEMENT PANELING (WHITE)
14. METAL CLADDING (WHITE)
15. ROOF TOP MECHANICAL EQUIPMENT ENCLOSURE (WHITE)
16. ALUMINUM PRIVACY SCREEN

**NOTES:**  
THIS IS A PRELIMINARY ELEVATION. IT IS NOT TO BE USED FOR CONSTRUCTION. ANY REVISIONS TO THIS DRAWING WILL BE MADE IN A SEPARATE DRAWING.



D 2019-01-14 Prepared by: [Name]  
C 2019-01-14 Prepared by: [Name]  
A 2019-01-14 Prepared by: [Name]  
REV: 001 DATE: 01-14-2019

W01-001-2 COURTYARD COMMONS	Elevation
A401	
PLAT DATE: 2019-01-14	SCALE: 1:100
DRAWN BY: [Name]	CHECK BY: [Name]



## **ARBORIST REPORT**

PROJECT:

**WATERSTOCK\_Beachway 2**

SITE ADDRESS:

**15704 – 15770 NORTH BLUFF ROAD, WHITE ROCK, BC**

CLIENT:

**WATERSTOCK PROPERTIES INC.**

PROJECT #

**AR2019-05**

PREPARED BY:

**VDZ + A Consulting Inc.**

**Suite 102, 9181 Church Street  
Fort Langley, BC, V1M 2R8**

**Suite 102, 355 Kingsway  
Vancouver, BC, V5T 3J7**

PROJECT ARBORIST

**Kelly Koome**

Urban Forestry - ISA Certified Arborist, PN-5962A

Tree Risk Assessment Qualified

Wildlife Danger Tree Assessor, #P2546

CONSULTING ARBORIST

**Sarah Bishop**

ISA Certified Arborist, PN-9038A

ISA Member Certified Wildlife Dangerous Tree Assessor, P2515

**September 21st, 2020**





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## **Background**

VDZ + A Consulting Inc. was contracted by Waterstock Properties Inc. to prepare an ISA Certified Arborist Tree Report for the properties at 15704 – 15770 North Bluff Road, White Rock, BC.

## **Assignment**

VDZ + A Consulting Inc. have been retained by the client to prepare a report to assess the tree(s) located at 15704 – 15770 North Bluff Road, White Rock, BC. The Consulting Arborist performed a site review entailing identification and visual assessment of the tree(s) on site. A tree survey of all off-site trees was completed by the client or representative(s).

The Project Arborist will provide recommendations for the retention or removal of tree(s) on this site based on the existing site conditions and the proposed use of the site. Mitigation of development impact on the tree(s) has been considered as part of the tree assessment process.

## **Limits of the Assignment**

The Consulting Arborist's observations were limited to one site visit on April 9, 2019. No tissue or soil samples were sent to a lab for identification or analysis. VDZ + A Consulting Inc. located the trees using existing landmarks and onsite navigation.

## **Testing and Analysis**

The Consulting Arborist used visual tree assessment and mallet sounding to test the trees' health, condition and risk level.

## **Purpose and Use of Report**

The purpose of this report is to assist the property owner in compliance with the City of White Rock Tree Management Bylaw, 2008 No. 1831.

## **Site Review**



Fig. 1 – Aerial view of properties (WROMS, 2019).



### **Proposed Site Development**

Two new residential buildings.

### **Environmental Description**

ISA Certified Arborist Austin Peterson of VDZ + A Consulting Inc. conducted a site review and evaluation of the trees located at the above referenced property on April 9, 2019.

The property consists of 16<sup>th</sup> Avenue to the north, single family homes to the south, Lee Street to the west, and a greenway to the east.

There are no seasonal creeks that transect the property.

There is no evidence of raptors nests, osprey nests or heron colonies on the site. Removal of trees however between March 15 – August 15 (date subject to change depending on seasonal nesting behavior and therefore must be confirmed with City of White Rock) will require a bird nesting survey. This is as prescribed by the federal Migratory Birds Convention Act (MBCA), 1994 and Section 34 of the BC Wildlife Act. It is the responsibility of the owner/developer to ensure they are in compliance with the city's regulations governing nesting birds on sites where development is occurring.

**Off-site Trees** – There are private off-site trees associated with this project.

**Municipal Trees** – There are City of White Rock trees associated with this project.

**Trees Straddling the Property Line** – There are trees straddling the property line associated with this project.

### **Tree Preservation Summary**

All the trees identified on the Tree Retention/Removal Plan and within the Tree Assessment Data Table have been given their Retention/Removal recommendation on a preliminary basis. Final recommendations will be based upon design/construction and grading details. Any City tree that is removed will have replacement tree bonds collected as Cash-in-Lieu. These replacement trees will be planted by the City of White Rock on City lands.

Long-term tree preservation success is dependent on minimizing the impact caused during pre-construction clearing operations, construction and post construction activities. Best efforts must be made to ensure the Tree Protection Zone remains undisturbed.

Ongoing monitoring of retained trees through the development process and implementation of mitigating works (watering, mulching, etc.) is essential for success.

