

Committee of Council Agenda

Tuesday, June 9, 2020

2:00 p.m.

Council Chambers

3rd Floor City Hall, 2580 Shaughnessy Street, Port Coquitlam, BC

Pages

1. CALL TO ORDER

2. ADOPTION OF THE AGENDA

2.1 Adoption of the Agenda

Recommendation:

That the Tuesday, June 9, 2020, Committee of Council Meeting Agenda be adopted as circulated.

3. CONFIRMATION OF MINUTES

3.1 Minutes of Committee of Council

1

Recommendation:

That the minutes of the following Committee of Council Meetings be adopted:

- *May 12, 2020*
- *May 26, 2020.*

4. REPORTS

4.1 Coach House Development Permit Application – 3622 Liverpool Street

9

Recommendation:

That Committee of Council approve Development Permit DP000326 to regulate a coach house development at 3622 Liverpool Street.

4.2 Official Community Plan and Rezoning Applications – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

26

Recommendation:

1. That Committee of Council, having given consideration to s.475 of the Local

Government Act, confirm the following consultation for the proposed Official Community Plan amendment:

- a. *on-site signage,*
- b. *the applicant's consultation with the community, and*
- c. *consideration of the application by Committee of Council in open meetings.*

2. That Committee of Council recommend to Council that:

- a. *The Official Community Plan land use designation for the site be amended from*
Townhouse Residential (RT) to Neighbourhood Commercial (N);
- b. *The zoning be amended from Single Residential RS1 to a Comprehensive Development zone that includes the following provisions:*
 - i. *Ground floor community commercial uses, to a maximum of 1,360m²*
 - ii. *A minimum of 16 townhouses and up to 121 apartments, with a provision of*
density bonus in the amount of \$50 per square foot for residential floor area proposed in excess of 6,592 sq m (70,950 sq ft), excluding the density associated with any non-market rental units;
 - iii. *A minimum of 1,290m² of outdoor amenity area and 274m² indoor amenity area, including an outdoor children's play space, common outdoor dining area(s), common indoor cooking area(s), common indoor gym(s) and common indoor workspaces.*
 - iv. *Private balcony or deck for each residential unit with a minimum depth of 1.8 M (6 ft).*
- c. *Prior to adoption of the amending bylaws, the following conditions be met to the satisfaction of the Director of Development Services:*
 - i. *Purchase and closure of Prince Street;*
 - ii. *Completion of a Housing Agreement to secure a minimum of 10 dwelling units as non-market rental housing;*
 - iii. *Registration of legal agreements to ensure the development is designed and*
constructed as follows:
 - *in accordance with the recommendations of the acoustical*

study;

• built to either a LEED® Silver standard or equivalent per the BC Energy Step Code;

iv. Submission of securities and fees for off-site works and services including

reconstruction of the full width of Harbour Street, a right-in/right-out vehicular

restrictions on Pitt River Road, and pedestrian improvements.

v. Completion of a subdivision plan to the satisfaction of the Approving Officer.

4.3 Kingsway Avenue Design Update

357

Recommendation:

That Committee of Council

- Endorse the preliminary design concepts for Kingsway Avenue as outlined in the staff report titled Kingsway Avenue Design dated February 18, 2020;*
- Add to the scope a northbound left hand turn lane at the McLean Avenue intersection (as per Scenario 2 within this report);*
- Direct staff to proceed with detailed design; and*
- Direct staff to Consider a new north/south connection from Kingsway Avenue to McLean Avenue as part of the Master Transportation Plan update.*

4.4 Letter of Support for Sport Nation proposal at Pitt River Middle School

377

Recommendation:

That a letter be provided to SD43 confirming the City's support of this project.

4.5 2117 Prairie Avenue – Request for Extension

The report for 2117 Prairie Avenue was left off of the agenda. The additional document can be viewed on the agenda web page.

Recommendation:

That Committee of Council extend the date of expiry for adoption of Official Community Plan Amendment Bylaw No.4075 and Zoning Amendment Bylaw No. 4076 to October 9, 2020.

4.6 Alcohol Consumption in City Parks

401

Recommendation:

That Council directs staff to prepare a bylaw to permit the consumption of alcoholic beverages in public parks, as a pilot project, with the following criteria:

1. *Pilot project ends October 31st, 2020; and*
2. *Located in neighbourhood parks with washroom and picnic facilities.*

5. COUNCILLORS' UPDATE

6. MAYOR'S UPDATE

7. CAO UPDATE

8. RESOLUTION TO CLOSE

8.1 Resolution to Close

Recommendation:

That the Committee of Council Meeting of Tuesday, June 9, 2020, be closed to the public pursuant to the following subsections(s) of Section 90(1) of the Community Charter:

Item 5.1

k. negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

Item 5.2

k. negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

Item 5.3

k. negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

Item 5.4

e. the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality;

Item 5.5

i. the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose;

l. discussions with municipal officers and employees respecting municipal objectives, measures and progress reports for the purposes of preparing an annual report under section 98 [annual municipal report].

Item 5.6

i. the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.

9. ADJOURNMENT

9.1 Adjournment of the Meeting

Recommendation:

That the Tuesday, June 9, 2020, Committee of Council Meeting be adjourned.

10. MEETING NOTES



Committee of Council Minutes

Tuesday, May 12, 2020

Council Chambers

3rd Floor City Hall, 2580 Shaughnessy Street, Port Coquitlam, BC

Absent: Chair - Mayor West
Councillor Darling
Councillor Dupont
Councillor McCurrach
Councillor Penner
Councillor Pollock
Councillor Washington

1. CALL TO ORDER

The meeting was called to order at 2:05 p.m.

2. ADOPTION OF THE AGENDA

2.1 Adoption of the Agenda

Moved-Seconded:

That the Tuesday, May 12, 2020, Committee of Council Meeting Agenda be adopted as circulated.

In Favour (6): Mayor West, Councillor Darling, Councillor Dupont, Councillor Penner, Councillor Pollock, and Councillor Washington

Absent (1): Councillor McCurrach

Carried

3. CONFIRMATION OF MINUTES

None.

4. REPORTS

4.1 2019 Year End Operating Variance

Staff presented the 2019 Year-end Operating Variance report.

4.2 2019 Audited Financial Statement

Moved-Seconded:

That Committee of Council recommend that:

1. *Council accept the 2019 Audited Consolidated Financial Statements; and*

2. *The 2020 financial plan be amended to include a transfer of \$395,000 from accumulated surplus to the Sewer Long Term Reserve Fund.*

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

4.3 Official Community Plan Scoping Report

Moved-Seconded:

That Committee of Council approve the Official Community Plan scope including:

1. *topic areas; and*
2. *timeline for the update.*

as outlined in the May 12, 2020, report, "Official Community Plan Update Scoping Report".

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

4.4 Development Permit - Coach House Application - 3771 Somerset Street

Moved-Seconded:

That Committee of Council approve Development Permit DP000422 to regulate a coach house development at 3771 Somerset Street.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

5. COUNCILLORS' UPDATE

Council provided updates on City business.

6. MAYOR'S UPDATE

Mayor West provided an update on City business.

7. CAO UPDATE

No update.

8. RESOLUTION TO CLOSE

8.1 Resolution to Close

Moved-Seconded:

That the Committee of Council Meeting of Tuesday, May 12, 2020, be closed to the public pursuant to the following subsections(s) of Section 90(1) of the Community Charter:

Item 5.1

k. negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

Item 5.2

c. labour relations or other employee relations.

Item 5.3

c. labour relations or other employee relations.

Item 5.4

i. the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose;

l. discussions with municipal officers and employees respecting municipal objectives, measures and progress reports for the purposes of preparing an annual report under section 98 [annual municipal report].

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

9. ADJOURNMENT

9.1 Adjournment of the Meeting

Moved-Seconded:

That the Tuesday, May 12, 2020, Committee of Council Meeting be adjourned at 07:26 p.m.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

10. MEETING NOTES

Councillor McCurrach joined the meeting at 02:15 p.m.

The meeting was recessed at 2:45 p.m. and reconvened at 6:50 p.m.

Mayor

Corporate Officer



Committee of Council Minutes

Tuesday, May 26, 2020

Council Chambers

3rd Floor City Hall, 2580 Shaughnessy Street, Port Coquitlam, BC

Present: Chair - Mayor West
Councillor Darling
Councillor Dupont
Councillor McCurrach
Councillor Penner
Councillor Pollock
Councillor Washington

1. CALL TO ORDER

The meeting was called to order at 2:18 p.m.

2. ADOPTION OF THE AGENDA

2.1 Adoption of the Agenda

Moved-Seconded:

That the Tuesday, May 26, 2020, Committee of Council Meeting Agenda be adopted as circulated.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

3. CONFIRMATION OF MINUTES

3.1 Minutes of Committee of Council

Moved-Seconded:

That the minutes of the following Committee of Council Meetings be adopted:

- April 28, 2020.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

4. REPORTS

4.1 Phase 1 PCCC Participation & Financial Summary

Staff presented the Phase 1 PCCC Participation & Financial Summary to Committee of Council.

4.2 Review of Grant & Funding Programs

Moved-Seconded:

That Committee of Council direct staff to prepare a revised Community Grant Policy as outlined in this report, and

That Committee of Council approve the consolidation of the Community Cultural Development Investment Program and Self-Help Matching Fund budgets.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

4.3 March 2020 Community Centre Update

Staff provided an update.

4.4 Outdoor Gas Appliances

Moved-Seconded:

That Committee of Council recommend that Council:

Adopt amendments to the Fire & Emergency Services Bylaw No. 3880 to permit the use of outdoor gas appliances, such as gas fire pits, portable heaters and decorative gas fire tables.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

5. COUNCILLORS' UPDATE

Council provided updates on City business.

6. MAYOR'S UPDATE

No update.

7. CAO UPDATE

No update.

8. RESOLUTION TO CLOSE

8.1 Resolution to Close

Moved-Seconded:

That the Committee of Council Meeting of Tuesday, May 26, 2020, be closed to the public pursuant to the following subsections(s) of Section 90(1) of the Community Charter:

Item 5.1

l. discussions with municipal officers and employees respecting municipal objectives, measures and progress reports for the purposes of preparing an annual report under section 98 [annual municipal report].

Item 5.2

c. labour relations or other employee relations;

Item 5.3

k. negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

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i. the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose;

l. discussions with municipal officers and employees respecting municipal objectives, measures and progress reports for the purposes of preparing an annual report under section 98 [annual municipal report].

Item 5.5

i. the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

9. ADJOURNMENT

9.1 Adjournment of the Meeting

Moved-Seconded:

That the Tuesday, May 26, 2020, Committee of Council Meeting be adjourned at 7:06 p.m.

In Favour (7): Mayor West, Councillor Darling, Councillor Dupont, Councillor McCurrach, Councillor Penner, Councillor Pollock, and Councillor Washington

Carried

10. MEETING NOTES

The meeting recessed at 3:40 p.m. and reconvened at 7:05 p.m.

Mayor

Corporate Officer

Coach House Development Permit Application – 3622 Liverpool Street

RECOMMENDATION:

That Committee of Council approve Development Permit DP000326 to regulate a coach house development at 3622 Liverpool Street.

REPORT SUMMARY

This report describes a proposed coach house to be located at 3622 Liverpool Street. The application complies with the City's guidelines and regulations and is recommended for approval.

BACKGROUND

A one-bedroom, two-storey coach house (combined coach house and garage) is proposed to be developed on a large lot with an existing single residential house in a predominately single family residential neighbourhood. The coach house is located at the rear of the lot and is accessed from the rear lane. Parking for the coach house will be provided within the two car garage on the first floor of the building.



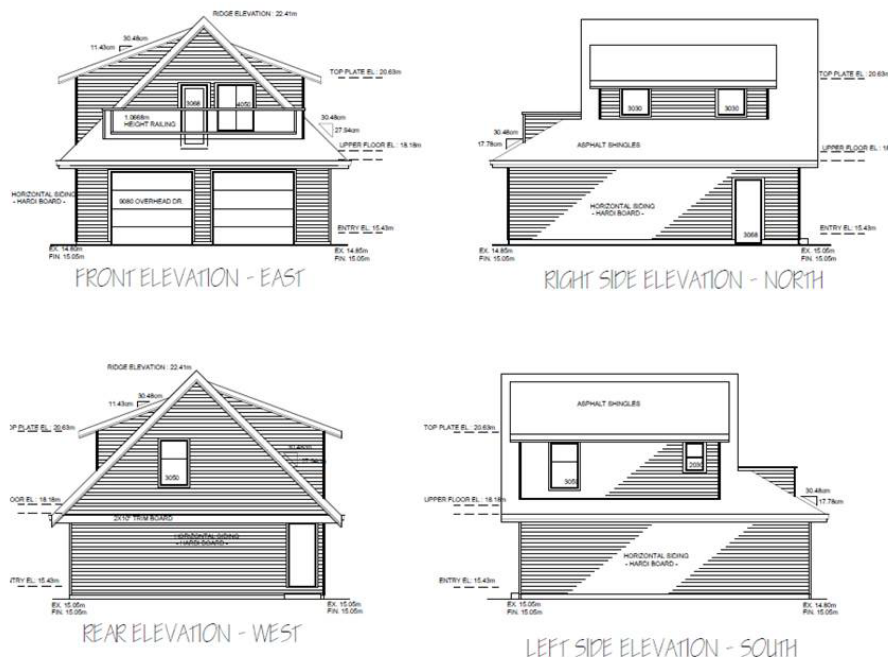
Location Map

The attached summary sheet describes and illustrates how the application conforms to Zoning Bylaw regulations and Official Community Plan design landscaping, and environmental conservation guidelines.

Coach House Development Permit Application – 3622 Liverpool Street

DISCUSSION

The small one bedroom unit is on the second floor of the coach house/garage building and is integrated within a sloping roof to reduce the appearance of the building massing. Also incorporated into the upper roof is a balcony which is oriented to overlook onto the lane, and is designed to maximize the visual privacy between the principal residence, the adjacent neighbours and the suite itself. This also promotes more natural light to the living areas within the coach house.



The existing principal dwelling is a 1970's two storey home, while the proposed coach house design is a more craftsman architectural style. The house and the coach house are to be coordinated using similar materials and colour. Both the principal residence and coach home will incorporate Earthy Russet for the fascia, window and door trim colour. The top half of the principal residence is stucco painted in Natural Wicker; the coach house will have the same color painted on the Hardie board. The lower portion of the coach house will be painted in Jackson Tan to compliment the lower half of the principal residence that has cedar siding and painted brick in the same colour. The garage doors will also be painted in Jackson Tan to compliment the same scheme as the main house. Gutters and down pipes will match the principal residence, and the patio railing is proposed to be black aluminum.

The landscaping includes an existing cedar tree, various fruits trees and cedar hedges to be retained. An additional 6' cedar hedge will be included to the south of the coach house, to provide further privacy to the outdoor patio. The coach house is further separated from the adjacent property to the north and south by a 6' high cedar fence as well as an additional privacy 4' high cedar fence to the west surrounding the coach house patio. A new fence will also be constructed to replace the aged fencing off the lane, to the east of the property.

Coach House Development Permit Application – 3622 Liverpool Street

The proposal conforms to Zoning Bylaw regulations and meets Development Permit guidelines; staff recommend approval.

PUBLIC CONSULTATION


A development sign was posted on site at the time of the application, and the owners/residents of adjoining properties have been notified of their opportunity to comment on the application at the Committee of Council meeting.

The applicants advise that, prior to applying for the Development Permit, they consulted with their immediate neighbours and no concerns were raised regarding their proposed coach house development. To date, staff have not received any feedback from surrounding residents.

FINANCIAL IMPLICATIONS

None.

OPTIONS (✓ = Staff Recommendation)

	#	Description
	1	Approve issuance of Development Permit DP000326
	2	Request amendments to the application or additional information prior to a decision
	3	Refuse to approve Development Permit DP000326, if Committee is of the opinion that the proposal does not comply with the OCP objectives and design guidelines. Pursuant to the Delegation Bylaw, the applicant may appeal the decision to Council

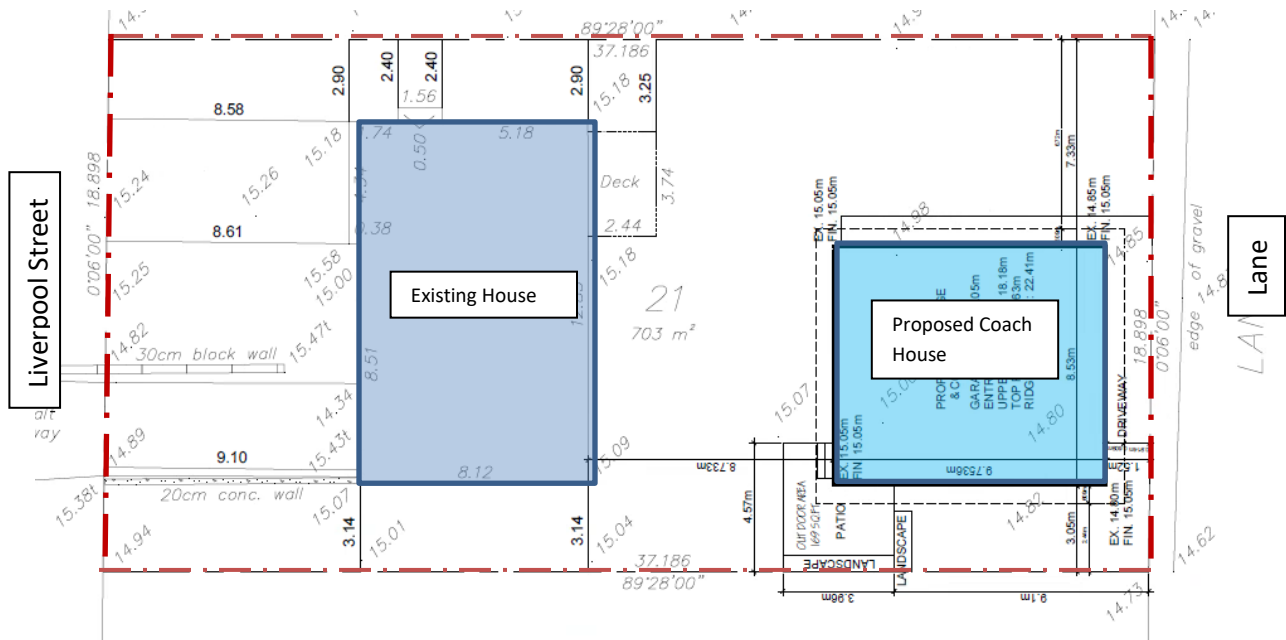
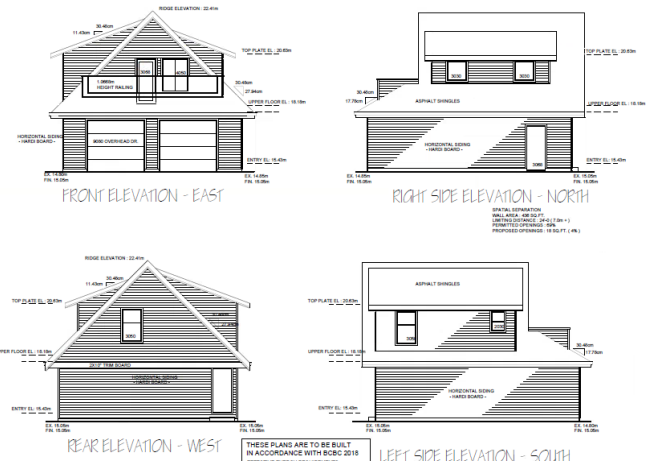
ATTACHMENTS

Att#1: Coach House Summary Sheet

Att#2: Draft Development Permit with Drawings Appended and Schedule A

Lead author(s): Graeme Muir

Coach House Summary Sheet – 3622 Liverpool Street



Summary of Compliance with OCP Objectives & Guidelines

Guideline ¹	Evaluation
Scale secondary or accessory to principal dwelling	Varying roof lines and stepping make the building appear accessory. The coach house and garage are smaller than the principal dwelling for the site.
Design compatibility with principal dwelling	The coach house will be painted to coordinate with the colours of the existing principal dwelling.
Design promotes natural lighting and visual privacy between adjoining properties	Window placement and balcony maximizes visual privacy between properties and primary dwelling.
Landscaped path to connect to street	Path connects the coach house to the street.
There are at least two trees on the lot	There is one existing birch tree in the front and three fruit trees in the rear yard, as well as cedar hedging located throughout the property.
Garbage/recycling space is provided	Enclosed within the garage
Environmental conservation components	High efficiency appliances, low-flow toilets, Energy Star rated windows, and drought tolerant landscaping

Summary of Compliance with Zoning Bylaw Regulations

	Coach House Regulations ²	Proposed ³	Comments/Variations
Maximum coach house size	70m ² (753.5ft ²)	49.5m ² (533ft ²)	
Minimum lot size for secondary suite and coach house	740m ² (7965.3 ft ²)	702m ² (7556 ft ²)	The lot is not large enough to permit a secondary suite and coach house.
Building height	8.5m (27.9ft)	7.36m (24.1ft)	
Coach house siting:			
Distance between coach house and principal dwelling	6m	8.73m	
Setback from rear	1.2 m	1.52 m	
Setback from interior property line (south)	1.8 m	3.05 m	
Setback from interior property line (north)	1.8 m	7.33 m	
Private open space area	15m ²	15.7m ² (169ft ²)	Patio provided outside of main entry to coach house plus covered 2 nd floor balcony
Lot coverage	40%	28.5%	
Impervious surface area	65%	48%	
On-site parking	1 additional parking space	2 spaces in garage	The garage under the coach house provides 2 parking stalls as well as the existing parking for the primary dwelling.

¹ Please refer to the Official Community Plan for complete objectives and guidelines applicable to coach houses.

² Please refer to the Zoning Bylaw for complete regulations applicable to a coach house in the RS1 Zone.

³ Information provided by the applicant; this information would be confirmed in issuance of a building permit.

THE CORPORATION OF THE CITY OF PORT COQUITLAM

“DEVELOPMENT PROCEDURES BYLAW, 2013, NO. 3849”

DEVELOPMENT PERMIT

NO. DP000326

Issued to: Troy and Denise Nelson
(Owner as defined in the Local Government Act,
hereinafter referred to as the Permittee)

Address: 3622 Liverpool Street, Port Coquitlam BC V3B 3W3

1. This Development Permit is issued subject to compliance with all of the Bylaws of the Municipality applicable thereto, except as specifically varied by this Permit.
2. This Development Permit applies to and only to those lands within the Municipality described below, and any and all buildings, structures and other development thereon:

Address: 3622 Liverpool Street, Port Coquitlam, BC V3B 3W3
Legal Description: LOT 21, BLOCK “M” DISTRICT LOT 479 GROUP 1 NEW WESTMINSTER DISTRICT, PLAN 21251
P.I.D.: 010-341-706

3. The above property has been designated as a Development Permit Area under Section 9.0 – Development Permit Area in the “Official Community Plan Bylaw, 2013, No. 3838”.
4. “Port Coquitlam Zoning Bylaw, 2008, No. 3630” is varied or supplemented as follows:
 - a. The form and character of the coach house building, including the siting, height and general design, and landscaping shall be as shown on drawings numbered DP000326(X) to DP000326(X) which are attached hereto and form part of this permit.
 - b. The building and landscaping shall provide the energy conservation, water conservation and GHG emission reduction elements as shown on Schedule A to the drawings which are attached hereto and form part of this permit.
5. The following standards for landscaping are imposed:

- (a) All landscaping works and planting materials shall be provided in accordance with the landscaping plan and specifications thereon, which forms part of this permit and is attached hereto as Drawing Number DP000326(X).

6. Landscape Security

- (a) As a condition of the issuance of this permit, the security set out below is held by the Municipality prior to the issuance of a building permit to ensure satisfactory provision of landscaping in accordance with the terms and conditions as set forth in Clause 5 above. There is filed accordingly an irrevocable Letter of Credit or cash security in the amount \$2,500.00 for the purpose of landscaping.
- (b) Should any interest be earned upon the security, it shall accrue to the Permittee and be paid to the Permittee if the security is returned. A condition of the posing of the security is that should the Permittee fail to carry out the works or services as hereinabove stated, according to the terms and conditions of this permit within the time provided, the Municipality may use the security to complete these works or services by its servants, agents or contractors, and any surplus shall be paid over to the Permittee.
- (c) The Permittee shall complete the landscaping works required by this permit within six months of the final inspection for the coach house. Within the six month period, the required landscaping must be installed by the Permittee, and inspected and approved by the Municipality.

If the landscaping is not approved within the six month period, the Municipality has the option of continuing to hold the security until the required landscaping is completed or has the option of drawing the security and using the funds to complete the required landscaping. In such a case, the Municipality or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the security was submitted.

- (d) Should the Permittee carry out the works and services permitted by this permit within the time set out above, the security shall be returned to the Permittee. Should the Permittee fail to remedy any aspect of the landscaping not in accordance with the approved plan, the Municipality may deduct the cost of remedying the defect from the said deposit and recoup additional costs from the Permittee if necessary.
- 7. The land described herein shall be developed strictly in accordance with the terms and conditions and provisions of this permit and any plans and specifications attached to this permit, which shall form a part hereof.
 - 8. This permit shall lapse if the Permittee does not substantially commence the construction permitted by this permit within two years of the (issuance) date of this permit.

9. The terms of this permit or any amendment to it, are binding on all persons who acquire an interest in the land affected by this permit.
10. This permit is not a building permit.

ISSUED BY THE COMMITTEE OF COUNCIL THE ____ DAY OF _____,
2020.

SIGNED THIS ____ DAY _____, 2020.

Mayor

Corporate Officer

I ACKNOWLEDGE THAT I HAVE READ AND UNDERSTAND THE TERMS AND
CONDITIONS UPON WHICH THIS PERMIT IS ISSUED.

Applicant (or Authorized Agent or
Representative of Applicant)

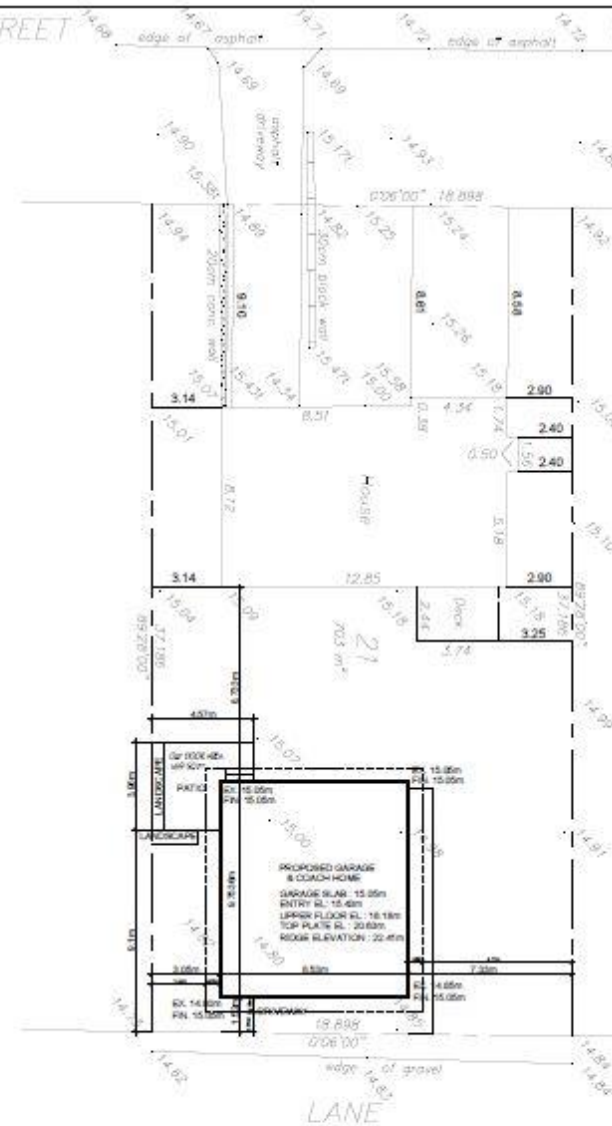
LIVERPOOL STREET

LIVERPOOL STREET



SITE PLAN
LOT 21, BLOCK M
DISTRICT LOT 479
GROUP 1, NWD
PLAN 21251

PARCEL NUMBER 010-341-706
CIVIC ADDRESS 3622 Liverpool Street
Port Coquitlam, B.C.



THESE PLANS ARE TO BE BUILT
IN ACCORDANCE WITH BCBC 2018
EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
AND VALUES USING THE PRESCRIPTIVE METHOD
FOR CLIMATE ZONE 4 (VANCOUVER LOWER
MAINLAND & SOUTHERN VANCOUVER ISLAND)

EATON HOME DESIGNS LTD.