### **Tree Health Care Plan During Construction**

To ensure continued health of the protected trees during construction, the following is recommended:

1. Remove dead, dying, and diseased branches prior to the start of construction.
2. Install tree protection barriers per bylaw specifications.
3. Regular weekly watering of trees between June 1 – October 1.
4. Application of wood chips within the tree protection zone (1-3 inches).
5. Monthly monitoring of protected trees by assigned Arborist.

Retained protected trees will require supplemental watering on a weekly basis (weather dependent), as well as the application of wood chips or mulch to the tree protection zone within the tree protection barriers. Wood chips are preferred to ensure porous movement through soil and protection from



compaction during construction. The mulch or wood chip height should not exceed the root collar (not to exceed 10cm) to avoid moisture retention concentrated on the stem. In addition to the City's requirements, recommendations include the pruning of dead or dying limbs prior to construction for worker safety, as well as monthly monitoring of the trees by an Arborist to ensure the health and well-being of the protected trees.

### **Summary of Findings**

1. Arborist is to monitor any work within 1- meter of a tree protection zone with 72 hours-notice given.
2. Areas identified that require arborist consultation / monitoring:
  - **Trees 016, 017, 018, 019, 020, 021, S1, OS 7** - There will be an on-grade north to south gravel path through the open space / green space. Minor crown raising may be required to accommodate walking clearance. VDZ Arborist to monitor pruning on site.
  - **Trees 020, 021** - A raised timber deck will be installed to the east of these trees. The arborist will advise on the locations of the posts as to avoid roots.
  - **Trees 020, 021** - The patio for unit 113B will require excavation – Arborist to monitor.
  - **Tree OS 1** - Loading zone will require excavation – Arborist to monitor.
  - **Trees 08, 09** – When removing these trees the stumps must be left in the ground in order to limit damage to the roots of adjacent trees – Arborist to monitor.



**Table 1 - Tree Assessment Data:**

Tree #	Tag #	Common Name <i>Botanical Name</i>	DBH (m.)	C-Rad (m.)	LCR (%)	Comments	Retain / Remove
<b>Limitations:</b>							
Many deciduous trees were dormant at the time of assessment; therefore, a limited Level 1 Visual Assessment was conducted.							
<b>The following trees are located on-site.</b>							
001	2125	Apple <i>Malus</i> spp.	0.40	4.0	80	CROWN – Ivy growing up 80% of stem. Hammock in crown. FIGURE 2 WITHIN PROPOSED UNDERGROUND PARKING ENTRANCE	REMOVE
002	0961	English holly <i>Ilex aquifolium</i>	0.30	-	-	INVASIVE SPECIES – NOT PROTECTED UNDER BYLAW	REMOVE
003	0960	Western redcedar <i>Thuja plicata</i>	0.45	4.0	90	CROWN – Flagging present. WITHIN PROPOSED UNDERGROUND PARKING ENTRANCE	REMOVE
004	0958	Scots pine <i>Pinus sylvestris</i> 'Chantry blue'	0.25	3.0	60	TRUNK – Leans south 45° before self-correcting. CROWN – Some dieback on ends of branches. UNDERSIZED	REMOVE
005	0959	Cypress <i>Chamaecyparis</i> spp.	0.30	1.0	80	TRUNK – Codominant at 1 meter. Decay column from base to 1 meter on west side. FIGURE 3 WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
006	3913	Lawson cypress <i>Chamaecyparis lawsonia</i>	0.40 0.40	3.5	100	TRUNK – Ivy growing up base. Codominant stems at base. CROWN – Excessive coning. Some flagging present. FIGURE 4 WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
007	3912	Lawson cypress <i>Chamaecyparis lawsonia</i>	0.50 0.35	3.5	100	TRUNK – Ivy growing up base. Codominant stems at base. CROWN – Excessive coning. Some flagging present. FIGURE 4 WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
007A	3914	Mountain-ash <i>Sorbus sitchensis</i>	0.39	4.5	75	TRUNK – Healed wound on south side. LOCATION – Growing next to driveway. WITHIN PROPOSED BUILDING ENVELOPE	REMOVE



Tree #	Tag #	Common Name <i>Botanical Name</i>	DBH (m.)	C-Rad (m.)	LCR (%)	Comments	Retain / Remove
008	0962	Douglas-fir <i>Pseudotsuga menziesii</i>	0.87	7.5	80	TRUNK – Broken fence leaning on south side. CROWN – Crown weighted to south side. Broken branches in lower crown on north side. Large hanger on east side. LOCATION – Adjacent to shed. <b>WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING</b>  <b>STUMP MUST BE LEFT IN GROUND</b>	REMOVE
009	0963	Scots pine <i>Pinus sylvestris</i>	0.58	6.5	80	TRUNK – Ivy growing up 80% of stem. CROWN – Previously topped. <b>WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING</b>  <b>STUMP MUST BE LEFT IN GROUND</b>	REMOVE
010	2511	Monkey puzzle <i>Araucaria araucana</i>	0.15	-	-	<b>UNDERSIZED</b>	REMOVE
011	2510	Monkey puzzle <i>Araucaria araucana</i>	0.25	-	-	<b>UNDERSIZED</b>	REMOVE
012	2512	Butterfly bush <i>Buddleia</i> spp.	0.05 – 0.15	5.0	95	TRUNK – Multi-stem at 1 meter. Leans south before self-correcting. <b>WITHIN PROPOSED BUILDING ENVELOPE</b>	REMOVE
013	2514	Magnolia <i>Magnolia</i> spp.	0.25 0.20 0.20	6.0	75	TRUNK – Codominant stems at base. <b>WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING</b>	REMOVE
014	2513	English holly <i>Ilex aquifolium</i>	0.25	-	-	<b>UNDERSIZED</b>	REMOVE
015	2502	Douglas-fir <i>Pseudotsuga menziesii</i>	0.85	7.5	90	Declining CROWN – Excessive coning. Pruned on north side for Hydro clearance. FIGURE 5 <b>WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING</b>	REMOVE