CUSTOM HOME DESIGNS & RENOVATIONS
#255 1488 MAIN STREET, NORTH VANCOUVER, B.C.
604-990-1107 CELL# 604-908-1853
eatonhomedesigns.com romanaeaton@gmail.com

NELSON RESIDENCE	SCALE: 1/8" = 1'-0"
3622 LIVERPOOL STREET	PREPARED BY: REATON
FEBRUARY 2020	SHEET # SITE PLAN



THESE PLANS ARE TO BE BUILT
IN ACCORDANCE WITH BCBC 2018
EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
AND VALUES USING THE PRESCRIPTIVE METHOD
FOR CLIMATE ZONE 4 (VANCOUVER LOWER
MAINLAND & SOUTHERN VANCOUVER ISLAND)



SPATIAL SEPARATION
WALL AREA: 459 SQ. FT.
LIMITING DISTANCE: 10' (2M)
PERMITTED OPENINGS: 21.5%
PROPOSED OPENINGS: 21.80 FT. (6.63M)

LEGAL RESPONSIBILITY AND THE DESIGN AND BUILD CONTRACT ALL INFORMATION MUST BE GIVEN AND DURING CONSTRUCTION THE DESIGNER HAD NEITHER THE LEGAL ABILITY NOR RESPONSIBILITY TO PROVIDE THIS INFORMATION AND CONSULTING.

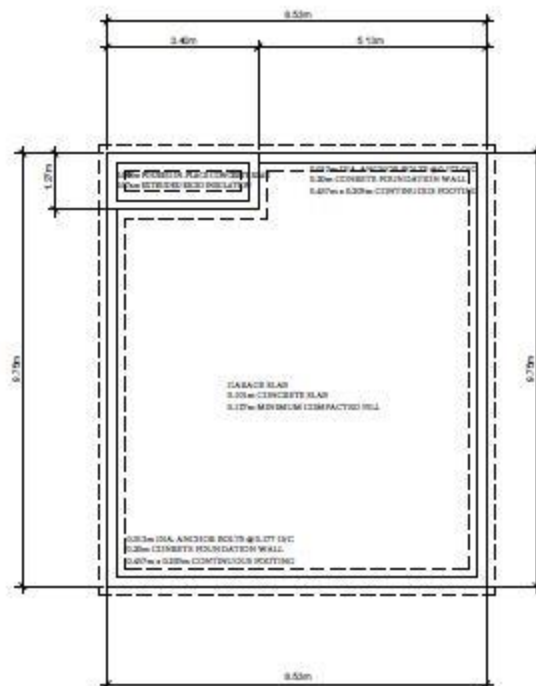
NELSON RESIDENCE SCALE: 1/8" = 1'-0"

EATON HOME DESIGNS LTD.

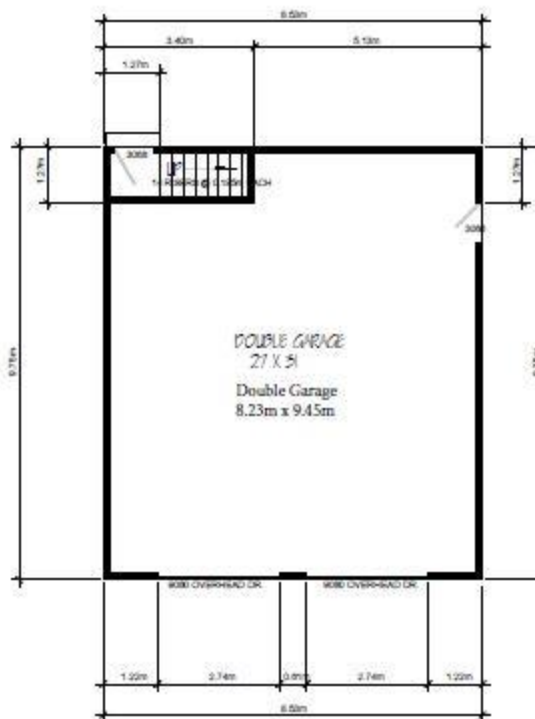
CUSTOM HOME DESIGNS & RENOVATIONS
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604-990-1107 CELL# 604-908-1853
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NELSON RESIDENCE	SCALE: 1/4" = 1'-0"
5622 LIVERPOOL STREET	PREPARED BY: REATON
	SHEET #
FEBRUARY 2020	1 of 4

EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
AND VALUES USING THE PRESCRIPTIVE METHOD
FOR CLIMATE ZONE 4 (VANCOUVER LOWER
MAINLAND & SOUTHERN VANCOUVER ISLAND)
HRV SYSTEM WILL NOT BE INSTALLED

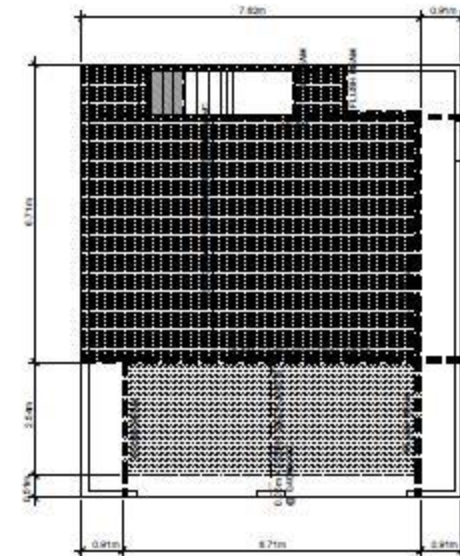


FOUNDATION PLAN



LOWER FLOOR PLAN

GARAGE AREA: 896 SQ.FT.
Garage Area: 83.24 SQ.M



FRAMING PLAN FOR UPPER FLOOR

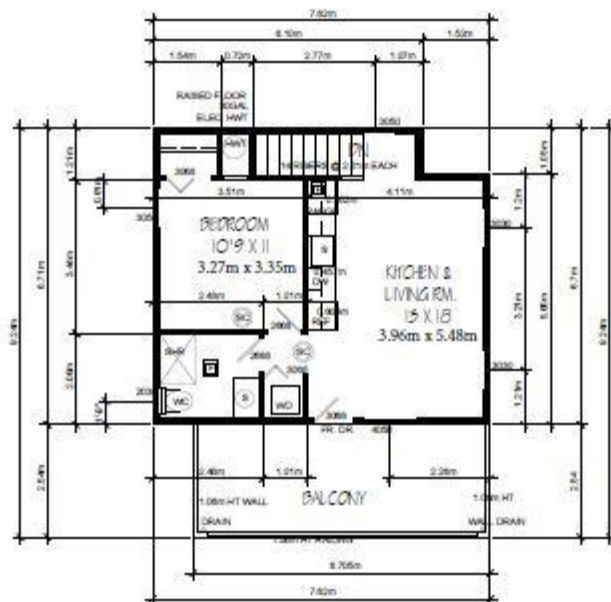
THESE PLANS ARE TO BE BUILT
IN ACCORDANCE WITH BCBC 2018
EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
AND VALUES USING THE PRESCRIPTIVE METHOD
FOR CLIMATE ZONE 4 (VANCOUVER LOWER
MAINLAND & SOUTHERN VANCOUVER ISLAND)

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NELSON RESIDENCE	SCALE: 1/4" = 1'-0"
5622 LIVERPOOL STREET	PREPARED BY: REAYON
DATE: FEBRUARY 2020	SHEET #
	2 OF 4

- EXHAUST FAN
SMOKES & CARBON MONOXIDE
DETECTOR



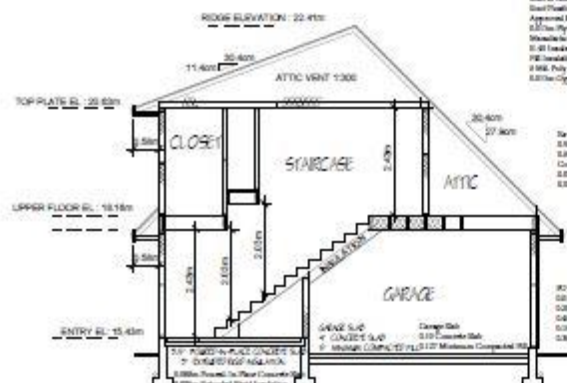
COACH HOME

FLOOR AREA: 655 SQ.FT. Floor Area: 49.5 SQ.M
BALCONY AREA: 185 SQ.FT. Balcony Area: 17 SQ.M

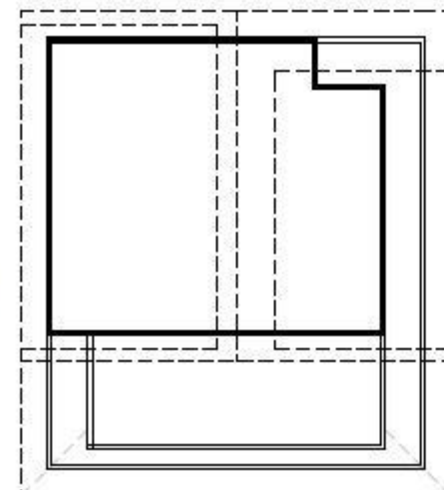
SEE ONE SHEETING
REINFORCED CONCRETE FOUNDATION
60 Year Life Span - 40 Year Design Life

THESE PLANS ARE TO BE BUILT
IN ACCORDANCE WITH BCBC 2018
EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
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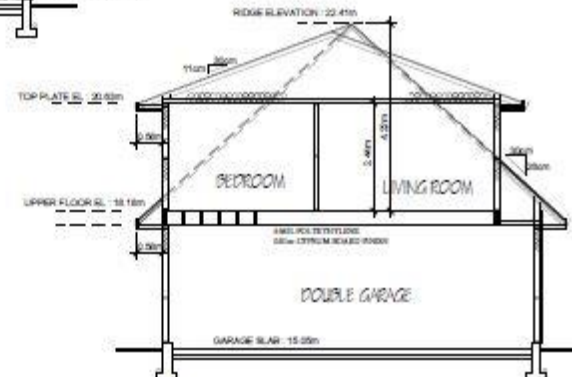
EFFECTIVE ENERGY REQUIREMENTS
THIS HOME IS TO BE BUILT TO COMPLY
WITH ENERGY EFFICIENCY REQUIREMENTS
AND VALUES USING THE PRESCRIPTIVE METHOD
FOR CLIMATE ZONE 4 (VANCOUVER LOWER
MAINLAND & SOUTHERN VANCOUVER ISLAND)
HVAC SYSTEM WILL NOT BE INSTALLED



CROSS SECTION - A



ROOF LAYOUT



CROSS SECTION - B

BC CLIMATE ZONE 4	
ORGANIC BUILDING ASSEMBLY	MINIMUM EFFECTIVE R-VALUE
CEILING (ON ATTIC)	4.00
CEILING (ATTIC TO GARAGE)	4.00
CEILING (GARAGE TO ATTIC)	2.00
CEILING (GARAGE TO GARAGE)	2.00
FLOOR (ON ATTIC)	4.00
FLOOR (ON GARAGE)	4.00
FLOOR (GARAGE TO GARAGE)	2.00
WALL (ON ATTIC)	4.00
WALL (ON GARAGE)	4.00
WALL (GARAGE TO GARAGE)	2.00
WALL (ON ATTIC)	4.00
WALL (ON GARAGE)	4.00
WALL (GARAGE TO GARAGE)	2.00

WINDOWS & DOORS: U-1.10
DOOR: U-1.10
GLASS BLOCK: U-1.10
GLASS BLOCK: U-1.10

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5622 LIVERPOOL STREET	PREPARED BY: RENON
	SHEET # 3 OF 4
DATE: FEBRUARY 2020	



CEILINGS BELOW ATTIC SPACES

Technical drawing of a roof cross-section showing insulation and ventilation details. The drawing includes the following labels:

- TALUSSE: 0.03m C.C.
- 0.05m X 0.10m BOTTOM CHORD
- 0.03m AIR SPACE FOR VENTILATION
- 0.03m RIGID INSULATION
- RS 552

BEHIND / AROUND PLUMBING STACKS & ELECTRICAL OUTLETS

A cross-sectional diagram of a cable assembly. It shows a central conductor surrounded by insulation, which is then encased in a braided shield. Labels include 'ELECTRICAL BOX' pointing to the central conductor, 'FLUOROPOLYMER' pointing to the insulation layer, and 'RIGID INSULATION' pointing to the braided shield layer.

** FOUNDRYING IN DUTCH WALL FOR ELECTRICAL CABLES, SPINDLE PINS
OR CABLES AND TO MAKE AIRBURN IN SOLAR AND DUTCH OR CABLES IN COMPACT
AND DUTCH TO SOLAR AND DUTCH. ** DUTCH INSULATION, REQUIRED FOR
THE DUTCH AIRBURN + DUTCH AND DUTCH AND THE DUTCH DUTCH

[illegible]

** WINDRES DOORS & STAIRS ARE INSTALLED TO THE EXTERIOR WALL FACES THE EFFECTIVE THERMAL INSULATION AND AIR TIGHTNESS MUST BE MAINTAINED BY THE EXTERIOR WALL STRUCTURAL MEMBERS OF THE DOOR OR STAIRS ARE TO BE INSTALLED ON AN EXTERIOR JOINTED WALL
 ** EFFECTIVE INSULATION OF CEILING, WALLS AND FLOORS MUST MEET THE REQUIREMENTS OF TABLE BSCB 9.36.2.6.A AND TABLE BSCB 9.36.2.6.B FOR THE CORRESPONDING CLIMATE ZONE
 ** THERMAL CHARACTERISTICS OF WINDOWS, DOORS AND SKYLIGHTS MUST MEET THE REQUIREMENTS OF TABLE BSCB 9.36.2.7.A, 9.3.6.C FOR THE CORRESPONDING CLIMATE ZONE
 ** EFFECTIVE INSULATION OF FOUNDATIONS MUST MEET THE REQUIREMENTS OF TABLE BSCB 9.36.2.8.A OR B
 ** FOR THE CORRESPONDING CLIMATE ZONE
 ** THERMAL INSULATION OF THE THERMAL ENCLOSURE ARE TO BE SEALED AND INSULATED TO THE EXTERIOR WALL INSULATION AS REQUIRED
 ** CHIMNEYS ARE TO BE INSTALLED AT AIR INTAKES AND EXHAUSTS IMAGING REQUIRED
 ** PIPING FOR HEATING AND COOLING SYSTEMS LOCATED WITHIN THE THERMAL ENCLOSURE ARE TO BE FULLY INSULATED
 ** HVAC EQUIPMENT MUST BE LOCATED WITHIN THE THERMAL ENCLOSURE OR BE SPECIFICALLY DESIGNED TO BE INSTALLED OUTSIDE THE THERMAL ENCLOSURE
 ** TEMPERATURE CONTROLS ARE TO BE INSTALLED ON ALL HEATING AND COOLING EQUIPMENT & MUST BE ACCURATE TO ± 5 DEGREES
 ** HVAC AND SERVICE WATER HEATING EQUIPMENT MUST MEET MINIMUM PERFORMANCE REQUIREMENTS FOR TABLE BSCB 9.36.3.1 AND BSCB 9.36.4.2
 ** WHEN SPILL ARE TO BE INSULATED AT THE STORAGE TANK INLET AND OUTLET FOR A DISTANCE OF 30 WITH 120MM THICK INSULATION
 ** WHEN MAIN ARE TEMPERATURE CONTROLS
 ** WHEN MAIN ARE NOT TIGHTER WITH A SURFACE AREA OF MORE THAN 700 CM² MUST HAVE A COVER WITH A MIN. THERMAL RESISTANCE RATING OF RSI 2.1 (R-12) IN
 ** HOMES WITH INDOOR POOLS OR HOT TUBS MUST INSTALL HEAT RECOVERY SYSTEMS OR EXHAUST FANS

RE CLIMATE ZONE 4	
CRACKLE BUILDING ASSEMBLY	MEAN EFFECTIVE U-FACTOR
GLASS FRONT FINE	4.05
CORNER, DOUBLE GLASS	4.87
GLASS DOOR	2.58
OUTSIDE WALL - 100% GLASS	2.70
OUTSIDE WALL - 40% TO 100% GLASS	2.70
FLOOR OVER HOT WATER RADIANT	4.97
FLOOR OVER HOT WATER RADIANT	4.93
FOUNDATION WALLS (GLASS) 100%	1.98
ROOF (GLASS) 100%	2.25
GLASS DOOR IN CORNER	10.00
WALL DOOR	3.00
WALL GLASS 100%	2.00

WINDOWS & DOORS - U-FACTOR	1.80
FRONT DOOR - U-FACTOR	2.80
GLASS BLOCK - U-FACTOR	2.80

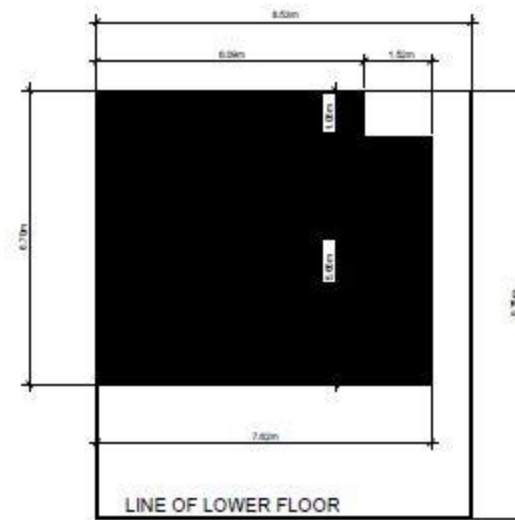
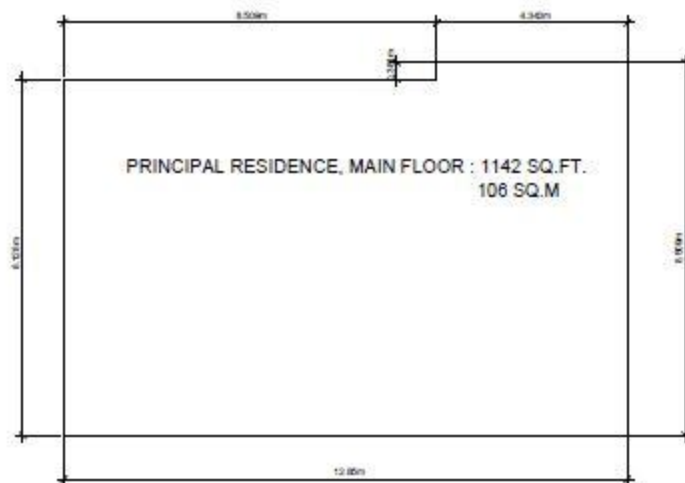
DESCRIPTION	DESCRIPTIVE RISK VALUES
0.30 WATT IRRADIATION IN 0.05m x 0.15m MEDICAL IMAGING @ 0.40m CAC (10)	R5 2nd 0.6-0.8
$\frac{25}{125} = \frac{25}{125}$ (Catching the ball)	
10% TYPICAL A.D. TEAM 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000) 0.50 WATT PERMANENT BEAM (1000)	0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05
10% TYPICAL A.D. TEAM	R5 2nd 0.6-0.8
10% TYPICAL A.D. TEAM	R5 2nd 0.6-0.8

* ALL LINKS AND REFERENCES BETWEEN EXTERNAL AND INTERNAL SPACES MUST BE IDENTIFIED BY SPECIFIC COMPONENTS OR ALIQUOTS AND PARTS OF COMPONENTS OF THE ARCHIVES MUST BE IDENTIFIED THROUGH THE AUTHOR ON THE WALL.

DESCRIPTION	EFFECTIVE RSE VALUE
100% 1/2" RIB FLOOR WITH #4 @ 18" O.C. 2" X 10" DEPRESSION IN CAVITY	0.40
CONTIGUOUS ELEMENT AS PER SECTION RETURN TO SLAB	0.02
ANCHOR BOLTS 2" X 10" RIB FLOOR	0.04
2" X 10" RIB FLOOR	0.06
2" X 10" RIB FLOOR	0.06
TOTAL EFFECTIVE AREA IN SQ. FT.	65.425
MINIMUM PERMITTED AREA 2500 SQ. FT. 5.000 SQ. FT. AREA (25%)	25.000

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NELSON RESIDENCE	SCALE: 1/4" = 1'
3622 LIVERPOOL STREET	PREPARED BY: REATON
RECEIVED 2000	SHEET # 4 OF 4



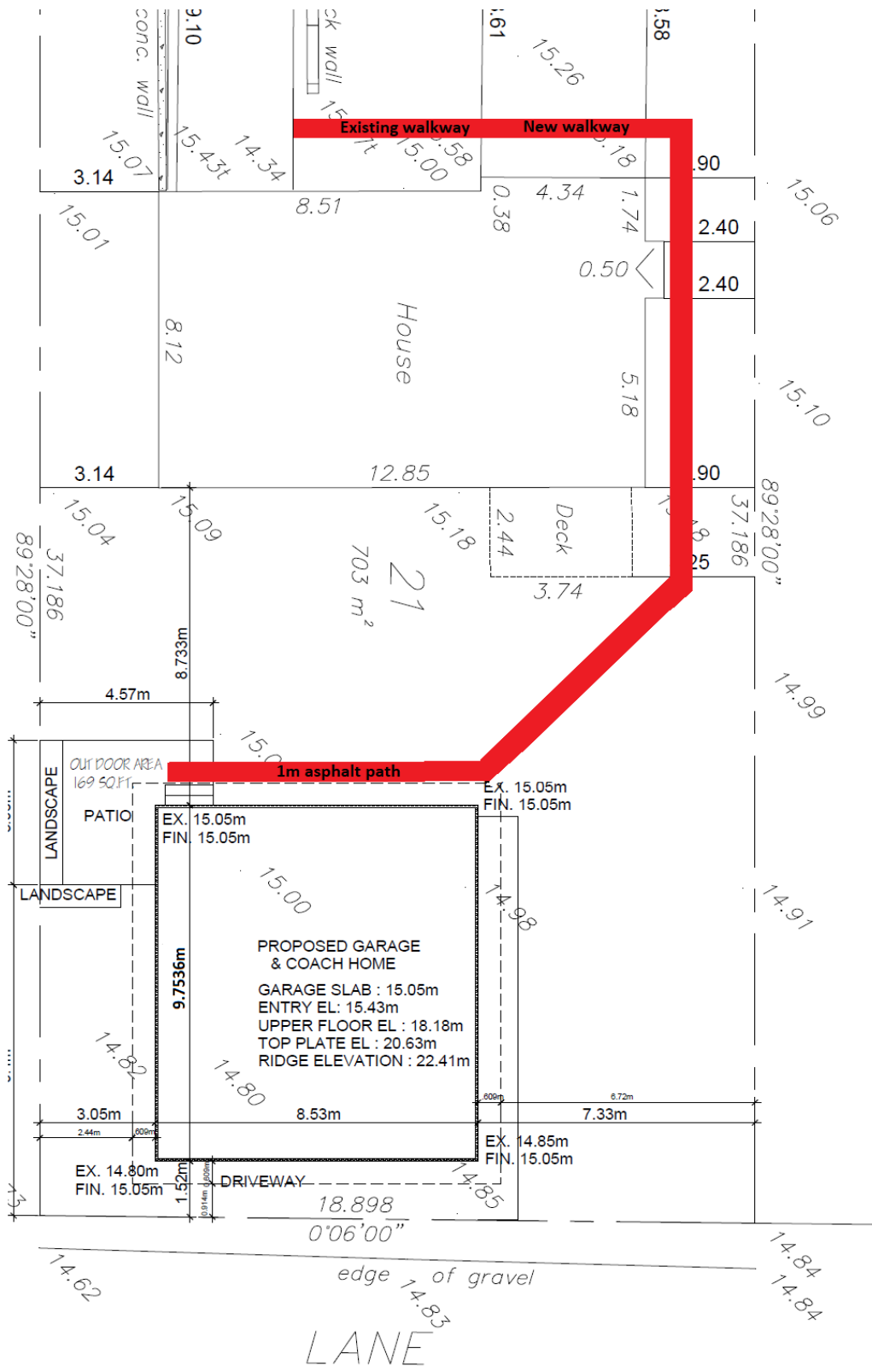
AREA OF LOWER FLOOR : 8.53m X 9.75m = 83.2 SQ.M.
MAXIMUM PERMITTED UPPER FLOOR : 60% = 49.94SQ.M.
PROPOSED UPPER FLOOR : 49.517 SQ.M. (59.4%)

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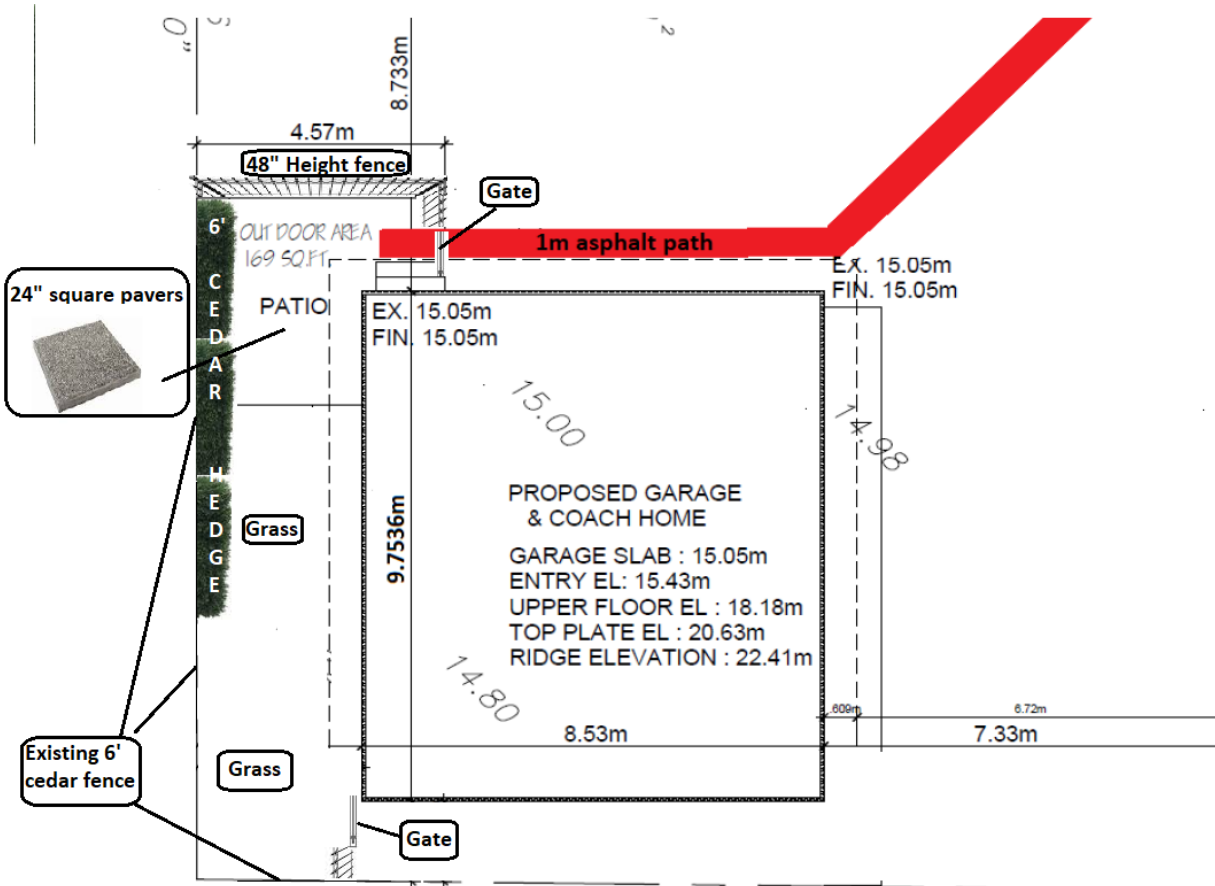
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5622 LIVERPOOL STREET		PREPARED BY: REASON
		SHEET #
DATE:	FEBRUARY 2020	

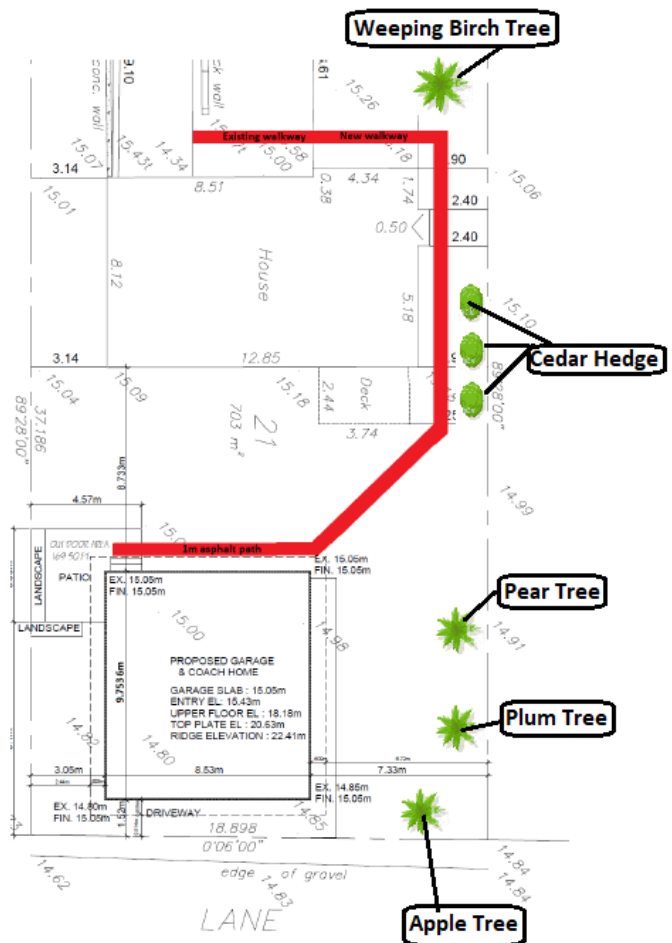
1m Asphalt Path, 3622 liverpool



Coach House Outdoor Area



Existing Trees on Property



Schedule A

Energy Conservation:

Conservation Measure	Verification Method
Location and size of windows to increase opportunities for natural ventilation and distribute natural daylight into interior spaces	DP and BP stage; staff review of building plans
Energy Star rated appliances	BP stage; written confirmation by applicant along with staff review of BP submission

Water Conservation:

Conservation Measure	Verification Method
Drought-tolerant and indigenous tree, shrub, and plant species and other xeriscaping techniques.	DP and BP stage; staff review of building plans

GHG Reduction:

Conservation Measure	Verification Method
Adequate storage space for garbage, recycling and organic materials shall be provided in easily accessible, secure locations.	DP and BP stage; staff review of building plans

per OCP Sec. 9.11 Environmental Conservation DPA designation

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

RECOMMENDATIONS:

1. That Committee of Council, having given consideration to s.475 of the *Local Government Act*, confirm the following consultation for the proposed Official Community Plan amendment:
 - a. on-site signage,
 - b. the applicant's consultation with the community, and
 - c. consideration of the application by Committee of Council in open meetings.
2. That Committee of Council recommend to Council that:
 - a. The Official Community Plan land use designation for the site be amended from Townhouse Residential (RT) to Neighbourhood Commercial (N);
 - b. The zoning be amended from Single Residential RS1 to a Comprehensive Development zone that includes the following provisions:
 - i. Ground floor community commercial uses, to a maximum of 1,360m²
 - ii. A minimum of 16 townhouses and up to 121 apartments, with a provision of density bonus in the amount of \$50 per square foot for residential floor area proposed in excess of 6,592 sq m (70,950 sq ft), excluding the density associated with any non-market rental units;
 - iii. A minimum of 1,290m² of outdoor amenity area and 274m² indoor amenity area, including an outdoor children's play space, common outdoor dining area(s), common indoor cooking area(s), common indoor gym(s) and common indoor workspaces.
 - iv. Private balcony or deck for each residential unit with a minimum depth of 1.8 M (6 ft).
 - c. Prior to adoption of the amending bylaws, the following conditions be met to the satisfaction of the Director of Development Services:
 - i. Purchase and closure of Prince Street;
 - ii. Completion of a Housing Agreement to secure a minimum of 10 dwelling units as non-market rental housing;
 - iii. Registration of legal agreements to ensure the development is designed and constructed as follows:
 - in accordance with the recommendations of the acoustical study;
 - built to either a LEED® Silver standard or equivalent per the BC Energy Step Code;
 - iv. Submission of securities and fees for off-site works and services including reconstruction of the full width of Harbour Street, a right-in/right-out vehicular restriction on Pitt River Road, and pedestrian improvements.
 - v. Completion of a subdivision plan to the satisfaction of the Approving Officer.

REPORT SUMMARY

This report provides for Committee consideration of an application to rezone a 2.37-acre site to permit a comprehensive development for a mix of apartments, townhouses and commercial uses. This site is currently designated in the Official Community Plan (OCP) for townhouse uses and amending the land use designation of the OCP would be required to facilitate rezoning for the proposed development. The report recommends a number of conditions be

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

required prior to consideration of bylaw adoption, including closure and sale of Prince Street, a Housing Agreement to ensure adherence to the City's Affordable and Family Friendly Housing Policy, and a legal agreement to ensure the development is constructed to adhere to CMHC residential acoustic standards and achieve a high level of energy performance.

PRIOR RESOLUTIONS:

On September 4, 2018, the following resolution was passed:

That the Smart Growth Committee direct staff that the early consultation required for further consideration of an application to amend the Official Community Plan at 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road include the following:

- 1) *on-site signage;*
- 2) *hosting an open house to obtain public comment on the proposed development; and*
- 3) *informing School District 43 of the proposal.*

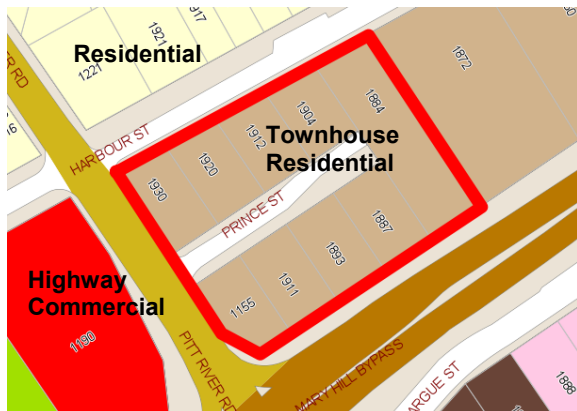
BACKGROUND

Proposal: The owner of the properties located at the corner of Pitt River Road and the Mary Hill Bypass, 393 Cathedral Ventures Inc., has submitted an application to redevelop the site for a mixed-use development that would include apartment units and townhomes along with commercial space.

Site Context: The 9,591m² (2.37 acre) site is bounded by Mary Hill Bypass, Pitt River Road and Harbour Street; Prince Street runs through the middle of the site and would need to be closed and consolidated should the development proceed. The site is currently vacant of structures and gently slopes south. To the north of the site are a mix of older and newer single residential homes, and townhouse complexes have been developed to the east. A gas station is located to the west of Pitt River Road and a mix of marine oriented, commercial and multi-family residential uses are located to the south of the Mary Hill Bypass.



Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road



Location Map Official Community Plan Designations

Policy and Regulations: The vacant site is currently designated Townhouse Residential (RT) in the OCP, a designation that would support a townhouse development with a density of approximately 43 units. The properties are currently zoned RS1, Single Residential.

The proposed mixed use development would be subject to the Commercial, Intensive Residential and Environmental Conservation

development permit area designations of the OCP. The applicant has not yet submitted a Development Permit application.

The City's Density Bonus policy provides for the City to retain the additional land value achieved by the rezoning and Official Community Plan amendment to put towards social housing and community amenities. The City's Affordable and Family Friendly Housing Policy requires that 10% of any additional residential density be secured as non-market rental housing.

Project Description: The applicant has proposed a mixed use development that would include approximately 1,353m² (14,566ft²) of commercial space at grade, three 4-storey apartment buildings with a total of approximately 121 apartment units, and 16 townhouse units built over a common parkade.

The building massing is proposed to be divided into four separate building areas with a large central landscaped courtyard/roadway area. The proposed development includes:

- A four-storey residential building on the south-east corner of the site adjacent to Mary Hill Bypass providing for approximately 50 residential units (Building 'A');
- A four-storey mixed use building on the corner of Pitt River Road and Mary Hill Bypass providing for approximately 39 residential units, plus 596m² (6,410ft²)



Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

- in 3 commercial units (Building 'B');
- A three and four-storey mixed use building on the corner of Pitt River Road and Harbour Street providing for approximately 41 residential units plus 758m² (8,157ft²) in 6 commercial units (Building 'C'); and
- Two townhouse buildings on the north-east corner of the site containing 16 three-storey units in total.
- A two level underground parkade providing 279 parking stalls for residential, commercial and visitors, along with 14 parking stalls for commercial uses provided at grade.
- A central common amenity space on the 2nd floor between the buildings which includes natural play elements for children, a landscaped cultural display as well as areas for seating and picnicking.

The main commercial frontage of the development is along Pitt River Road, with street oriented commercial uses fronting Pitt River, wrapping around the corners of Mary Hill Bypass and Harbour Street and continuing along an internal roadway towards the interior landscaped courtyard. The vehicular accesses include full access on Harbour Street and a restricted access on Pitt River Road, connecting to an internal roadway providing access to at-grade commercial parking, short term residential visitor parking, as well as access to the common underground parkade and the lobbies for the residential buildings.



Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road



VIEW FROM CORNER PITT RIVER ROAD AND HARBOUR STREET

A three storey building massing with individual, street-level access to apartment units and townhomes is proposed along the Harbour Street stretch to reflect the adjacent existing single family and townhome residential. The buildings along Mary Hill Bypass are oriented towards the internal courtyard to reduce impacts of traffic noise and vibrations.

The applicant advises the residential units will provide a wide range of options for families, with apartment units ranging in size from one to three bedrooms and 3 bedroom townhomes. Each building would include indoor amenity areas and have access to the common outdoor amenity space; each townhouse unit would be provided with an elevated garden plot.

The inner courtyard area of the site has several defined outdoor amenity areas, including gathering spaces and play areas for the residents that take advantage of the south facing orientation and views. All residential units above the courtyard have large decks to increase livability of the units and add interest to the massing of the buildings.

The proposed parking and loading is in keeping with the Parking and Development Management Bylaw. Residential parking is contained within the parking structure and secured separately from the commercial and visitor parking areas. All loading and garbage areas have been internalized within the site.

The applicant describes the architectural character as a West Coast modern contemporary approach with generous fenestration, use of natural materials and quality cladding materials. Further details and an analysis of the proposal's compliance with the objectives and guidelines of the development permit area designations would be provided in consideration of a Development Permit.

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

Retail Impact Assessment (Attachment 2): To support the proposed commercial uses, the applicant submitted a retail impact assessment which assessed the anticipated trade area for the proposed retail space, identified the recommended commercial mix and evaluated the impact of these commercial uses on other commercial districts in the City, particularly the downtown. In summary, the assessment concluded there will be sufficient market demand to support the retail commercial on the site with “little to no impact on Downtown Port Coquitlam” as the diverse mix of shops and services in the downtown is resilient and relies on an extensive trade area outside the immediate Port Coquitlam region. The assessment further noted the Downtown is less reliant on the trade area around the proposed development, as these Port Coquitlam residents tend to shop on their commute home, often within other communities.

The assessment noted that over 4,000 residents live within a 10 minute walk to the site and a limited amount of community oriented commercial on site would meet the needs of this community for local shops and services. The types of commercial business suggested by the assessment to meet the demands of this trade area includes personal care establishments, recreation facilities, restaurants, daycares, and retail sales of household and lifestyle goods – such as furniture, sporting goods, hobbies and home furnishing. Larger retail stores, pharmacies, banks, automotive uses and drive through establishments were not recommended.

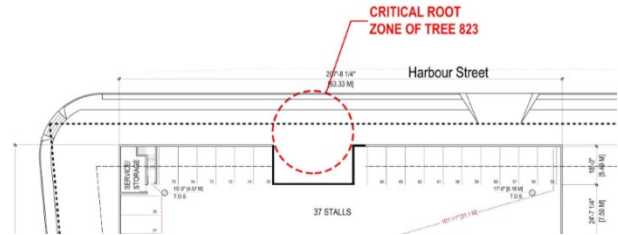
The applicant has advised they would focus on commercial uses that provide neighbourhood scale and oriented services, such as eating establishments, food and beverage, home furnishing, leisure retail, recreation and spa type uses. A Comprehensive Development Zone would reference uses permitted in the Community Commercial zone, with specific exclusions in keeping with the recommendations of the retail assessment (regionally serving uses such as large retail and financial institutions; offices, automobile-oriented uses)

Acoustical Study (Attachment 2): The applicant submitted an acoustical study which assessed traffic noise levels and impacts to the units in proximity to the Mary Hill Bypass/Pitt River Road intersection as well as the outdoor spaces. The assessment concluded that suites adjacent to the Mary Hill Bypass should include acoustically rated windows and doors, exterior wall upgrades such as additional layers of interior drywall, and air conditioning units (heat pumps) for the units that face onto Mary Hill Bypass (to reduce the need to open windows). The study recommended further assessment should be undertaken once the details of the building design are completed to ensure the building meets acceptable noise levels as determined by Canada Mortgage and Housing Corporation (CMHC).

Transportation (Attachment 3): The applicant submitted a transportation impact assessment which confirmed the existing road network would have the capacity to support the additional traffic from this development and did not identify the need for additional traffic mitigation or intersection upgrades; however, staff would recommend that access off Pitt River be restricted to right in right out and a concrete median installed to prevent left hand turn movements at this location. Approval from the Ministry of Transportation and Infrastructure is required prior to final adoption.

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

Trees (Attachment 4): The applicant submitted an arborist report which assessed the trees on the site, as well as those located on adjacent Pitt River and Mary Hill Bypass road-right-of way. The species of trees included pine, cedar, maple, cherry, walnut and a great number of black cottonwood and alder. The condition of the trees varied significantly from good to poor. Most of the trees were located towards the middle and south of the site, which is sloped down towards Mary Hill Bypass



The arborist report recommended retention of one tree on the subject property, a large Jeffery Pine located adjacent to the property line on Harbour Street. The proposed development has designed the outline of the building and underground parking to facilitate retention of the tree and ensure the drip line is not impacted.

The remaining on-site trees are to be removed as they conflict with the footprint of the development. In addition, the report notes that four trees within the City's right of way on Pitt River Road will be impacted by the offsite road improvements and will need to be removed.

Any significant trees that are removed will be replaced at a ratio of 2:1; all other trees will be replaced at a ratio of 1:1. The details of the tree replacement scheme will be confirmed through submission and review of a Development Permit application.

Infrastructure: Offsite requirements for the development is recommended to include reconstruction of Harbour Street (1/2 road plus 1 meter plus and a mill and overlay of the north half of Harbour) to ensure the additional traffic can be accommodated; reconstruction of Pitt River Road (1/2 road plus 1 meter) including a bike lane and 1.8 metre wide sidewalk; installation of a RRFB (pedestrian flashing beacon) at the Pitt River/Harbour intersection to ensure adequate pedestrian safety; a streetlight at the north/south east corner of the Harbour/Pitt intersection to light the intersection and the east half of the crosswalk and removal of the existing crosswalk on the north leg to encourage pedestrians to cross at the safest point.

Energy Efficiency: The applicant has proposed that the project would be designed to meet or exceed a LEED® Silver level. This program requires buildings to be energy and water efficient, promotes indoor air quality and efficient use of resources. As an alternative, the development could be designed to achieve a higher level of the Step Code.

Archeology: The BC Archeology Branch has identified the site as being in proximity to a known archaeological site. The applicant advised they have met archaeological assessment and permit

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

requirements from the Branch; confirmation from the Branch will be required prior to issuance of a Building Permit.

Affordable and Family Friendly Housing Policy: The applicant's proposal provides for 103 additional residential units and compliance with the City's Affordable and Family Friendly Housing policy requires the provision of 10 non-market rental units.

The applicant has instead proposed a homeownership assistance program as an alternative to providing 10 non-market rental units (Attachment 5). The proposal provides 4-6% of the purchase price as a down payment for up to 30 qualified purchasers. The conditions of the program end 3 years after initial occupancy, or less if the original purchaser sells their unit within 3 years of initial occupancy. The proposal provides that the owner would pay a percentage of the down payment assistance to the City for its Social Housing amenity fund should they sell before the end of the 3 year occupancy. The program does not extend beyond the three years or to new purchasers after the original purchase of the unit, which does not meet the objectives and intent of the Policy.

Density Bonus Policy: The City's Density Bonus policy requires a density bonus payment equal to the land lift associated with this additional residential density. Past practice provided for the value of density bonus payments be determined through an appraisal after third reading and submitted prior to adoption of the amending bylaw.

The recommended best practices for establishing density bonus or community amenity contributions is to provide a standardized and established value as a provision in the zoning bylaw amendment. In keeping with this advice, the City has moved forward with a standardized approach of \$50 per sq. ft. of residential density that exceeds density thresholds provided in the OCP and/or Zoning, excluding any density used to construct non-market rental units. This approach has been used for many years in the downtown and provides for consistency and transparency in establishing density bonus payments. The amount was reviewed in 2019 and confirmed the amount was an appropriate balance of providing a development incentive while ensuring the community was receiving a public benefit from the additional density. It also eliminates the significant concerns the City has had pertaining to the assumptions, accuracy and thoroughness of appraisals which have been submitted by applicants to establish a density bonus payment. Using this approach, the estimated value of the increased density for this application would amount to approximately \$2,300,000 (assuming a base density of 43 townhouse units, each averaging 1650 sq. ft.).

The applicant has noted concern (Attachment 6) with the City's standardized approach, advising that when they applied for the development, they had assumed a land lift value of \$1,254,000 (\$27/ sq. ft.). They suggest the value of the additional density for this site should be lower than elsewhere in the City, and that when combined with the value of the affordable home ownership program, a \$21/ sq ft value is reasonable. This would amount to approximately \$957,000.

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

DISCUSSION

The OCP and various City policies establishes how the community is intended to develop as well as designates lands for uses in keeping with these policies. An evaluation of the proposal with the applicable policies indicates:

- The OCP's existing designation of this site for townhouses reflects policies that look to meeting the community's significant demand for ground-oriented housing. In retaining 16 townhouse units within the residential housing mix, the proposal responds in part to these policies, as well as the direction of providing family friendly units which are a minimum of 2 bedrooms in size and have a den or direct access to private outdoor space.
- The Plan supports locating apartment buildings in urban centres close to community services and transit. While this site is not within a designated urban center, the property does have access to the 791 line bus service, is easily accessed off Mary Hill Bypass and is in proximity to other multi-family developments, the Traboulay Poco Trail and existing commercial uses.
- The Plan provides that residential units should be buffered from negative impacts. The impact of traffic noise from Mary Hill Bypass could be reduced by a combination of maintaining sufficient setbacks from the highway and implementation of acoustical measures. The higher built form on the site will act as a noise buffer to the adjacent existing residential areas from the traffic noise.
- The variation in outdoor amenity spaces (including child and family oriented) responds to policies for both private and shared amenity spaces in multifamily developments and intends to mitigate distance to other public park space. The recent COVID-19 situation has highlighted the need for residents to have access to private outdoor space and staff recommend all units be provided with this amenity.
- The proposal for adding additional commercial space in this area is supported by the retail study which indicates that there is market demand for local commercial type uses in this area. A proposal to locate local commercial uses in this area will create a destination that is easily accessible by neighbourhood residents walking or biking and will serve the new residents which is keeping with OCP policies which support the development of small pedestrian-oriented neighbourhood commercial sites to serve neighbourhoods.
- Staff do not recommend accepting the request to deviate from the City's Affordable and Family Friendly Housing Policy to provide a home-ownership program. This proposal does not meet the intent of this policy or OCP direction as the proposed program does not include affordability (i.e. income level) in its selection criteria, nor does the proposal provide for continued affordability measures beyond 3 years of occupancy. It would also require the City to monitor occupancy and sales data during the construction of the project and in the 3 years following occupancy to ensure the commitments are being met. In staff's opinion, compliance with the Policy by dedicating 10 units as secure non-market rental units better meets the City's objectives to encourage the provision of affordable housing, particularly to

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

low and mid-income families. These units would be secured in perpetuity through registration of a housing agreement prior to bylaw adoption and would be administered through a social housing provider, limiting the need for further municipal involvement. Further, compliance with City policies would ensure a mixture of unit sizes and ensure a minimum number of Family Friendly housing units as per the Policy.

- Staff recommend an established rate of \$50 per square foot for the requested additional residential density. This value is consistent with the approach being taken in other areas of the City when a density bonus is proposed, will ensure funds are available to support new community amenities and social housing in the community. Staff have not been provided with any evidence to support the assertion that land value associated with this development are significantly decreased over other areas of the City. The applicant would not be required to pay density bonus value for the floor area used to construct the non-market units.
- Closure and purchase of Prince Street is required in order for the applicant to construct the development as proposed and staff support the request. The value of Prince Street would be established by an appraiser on the City's behalf based on highest and best use, excluding the value associated with an established density bonus payment. The existing servicing would be removed and relocated as necessary.
- Additional offsite requirements necessary to support the development including reconstruction of the full width of Harbour Street, a right-in/right-out vehicular restriction on Pitt River Road, and pedestrian signalization and mobility improvements on Pitt River Road..

On balance, staff support the proposal with the following recommended conditions:

1. A housing agreement to secure at least 10 non-market rental housing units to be managed by a social housing provider with a range of bedroom mixes and to be constructed in the first phase of the project.
2. The CD zone to include:
 - a. A minimum of 16 townhouse units and a maximum of 121 apartment units;
 - b. Density bonus provision of \$50 per square foot for all residential density over 6,592 sq m (70,950 sq ft) , excluding the density associated with any non-market rental units;
 - c. The provision of a minimum of 1,290m² of outdoor amenity area and 274m² indoor amenity area;
 - d. Commercial uses in keeping with the Community Commercial (CC) zone, with limitations as noted by the retail consultants; and
 - e. Private outdoor patio or balcony space provided for each residential unit with a minimum depth of 1.8 m (6 ft).
3. Registration of legal agreements to ensure:
 - a. Development in accordance with the recommendations of the acoustical study; and
 - b. built to either a LEED® Silver standard or equivalent per the Energy Step Code.

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

4. Offsite requirements to include identified measures to support vehicular and pedestrian mobility.

FINANCIAL IMPLICATIONS


Density Bonus payments would be split between the Community Amenity and the Social Housing Amenity funds. Funds from the sale of Price Street would go into the Land Sale Reserve.

PUBLIC CONSULTATION

A development sign was posted facing Pitt River Road. The applicant team has conducted several open houses and have submitted summary reports on these consultation activities (Attachment 7). Responses have ranged from support for the project to concern regarding traffic and parking, and some respondents who do not support the change in use.

Staff have received additional remarks from the public outside of these Open House comments concerning the height of the development, traffic impacts and fit with the neighbourhood. The public hearing would provide a formal opportunity for Council to hear comments from the community on the proposed amendments. Due to social distancing requirements, this public hearing would be held virtually.

OPTIONS

#	Description
1 	Recommend to Council that the Official Community Plan and Zoning Bylaw amendments be considered for approval.
2	Request additional information, amendments to the application, changes to recommended conditions of prior to forwarding the application to Council.
3	Defer further consideration of this application until an social distancing restrictions are lifted and an in-person public hearing can be held.
4	Recommend to Council that the application be refused.

ATTACHMENTS

Official Community Plan Application and Rezoning Application – 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

- Attachment #1: Retail Impact Study
- Attachment #2: Acoustical Study
- Attachment #3: Traffic Impact Assessment
- Attachment #4: Arborist Report
- Attachment #5: Letter from applicant re: proposed home ownership proposal
- Attachment #6: Letter from applicant re: density bonus provision
- Attachment #7: Consultation Report #2
- Attachment #8: Sept 4, 2018 Committee Report



GREYSTONE PLACE RETAIL FEASIBILITY STUDY AND ECONOMIC IMPACT STUDY

Prepared for 393 Cathedral Ventures Ltd. and
Schmidt and Associates Development Planning Ltd.

October 2018

DRAFT

Prepared by:
Three Sixty Collective and
Harris Consulting

October 28, 2018

Garry Peters
393 Cathedral Ventures Ltd.

and

Mr. Laurie Schmidt
Schmidt and Associates Development Planning Ltd.
Port Coquitlam, BC

Dear Mr. Peters and Mr. Schmidt,

Re: Retail Feasibility Study and Economic Impact Assessments – Greystone Place, Port Coquitlam

Three Sixty Collective and Harris Consulting are pleased to submit our Retail Feasibility Study and Economic Impact Study, which has been undertaken with respect to the Greystone Place site at Pitt River Road and Harbour St. in support of your application for a Zoning By-Law amendment in the City of Port Coquitlam.

Based on current site plan statistics, the proposed development is to include 12,000 sq. ft of retail commercial space on the ground level. It is our opinion that there will be sufficient market demand to support the retail commercial on the site with little to no impact on Downtown Port Coquitlam.

The analyses in the attached report provide our detailed study findings and conclusions.

We appreciate the opportunity to conduct this assignment on your behalf.

Best wishes



John Archer
Chief Development Officer



T H R E E
S I X T Y

collective



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1.0 INTRODUCTION

Three Sixty Collective was retained by 393 Cathedral Ventures Ltd. and Schmidt and Associates Development Planning Ltd. to undertake a Retail Feasibility Study and Economic Impact Study in support of their applications for a Zoning By-Law amendment in the City of Port Coquitlam. This amendment is being sought to permit the development of approximately 12,000 sq. ft. of new retail/service space at Pitt River Road and Harbour Street. The site is identified as Greystone Place.

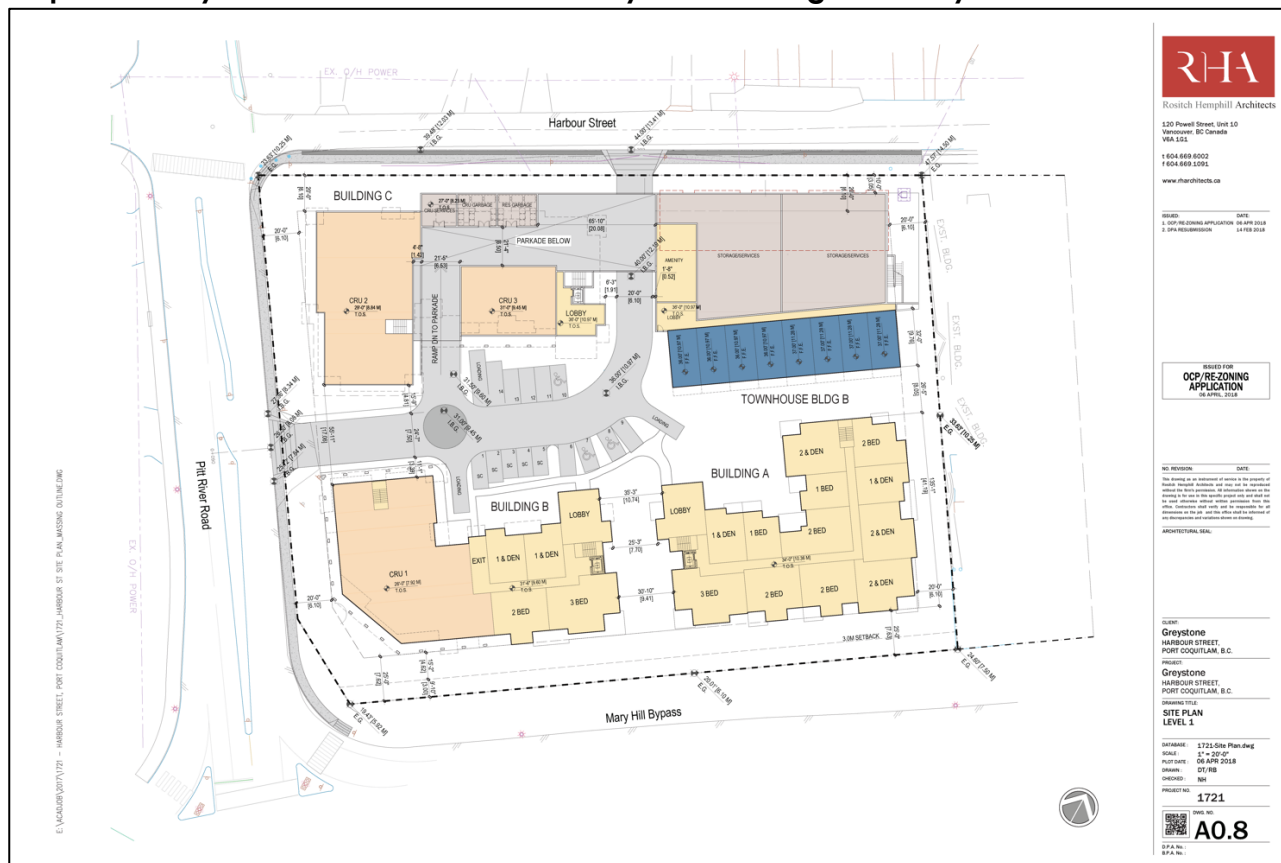
1.1 Background

Based on the current site plan statistics provided by Schmidt and Associates Development Planning Ltd., the proposed development includes the following parameters:

ELEMENT	DETAILS
Land area	0.961 HA or 2.374 Acres
Number of units	130 Apartments and 16 Townhouses
Retail Commercial	12,000 sq. ft. (approximately)
Retail Commercial Parking	37 Parking Stalls



Proposed Greystone Place Ground-Level Layout including Retail Layout



Retail Components

- The retail fronts onto Pitt River Road as well as one unit located internally on the site.
- There is approximately 12,000 sq. ft. of retail commercial space planned for this site.