Tree #	Tag #	Common Name <i>Botanical Name</i>	DBH (m.)	C-Rad (m.)	LCR (%)	Comments	Retain / Remove
016	2506	Paper birch <i>Betula papyrifera</i>	0.36	4.0	40	Declining TRUNK – Holly growing up 60% of stem. FIGURE 6	REMOVE
017	2505	Paper birch <i>Betula papyrifera</i>	0.31	4.0	40	TRUNK – Conks present. Lean north. Past stems trimmed at base on south side. CROWN – Broken top. Likely decay column in broken top from Bronze Birch Borer. FIGURE 6 RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
018	2504	Paper birch <i>Betula papyrifera</i>	0.30 0.30	4.0	50	TRUNK – Conks present. Lean north. Past stems trimmed at base on south side. Codominant stems at base. CROWN – Broken top. Likely decay column in broken top from Bronze Birch Borer. FIGURE 6 RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
019	2509	English holly <i>Ilex aquifolium</i>	0.25	-	-	UNDERSIZED	RETAIN
020	2508	Monkey puzzle <i>Araucaria araucana</i>	0.40	6.0	90	RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
021	2503	Douglas-fir <i>Pseudotsuga menziesii</i>	0.80	8.0	90	ROOTS – Structural roots exposed. CROWN – Dieback present. Flagging present. SUITABLE FOR RETENTION	RETAIN
022	0957	Western hemlock <i>Tsuga heterophylla</i>	0.10 – 0.20	3.0	50	TRUNK – Four codominant stems at base. FIGURE 7 WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING	REMOVE
023	0956	Douglas-fir <i>Pseudotsuga menziesii</i>	0.15 0.15	3.0	40	CROWN – No foliage in lower crown. FIGURE 7 WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING	REMOVE





Tree #	Tag #	Common Name <i>Botanical Name</i>	DBH (m.)	C-Rad (m.)	LCR (%)	Comments	Retain / Remove
024	0955	English holly <i>Ilex aquifolium</i>	-	-	-	INVASIVE SPECIES – NOT PROTECTED UNDER BYLAW FIGURE 7	REMOVE
025	0952	Western redcedar <i>Thuja plicata</i>	0.50	5.5	80	CROWN – Pruned on north side for Hydro clearance. Flagging in upper crown. WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING. PROJECT ARBORIST TO MONITOR	REMOVE
026	0953	Western redcedar <i>Thuja plicata</i>	0.30	2.5	100	RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
The following trees are located off-site. All off-site trees were assessed onsite and were separated by fencing. The off-site assessment therefore was limited by these factors.							
OS 1	-	Willow <i>Salix</i> spp.	0.25 0.10	6.0	70	TRUNK – Leans north. Codominant stems at base. Bend in trunk north at 0.5 meters. ROOTS – Debris piled against stem. EXCAVATION WITHIN THE TPZ PERMITTED WITH ARBORIST SUPERVISION. RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
OS 2	-	SPECIES COULD NOT BE IDENTIFIED DUE TO IVY COVERAGE	0.80	5.0	-	TRUNK – Ivy covering entire stem. SPECIES COULD NOT BE IDENTIFIED DUE TO IVY COVERAGE RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
OS 3	-	Eastern white cedar <i>Thuja occidentalis</i>	0.15 – 0.30	4.5	95	TRUNK – Five codominant stems at base. CROWN – Previously pruned on north side. RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN
OS 4	-	Mountain-ash <i>Sorbus sitchensis</i>				TRUNK – Multi-stem at base. Fence leaning on north side of trunk. RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION	RETAIN