1.2 Purpose

This study has been undertaken in support of Schmidt and Associates Development Planning Ltd. And 393 Cathedral Ventures Inc.'s rezoning application for Greystone Place. Given that the site is not currently zoned to include retail commercial, an economic impact study related to the site and Downtown was determined to be relevant.

The study's objectives and deliverables include the following:

Project Objectives

- Undertake a thorough strategic retail market opportunities assessment of Greystone Place in Port Coquitlam
- Conduct an economic impact assessment of Greystone Place in relation to Downtown Port Coquitlam
- Determine the key retail business plan that Greystone Place can successfully capitalize on in the future to ensure commercial growth and success

Agreed Upon Retail Commercial

The following retail commercial categories were agreed upon by the team and the City as potential businesses for Greystone Place:

- Eating establishments – limited service (e.g., café, coffee/tea, quick service eateries) and full service restaurants (e.g., sit down restaurants with waiter/waitress) but excluding any drive-through operations, bars, nightclubs, gambling
- Food and beverage – including small grocers, supermarkets, specialty food stores but excluding convenience stores, alcohol, wine, beer stores (as a main part of the business)
- Leisure retail – including sporting goods, book stores, music, and hobby stores
- Home furnishings retail – but excluding furniture and appliance stores
- Fitness and recreation – including gyms, work out centres, yoga, pilates, martial arts, dance
- Spa

Specifically excluded uses:

- Automotive and gas stations
- Home improvement, building supply
- Department store
- Travel agent
- Electronics, mobile phone store
- Bank, financial institution (but allow ATM)
- Finance, insurance, real estate
- Social services



Project Deliverables

- Trends
- Trade area review and target markets audit
- Competitive and complementary retail supply positioning including Downtown Port Coquitlam
- Demand assessment and corresponding amount and type of retail space
- Configuration of space
- Economic impact assessment of the site in relation to Downtown using a residual approach based on population growth as well as the potential for sales recapture
- Report and recommendations

1.3 Approach

The following describes the major work steps that have been undertaken by Three Sixty Collective in preparing this Retail Feasibility Study and Economic Impact Assessment.

Site Evaluation

We have examined the site and assessed its suitability for the retail and service commercial uses that are being proposed. This assessment considered such factors as ingress, egress, accessibility by vehicle and by foot, visibility, as well as the site's relationship to the surrounding existing and proposed land uses.

Policy Framework Review

We have reviewed the development application materials, Port Coquitlam Official Community Plan (OCP), Port Coquitlam neighbourhood commercial retail policies, other development applications. We have met with City staff at Port Coquitlam's planning department to review both the site's and Downtown's vision, retail context, future potential, and other competitive areas.

Trade Area Delineation

Trade areas were developed for both Greystone Place and Downtown. Downtown's trade areas were based on the 2017 Downtown Port Coquitlam Recommended Action Plan as well as a sample of over 17,000 visitors based on cell phone app data. The data was collected over a one year period from visitors who were in Downtown Port Coquitlam for at least ten minutes.



The trade area for Greystone Place has been divided into three zones in order to reflect the unique demographic characteristics and expenditure pattern of the residents. This includes a five minute walk time (400 m radius), ten minute walk time (800 m radius), and a five minute drive time.

Inventory of Existing and Proposed Competition

An inventory of ground-level and all retail commercial space in Downtown Port Coquitlam was undertaken in September 2018. This included all uses regardless of whether they were in the main retail categories being considered for the site.

In addition, nearby eating establishments, food and beverage, and fitness centre spaces within or nearby the three trade areas were identified.

The information provided details as to the level of direct or indirect competition the proposed Greystone Place would have on the Downtown.

Identification of Proposed Retail Developments

Through interviews with Schmidt and Associates Development Planning Inc. and the City of Port Coquitlam Planning Department, it was determined the major competition for the site was Downtown. Fremont Village at the Dominion Triangle was mentioned as a more urban scaled development as well. Both Downtown Port Coquitlam and Fremont Village are outside of the 5 minute drive time trade area for Greystone Place.

Dimensions of Trade Area Market

The types of residents and their expenditure patterns at Greystone Place will be different from the existing trade areas. Three proxy areas were identified including Newport Port Moody, Edgemont North Vancouver, and the ten minute walk time. An average of the three areas was used to represent the new residents who will be moving into the new housing units at Greystone Place. This includes a combination of higher income empty nesters and active seniors as well as younger families.

Our analysis included the time period 2018 to 2021 for build out and 2023 (five year time horizon). By 2023 Greystone Place will be fully built out and should be fully leased. It is noted that the retail areas may take time after the property is built to be fully leased.

Market Demand Analysis

A residual market approach was undertaken for the specific retail categories of eating establishments, food and beverage retail, home furnishings, and leisure retail.



For the three trade areas of Greystone Place, the retail demand for these categories was calculated for 2018 and 2023. The incremental growth over that five year period was determined to be the residual demand.

In addition, there is an opportunity for Greystone Place to recapture retail leakage that is not staying within the community or Downtown.

Demand was only analyzed based on local area neighbourhoods. Nearby worker target markets and the Mary Hill Bypass commuters are excluded from the analysis as potential target markets. It is recognized that these markets may contribute some business to the Greystone Place development. They are excluded from the analysis to ensure that the projections are conservative

The analysis indicates that residual demand is sufficient to support the proposed addition of retail floor space. No sales transfer from the Downtown were determined to be necessary to support the retail commercial square footage within the proposed mix of Greystone Place.

Evaluate Impacts

Based on the above analysis, we have identified any potential impacts on specific retail categories in the Downtown and determined whether the proposed retail on Greystone Place would impact the economic health of the Downtown.

1.4 Site Context

To examine the suitability of the various retail commercial uses that could be located on Greystone Place, we have examined the site in terms of its location, size, configuration, accessibility, and relationship to the surrounding land uses.

- The site is located on the east side of Pitt River Road and Harbour St.
- Pitt River Road is a major north/south road connector through the City and to B.C. Highway 7 and the Mary Hill Bypass.
- The 2.374 acre site historically had two houses.
- The west side of Pitt River Road is a gas station.
- Across from Mary Hill Bypass is the Pitt River.

Accessibility

- The site offers very good accessibility to Port Coquitlam communities in the southern part of the City. The site is accessible to the Mary Hill Bypass as well.
- The trade area for the site is truncated by the Pitt River and lack of access points across the river near the site.



Surrounding Land Uses

- The west side of Pitt River Road is a gas station.
- To the north is middle to higher income housing primarily in single detached homes.
- To the south are businesses and employment uses along the Pitt River.
- Further to the east is an employment area.
- It is noted that there is a lack of retail in the southern portion of the City of Port Coquitlam.

1.5 Retail Commercial Vision for Greystone Place and Downtown

Greystone Place Retail Vision

Based on discussions with Schmidt and Associates, 393 Cathedral Ventures Ltd., and the City of Port Coquitlam, the following vision elements for the retail commercial came forward:

1. Serve the local neighbourhood – there is a current lack of retail and quality retail in the south Port Coquitlam neighbourhoods. Providing convenience-oriented goods and services (e.g., small grocer, café, etc.) that match the higher household income profile of the existing and proposed residents will be a key determinant of success for this retail development.
2. Community building – retail can be the glue that holds a community and neighbourhood together. This site offers the potential to be the local neighbourhood community gathering spot. Community gathering is becoming a key differentiator in terms of future retail success.
3. Offer site magic and experience to the visitors – the location near the Pitt River and views out over the site can provide an enhanced experience beyond just a site that offers quality goods and services to the local neighbourhood residents.

The types of retailers that are envisioned for Greystone Place are limited to those within the eating establishment, food and beverage, home furnishings, leisure retail, and recreation and spa type fields.



Downtown Action Plan

We have reviewed the 2017 Downtown Action Plan, and strongly support its goal to support and strengthen the Downtown.

Recommendations that are relevant to the consideration of the retail commercial component of the Greystone Place development are:

1. The identification of a small increase in Downtown Port Coquitlam demand, sufficient to support the addition of about 10,000 sq. ft. of retail/restaurant space by 2021 and 32,600 sq. ft. of space by 2031.
2. The Plan recommends that Port Coquitlam avoid approving additional Downtown retail space beyond these levels to maintain critical mass on Shaughnessy and McAllister.
3. The growth should be accommodated by encouraging street-related retail and restaurant uses along Shaughnessy and McAllister. Professional and medical office should be encouraged to concentrate on Elgin Avenue or to locate on the upper floors on Shaughnessy and McAllister.
4. A retail recruitment initiative should be undertaken to attract more branded operations to the downtown including targeting a brand store to independent store ratio of 20:80 (from the current ratio of 13:87). Food and beverage services (especially upscale casual dining) and convenience retail are the prime categories with growth potential.



2.0 PLANNING CONTEXT

We have reviewed Port Coquitlam's Official Plan, Zoning By-law (By-law 3630) and Downtown Action Plan (September 2017) from the perspective of their relevance to the retail component of the Greystone proposal.

Official Plan

The site's current Official Plan designation is Townhouse Residential. Two small houses previously occupied the site. Residential uses are to the east and north along Harbour Street and a Highway Commercial Area designation (service station) is to the west across Pitt River Road. It is adjacent to the Meridian Industrial Park. Further to the east.

An Official Plan amendment designating the site for mixed use apartment, townhouse and small-scale commercial development is consistent with current trends. The permission of small-scale commercial development supports Commercial Area policy 4:

Support the development of small pedestrian-oriented neighbourhood commercial sites to serve the local population. In particular, encourage an appropriate neighbourhood commercial development in the Citadel Hill area.

Port Coquitlam's commercial priority is to reinforce the Downtown as the primary city centre with a vibrant commercial core. As is further discussed below, permitting the proposed 12,000 square feet of commercial space on Greystone Place is consistent with this policy since it would be extremely unlikely to have a discernible negative impact on the viability of downtown commercial space.

Zoning By-law

The scale of commercial uses envisioned for the site is consistent with a Neighbourhood Commercial designation. The **Neighbourhood Commercial** designation "allows for commercial uses intended to service the larger neighbourhood. Development could include retail and office uses in a building up to four storeys with residential uses above the first floor". With a site-specific exception permitting the townhouse component, this would seem to be the most appropriate Official Plan land use designation.

However, the types of uses permitted by Port Coquitlam's NC zoning is very limited and would significantly limit the role of the development in serving local residents and adding an attractive retail/restaurant opportunity to the south Port Coquitlam neighbourhood. This is illustrated in the following table which summarizes the uses permitted in the Neighbourhood Commercial and Community Commercial categories.



USE	NEIGHBOURHOOD COMMERCIAL	COMMUNITY COMMERCIAL
Apartments		✓ if above ground floor, separate entrance, indoor parking
Automobile parts sales		✓
Building and landscape supplies sales & rentals; nurseries		✓
Child Care Facilities	✓	✓
Cinemas		✓
Commercial Indoor Recreation		✓
Commercial Schools		✓
Financial Institutions		✓
Funeral Homes		✓
Hotels		✓ minimum lot size of 1 400 m2 and no at-grade units
Household furniture, tools, electronics & appliance sales & rentals		✓
Musical Instrument Sales		✓
Offices		✓
Parking lots		✓
Parks & Playgrounds	✓	✓
Personal Services		✓ ☐☐☐☐ Payday loan and cheque-cashing services must be 1+ km away from other such businesses



USE	NEIGHBOURHOOD COMMERCIAL	COMMUNITY COMMERCIAL
Restaurants	✓ Maximum 10 seats	✓
Retail Sales - Convenience	✓ only groceries, meat, fish, produce, baked goods & flowers with interior floor spaces no more than 112 m2	✓
Retail Sales - General		✓ with limits on fire arms and ammunition (10% floor space)
Theatres		✓
Trade Contractors		✓
Veterinary Services		✓
Wine & Beer Making		✓
Accessory office	✓	
Accessory personal services		✓
Accessory Rental & Repair		✓
Accessory Restaurant		✓
Accessory Retail		✓

It is suggested that consideration is given to using the CC designation as a base for the site's zoning. The limited scale of commercial use (12,000 square feet divided into 3 nodes) and the physical layout of the site in of themselves should be sufficient to prevent the attraction of tenants that are competitive with the Downtown or not compatible with the area's prevailing residential character. But if added assurance were desired, uses that are incompatible with the retail vision for the site could be excluded on a site-specific basis.

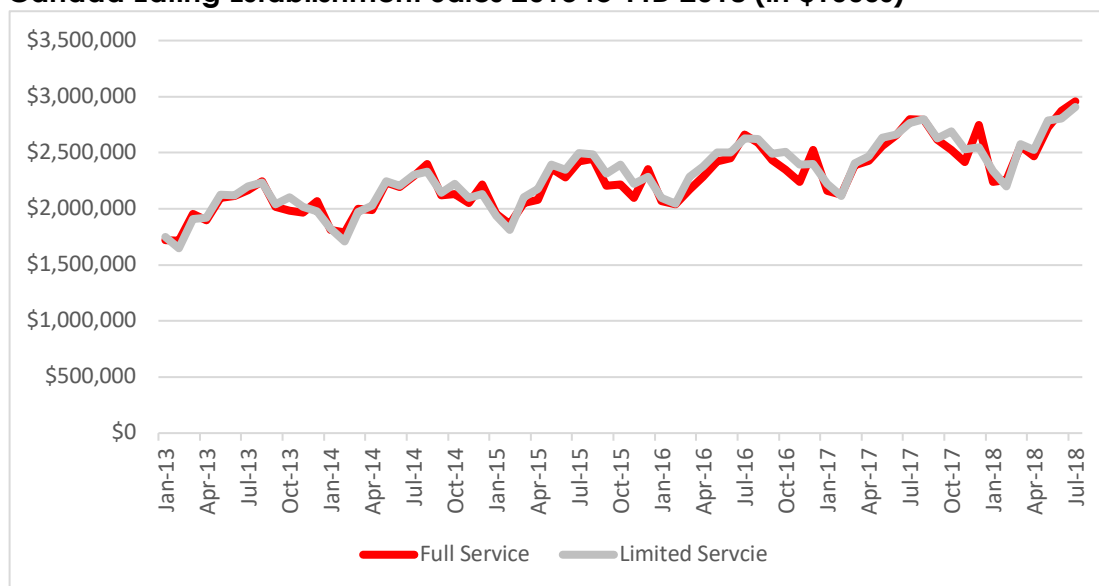
We prefer the approach of using the broader CC designation as a base and deleting the incompatible uses instead of adding desired uses to the NC designation to provide for future flexibility in the event that a currently unanticipated use emerges as a possible tenancing opportunity and desired neighbourhood amenity.



3.0 EATING ESTABLISHMENT, FOOD AND BEVERAGE, AND LEISURE RETAIL TRENDS

- The following graphs illustrate sales data for key eating establishment and retail categories from 2013 to July (Year-to-Date: YTD) 2018.
- For eating establishments, data is only available for Canada and B.C.
- For food and beverage and leisure retail, data is available for Vancouver CMA and the Rest of B.C. (B.C. excluding Vancouver CMA).

Canada Eating Establishment Sales 2013 to YTD 2018 (in \$1000s)



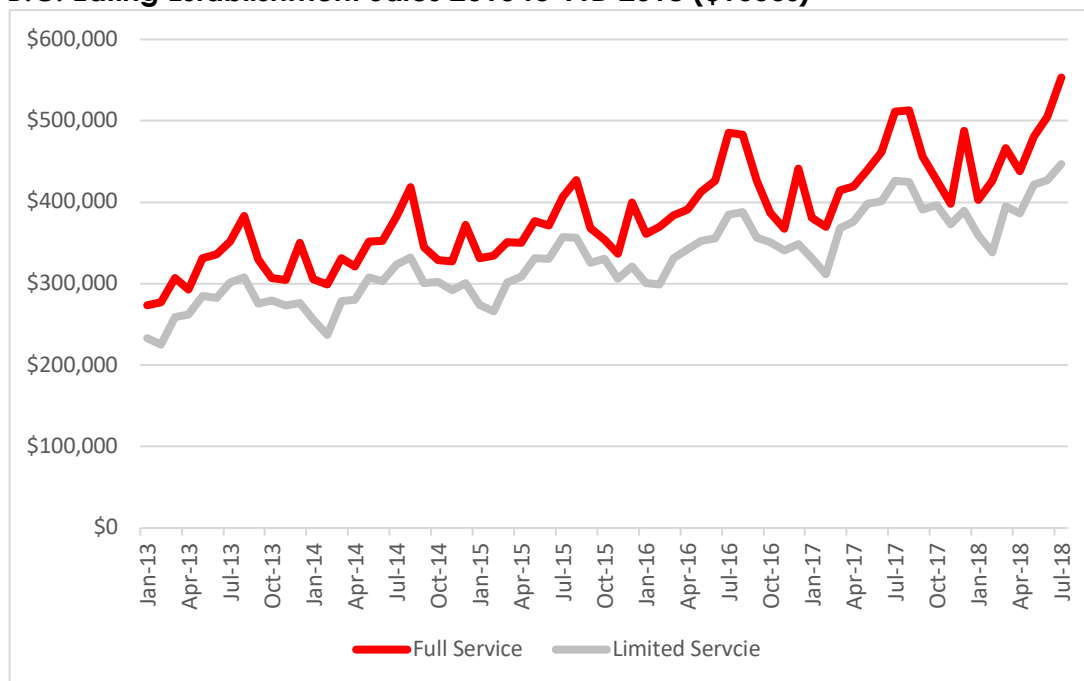
Source: Statistics Canada

Canada Eating Establishment Sales Trends

- Across Canada, sales growth for eating establishments has been very high.
- It has grown at an annualized rate of 5.8% from 2013 to YTD 2018.
- Full service and limited service have similar sales levels from 2013 onwards.



B.C. Eating Establishment Sales 2013 to YTD 2018 (\$1000s)



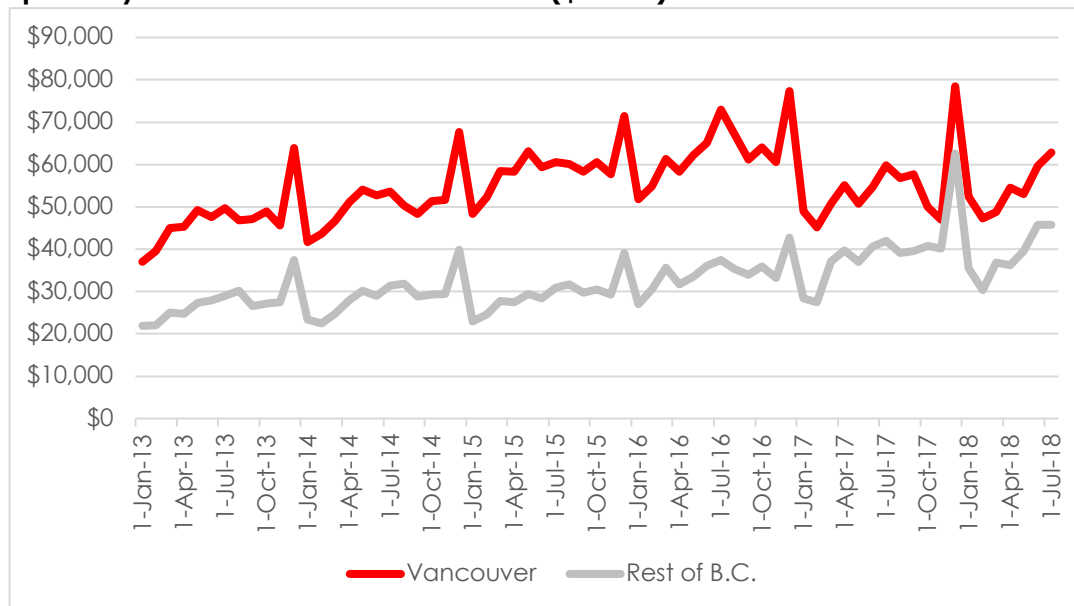
B.C. Eating Establishment Sales Trends

- B.C. has had one of the fastest eating establishment sales growth across Canada at an 8.5% annualized growth rate.
- Total sales at full service eating establishments still out-perform limited service eating establishments. This differs compared to the Canada-wide statistics.
- However, the gap between the two categories is narrowing as urban concepts continue to grow (which tend to be limited service oriented).
- Profitability has increased for full-service establishments and declined slightly for limited service operators.
- Limited service eating establishments have been gaining traction for a number of reasons including:
 - New innovative food concepts can be developed with less intensive capital costs allowing them to respond quicker to the consumers' need for constant updated food concepts.
 - Increasingly, residents and workers lead highly pressured lives and have less time for sit down service eating establishments and therefore are looking for quick service eateries.

Source: Statistics Canada



Specialty Food Sales 2013 to YTD 2018 (\$1000s)



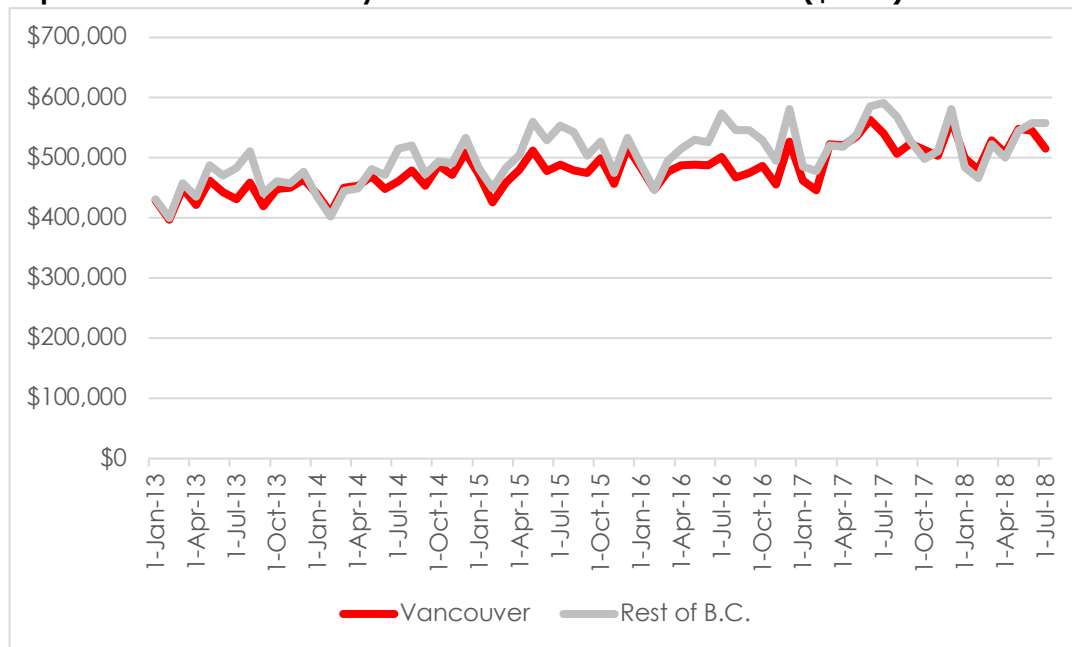
Source: Statistics Canada

Vancouver Specialty Food Sales Trends

- Specialty food sales (e.g., butchers, seafood stores, bakeries, fruit and vegetable stores, etc.) had been increasing at a very high annualized growth rate from 2013 to 2016.
- In the first three-quarters of 2017, sales had stalled and declined to 2014 levels, but by December 2017 sales had picked up considerably.
- The summer months are beginning to match December specialty food sales as consumers are willing to spend more on higher quality food items during summer and bbq season.
- Specialty food sales in the Rest of B.C. have been gaining each year during the period that Vancouver specialty food sales have stalled.
- Profitability for specialty food retailers in B.C. has increased from 3% to 6% during the same time period despite slower growth.



Supermarket and Grocery Stores Sales 2013 to YTD 2018 (\$100s)



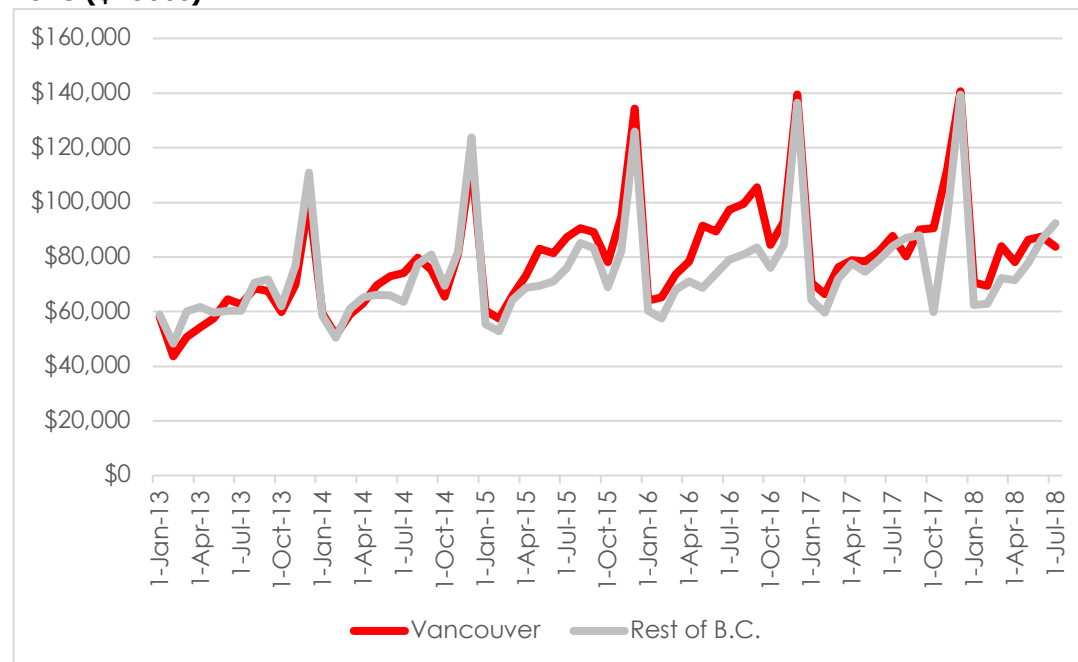
Source: Statistics Canada

Supermarket and Grocery Store Sales Trends

- Vancouver CMA accounts for 54% of B.C.'s population and 52% of B.C.'s households.
- Despite the higher population in the Vancouver CMA, sales at supermarkets and grocery stores tends to be slightly lower.
- From 2013 to 2016, sales had been relatively strong.
- Since 2016 to YTD 2018, sales have been relatively flat to modest growth.
- The modest growth is occurring in Vancouver CMA from 2016 to 2017 but again, in YTD 2018, sales have been flat.
- Grocery retailers are fighting for market share as opposed to higher profit margins.
- Profitability in B.C. remains relatively low (under 2%).



Leisure Retail: Sporting Goods, Book, Music, Hobby Stores Sales 2013 to YTD 2018 (\$1000s)



Source: Statistics Canada

Leisure Retail: Sporting Goods, Book, Music, and Hobby Stores Sales Trends

- From 2013 to 2015, there was high sales growth.
- From 2016 to YTD 2018, sales have been flat.
- Sales in Vancouver are modestly ahead of the Rest of B.C.
- Profitability in B.C. has increased from 4% to 6% during the same time period.

Overall Findings and Implications for Greystone Place

- Vancouver retail and eating establishment sales growth had been very high from 2013 to 2015/2016.
- Eating establishment sales growth has continued to increase during the 2017 and YTD 2018 period.
- Starting in 2017 and continuing to YTD 2018, sales at food and beverage retailers as well as sporting goods, book, music, and hobby stores have generally had flat to modest growth.
- There are modest signs of food and beverage sales rebounding in 2018.
- The sales are tied to the economy and as the Vancouver and B.C. economy began to stall, so too did the retail sales activity level. However, they are not continuing to decrease but have stalled as households have held their spending levels at 2016/2017 levels.



- Investment in eating establishments as well as specialty food or small grocer represents a good growth prospect. There is a demand for better quality offerings. In addition, despite modest sales growth, profitability is increasing across a number of relevant categories for Greystone Place.



4.0 DOWNTOWN PORT COQUITLAM RETAIL DEMAND AND SUPPLY ANALYSIS

To assess the economic impact of proposed retail uses at Greystone Place on Downtown Port Coquitlam, a review of the demand and supply characteristics was undertaken.

4.1 Downtown Port Coquitlam Visitor Profile and Trade Area Delineation

- The trade area for Downtown Port Coquitlam is very broad.
- This was verified by the Downtown Port Coquitlam Recommendations and Action Plan 2017 (Cushing Terrell Architecture June 2017) survey of 200 intercept respondents as well as current consumer cell phone data for 2017/2018,

Cell Phone Visitation Data

Methodology

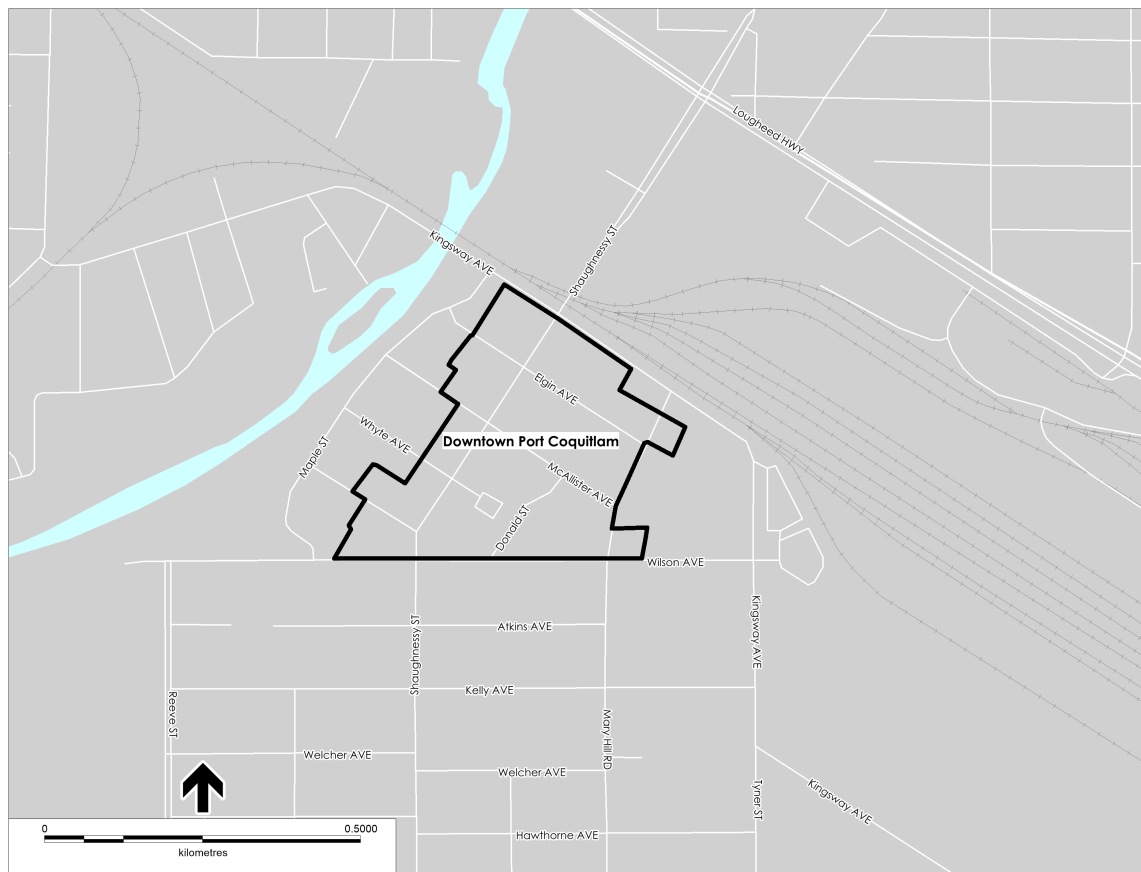
- Data is collected by visitors in the prescribed Downtown Port Coquitlam retail commercial area (see the following page).
- The area accounts for approximately 1.3 million square feet of land area.
- Visitors to the Downtown study area have to have subscribed to one of the apps owned and controlled by Uber Media and their cell phone locational services had to be active.
- Visitors had to have been in the Downtown for a minimum of ten minutes thereby excluding some of the drive-by traffic visitors.
- Those who live in the study area were excluded from the analysis.
- Data included in the analysis includes a cell phone specific code tied to the owner of the device, a postal code for the home address of that owner, their postal code, and a date/time stamp.
- In addition, the number of visits can be analyzed and total visitation. The focus is on frequent visitation.
- The postal code address provides information on socio-economic indicators such as median age, average household income, etc.
- Data was analyzed for one year from October 2017 to September 2018.

The data was analyzed for two specific queries:

1. Assessment of the Downtown Port Coquitlam visitors, who they are, and how far they travel to get to Downtown.
2. Assessment of those Downtown Port Coquitlam visitors who live in the 5 minute drive time trade area of Greystone Place (since these people are likely to be more frequent visitors and account for a high proportion of total sales).



Downtown Port Coquitlam Study Area



Downtown Study Area

- The Downtown Port Coquitlam study area is from the rail line / Kingsway Ave. in the north to Wilson Ave in the south. As well as from east of Maple St. on the west to Mary Hill Rd. on the east.
- This is equivalent to approximately 1.3 million square feet of land area.



Downtown Port Coquitlam Visitation Profile

HOME LOCATION	UNIQUE VISITORS	% OF TOTAL VISITORS	TOTAL VISITATION	AVERAGE NUMBER OF VISITS ANNUALLY	% OF TOTAL VISITATION	AVERAGE AGE	AVERAGE HOUSEHOLD INCOME
Downtown Port Coquitlam Study Area	194	1.1%	83,845	432.19	25.9%	50.6	\$58,864
2 km Radius Excl.							
Downtown	2,627	15.3%	67,052	25.52	20.7%	39.9	\$80,928
2 to 5 km Radius	4,147	24.1%	63,704	15.36	19.7%	39.2	\$108,260
5 to 10 km Radius	2,300	13.4%	30,702	13.35	9.5%	39.3	\$101,298
10 to 20 km Radius	3,536	20.6%	41,168	11.64	12.7%	40.1	\$ 96,535
20+ km Radius	4,387	25.5%	37,355	8.51	11.5%		
Total	17,191	100.0%	323,826	18.84	100.0%		

Source: Uber Media, Statistics Canada, Environics

Downtown Port Coquitlam Visitation Profile

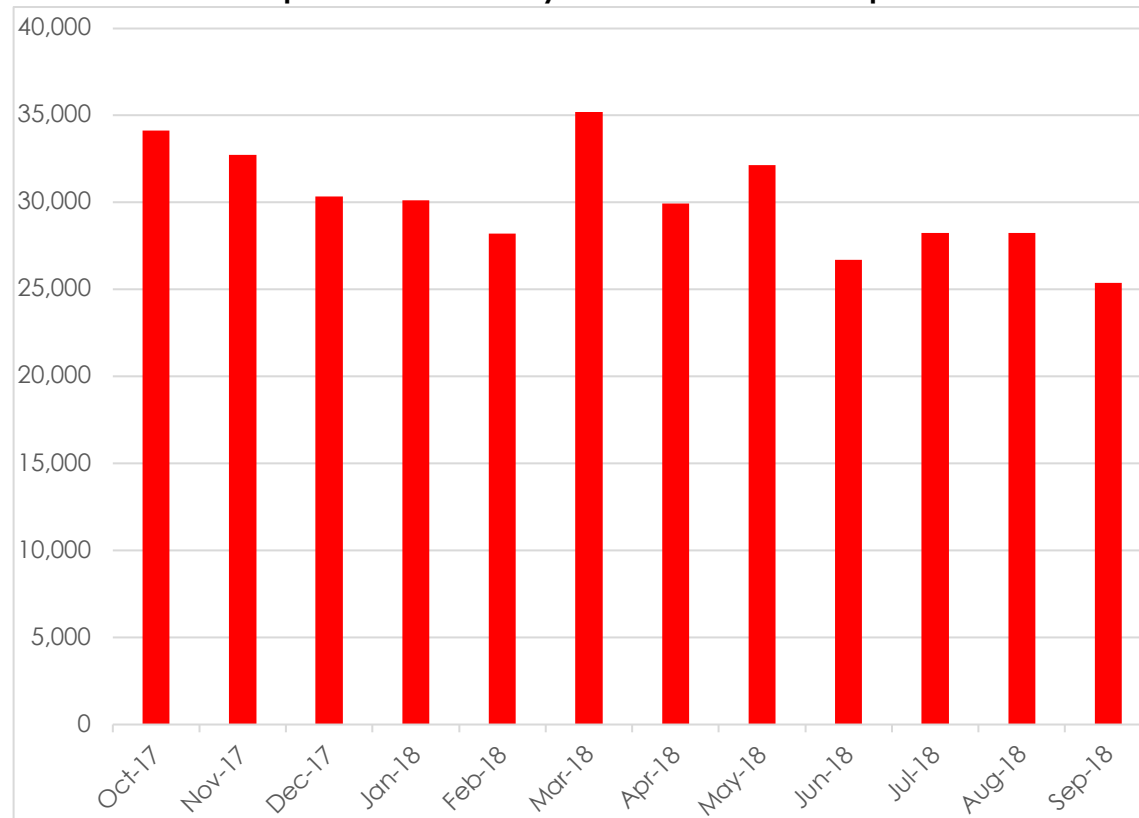
- There are 17,191 unique visitors in the sample of downtown visitors based on the cell phone data.
- This is equivalent to 323,826 total visitation (in the sample) or an average of 18.8 visits annually.
- Downtown draws from a large area, including 20.6% who live between 10 km and 20 km of Downtown Port Coquitlam and a further 25.5% who live beyond the 20 km radius including other parts of B.C., Canada, and the USA.
- In terms of visitation, two-thirds of the visitation is within a 5 km radius of Downtown Port Coquitlam. However, 24.3% or almost one-quarter of all visitation comes from more than 10 km away.
- The average household income skews lower for the most frequent visitors who live within the 5 km radius. And overall incomes in this area are lower than the City of Port Coquitlam average.
- The Downtown residents tend to be older and have lower household incomes.



Downtown Port Coquitlam Visitors

- The survey included 17,191 unique visitors to Downtown over the one year period. This equates to 323,826 total visitation. Average number of visits annually is 18.8 times.

Downtown Port Coquitlam Visitation by Month Oct 2017 to Sept 2018



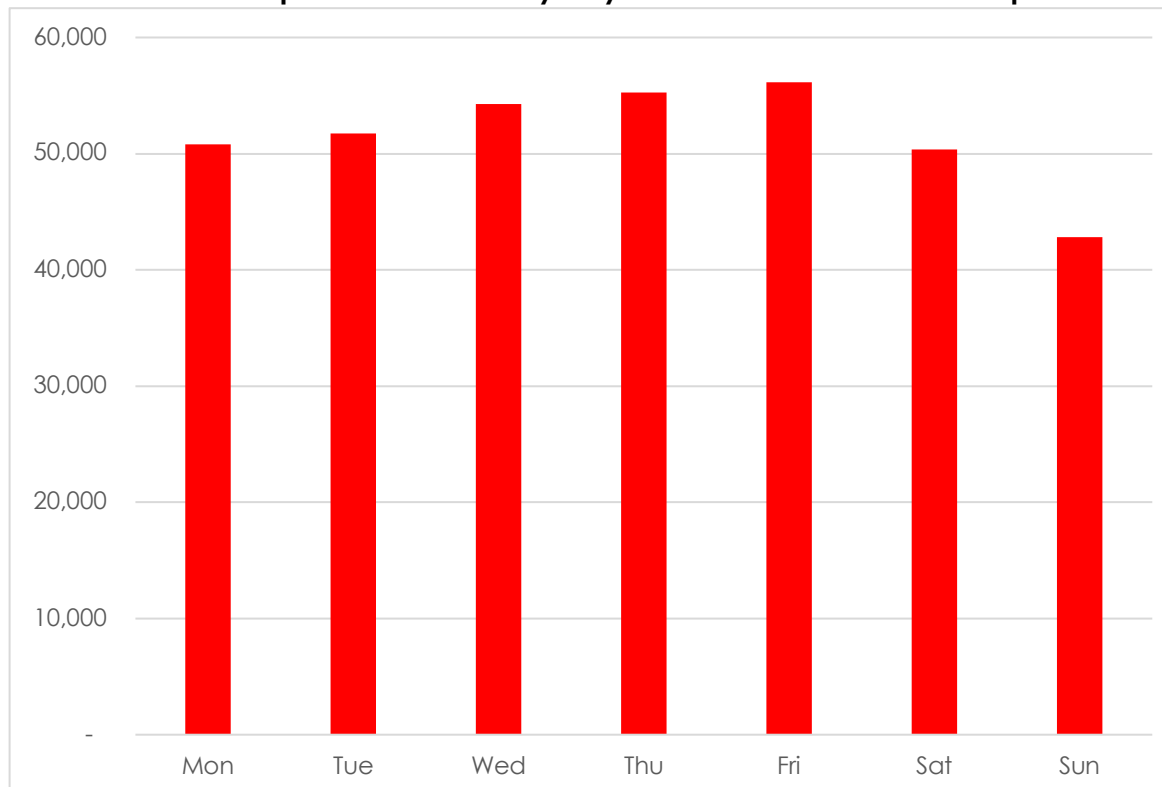
Source: Uber Media

Downtown Port Coquitlam Visitation by Month

- Based on a survey of visitors collected through cell phone data.
- Early spring and late fall have the highest visitation rates.
- Summer is a slower time during the year as many local residents and business workers/visitors are away on holidays.
- There is no December holiday bump in visitation from holiday shopping or special events.



Downtown Port Coquitlam Visitation by Day of the Week Oct 2017 to Sept 2018



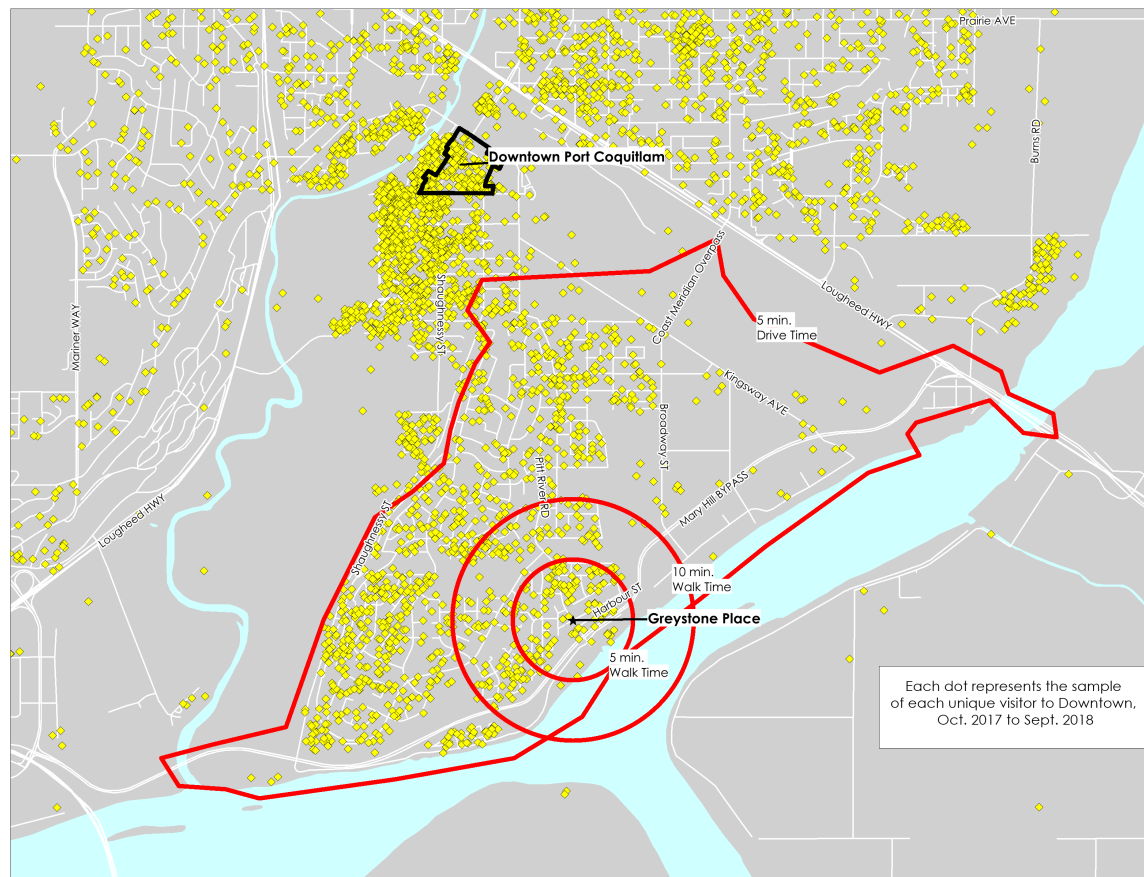
Source: Uber Media

Downtown Port Coquitlam Visitation by Day of the Week

- Based on a survey of visitors collected through cell phone data.
- There is a good base-line of visitation Monday to Saturday providing a solid core of visitors for businesses to appeal to. This includes business workers, business visitors, and local area residents.
- Friday is the most visited day followed by Thursday and Wednesday.
- Family-oriented shopping is a key differentiator as families will stock up on items ahead of the weekend so as to enjoy their weekends on family activities.



Downtown Port Coquitlam Visitors within Vancouver Region – Zoomed In



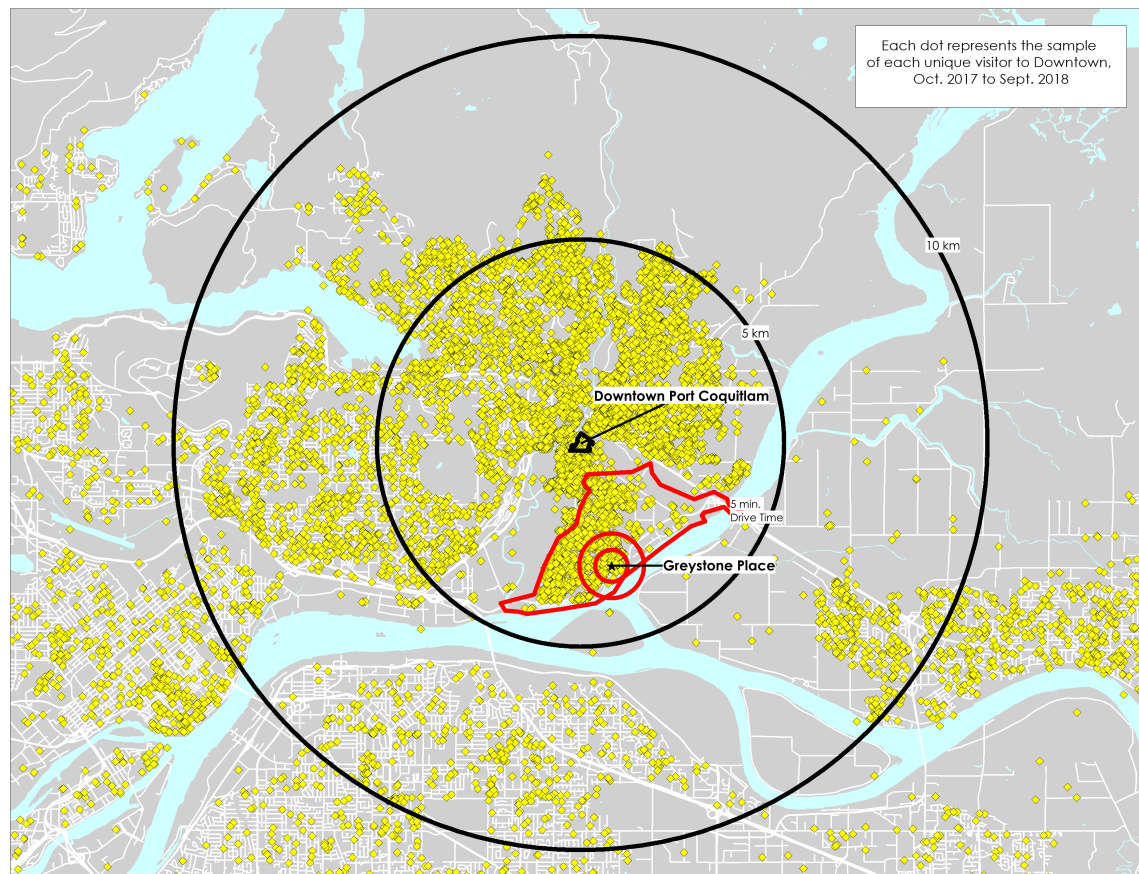
Source: Uber Media

Downtown Port Coquitlam Visitors

- Each yellow dot refers to the address of the cell phone user and represents one unique visitor to Downtown Port Coquitlam.
- The map does not convey visitation frequency.
- There is a very high number of visitors from people who live in very near Downtown as well as immediately south (to Pitt River Road) and from residents on the west side of Coquitlam Creek.



Downtown Port Coquitlam Visitors within Vancouver Region – Zoomed Out



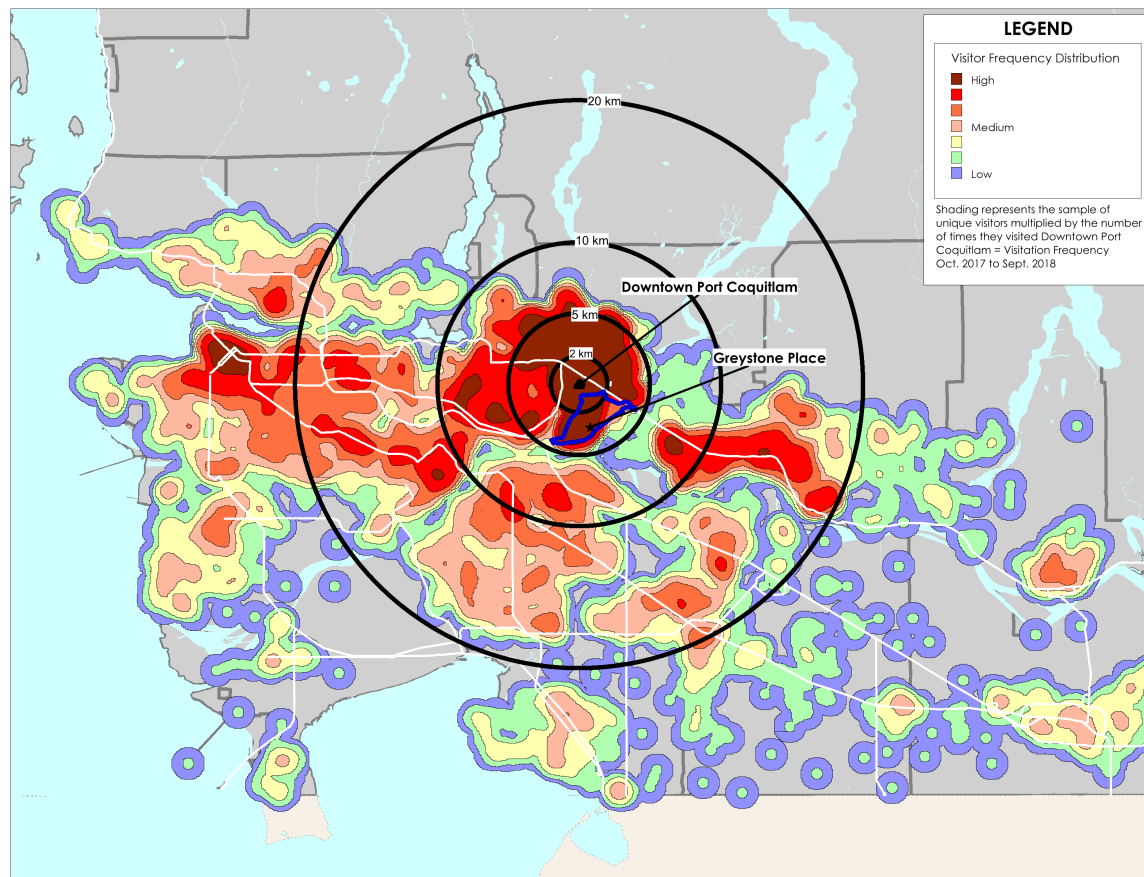
Source: Uber Media

Downtown Port Coquitlam Visitors

- Each yellow dot refers to the address of the cell phone user and represents one unique visitor to Downtown Port Coquitlam.
- The map does not convey visitation frequency.
- As stated, visits to Downtown come from a very broad trade area.



Downtown Port Coquitlam Visitation Frequency within Vancouver Region



Source: Uber Media

Downtown Port Coquitlam Visitation Frequency by Region

- The shading in the map refers to the total visitor frequency to Downtown Port Coquitlam.
- The draw of Downtown Port Coquitlam is extensive across Vancouver as well as Canada and USA.
- The majority of visitation frequency is within the 2 km radius including Port Coquitlam and Coquitlam.
- However, the main trade area is with the 5 km radius trade area. This area captures approximately two-thirds of all visitation.



Implications for Greystone Place

- Downtown Port Coquitlam draws extensively from very close to the Downtown as well as from throughout the Vancouver CMA region.
- The main draw is beyond the City's borders to within the 5 km radius of Downtown.
- Downtown is busy through the week with a solid base of visitation.
- There is a seasonality attached to the visitation as summer tends to be slower compared to early spring and late fall.
- The household income of the Downtown visitors tends to be lower than the overage household income for the trade area region suggesting that higher income households are not visiting Downtown Port Coquitlam as often. These sales may be leaked to other districts.



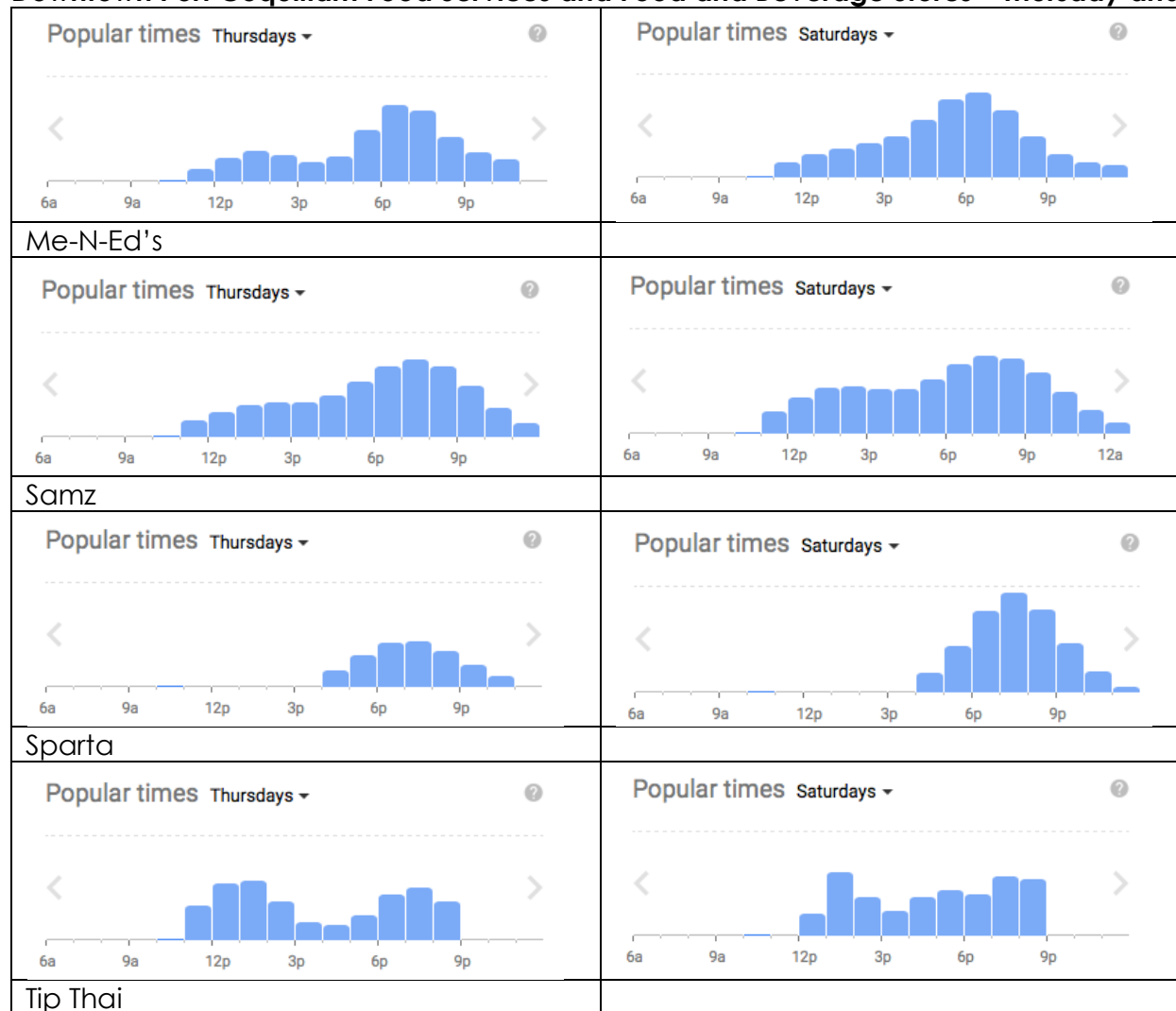
4.2 Downtown Port Coquitlam Business Visitation

Business Visitation Methodology

- The following graphs are sourced from Google based on real-time business visitors who have google or google related apps/functions open or active on their cell phone when they visit each business.
- The following information is directional only. However, when tied with other data collected, it assists in illustrating the visitor profile of Downtown Port Coquitlam business visitation.
- Two days of the week are included in the analysis, Thursday and Saturday, which represent a typical weekday and weekend visitation profile.
- Eating establishments including sit downtown restaurants, quick service cafes, and limited service take away services are included as well as food and beverage type stores such as grocery stores and specialty food stores. The bowling centre as an entertainment venue is also included in the analysis. These businesses account for a major strength of Downtown Port Coquitlam's business mix.
- In addition, should Greystone Place include eating establishments or food and beverage type retailers it will be important to understand the competition and potential economic impact.