Tree #	Tag #	Common Name <i>Botanical Name</i>	DBH (m.)	C-Rad (m.)	LCR (%)	Comments	Retain / Remove
OS 5	-	Western redcedar <i>Thuja plicata</i>	0.15 – 0.35	3.5	100	TRUNK – Five codominant stems at base. CROWN – Flagging present. Excessive coning. <b>RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION</b>	RETAIN
OS 6	-	English walnut <i>Juglas regia</i>	0.45 0.35	5.0	80	TRUNK – Codominant stems at 1 meter. North stem growing through fence onto onsite property. FIGURE 9 <b>RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION</b>	RETAIN
OS 7	-	Douglas-fir <i>Pseudotsuga menziesii</i>	0.60	6.5	80	<b>RETAIN WITH TREE PROTECTION FENCING SUITABLE FOR RETENTION</b>	RETAIN
<b>The following trees are straddling the property line.</b>							
S 1	0951	English laurel <i>Prunus laurocerasus</i>	0.15	-	-	<b>UNDERSIZED</b>	RETAIN
S 2	2507	English holly <i>Ilex aquifolium</i>	0.15	-	-	<b>UNDERSIZED</b>	RETAIN
S 3	0954	Douglas-fir <i>Pseudotsuga menziesii</i>	0.40	4.5	90	LOCATION – Adjacent to fence. CROWN – Pruned on east side. Sparse foliage. FIGURE 8 <b>STRADDLING TREE REQUIRES CITY PERMISISON TO REMOVE – REPLACEMENTS HANDLED CASH IN LIEU WITHIN PROPOSED EXCAVATION ZONE FOR BUILDING AND UNDERGROUND PARKING</b>	REMOVE



## **APPENDIX A – GLOSSARY OF KEY TERMS**

**Abutment:** A structure built to support the lateral pressure of an arch or span, e.g., at the ends of a bridge.

**Adapted Trunk Diameter Method:** This method uses the trees age and tolerance to construction damage to determine the factor that will be multiplied by the diameter to provide a sufficient tree protection zone given these factors.

**Age:** The relative age (young, intermediate, mature) within the particular stand of trees or forest.

**Algae:** Is a simple, nonflowering plant (includes seaweeds and many single-celled forms). They do contain chlorophyll (but lack true stems, roots, and vascular tissue)

**ALR:** The Agricultural Land Reserve in which agriculture is recognized as the priority.

**Bole:** The stem or trunk of a tree.

**Chlorotic:** Yellowing of plant tissues caused by nutrient deficiency &/or pathogen.

**Co-dominant Leaders:** Forked dominant stems nearly the same size in diameter, arising from a common junction.

**Co-dominant Within Stand:** Individual tree whose height is generally equal to trees (regardless of species) within the same stand.

**Compaction:** Compression of the soil that breaks down soil aggregates and reduces soil volume and total pore space, especially macropore space.

**Conk:** A fungal fruiting structure typically found on trunks and indicating internal decay.

**Dead Standing:** A tree that has died but is still standing erect.

**DBH:** The Diameter of the tree at 1.40 meters above the ground.

**Dominant Within Stand:** Individual tree whose height is significantly greater than adjacent trees (regardless of species) within the same stand.

**C-rad:** Crown radius, is the dripline measured from the edge of the trunk to the outermost branches of the crown.

**CRT:** Critical Root Zone

**CRZ:** Critical Root Zone - The area between the trunk and to the end of the Drip Line.

**Fair:** Healthy but has some defects such as co-dominant trunk, dead branches.

**Feeder Roots:** The smaller roots responsible for water and nutrient absorption and gas exchange. These roots can extend far beyond the Drip Line (or outer canopy) of the tree.

**Fungus (singular) / Fungi (plural):** Unicellular, multicellular or syncytial spore-producing organisms that feed on organic matter (including molds, yeast, mushrooms and toadstools)

**Girdling Root:** Root that encircles all or part of the trunk of a tree or other roots and constricts the vascular tissue and inhibits secondary growth and the movement of water.

**Good:** Good form and structure, healthy with no defects.

**Hazardous:** Significant hazard exists with a high risk of immediate failure; which could result in serious damage to property or person(s).

**Height:** Height of tree is approximate.

**LCR:** Live Crown Ratio – The ratio of crown length to total tree length.

**Level 1 Limited Visual Assessment:** Limited visual assessment looking for obvious defects such as, but not limited to dead trees, large cavity openings, large dead or broken



branches, fungal fruiting structures, large cracks, and severe leans.

**Level 2 Basic Visual Assessment:** Detailed visual inspection (aboveground roots, trunk, canopy) of tree(s) may include the use of simple tools to perform assessment (i.e. sounding mallet, trowel, measuring tape, binoculars). The assessment does not include advanced resistance drilling of trunk.

**Level 3 Advanced Assessment:** To provide detailed information about specific tree parts, defects, targets, or side conditions. May included aerial inspection, resistance drilling of tree parts, laboratory diagnosis of fungal or plant tissue.

**Mildew:** Is a minute powdery or web-like fungi (of different colours) that is found on diseased or decaying substances.

**Moss:** A small, green, seedless plant that grows on stones, trees or ground.

**No Disturbance Zone:**  $(\text{Trunk Diameter} \times 6) + \text{Trunk Radius} + (60 \text{ cm excavation zone})$ . For example, a 50-cm diameter tree would have a No Disturbance Zone = 3.85 meters measured from the edge of the trunk.