Downtown Port Coquitlam Food Services and Food and Beverage Stores – Thursday and Saturday Visitation

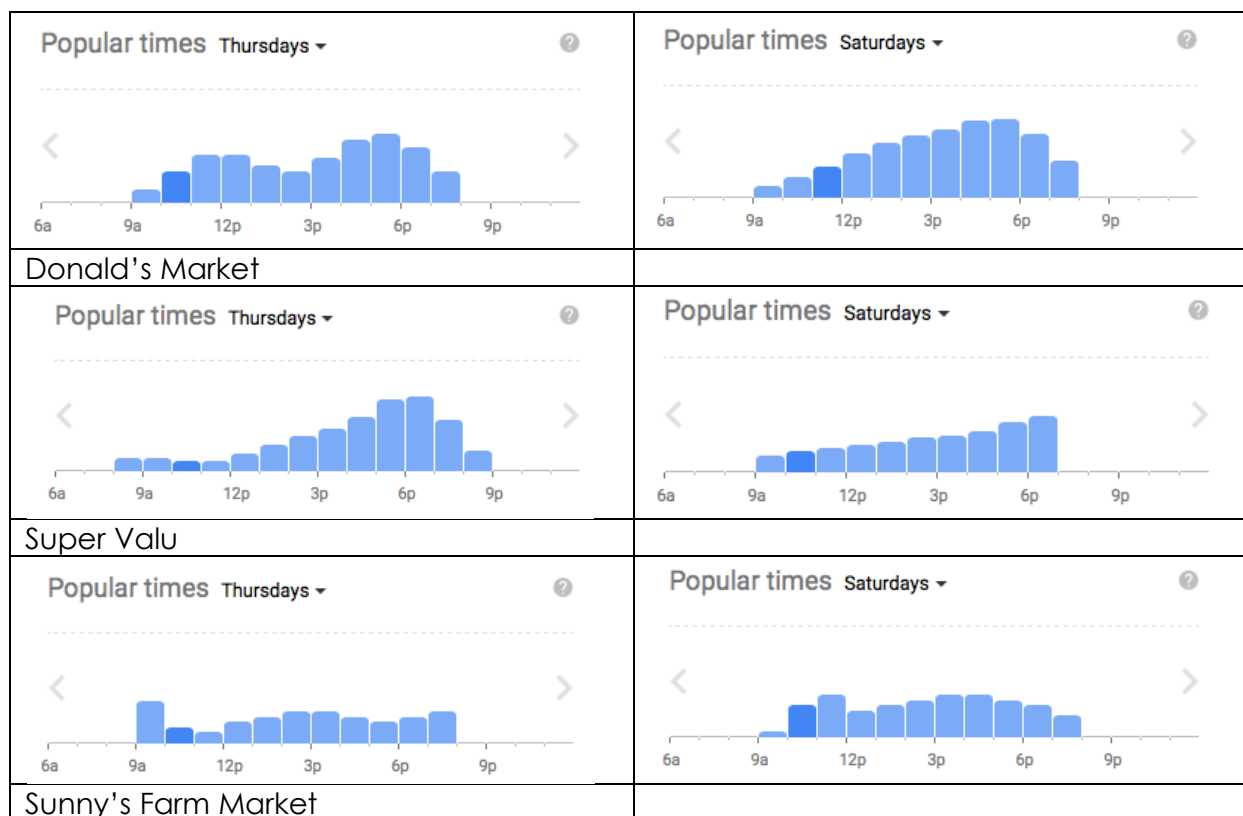




<p>Popular times Thursdays ▾ ?</p>	<p>Popular times Saturdays ▾ ?</p>
Inno Bakery	
<p>Popular times Thursdays ▾ ?</p>	<p>Popular times Saturdays ▾ ?</p>
European Bakery and Deli	
<p>Popular times Thursdays ▾ ?</p>	<p>Popular times Saturdays ▾ ?</p>
Pho T&T	
<p>Popular times Thursdays ▾ ?</p>	<p>Popular times Saturdays ▾ ?</p>
PoCo Bowling	



<p>Popular times Thursdays ▼</p>	<p>Popular times Saturdays ▼</p>
Hiroba Sushi	
<p>Popular times Thursdays ▼</p>	<p>Popular times Saturdays ▼</p>
Starbucks	
<p>Popular times Thursdays ▼</p>	<p>Popular times Saturdays ▼</p>
Waves	
<p>Popular times Thursdays ▼</p>	<p>Popular times Saturdays ▼</p>
Matteo's Gelato	



Salient Findings and Implications for Greystone Place:

- As stated, the Downtown visitor profile extends across the region and is very broad.
- Downtown Port Coquitlam benefits from a range of target markets including daytime, early evening, and weekend traffic. The traffic comes from local area daytime workers and residents as well as business visitors, entertainment-oriented visitors, and local and regional residents.
- There is a good range of smaller eating establishments that are able to conduct a good lunch time and early evening business throughout the work week and on weekends. Tip Thai, Pho T&T, and Hiroba Sushi.
- Starbucks and Waves are busy throughout the day from early morning workers to late evening post-dinner treats. Similarly, Matteo's Gelato has a late evening post-dinner treat crowd.
- There is a strong evening economy at Me-N-Eds, Samz, Sparta, and PoCo Bowl.



- The specialty food retailers such as Inno Bakery and European Bakery and Deli are primarily busy weekends but there is some early evening commute traffic as people pick up items on their way home from work.
- The small grocers such as Donald's Market, Super Valu, and Sunny's Farm Market are busy throughout the day but peak during the early evening period and on weekends. There is some lunchtime activity at Donald's Market.
- Overall, there is a diverse mix of daytime, nighttime, and weekend food-related activity in Downtown Port Coquitlam including eating establishments and food and beverage stores.
- Downtown is not reliant on solely one type of visitor or time period but is reliant on broadly based support. Downtown is more immune to changes in the marketplace due to this more balanced target market appeal.



4.3 Downtown Inventory

- An audit on ground-level and upper-level retail commercial uses in Downtown Port Coquitlam was undertaken in September 2018.
- The audit categorized each accessible business by their name, address, NAICS code, and estimated square footage based on aerial building footprints.
- An audit conducted by Cushing Terrell Architecture Inc. in 2017 for the Downtown Port Coquitlam Recommended Action Plan yielded similar statistics; however, there are differences in the NAICS categories used and the estimated square footage.
- The most notable change since 2017 is that in 2018, the building on McAllister Ave. beside Me-N-Eds has been demolished.



Downtown Port Coquitlam Retail Inventory September 2018

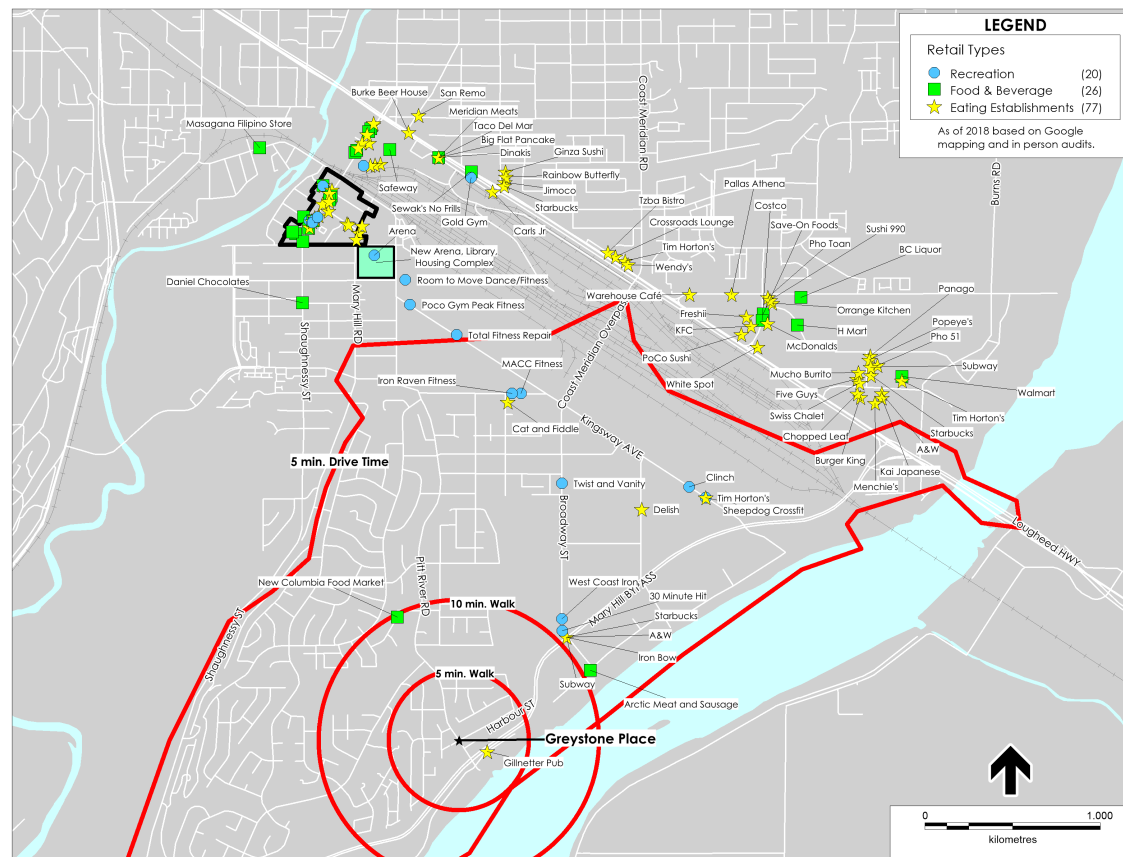
	GROUND-LEVEL				TOTAL DOWNTOWN			
	NUMBER OF STORES	% OF TOTAL	EST. SQ. FT.	% OF TOTAL	NUMBER OF STORES	% OF TOTAL	EST. SQ. FT.	% OF TOTAL
Retail Merchandise								
Clothing, Accessories, Jewellery	3	2.6%	3,675	1.4%	3	2.1%	3,675	1.1%
Furniture and Home Furnishings	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Electronics and Appliances	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Home Improvement	3	2.6%	22,050	8.5%	3	2.1%	22,050	6.8%
Sporting Goods, Book, Music, Hobby	2	1.7%	3,550	1.4%	2	1.4%	3,550	1.1%
General Merchandise	2	1.7%	4,200	1.6%	2	1.4%	4,200	1.3%
Other Retail incl. Used	5	4.3%	10,400	4.0%	5	3.4%	10,400	3.2%
Total Retail Merchandise	15	13.0%	43,875	16.9%	15	10.3%	43,875	13.6%
Food and Drug Retail								
Grocery Stores	4	3.5%	24,000	9.3%	4	2.7%	24,000	7.4%
Convenience Stores	4	3.5%	5,850	2.3%	4	2.7%	5,850	1.8%
Specialty Food Stores	7	6.1%	15,200	5.9%	7	4.8%	15,200	4.7%
Alcohol, Wine, Liquor Stores	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Drug Store and Pharmacy	2	1.7%	5,500	2.1%	2	1.4%	5,500	1.7%
Health Supplements	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Optical	1	0.9%	1,875	0.7%	1	0.7%	1,875	0.6%
Beauty Supply	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total Food and Drug Retail	18	15.7%	52,425	20.2%	18	12.3%	52,425	16.2%
Food Services								
Full Service Food Operations	9	7.8%	19,900	7.7%	10	6.8%	22,900	7.1%
Limited Service Food Operations	12	10.4%	14,450	5.6%	12	8.2%	14,450	4.5%
Other Entertainment	1	0.9%	5,000	1.9%	2	1.4%	10,000	3.1%
Total Food Services	22	19.1%	39,350	15.2%	24	16.4%	47,350	14.6%
Services								
Beauty and Barber Services	13	11.3%	18,498	7.1%	13	8.9%	18,498	5.7%
Dry Cleaning	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Travel	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Financial Banking	4	3.5%	9,000	3.5%	4	2.7%	9,000	2.8%



Other Personal Services	2	1.7%	3,075	1.2%	3	2.1%	4,575	1.4%
Business Services	2	1.7%	1,200	0.5%	2	1.4%	1,200	0.4%
Professional Services	18	15.7%	55,800	21.5%	32	21.9%	102,100	31.6%
Medical and Dental Services	11	9.6%	22,416	8.6%	19	13.0%	46,116	14.3%
Recreation, Fitness	2	1.7%	2,200	0.8%	8	5.5%	12,600	3.9%
Learning	3	2.6%	3,000	1.2%	5	3.4%	5,750	1.8%
Total Services	55	47.8%	115,189	44.4%	55	37.7%	115,189	35.6%
Total Occupied Space	110	95.7%	250,839	96.8%	141	96.6%	315,028	97.4%
Vacant	4	3.5%	6,350	2.4%	4	2.7%	6,350	2.0%
Redevelopment Site	1	0.9%	2,000	0.8%	1	0.7%	2,000	0.6%
Total	115	100.0%	259,189	100.0%	146	100.0%	323,378	100.0%



Eating Establishments, Food and Beverage, and Fitness Centres within and Near Greystone Place Trade Areas, Oct 2018



Source: 360 Collective, Google Maps as of Oct 2018

Competitive Positioning

- There is very little existing competition within food services, food and beverage, and fitness centres immediately near the Greystone Place site.
- The fitness centres are clustered in the lower rent employment areas.
- The food and beverage retailers are focused in Downtown and Lougheed Highway.
- The eating establishments are focused in Downtown and Fremont Village area. Quick service and fast casual, chain related eating establishments are clustered in distinct areas along Lougheed Highway.



Downtown and Area Retail Rents

ADDRESS	SQ. FT.	RETAIL RENT	COMMENTS
2255 Wilson Ave.	1,377	\$18	Triple Net
2255 Wilson Ave.	1,678	\$19.50	Triple Net
2540 Shaughnessy St.	1,107	\$18	Gross Interior Space
2540 Shaughnessy St.	535	\$16	Gross Interior Space
1502 Broadway	6,210	\$29	Net (base) \$15.96 TMI

Source: mls.ca

Outlying Vancouver CMA Retail Rent Analysis

RETAIL TYPE	AMOUNT OF SQ. FT.	VACANCY RATE	AVERAGE NET RENT
Mall	1.4 million	0.2%	\$21.91
Neighbourhood Centre	3.9 million	4.7%	\$22.15
Strip Centre	0.6 million	4.4%	\$24.38
General Retail	8.5 million	3.5%	\$21.64

Source: CoStar – Outlying Vancouver: Port Coquitlam, Coquitlam, Port Moody, Maple Ridge, Silver Valley, Langley Township

Salient Findings:

- There is approximately 260,000 sq. ft. of ground-level retail commercial and approximately 325,000 sq. ft. of total retail commercial and office space.
- This is spread out over 146 businesses.
- Vacancy rates are very low at just over 2%.
- Services is the largest category primarily due to the number of offices and medical clinics in the Downtown in purpose built office buildings as well as upper and ground-level offices.
- The services are a mix of local serving appointment based such as beauty and aesthetics as well as professional/medical services and recreational services such as fitness, yoga, and martial arts.
- The large number of medical and dental related services draw visitors to the Downtown.
- The professional services draw not only daytime workers but are similarly aligned and draw business visitors (e.g., visiting lawyers, City services, accountants, real estate professionals, etc.)
- The recreation and learning based services can draw extensively based on the quality of the service.
- Food and drug retailing catering to the local population as well as destination food accounts for the second largest proportion of the total ground-level square footage. Over 20% of the total square footage is devoted to food and drug type retailing. This is a healthy proportion related to serving local residents as well as specialized food and beverage retailers.



- Retail merchandise is a relatively small category. The inclusion of PoCo Building Supplies skews this category higher. There are relatively few retail merchandise stores except for some specialized retailers such as musical instruments and second hand clothing and some home improvement business.
- Food services accounts for over 15% of the total square footage. It is important to note that the PoCo Bowl is included in the Cushing Terrell restaurant and entertainment inventory but not in this analysis.
- This is a healthy mix for food services. It is a growing category across North America and many downtowns now target over 20% food services.
- Downtown rents are \$15 to \$20/sq. ft. net with some retailers paying higher for exceptional visibility or dedicated parking.

The strength of Downtown's commercial mix is:

- Businesses that draw both workers and business visitors who need breakfast, snacks, break food, lunch, and home meal replacement.
- Local residents who cross shop the food and beverage stores including small grocers, health food stores, bakeries, desserts, etc. as well as the Wednesday Farmers' Market.
- Evening commuters who need quick food and home meal replacement.
- Evening crowd looking to socialize with family and friends at nearby restaurants.
- Recreational services for visitors themselves or for their families.
- Overall, despite the absence of traditional retail merchandise type businesses and comparison goods (e.g., footwear, clothing stores, etc.), Downtown Port Coquitlam provides a diverse mix of businesses and is not solely dependent on the success of only one category. This helps the Downtown weather economic and demographic changes better than many other business districts.



5.0 GREYSTONE PLACE RETAIL TRADE AREA DELINEATION

The retail trade areas for Greystone Place is based on both walk times and local drive times.

While the site is adjacent to the highway that carries commuters and regional visitors, the strategic business plan for the site is not to specifically cater to that target market.

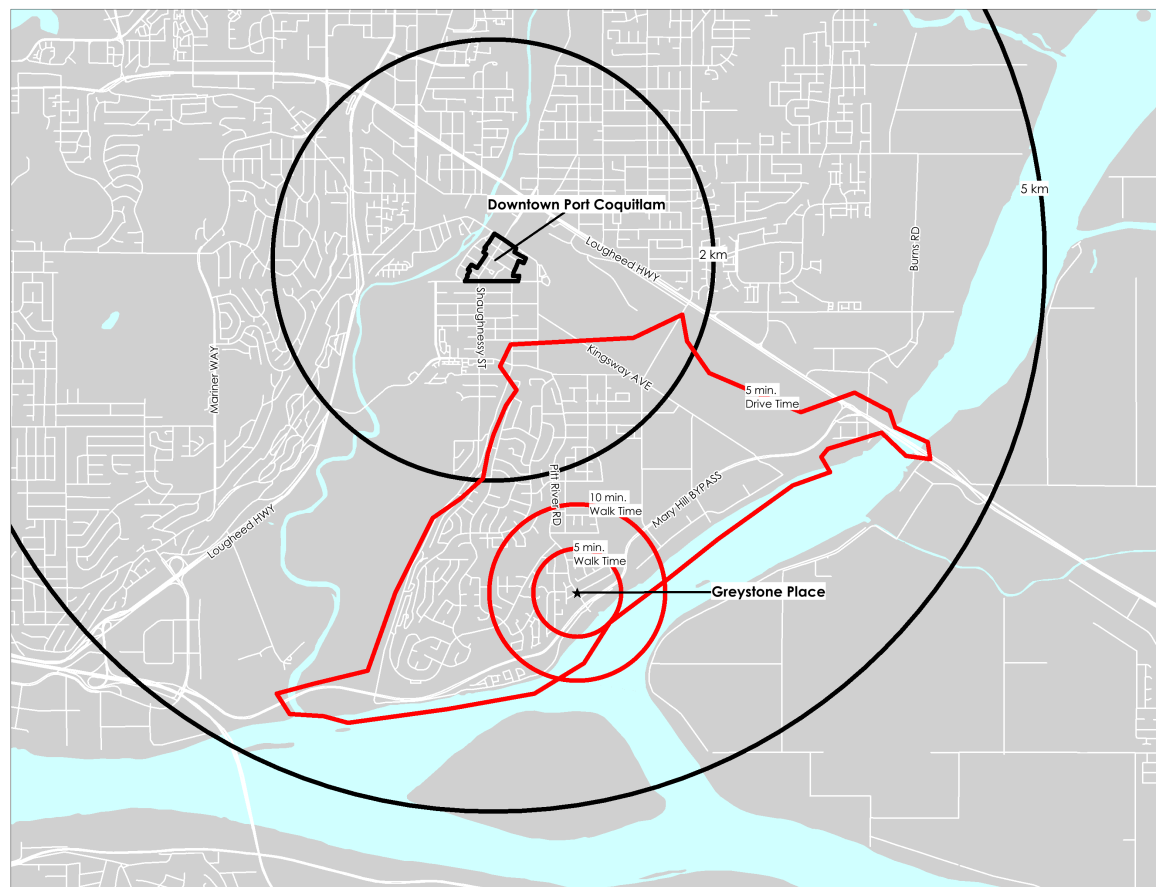
Rather, the business mix strategy is focused on the local neighbourhood.

The trade area includes:

- 5 Minute Walk Time: 400 m
- 10 Minute Walk Time: 800 m
- 5 Minute Drive Time



Greystone Place Trade Area in Relation to Downtown Port Coquitlam



Greystone Place Trade Area Delineation

- The trade areas:
 - Includes the local neighbourhoods of Citadel Heights.
 - Include the southern portion of the City of Port Coquitlam.
 - Exclude Downtown and the new arena/library/housing development.
 - Include the employment area to the east (but will not be considered a major target market).
 - Is affected by the Pitt River as a natural barrier limiting the trade area to the south



5.1 Trade Area Socio-Economic Profile

Population, Mobility, and Daytime Workers

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Population 2018 Est.	1,074	4,244	15,370	62,407	2,621,880
Annual Growth Rate 2011 to 2016	0.9%	1.1%	0.8%	0.9%	0.9%
Persons Per Household	2.88	2.91	2.93	2.66	2.52
Mobility					
Mover within 5 years	27%	22%	29%	36%	45%
Daytime Worker Population	75	3,063	9,403	29,599	1,419,043

Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

- Surrounding Greystone Place, the population is relatively low. There are approximately 1,000 residents within a five minute walking distance and over 4,000 residents within 10 minutes.
- Within a 5 minute drive, there is a healthy population base of over 15,000 residents from which Greystone can draw upon to support the potential retail on the site.
- The population has been increased from 2011 to 2016 Census periods at a rate of approximately 1% annually. This is a stable growth rate as new housing is built and home transition from older households to younger growing households.
- The household sizes are relatively large in comparison to other areas of Port Coquitlam and the Vancouver region.
- The mobility rate in the local five and ten minute walk area and even the 5 minute drive time area is lower than elsewhere in Port Coquitlam and in Vancouver CMA. Local residents are opting to age in place rather than downsize as they become empty nesters. This limits the number of new young families that are moving into the area. This may be countered with the Greystone development which will allow local area residents to downsize and remain in their local neighbourhood.

Implications for Greystone Place

- The five minute walk population will increase significantly to at least 1,500 residents.
- The growing population base of over 15,000 residents that is primarily focused on families and young families as well as active seniors creates retail opportunities that focus on young families and active seniors who want higher quality goods and services in a community setting.



Age Profile

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
0 to 9	9%	10%	10%	11%	10%
10 to 19	11%	13%	12%	12%	10%
20 to 29	13%	12%	13%	13%	15%
30 to 39	12%	12%	12%	15%	15%
40 to 49	13%	14%	14%	15%	14%
50 to 59	17%	17%	18%	16%	14%
60 to 69	16%	13%	12%	11%	11%
70+	10%	8%	9%	9%	11%
Median Age	44.9	42.5	42.4	40.3	40.3

Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

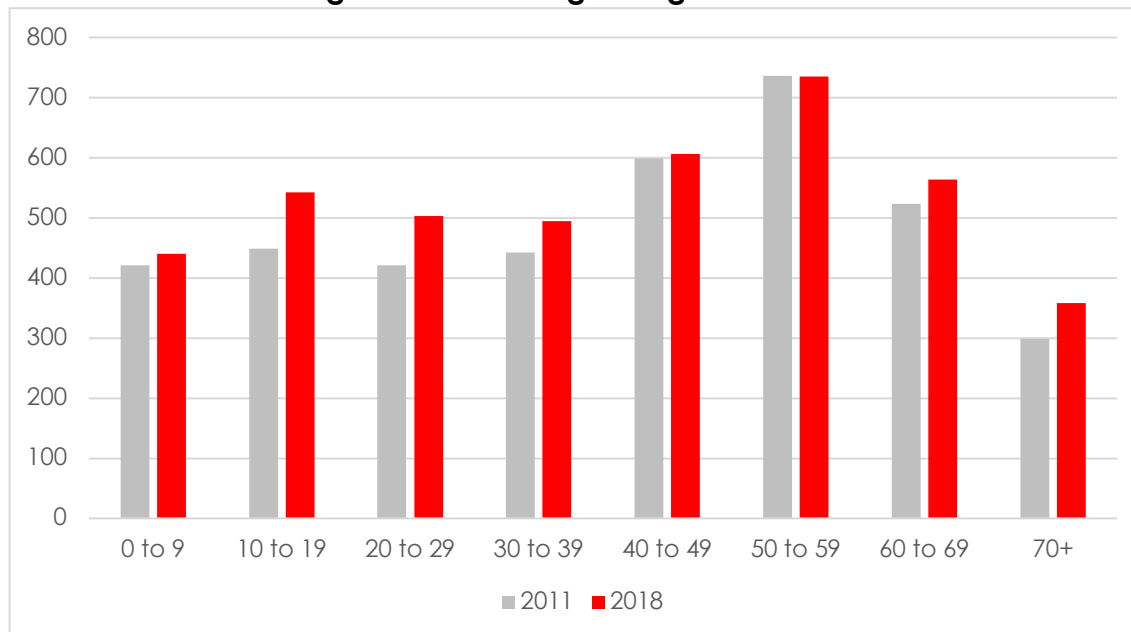
- Port Coquitlam is very family-oriented. 23% of the population is under 20 years of age.
- The age profile of the five minute walk time skews towards active seniors who are 60 to 69 years of age as well as young families.
- The other trade areas including the 10 minute walk time and the 5 minute drive time skew older as well. 18% of the 5 minute drive time trade area is 50 to 59 years of age.

Implications for Greystone Place:

- Clearly, this resident population likes their home and want to age in place. The pace of housing turnover is slower than elsewhere. However, as stated, these residents could potentially relocate to Greystone Place thereby freeing up their home for a new young family to move into. New families moving into the area would spur retail sales potential at Greystone as these families are in the early family and career formation years and tend to spend more than others.



10 Minute Walk Time Age Profile – Change in Age from 2011 to 2018



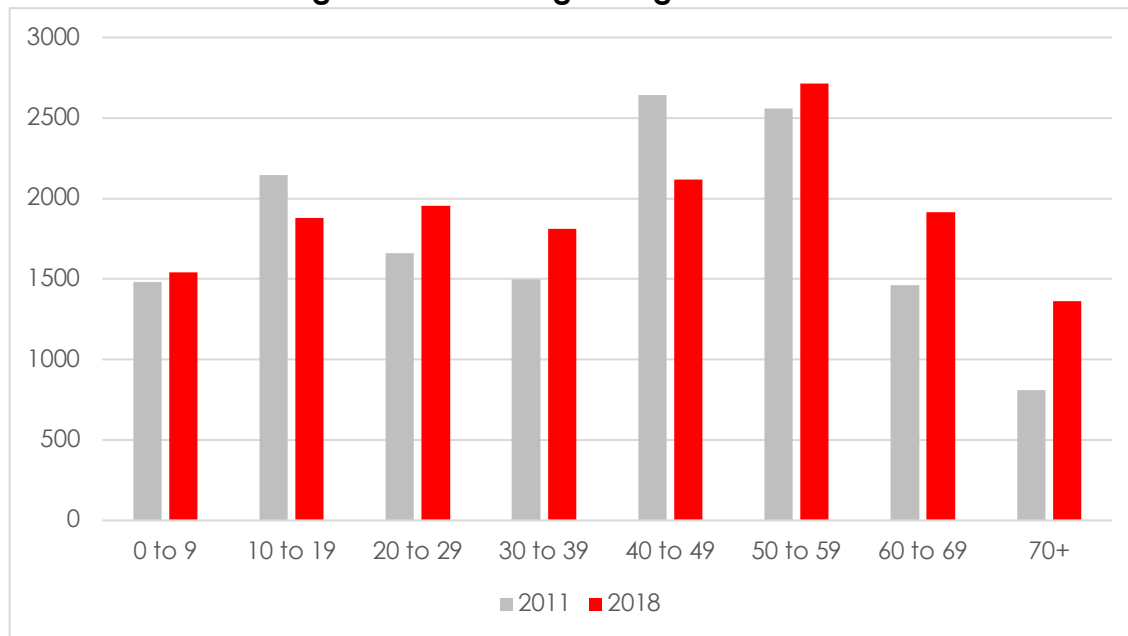
Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

- The age profile skews older.
- Growth in the 10 minute walk time trade area has been in the number of younger families moving in and the number of teenagers.
- The number of seniors and active seniors is growing as many are opting to remain in their homes.



5 Minute Drive Time Age Profile – Change in Age from 2011 to 2018



Salient Findings:

- The age profile skews older and has been growing.
- New younger families have been moving into the area and the number of young children has increased.
- There has been a decline in older families with teenagers, however, this category still accounts for a large segment of the population.

Implications for Greystone Place:

- The success of the retail at Greystone Place will be on retaining active seniors in downsized homes and allowing for more younger families to move into the area.

Source: Statistics Canada 2011, 2016, Environics



Household Income Profile and Housing Tenure

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Income Profile					
Average Household Income	\$178,618	\$157,717	\$155,724	\$114,220	\$106,833
HH Income \$100,000 to \$150,000	24%	29%	27%	24%	19%
HH Income \$150,000 to \$200,000	13%	11%	12%	9%	9%
HH Income \$200,000+	16%	13%	14%	7%	9%
Annual Growth Real HH Inc.	2%	2%	2%	2%	2%
Housing Tenure					
Own/Rent	93.8% / 6.2%	90.4% / 9.6	85.2% / 14.8%	76.7% / 23.3%	63.4% / 36.6%

Source: Statistics Canada 2011, 2016, Environics

Salient Findings and Implications for Greystone Place:

- The average household income of the five and ten minute walk time as well as the five minute drive time trade area is high. Immediately adjacent to Greystone Place, the average household income is \$178,618. Within the five minute drive time trade area, the average household income is \$155,724. This is 45% higher than the average for the Vancouver CMA area.

Implications for Greystone Place:

- Real household income growth (excluding the effects of inflation) has been high for Greystone Place trade area and for the Vancouver CMA region at 2% annually. Despite inflationary pressures, households are earning more and shifting their buying preferences. This impacts positively on retail opportunities at Greystone Place.



Ethnicity, Visible Minority, and Generation Status

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Ethnicity					
Visible Minority	46%	38%	35%	36%	51%
1st Generation	36%	30%	30%	32%	45%
2nd Generation	30%	23%	26%	25%	24%
3rd + Generation	34%	47%	45%	43%	30%

Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

- Within the five minute walk time, there is a relatively high proportion of visible minority residents. However, 64% are at least second generation Canadians or longer.
- Within the five minute drive time and within Port Coquitlam, the proportion of visible minorities and first generation Canadians is lower.

Implications for Greystone Place:

- These residents are fully immersed in the Vancouver way of life and less influenced by language and ethnic shopping behaviours.



Education and Occupation (15 yr.+)

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Education					
Bachelor Degree or Higher	33%	29%	31%	29%	40%
Labour Force Participation Rate	73%	75%	73%	72%	68%
Occupation					
Management, Business, Admin	36%	33%	32%	27%	26%
Science Related	14%	9%	9%	9%	9%
Health Related	5%	5%	6%	7%	7%
Education, Government	8%	10%	11%	10%	11%
Arts, Culture, Recreation	5%	5%	4%	4%	5%
Sales and Services	19%	23%	20%	22%	22%
Other Blue Collar	11%	15%	17%	20%	17%

Source: Statistics Canada 2011, 2016, Envirionics

Salient Findings:

- Local residents within a five minute walk and within a five minute drive time are relatively well educated.
- There is a high labour force participation rate reflective of many dual income families living in the suburbs of Vancouver. Families lead very busy lives and providing goods and services related to their high pressured lives can be a sustainable niche.
- The majority of working adults are employed in management, business, or administrative type occupations. Science related occupations are relatively high as well.
- Despite the proximity to a large employment area, the proportion of local residents working in these blue collar occupations are lower than in the City of Coquitlam.

Implications for Greystone Place:

- The proximity of Greystone Place to the major highways including Hwy 7 is a factor in their home choice allowing them easy access to other employment nodes such as Burnaby and Downtown Vancouver. These residents will be looking for convenient, high quality goods close to their home and commute. The "right-in; right out" accessibility factor of the site is an additional positive feature of the site.



Travel to Work

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Vehicle	79%	85%	83%	81%	70%
Public Transit	17%	11%	12%	14%	20%
Walk	2%	3%	3%	4%	7%
Bike	0%	1%	1%	1%	2%
Other	2%	2%	2%	1%	2%

Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

- Over 80% of trade area working residents commute to work by car or as a passenger in a vehicle.
- The reliance on public transit is relatively low.
- This means that local residents face long commutes and will be very time-starved with respect to their work/life balance.

Implications for Greystone Place:

- Families will look to options such as home meal replacement, easy access, parking convenience, and combining activities together (e.g., workout with grocery buying) to save time.



Marital Status and Household Size

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Marital Status					
Married / Common Law	64%	65%	63%	59%	56%
Single Never Married	26%	25%	26%	28%	30%
Sep. Divorced, Widowed	10%	10%	11%	14%	14%
Household Size					
1 Person	14%	12%	13%	22%	29%
2 Person	32%	32%	32%	31%	31%
3 Person	21%	22%	21%	19%	16%
4 Person	23%	25%	23%	18%	14%
5+ Person	11%	10%	11%	9%	10%

Source: Statistics Canada 2011, 2016, Environics

Salient Findings:

- Two-thirds of households are married or common law.
- The proportion of three and four person households is higher than elsewhere in Port Coquitlam and higher than Vancouver CMA.



Prizm Segmentation

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Boomerang City	32.4%	18.3%	12.9%	5.6%	4.8%
Diversity Heights	23.0%	10.5%	12.4%	9.9%	6.6%
Kids and Careers	14.8%	18.1%	17.7%	5.2%	2.2%
Urbane Villagers	10.2%	13.4%	8.2%	2.2%	1.2%
Heritage Hubs	8.9%	9.5%	14.8%	12.1%	2.3%
Aging in Suburbs	8.5%	10.4%	11.0%	9.6%	3.4%

Source: Environics

Salient Findings:

Segmentation is based on a broad category classification that groups the Canadian households and populations into one of over 68 cluster groups. This is based on common behaviours and attributes under the assumption that “birds of a feather flock together”.

There are very unique household segmentation clusterings for the households who live within Greystone Place trade areas. This includes

- Boomerang City – Diverse, middle aged and older families often with older children living at home. Are well educated and are very social. They participate in activities such as film festivals, museums, health clubs, boat shows, theatre. They are very health conscious.
- Diversity Heights – Middle aged, diverse suburban families often from immigrant families that came over 30 years prior. They live in multi-lingual homes. They enjoy outdoor activities. They tend to still follow traditional family shopping behaviours and frequent family-oriented businesses similar to their own ethnicity.
- Kids and Careers – large, well-off, middle aged, suburban families. These families are very well-off and have a large number of children usually teenagers. They are interested in golf, fitness, upscale malls. They follow team sports from both a spectator and participant perspective. They spend money on home entertainment.
- Urbane Villagers – second wealthiest lifestyle group. Families with teenagers who enjoy international travel, golf clubs, beauty treatments, gourmet cooking, and the arts.
- Heritage Hubs – Upscale, multigenerational, urban households. Often have dual incomes. Enjoy going to exhibitions such as gardening, pets, autos, food, wine. They like to travel but can be thrifty at times.

**Implications for Greystone Place:**

- Most of these segments are not representative of the overall Port Coquitlam segmentation. The trade area accounts for higher income/wealth and households that lead very active and social lives. These residents are not found in Downtown on an as frequent basis and potentially these residents are shopping elsewhere. These sales can be re-captured by Greystone Place development.



Annual Household Expenditure (High Indexed Expenditure to Income Commodity Categories are Highlighted in Red)

	5 MINUTE WALK TIME	10 MINUTE WALK TIME	5 MINUTE DRIVE	PORT COQUITLAM	VANCOUVER CMA
Local Neighbour Goods					
Food from Grocery Stores	\$12,767	\$11,388	\$11,386	\$9,055	\$7,981
Health Care and Pharmacy	\$4,350	\$3,796	\$3,837	\$3,150	\$2,796
Alcohol Purchased from Stores	\$3,875	\$3,258	\$3,155	\$2,049	\$1,761
Retail Merchandise					
Women's Clothing and Accessories	\$6,841	\$6,084	\$6,036	\$4,364	\$4,367
Reading Materials	\$490	\$373	\$376	\$267	\$265
Pet Food	\$417	\$364	\$373	\$276	\$250
Home Furnishings	\$3,533	\$3,136	\$3,105	\$2,241	\$2,090
Garden Nursery Items	\$532	\$440	\$416	\$289	\$235
Sporting Goods / Bikes	\$721	\$451	\$452	\$281	\$218
Eating Operations					
Dinner at Restaurants	\$4,113	\$3,440	\$3,380	\$2,550	\$2,689
Lunch at Restaurants	\$2,434	\$2,001	\$1,978	\$1,605	\$1,749
Breakfast at Restaurants	\$545	\$455	\$458	\$399	\$385
Snacks and Beverages	\$862	\$759	\$738	\$562	\$518
Alcohol Serviced on Premises	\$1,770	\$1,326	\$1,320	\$908	\$986
Services					
Clothing Services	\$274	\$230	\$225	\$160	\$203
Packaged Travel	\$1,112	\$1,064	\$1,020	\$616	\$674
Recreation Memberships	\$1,062	\$974	\$955	\$593	\$602
Personal Care	\$1,201	\$1,060	\$1,042	\$760	\$705

Source: Statistics Canada 2011, 2016, EnviroNics

**Salient Findings:**

- As stated, the household incomes in the local trade area are at least 45% higher than the Vancouver CMA average. As a result, household and per capita expenditures across almost all commodity categories will be higher.
- Assessing demand based on indexing the expenditure for each trade area against Vancouver CMA household expenditures and then re-indexing again based on household income provides a measure of certain commodities that trade area residents will spend an exceptionally high proportion of their budget on (note these commodity categories are highlighted in red).
- These high expenditure commodity categories include:
 - Looking good – recreational members, personal care services
 - Entertaining and being entertained including alcohol served and purchased
 - Their young families including home amenities and décor such as
 - Furniture and home furnishings as well as nursery and plants
 - Taking care of their children and their busy lives
 - Sporting goods, books, hobby, music



5.2 Downtown Port Coquitlam Reliance on Greystone Place Trade Area Residents

The following charts highlight how much Downtown Port Coquitlam relies on Greystone Place trade areas.

Cross Reference: Visitation to Downtown Port Coquitlam from Residents Living Greystone Place Trade Area

GREYSTONE PLACE TRADE AREA	VISITORS	VISITATION FREQUENCY TO DOWNTOWN	AVERAGE NUMBER OF VISITS	AVERAGE AGE	AVERAGE HOUSEHOLD INCOME
5 Min. Walk Time (400m)	116	1,514	13.05	42.1	\$121,447
5 Min to 10 Min Walk Time (400 m to 800 m)	156	2,218	14.22	40.1	\$124,546
10 Min Walk Time to 5 min Drive Time	823	16,886	20.52	40.9	\$108,015
Total Greystone Trade Area	1,095	20,618	18.83	40.9	\$111,793

Source: Uber Media, Statistics Canada, Environics

Cross Reference: Visitation to Downtown from Residents Living in Greystone Place Trade Area

GREYSTONE PLACE TRADE AREA	VISITORS	% OF TOTAL VISITS	VISITATION FREQUENCY TO DOWNTOWN	% OF TOTAL VISITATION
5 Min. Walk Time (400m)	116	0.7%	1,514	0.5%
5 Min to 10 Min Walk Time (400 m to 800 m)	156	0.9%	2,218	0.7%
10 Min Walk Time to 5 min Drive Time	823	4.8%	16,886	5.2%
Total Greystone Trade Area	1,095	6.4%	20,618	6.4%
Total Downtown Visitors and Visitation	17,191		323,826	

Source: Uber Media, Statistics Canada, Environics

Salient Findings and Implications for Greystone Place:

- For those residents who live within the Greystone Place trade areas, the preceding information is provided to illustrate how reliant Downtown Port Coquitlam is on the Greystone Place trade area population.
- The number of visits to Downtown from residents living nearby Greystone Place is lower than elsewhere. Nearby Greystone Place trade area residents visit Downtown on average 13 to 14 times annually compared to other trade area residents within the 2 km to 5 km radius of Downtown who visit 15.5 to 25.5 times annually.



- Of all Downtown visitation, the total number of visitations that come from residents who live in Greystone Place trade area is 6%.



6.0 GREYSTONE PLACE RETAIL DEMAND ANALYSIS

The demand analysis is based on the following assumptions:

- Trade area only includes the 5 minute walk time, the 10 minute walk time, and the 5 minute drive time.
- Current state is 2018 and future build-out state is 2023.
- Population is anticipated to continue to grow at previous annual rates which is a combination of new housing being built as well as new families moving in and having children (replacing an empty nester household with a young family with one or two children). A conservative annual growth rate of 0.8% is applied.
- Categories included in the study only include food services, food and beverage retail, and sporting good, book, music, and leisure retail. All other categories such as automotive, gas station, home improvement, large furniture stores, large electronics stores, drug stores/pharmacies, clothing and accessories stores, department stores, are excluded as they don't fit the desired business mix vision.
- Services such as food services are included but other services such as gym, fitness would be considered separate and not part of the demand analysis although they could fit into the business mix.
- Per capita expenditure is based on Vancouver CMA retail sales by Statistics Canada.
- Real incomes excluding inflation are anticipated to increase at a similar rate of 1% annually.
- Adjustments in expenditure are based on average household income of each trade area, elasticity of demand based on household income of trade area compared to Vancouver CMA, and an online sales adjustment (current and future).
- The residents of Greystone Place are anticipated to be an average of the three proxy areas including the 10 minute walk time, Newport in Port Moody, and Edgemont in North Vancouver. The average household income of these three communities is \$151,921.
- The warranted space calculations are based on higher than current sales levels. This ensures the analysis is conservative and allows for both Downtown and Greystone Place to perform at higher than current sales levels.
- A residual approach includes the incremental retail and food service demand for the aforementioned categories.
- This approach allows for Downtown Port Coquitlam to remain at a minimum at the 2018 sales level.



Greystone Retail Demand Analysis Assumptions

	GREYSTONE PLACE	10 MIN WALK TIME RESIDENTS	5 MIN DRIVE TIME RESIDENTS
2018 Existing Population	0	4,244	11,126
2023 Future Population	292	4,416	11,578
Per Capita Income	\$151,921	\$157,717	\$155,724
Real Income Growth Adjustment	1.0%	1.0%	1.0%
Expenditure Per Person			
Supermarkets	\$2,364	\$2,364	\$2,364
Convenience Stores	\$118	\$118	\$118
Specialty Food	\$250	\$250	\$250
Home Furnishings	\$209	\$209	\$209
Leisure Retail	\$402	\$402	\$402
Full Service Restaurants	\$1,085	\$1,085	\$1,085
Limited Service Restaurants	\$943	\$943	\$943
Elasticity of Demand			
Supermarkets	-7.9%	-4.3%	-2.2%
Convenience Stores	-7.9%	-4.3%	-2.2%
Specialty Food	-7.9%	-4.3%	-2.2%
Home Furnishings	0.0%	1.6%	1.9%
Leisure Retail	57.0%	40.1%	42.2%
Full Service Restaurants	-11.4%	-13.3%	-13.8%
Limited Service Restaurants	-17.5%	-22.5%	-22.4%



Greystone Retail Demand Analysis Assumptions

	GREYSTONE	10 MIN WALK TIME RESIDENTS	5 MIN DRIVE TIME RESIDENTS
Online Expenditure Adjustment			
Supermarkets	-0.5%	-0.5%	-0.5%
Convenience Stores	0.0%	0.0%	0.0%
Specialty Food	-0.5%	-0.5%	-0.5%
Home Furnishings	-2.0%	-2.0%	-2.0%
Leisure Retail	-7.0%	-7.0%	-7.0%
Full Service Restaurants	0.0%	0.0%	0.0%
Limited Service Restaurants	0.0%	0.0%	0.0%
Future Online Expenditure Adjustment			
Supermarkets	-0.2%	-0.2%	-0.2%
Convenience Stores	-0.2%	-0.2%	-0.2%
Specialty Food	-0.2%	-0.2%	-0.2%
Home Furnishings	-0.6%	-0.6%	-0.6%
Leisure Retail	-0.3%	-0.3%	-0.3%
Full Service Restaurants	-0.1%	-1.0%	-0.1%
Limited Service Restaurants	-0.1%	-0.1%	-0.1%



The following two charts show the incremental demand from the Greystone Place trade areas for 2021 (property build out) and 2023 (fully retail lease properties).

Greystone Place 2021 Warranted Space Based on Incremental Demand from 2018

	GREY- STONE PLACE	10 MIN WALK TIME RESIDENTS	5 MIN DRIVE TIME RESIDENTS	2023 DEMAND	2018 EXISTING	INCREMENTAL DEMAND
Total Expenditure						
Supermarkets	\$647,842	\$10,020,634	\$26,846,384	\$37,514,860	\$35,148,005	\$2,366,855
Convenience Stores	\$32,500	\$502,697	\$1,346,782	\$1,881,979	\$1,763,243	\$118,736
Specialty Food	\$68,511	\$1,059,712	\$2,839,085	\$3,967,308	\$3,717,006	\$250,302
Home Furnishings	\$60,517	\$915,264	\$2,406,526	\$3,382,307	\$3,205,289	\$177,017
Leisure Retail	\$175,001	\$2,324,629	\$6,185,557	\$8,685,188	\$8,137,817	\$547,371
Full Service Restaurants	\$288,341	\$4,087,667	\$10,947,583	\$15,323,591	\$14,398,124	\$925,468
Limited Service Restaurants	\$233,351	\$3,263,104	\$8,565,538	\$12,061,993	\$11,243,272	\$818,721
Warranted Space (Sq. Ft.)						
Supermarkets (\$550/sq. ft.)	1,178	18,219	48,812	68,209	63,905	4,734
Convenience Stores (\$550/sq. ft.)	59	914	2,449	3,422	3,206	237
Specialty Food (\$550/sq. ft.)	125	1,927	5,162	7,213	6,758	501
Home Furnishings (\$250/sq. ft.)	242	3,661	9,626	13,529	12,821	708
Leisure Retail (\$400/sq. ft.)	438	5,812	15,464	21,713	20,345	1,368
Full Service Restaurants (\$600/sq. ft.)	481	6,813	18,246	25,539	23,997	1,851
Limited Service Restaurants (\$600/sq. ft.)	389	5,439	14,276	20,103	18,739	1,637
TOTAL	2,911	42,784	114,034	159,729	149,771	9,958



Greystone Place 2023 Warranted Space Based on Incremental Demand from 2018

	GREY- STONE PLACE	10 MIN WALK TIME RESIDENTS	5 MIN DRIVE TIME RESIDENTS	2023 DEMAND	2018 EXISTING	INCREMENTAL DEMAND
Total Expenditure						
Supermarkets	\$658,222	\$10,344,752	\$27,714,733	\$38,717,708	\$35,148,005	\$3,569,703
Convenience Stores	\$33,021	\$518,957	\$1,390,344	\$1,942,321	\$1,763,243	\$179,079
Specialty Food	\$69,609	\$1,093,988	\$2,930,915	\$4,094,512	\$3,717,006	\$377,507
Home Furnishings	\$60,995	\$937,309	\$2,464,490	\$3,462,794	\$3,205,289	\$257,505
Leisure Retail	\$177,449	\$2,395,013	\$6,372,839	\$8,945,301	\$8,137,817	\$807,485
Full Service Restaurants	\$293,549	\$4,152,501	\$11,324,343	\$15,770,393	\$14,398,124	\$1,372,269
Limited Service Restaurants	\$237,565	\$3,375,404	\$8,860,321	\$12,473,290	\$11,243,272	\$1,230,018
Warranted Space (Sq. Ft.)						
Supermarkets (\$550/sq. ft.)	1,197	18,809	50,390	70,396	63,905	7,139
Convenience Stores (\$550/sq. ft.)	60	944	2,528	3,531	3,206	358
Specialty Food (\$550/sq. ft.)	127	1,989	5,329	7,445	6,758	755
Home Furnishings (\$250/sq. ft.)	244	3,749	9,858	13,851	12,821	1,030
Leisure Retail (\$400/sq. ft.)	444	5,988	15,932	22,363	20,345	2,019
Full Service Restaurants (\$600/sq. ft.)	489	6,921	18,874	26,284	23,997	2,745
Limited Service Restaurants (\$600/sq. ft.)	396	5,626	14,767	20,789	18,739	2,460
TOTAL	2,956	44,025	117,678	164,659	149,771	14,888

- Incremental Demand or Residual Demand increases from approximately 10,000 sq. ft. in 2021 within these defined retail categories to approximately 15,000 sq. ft. by 2023.
- Again, in 2023, after full build out of the property and then giving time for the retail area to be leased up, the Residual Demand is 14,888 sq. ft. of retail defined within the categories of food and beverage, leisure retail, home furnishings retail, and eating establishments. Additional demand from services such as gym would be considered on top of this demand.



- In addition, there is an opportunity for Greystone Place to recapture some of the existing sales being leaked to other areas not in Port Coquitlam. As an example, a 5% recapture would equate to 7,490 sq. ft. within these seven retail categories.
- Assuming additional services would account for 25% of the mix or 3,000 sq. ft. (e.g., gym, fitness, dance, etc.)
- This equates to over 25,000 sq. ft. of retail demand.
- From a residual demand perspective and a retail recapture perspective, there would be a portion of the total 25,000 sq. ft. of retail that could locate at Greystone Place.
- There are a series of different retail and business mix scenarios using the above-listed categories to achieve 12,000 sq. ft. of space and not have an impact on Downtown Port Coquitlam.



7.0 ECONOMIC IMPACT ANALYSIS SUMMARY

Impact on Downtown Port Coquitlam

- Downtown draws extensively beyond the south end of the City that includes the Greystone Place trade areas. There is significant inflow from the Vancouver region and it is not reliant solely on the City. The primary trade area is extensive at 5 km radius of the site. As a result, Downtown is less reliant on Greystone Place trade area residents.
- The business mix and visitor draw in Downtown is not a one trick pony. There is a diverse mix of businesses that are busy at different times of the day and different days of the week. This means the Downtown can withstand increased competition compared to other areas. Downtown is very resilient.
- There is sufficient population growth and changes in the socio-economic composition of the Greystone trade areas that the incremental demand from 2018 to 2023 supports enough retail at the site without impacting Downtown Port Coquitlam.
- Greystone Place trade area residents do not visit Downtown as often as other residents. The higher income profile and other factors are causing them to shop elsewhere. This includes the fact that many trade area residents commuting home along the Mary Hill Bypass do not want to travel to Downtown to shop and then backtrack home. They would prefer to shop closer to home. As a result, there is an opportunity to recapture some of the sales leakage to other communities back into the City of Port Coquitlam.
- We believe that the retail commercial proposed at the Greystone Place site will have little to no impact on the retail commercial functionality of Downtown Port Coquitlam based on a property build out of 2021 and a lease build out of 2023. Any impact would be very short in duration.

Project: A04.182

October 2, 2019

Rositch Hemphill Architects
10 - 120 Powell Street
Vancouver, BC V6A 1G1

Attention: Mr. Bryce Rositch

Dear Mr. Rositch:

Re: Greystone Village, Port Coquitlam

Appended is our report entitled "Greystone Village - Acoustical Evaluation".

Please call if you have any questions.

Yours very truly,

BROWN STRACHAN ASSOCIATES



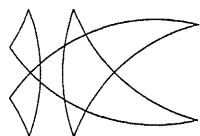
Andrew R. Fawcett, Eng.L., ASCT.

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GREYSTONE VILLAGE
ACOUSTICAL EVALUATION

Prepared for:
ROSITCH HEMPHILL ARCHITECTS

Andrew R. Fawcett, Eng.L., ASCT.
David W. Brown, P.Eng
October 2, 2019



Brown Strachan Associates
Consulting Engineers in Acoustics

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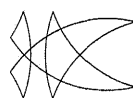
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APPENDIX



GREYSTONE VILLAGE - ACOUSTICAL EVALUATION1.0 INTRODUCTION

Brown Strachan Associates (BSA) have been retained by #393 Cathedral Ventures Ltd. to conduct an acoustical evaluation of the residential component of the proposed Greystone Village mixed-use development at 1155 Pitt River Road, 1884-1930 Harbour Street and 1887-1911 Prince Street, Port Coquitlam (City File: OCP00025, RZ000159), as designed by Rositch Hemphill Architects on progress drawings dated 1 October 2019 (appended).

The terms of reference of this report are to assess traffic noise at the development site and to recommend facade upgrades necessary to satisfy indoor noise design criteria recommended in the Canada Mortgage and Housing Corporation (CMHC) publication "Road and Rail Noise: Effects on Housing" (print appended). This report considers noise from future traffic on the Mary Hill Bypass (Provincial Highway 7B), Pitt River Road and Harbour Street.

2.0 DESIGN CRITERIA

The development has been evaluated with respect to the following CMHC noise level design criteria.

<u>Room</u>	<u>Noise Level (Decibels)</u>
Bedrooms	35
Living, dining, and recreation rooms	40
Kitchen, bathrooms and hallways	45
Outdoor recreation area	55

The design criteria are A-weighted 24-hour equivalent levels, Leq(24) in decibels (dB).

3.0 RECOMMENDATIONS

The following are recommendations to satisfy the CMHC design criteria, based on the progress drawings dated 30 September 2019, and should be referenced in the tender documents. These recommendations may be revised based on the final building design, including window & door shop drawings, etc. The working drawings and window & door shop drawings should be reviewed with reference to this report. Other design considerations, such as structural, thermal, building envelope, fire ratings, etc., should be reviewed by other disciplines.

Port Coquitlam may require written confirmation that the acoustical measures have been incorporated into the final design and construction drawings, based on the recommendations in this report.

Coordination of Code requirements, acoustical recommendations, field reviews, letters of assurance, construction or occupancy certification requirements, etc., should be provided by the Registered Professional of Record. See appended Acoustical Evaluation Reports - Background Information. Sources or other acoustical design considerations for which insufficient information exists at this stage have not been evaluated, e.g. mech. sources, etc.

3.1 Disclosure

Full disclosure should be made to prospective residents that the project site is near arterial roads operating day and night, including heavy vehicles and buses. The disclosure should indicate that these activities cause noise and vibration, which may be annoying to some individuals. The City of Port Coquitlam, TransLink and the Ministry of Transportation & Infrastructure (MoTI) may have specific disclosure statement wording satisfying their requirements.

3.2 Exterior Design Noise Levels

At the most exposed locations along the Mary Hill Bypass, the recommended exterior design level for traffic noise is $Leq(24) = 73$ dB (prints appended).

3.3 Facade Upgrades

To satisfy the CMHC indoor design criteria, recommended window, door and exterior wall upgrades are indicated on the appended Greystone Village - Facade Upgrade Schedule (Schedule).

The window and door supplier(s) should submit fenestration test reports to ASTM E90 for their proposed assemblies, as tested on representative construction, i.e. glazing including complete window frame and door assemblies. At substantial completion, the supplier(s) should confirm in writing that their rated assemblies, as installed on site, are equivalent to their tested assemblies and conform fully with this report and the appended Schedule.

Wind loading, safety, structural, thermal requirements, visual specifications, etc., should be checked for all glazing in windows and doors and may dictate thicker glazing than the references indicated on the appended Schedule. Glazing may require strengthened glass or may have a size limitation to satisfy Code requirements or design considerations such as structural requirements, visual specifications, manufacturer's weight restrictions, etc.,



e.g. mullions may be required. Windows and exterior doors should satisfy Code airtightness requirements.

Sound transmission through the exterior facade has been evaluated based on the specified window and door areas, conventional exterior construction with finishes comparable to cementitious panels (James Hardie), cultured stone or Sagiper vinyl lap siding (prints appended). Rooms requiring exterior wall upgrades are indicated on the appended Schedule.

3.4 Ventilation & Equipment

Sound transmission through the exterior facade has been evaluated based on windows and doors in the closed position. Ventilation details, thermal requirements, etc., should be designed by a mechanical consultant. Equipment should be selected to satisfy Code acoustical requirements, e.g. Code 6.2.1.1 & 9.32.3.5, and the City of Port Coquitlam Noise Control Bylaw, 1994, No. 2891. For equipment considered critical, BSA should review proposed design details.