**Poor:** multiple defects, disease, poor structure and or form, root and or canopy damage.

**Phloem:** Plant vascular tissue that transports sugar and growth regulators. Situated on the inside of the bark, just outside the cambium. Is bidirectional (transports up and down). Contrast with xylem.

**Phototropic:** Growth toward light source or stimulant.

**Retain & Monitor:** Monitor health and condition of tree every 12 months for signs of deterioration.

**Root Crown:** Also, called the root collar, it includes the flare at the base of the trunk and the initial roots that develop below the trunk. These roots generally taper and subdivide rapidly to form the root system of the tree.

**SPEA:** Streamside Protection and Enhancement Area

**Spiral Decline:** The health and condition of the tree is deteriorating.

**Sub-dominant Within Stand:** Individual tree whose height is significantly less than adjacent trees (regardless of species) within the same stand.

**Suppressed:** Individual tree whose growth, health and condition is negatively impacted by adjacent tree(s).

**TPZ:** Tree Protection Zone - The area between the trunk and the Tree Protection Barrier.

**Wildlife Tree:** A tree or a group of trees that are identified to be retained to provide future wildlife habitat. Wildlife habitat can exist in tree risks (cavities, dead snags, broken tops). Often times the tree risk to potential targets (people & property) is reduced by removing that part of the tree posing the risk of failure, but the tree (or portion of) is retained to provide future habitat.

**Witches Broom:** A dense mass of shoots growing from a single point, with the resulting structure resembling a broom or a bird's nest.

**Xylem:** Thin overlapping cells that helps provide support and that conducts water and nutrients up

ward from the roots all the way to the leaves.





## APPENDIX B – PHOTOS



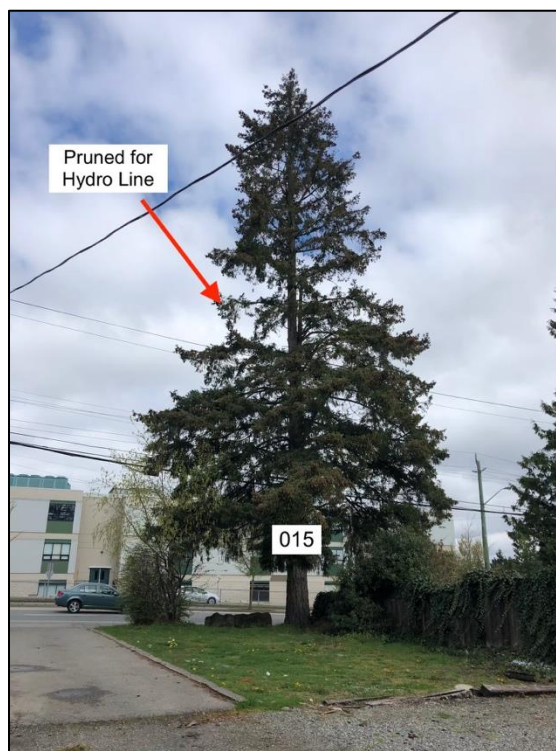
**Fig. 2** – Tree 001 with ivy growing throughout crown.



**Fig. 3** – Tree 005 with decay from base to 1 meter.

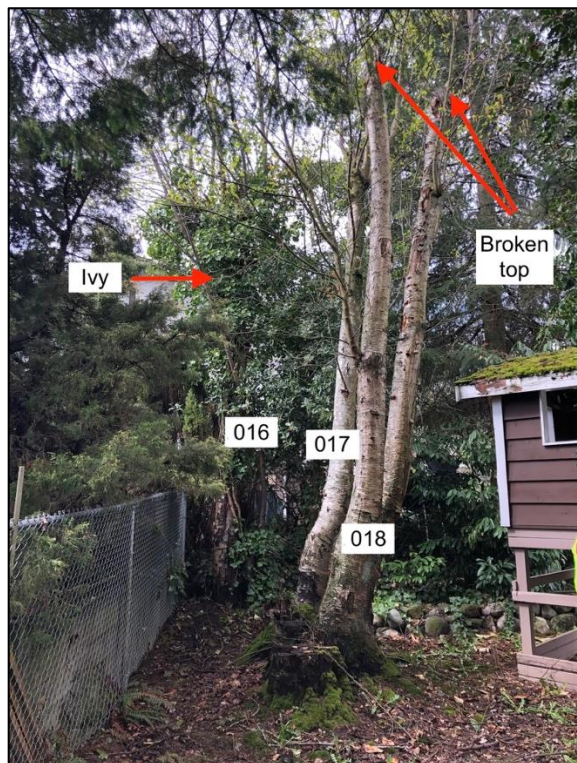


**Fig. 4** – View of Trees 006 and 007.

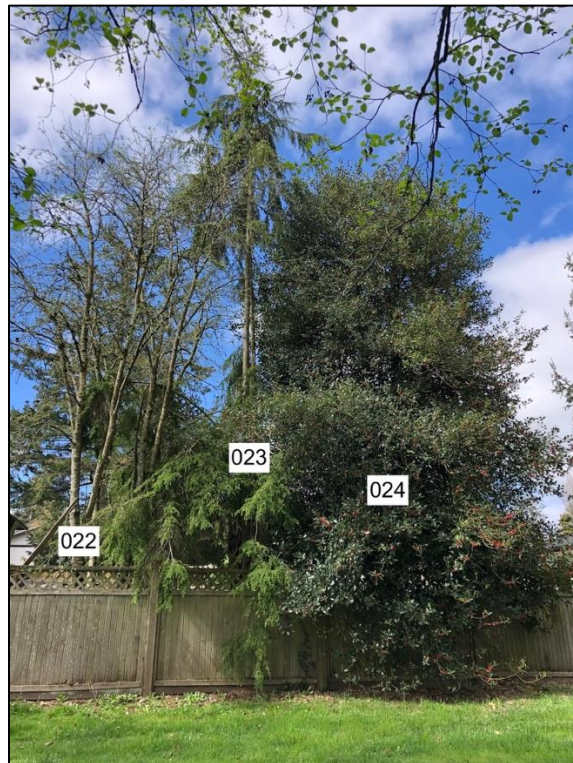


**Fig. 5** – Tree 015 with pruning on north side.





**Fig. 6** – Trees 016, 017, and 018 in poor condition.



**Fig. 7** – West view of Tree 022, 023, and 024.



**Fig. 8** – Tree S 3 with crown weighted to west side.



**Fig. 9** – Tree OS 6 growing through fence.



## **TREE REPLACEMENT SUMMARY**

### **White Rock Tree Management Bylaw, 2008, No. 1831**

The number and size of the replacement trees is dependent upon the size of the protected tree removed. Replacement trees shall be required according to the following:

- (a) Less than 50 cm DBH protected tree removed – Two replacement trees
- (b) 51 cm to 65 cm DBH protected tree removed – Three replacement trees
- (c) 66 cm to 75 cm DBH protected tree – Four replacement trees
- (d) 76 cm to 85 cm DBH protected tree – Five replacement trees
- (e) Greater than 85 cm DBH protected tree – Six replacement trees

<b>Size</b>	<b>Removed</b>	<b>Replacement Trees</b>
<b>Less then 50cm DBH</b>	<b>10</b>	<b>20</b>
<b>51-65cm DBH</b>	<b>3</b>	<b>9</b>
<b>66-75 DBH</b>	<b>0</b>	<b>0</b>
<b>76-85cm DBH</b>	<b>1</b>	<b>5</b>
<b>85cm+ DBH</b>	<b>1</b>	<b>6</b>
<b>Undersize Trees</b>	<b>7</b>	<b>0</b>
	<b>Total</b>	<b>40</b>

40 Total Replacement Trees Required, 2 of which will be handled by Cash in Lieu as Tree S3 is straddling city property.

### **Recommended Replacement Species**

It is recommended that the landscape architect use a mix of the following species in the replanting plan:

- Acer Griseum 6 cm cal. 1.2m Std.
- Nyssa Sylvatica ‘Tupelo Tower’ 6 cm cal. 1.2m std.
- Picea Omorika “Bruns” 3m
- Stewartia Pseudocamellia 6 cm cal. 1.2m Std.

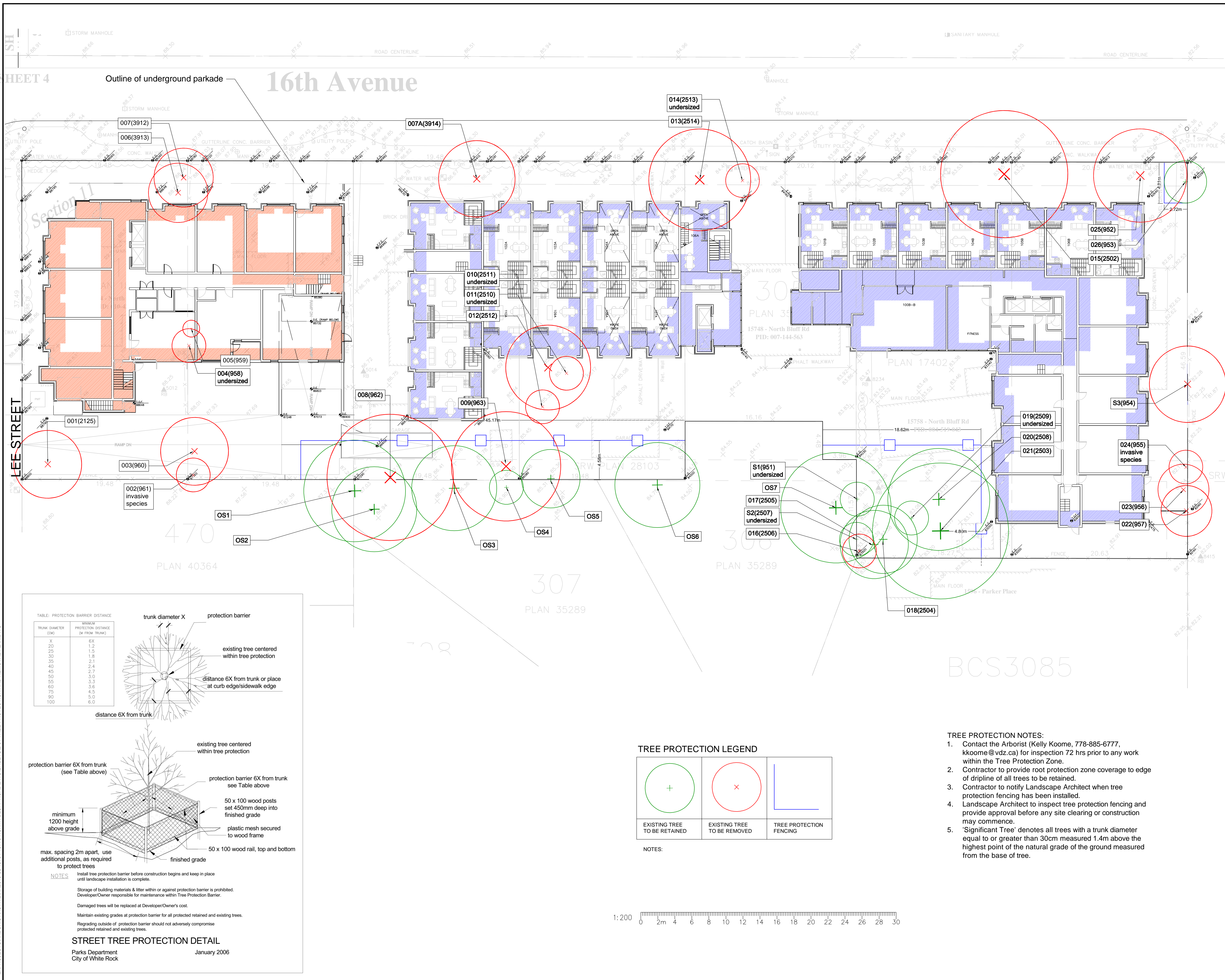




## **APPENDIX C – TREE RETENTION AND REMOVAL PLAN**

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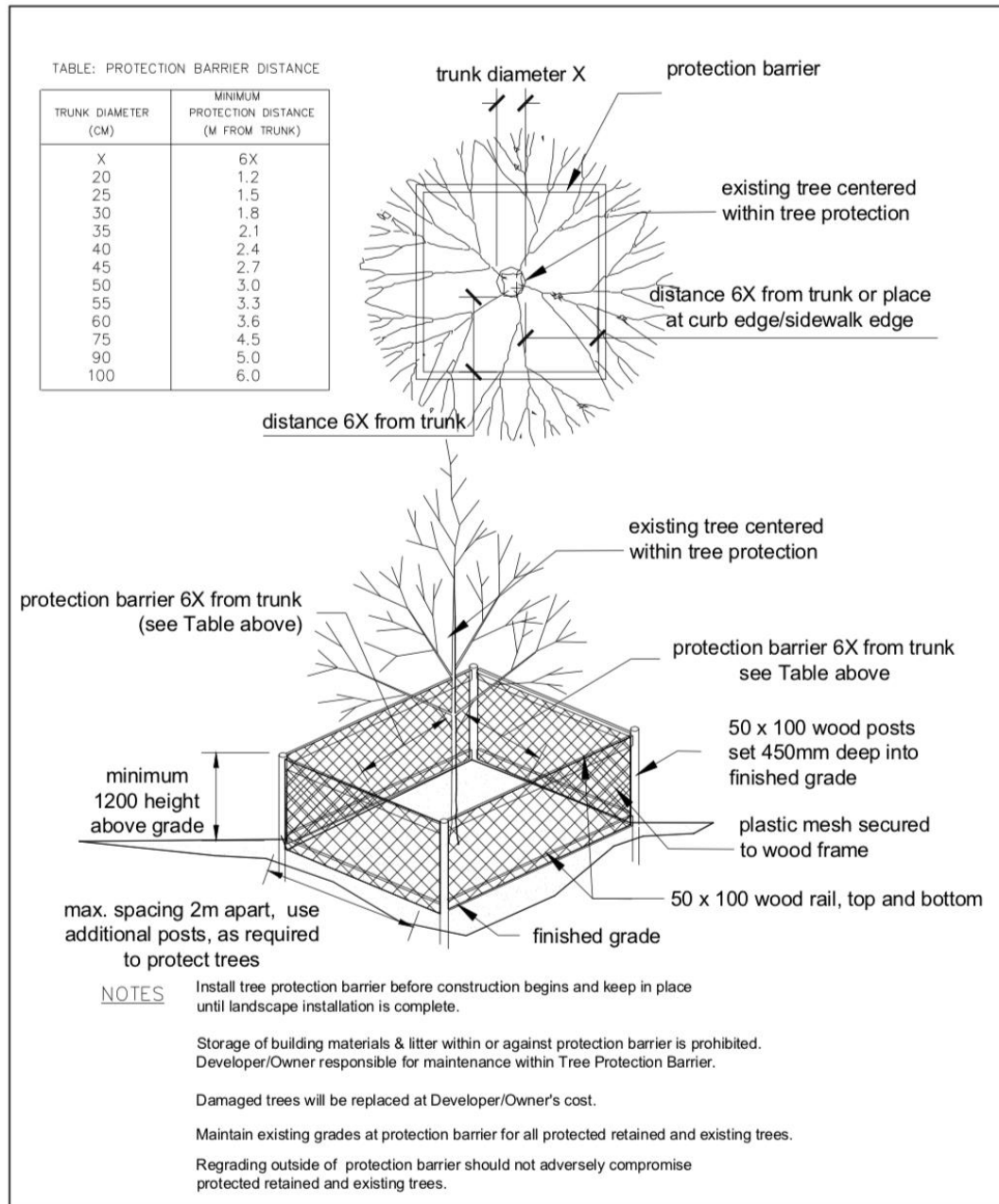




## APPENDIX D – CONSTRUCTION ACTIVITY AROUND TREE PROTECTION ZONE

### Tree Protection Fencing

#### Specifications for Tree Protection Barriers





## **General Requirements and Limitations for Operations Within the Tree Protection Zone**

- The Contractor shall not engage in any construction activity within the Tree Protection Zone (TPZ) without the approval of the Project Arborist including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks. Permitted activity, if any, within the Tree Protection Zone maybe indicated on the drawings along with any required remedial activity as listed below.
- In the event that construction activity is unavoidable within the Tree Protection Zone, notify the Project Arborist and submit a detailed written plan of action for approval. The plan shall include: a statement detailing the reason for the activity including why other areas are not suited; a description of the proposed activity; the time period for the activity, and a list of remedial actions that will reduce the impact on the Tree Protection Zone from the activity. Remedial actions shall include but shall not be limited to the following:
- In general, demolition and excavation within the drip line of trees and shrubs shall proceed with extreme care either by the use of hand tools, directional boring and/or Air Spade. If any excavation work is required within the Tree Protection Zone (TPZ), the Project Arborist must be present during excavation, and a trench should be 'hand dug' to a depth of 60 cm outside the Drip Line, to uncover any potential roots. The Project Arborist should cleanly prune roots and recommend the appropriate treatment for any structural roots encountered.
- Knife excavation where indicated or with other low impact equipment that will not cause damage to the tree, roots soil.
- When encountered, exposed roots, 1 inches and larger in diameter shall be worked around in a manner that does not break the outer layer of the root surface (bark). These roots shall be covered in Wood Chips and shall be maintained above permanent wilt point at all times. Roots one inch and larger in diameter shall not be cut without the approval of the Project Arborist. Excavation shall be tunnelled under these roots without cutting them. In the areas where roots are encountered, work shall be performed and scheduled to close excavations as quickly as possible over exposed roots.
- Tree branches that interfere with the construction may be tied back or pruned to clear only to the point necessary to complete the work. Other branches shall only be RETAINED when specifically indicated by the Project Arborist. Tying back or trimming of all branches and the cutting of roots shall be in accordance with accepted arboriculture practices (ANSI A300, part 8) and be performed under supervision of the Project Arborist.
- Do not permit foot traffic, scaffolding or the storage of materials within the Tree Protection Zone.
- Protect the Tree Protection Zone at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Project Arborist of any spills, compaction or damage and take corrective action immediately using methods approved by the Project Arborist.



## **APPENDIX E – LIMITATIONS**

This report is valid for the day the trees were reviewed. This report is not to be re-printed, copied, published or distributed without prior approval by VDZ + A Consulting Inc.

Sketches, diagrams and photographs contained in this report being intended as visual aids, should not be construed as engineering reports or legal surveys.

Only the subject tree(s) was inspected and no others. This report does not imply or in any other way infer that other trees on this site or near this site are sound and healthy.

The tendency of trees or parts of trees to fall due to environmental conditions and internal problems are unpredictable. Defects are often hidden within the tree or underground. The project arborist has endeavored to use his skill, education and judgment to assess the potential for failure, with reasonable methods and detail. It is the owner's responsibility to maintain the trees and inspect the trees to reasonable standards and to carry out recommendations for mitigation suggested in this report.

## **APPENDIX F – REFERENCES**

Bond, Jerry & Buchanan, Beth (2006) Best Management Practices: Tree Inventories, International Society of Arboriculture, Champaign, IL.

Dunster, Dr. Julian (2003) *Preliminary Species Profiles for Tree Failure Assessment*. ISA Pacific Northwest Chapter, Silverton, OR, USA

Dunster, Dr. Julian & Edmonds, Dr. R. (2014) Common Fungi Affecting Pacific Northwest Trees, ISA Pacific Northwest Chapter, Silverton, OR, USA

Fite, Kelby & Smiley, E. Thomas (2016) Best Management Practices: Managing Trees During Construction, International Society of Arboriculture, Champaign, IL.

Sibley, David Allen (2009) *The Sibley Guide to Trees*. Alfred A. Knopf, New York, NY

Smiley, E.T., Matheny, N., Lilly, S. (2011) Best Management Practises: Tree Risk Assessment. International Society of Arboriculture, Champaign, IL.