If make-up air ducts from the exterior are also required to satisfy ventilation requirements, the ducts should be designed to provide a noise reduction of 50 dB for exterior noise, e.g. nominally 6 ft. of 4" diameter acoustically lined ductwork or lined flexible connector. BSA should review proposed ductwork details penetrating the facade into bedrooms and living/dining areas.

3.5 Amenity Areas

The provision of outdoor amenity space on the north side of Buildings 1 & 2, shielded from traffic on Mary Hill, satisfies CMHC's criteria for outdoor amenity space. The recommended exterior design noise level for traffic on Mary Hill is $Leq(24) = 73$ dB, with a design barrier noise reduction of 20 dB for Buildings 1 & 2 (ref. CMHC data appended). For indoor amenity space, recommended window and door upgrades have been included in the Schedule to satisfy CMHC's criterion in recreation rooms.

4.0 DISCUSSION

4.1 Method of Evaluation

The method of evaluation used in this report gives detailed consideration of traffic sound transmission, referencing NRC's IBANA-Calc analysis software and related validation studies (see 4.3 Interior Noise, below). To determine possible facade upgrades necessary to satisfy the City's indoor design criteria, evaluation of the proposed construction is based on $Leq(24)$ sound transmission, windows and doors in the closed position, rooms with the greatest exposure to noise and the largest window, door and exterior wall area with respect to floor area.



4.2 Traffic Noise

Traffic noise exposure has been evaluated based on the forecasted 2030 a.m. & p.m. peak hour traffic data in the CTS Traffic Impact Assessment (appended). The a.m. + p.m. peak hour data are considered equivalent to 13% of the daily total traffic (MoTI ref. data appended). All local roads in this area have been evaluated based on their posted speed limits, i.e. 70 km/h on Mary Hill Bypass, 50 km/h on Pitt River Road and Harbour Street. The City's truck route and Translink's bus route maps have been considered (prints appended).

Based on the CTS traffic data, site observations and previous studies in this area, the following design volumes have been used to evaluate future traffic noise at the development site:

	Vehicles per day (vpd)	% Heavy veh.
Mary Hill Bypass (E./W.Bnd):	41,900 / 36,100	5
Pitt River Road (N.+S.Bnd):	10,800	1
Harbour Street (E.+W.Bnd):	1,500	1

Design traffic noise levels have been derived from statistical tables, developed by NRC, in CMHC's "Road and Rail Noise: Effects on Housing". These tables have been used on numerous housing site assessments throughout Metro Vancouver, including recent studies in this area, with good correlation between measured and calculated levels (typically +/-1 dB, for normal traffic conditions). For the design volumes, the CMHC calculated traffic noise level is $Leq(24) = 73$ dB at the most exposed locations along the Mary Hill Bypass (prints appended).

To check that the CMHC traffic noise calculations correlate with traffic in this area, sample daytime measurements were conducted at a Test Location approximately 1.5m north of the south property line along Mary Hill and 28m west of the east property line (site plan appended). The average measured $Leq = 74$ dBA (Table and Graphs appended). For the observed traffic, the calculated CMHC equivalent traffic noise level is $Leq(24) = 75$ dB (printout: predict, appended). The difference is attributed to westbound traffic on Mary Hill moving slower than the 70 km/h posted speed limit, likely as a result of congestion at the Pitt River Road intersection (printout: pred-2). No corrections have been made to the recommended exterior design levels for this local site condition.

4.3 Interior Noise

The project has been evaluated with referencing NRC's IBANA-Calc analysis software, related validation studies, statistical source data normalized for future design conditions and facade transmission loss data. Detailed calculations of sound transmission through the exterior facade are summarized in Table 1 (appended) and include the absorption typical of furnished rooms (printouts appended). Table 1 shows the sound level transmitted by each sound path, such as windows, doors & exterior walls, and compares the total sound to the Leq(24) design criterion.

Sound levels can vary relative to calculated levels due to normal variation in traffic activity, possible contribution from other sources, on-site performance of facade components, flanking sound transmission, room absorption, etc.

5.0 CONCLUSION

Provided the recommendations in this report are implemented, our evaluation indicates that the residential component of the proposed Greystone Village mixed-use development satisfies the CMHC indoor noise level design criteria.



APPENDIX



GREYSTONE VILLAGE - FAÇADE UPGRADE SCHEDULE

This two page schedule forms part of the Brown Strachan Associates (BSA) acoustical report dated 2 October 2019 and should be read with the full report. It is the supplier's responsibility to ensure that the rated windows and doors, as installed on site, fully conform to this schedule and report (confirm in writing, when requested).

Unless otherwise indicated in table below, provide conventional windows and doors with standard thermal glazing, including all windows and doors in the townhouses. Specified façade upgrades are applicable to all exterior walls, doors and windows in a given room.

Bldg.	Level	Suite No. (Type)	Room	Window & Door Rating	Ext. Wall Upgrade
1	1	Amenity	Amenity Room & Gym	OITC 32	
		105 (J1)	Master Bdrm. & Liv/Din	OITC 29	
		106 (H)	Bdrms. (both) & Liv/Din	OITC 29	
		107 (J1)	Bedrooms (both)	OITC 32	2x GWB
			Liv/Din & Den	OITC 32	2x GWB
		108 & 110 (H)	Bedroom #2	OITC 32	2x GWB on Res.
			Master Bdrm.	OITC 32	2x GWB
			Liv/Din	OITC 29	
		109 (C)	Bedroom	OITC 32	2x GWB
			Liv/Din	OITC 29	
		111 (J1)	Master Bdrm.	OITC 32	2x GWB on Res.
			Liv/Din & Den	OITC 32	2x GWB
			Bedroom #2	OITC 32	
	2, 3 & 4	01 (G)	Bedrooms (both)	OITC 32	
		06 (J1)	Master Bdrm. & Liv/Din	OITC 29	
		07 (H)	Bdrms. (both) & Liv/Din	OITC 29	
		208 & 308 (J1)	Bedrooms (both)	OITC 32	2x GWB
			Liv/Din & Den	OITC 32	2x GWB
		408 (J1) [higher clg.]	Bedrooms (both)	OITC 35	2x GWB
			Liv/Din & Den	OITC 35	2x GWB
		09 (C)	Bedroom	OITC 32	2x GWB
			Liv/Din	OITC 29	
		10 (H)	Bedrooms (both)	OITC 32	2x GWB
			Liv/Din	OITC 29	
		11 (H)	Master Bedrm.	OITC 32	2x GWB
			Bedrm. #2 (two facades)	OITC 32	2x GWB on Res.
			Liv/Din	OITC 29	
		212 & 312 (J1)	Master Bedrm.	OITC 32	2x GWB on Res.
			Liv/Din & Den	OITC 32	2x GWB
			Bedroom #2	OITC 32	
		412 (J1) [higher clg.]	Master Bedrm.	OITC 35	2x GWB on Res.
			Liv/Din & Den	OITC 35	2x GWB
			Bedroom #2	OITC 35	2x GWB



GREYSTONE VILLAGE - FAÇADE UPGRADE SCHEDULE (CONT'D)

Bldg.	Level	Suite No. (Type)	Room	Window & Door Rating	Ext. Wall Upgrade
2	1, 2, 3 & 4	Amenity	Amenity Room	OITC 32	
		01 (J1)	Master	OITC 32	2x GWB on Res.
			Liv/Din & Den	OITC 32	2x GWB
			Bedroom #2	OITC 32	
		401 (J1) [higher clg]	Master	OITC 35	2x GWB on Res.
			Liv/Din & Den	OITC 35	2x GWB
			Bedroom #2	OITC 35	2x GWB
		02 (B) 03 & 04 (C)	Bedroom	OITC 32	2x GWB
			Liv/Din	OITC 29	
		05 (F)	Bedrooms (both)	OITC 35	2x GWB, stone
			Liv/Din	OITC 32	2x GWB
		405 (F) [Lev. 4]	Bedrooms (both)	OITC 35	2x GWB, stone
			Liv/Din [higher clg]	OITC 35	2x GWB
		06 (C)	Bed, Liv/Din & Den	OITC 29	
		07 (J1)	Bed, Liv/Din & Den	OITC 29	
		11 (G)	Bedrooms (both)	OITC 32	
3	2, 3 & 4	05 (D)	Bedroom #2	OITC 29	
		06 (D)	Bedrooms (both)	OITC 29	
			Liv/Din & Den	OITC 29	
		07 (H)	Bedrms. (both) & Liv/Din	OITC 29	
		08 (J2)	Bedrooms (both)	OITC 29	
			Liv/Din & Den	OITC 29	

Legend (including sliding and swing exterior doors):

OITC 35: Provide OITC 35 rated assemblies. Note: Stringent design requirement, possibly requiring triple glazing and/or thick laminated glazing.

OITC 32: Typically laminated glazing, e.g. 6-13-6Lam thermal glazing.

OITC 29: Typically 6-13-4 or 6-13-6 thermal glazing.

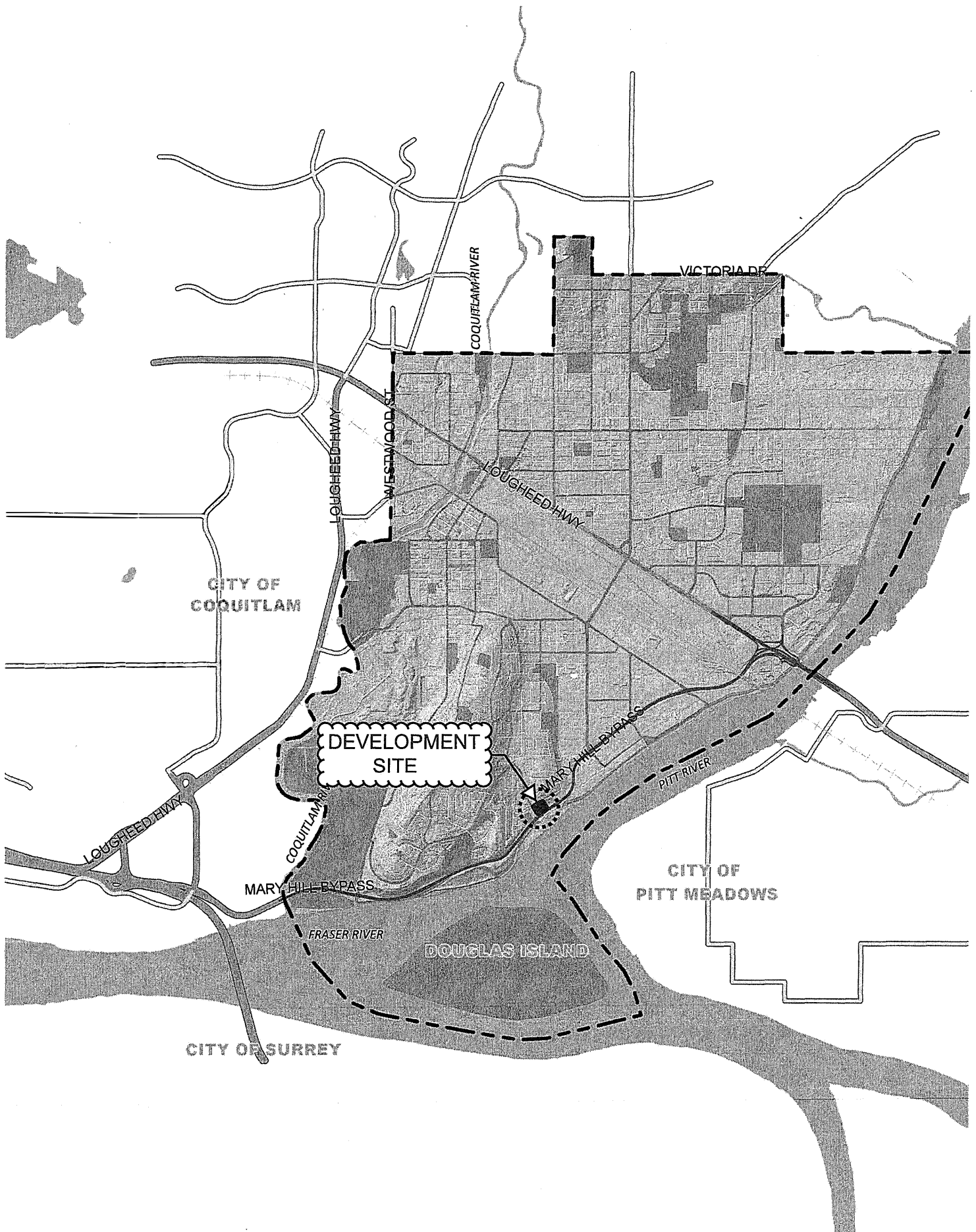
2x GWB: Provide two layers of interior GWB (2x GWB) applied directly to exterior wall framing (exclude closets, ensuites and furred walls at concrete columns).

2x GWB on Res: Provide resilient furring on suite side of exterior walls & finish with 2x GWB (above). Install resilient furring to manufacturer's specifications, directly to exterior wall framing only, not between layers of drywall.

For all windows and doors, provide fenestration test reports to ASTM E90, as tested on representative assemblies. If necessary to satisfy wind loading, safety, structural, thermal, visual specifications, etc., provide thicker glazing units than indicated above (subject to acoustical review by BSA). Glazing may require strengthened glass or may have size limitation to satisfy other design considerations, e.g. mullions may be required. Provide windows and exterior doors satisfying Code airtightness requirements. See Acoustical Evaluation Reports - Background Information (appended to report).

Schedule based on progress drawings dated 1 October 2019 and temporary suite numbers.



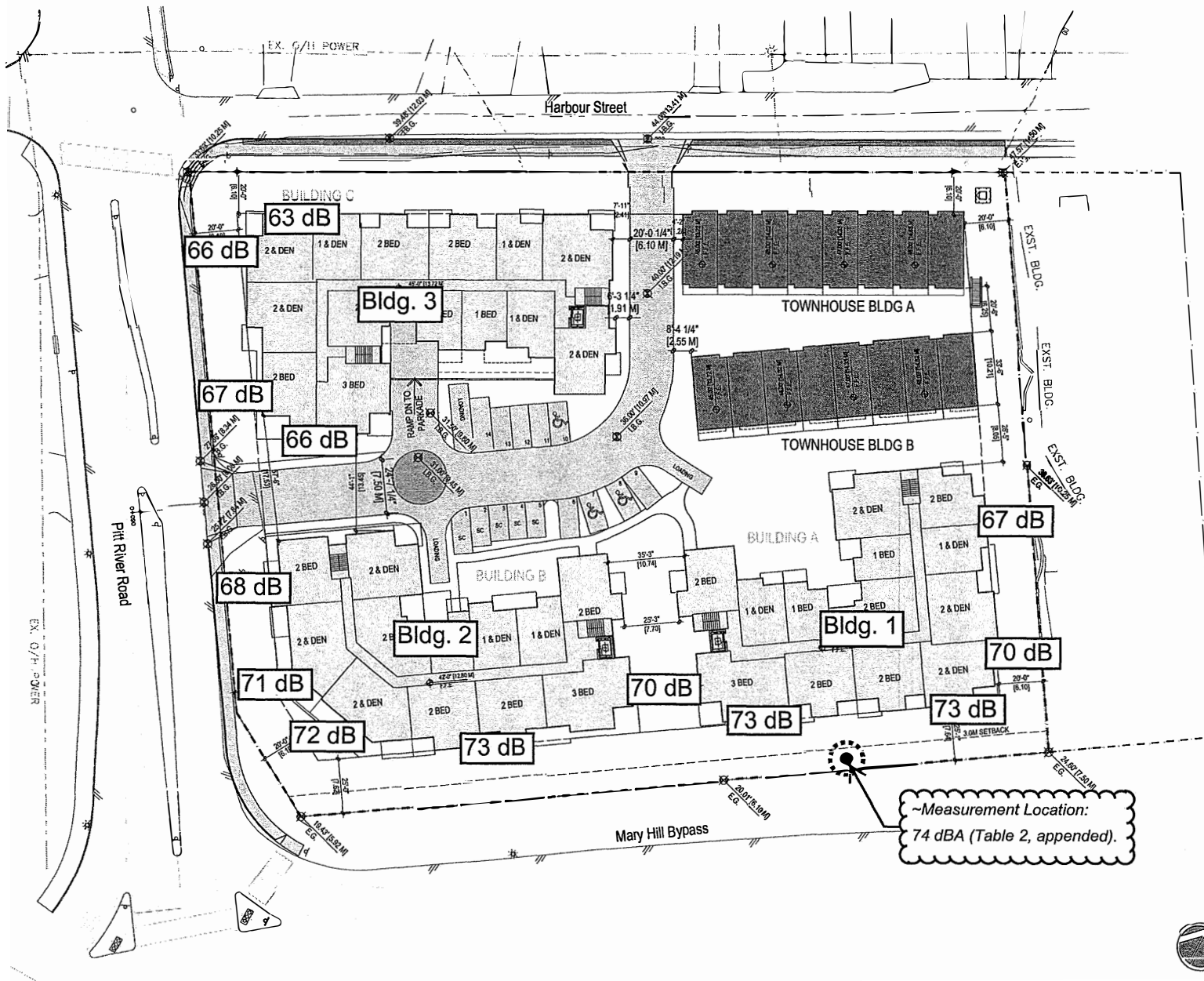




**DEVELOPMENT
SITE**



RECOMMENDED EXTERIOR DESIGN LEVELS FOR TRAFFIC NOISE, Leq(24)



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TYPICAL PLATE - LEVELS 2-4

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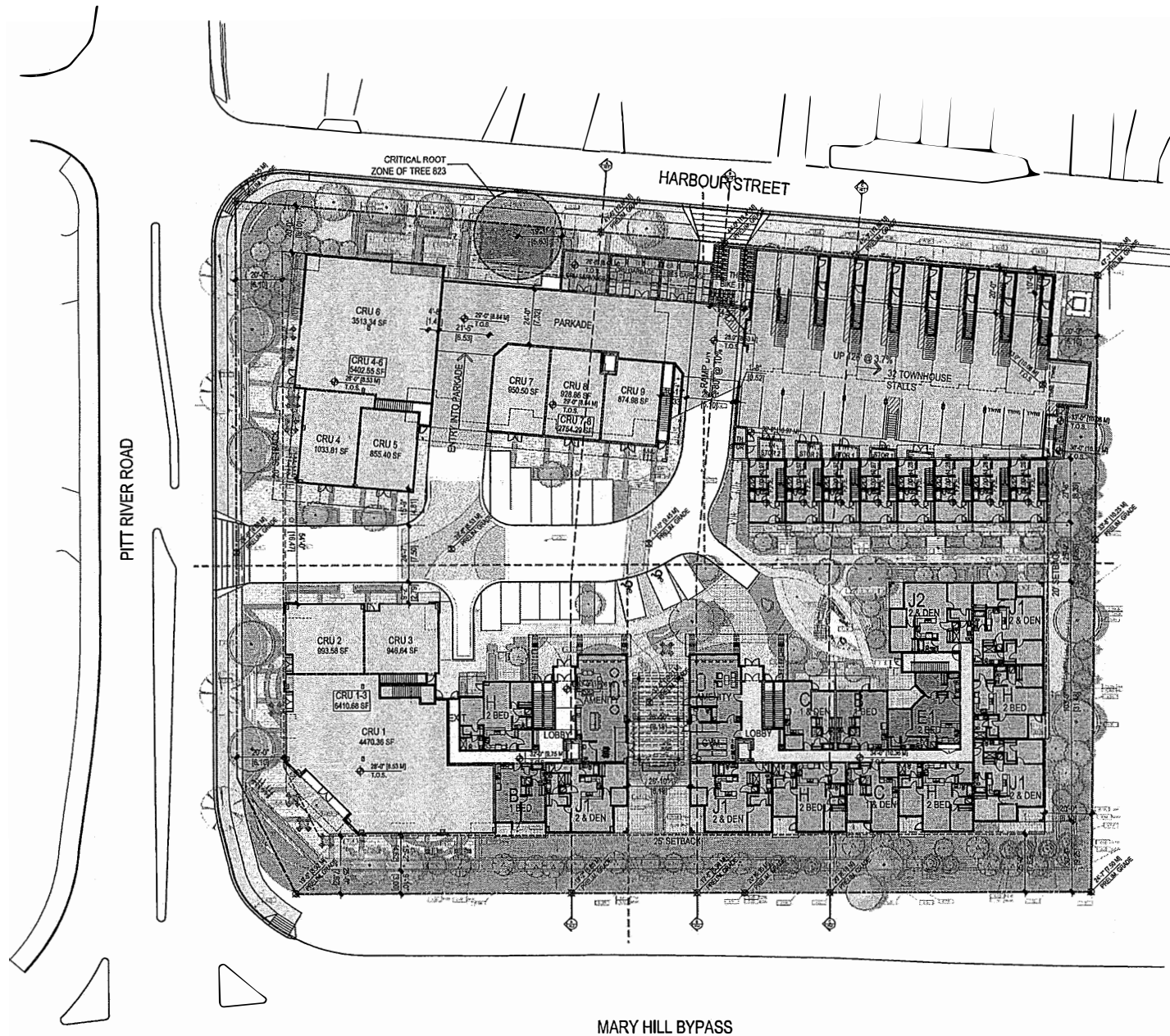
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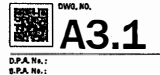
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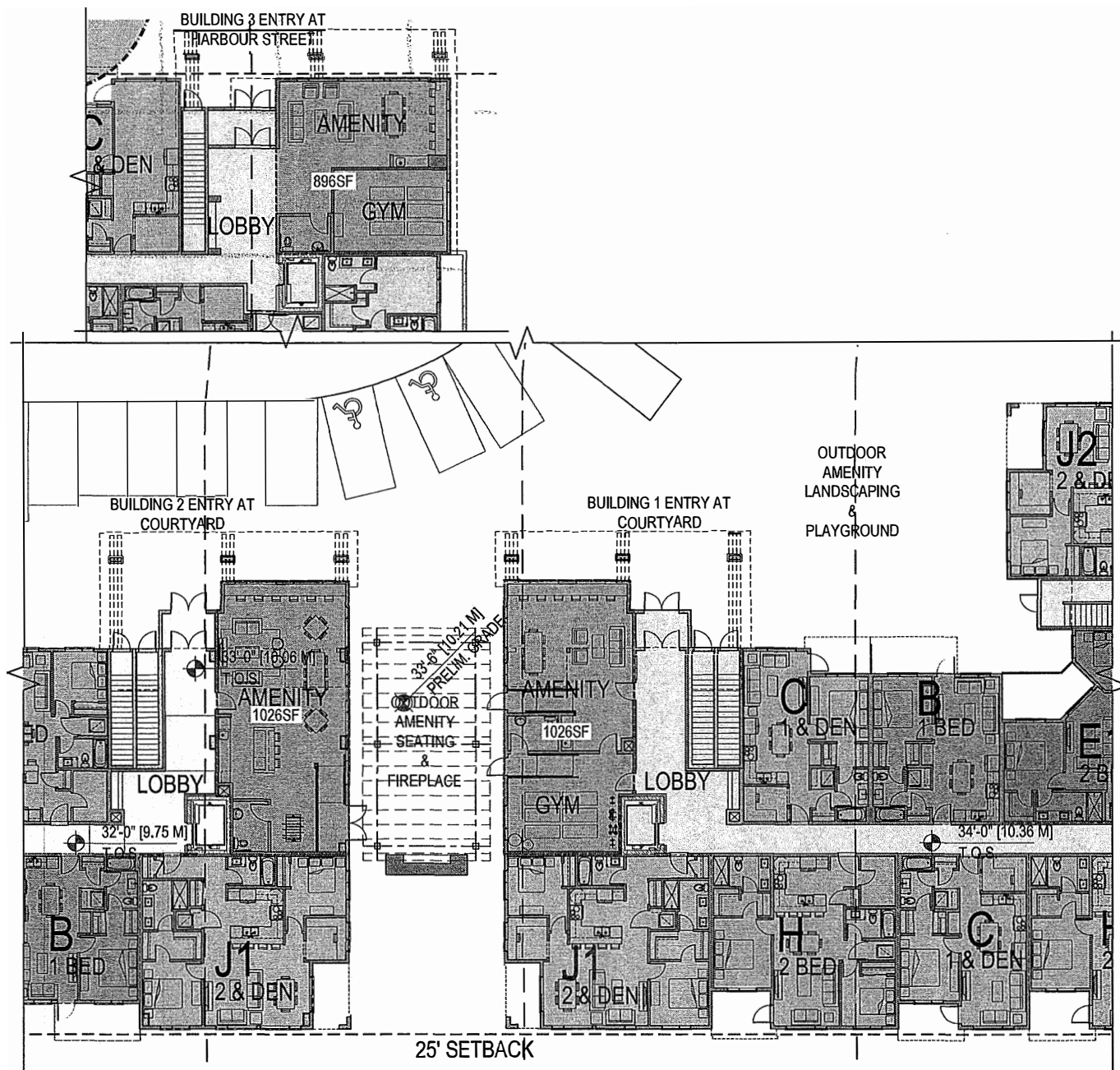


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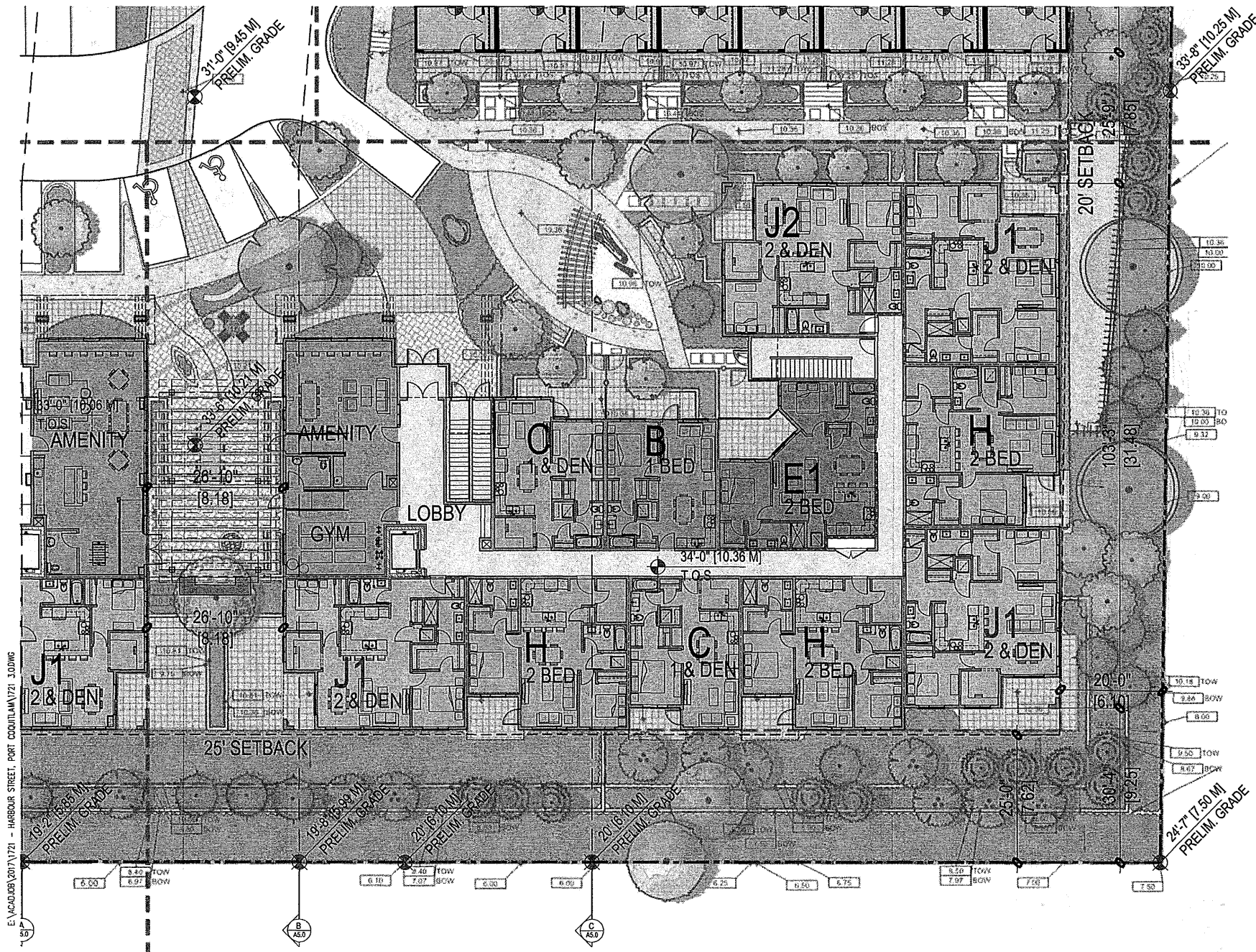
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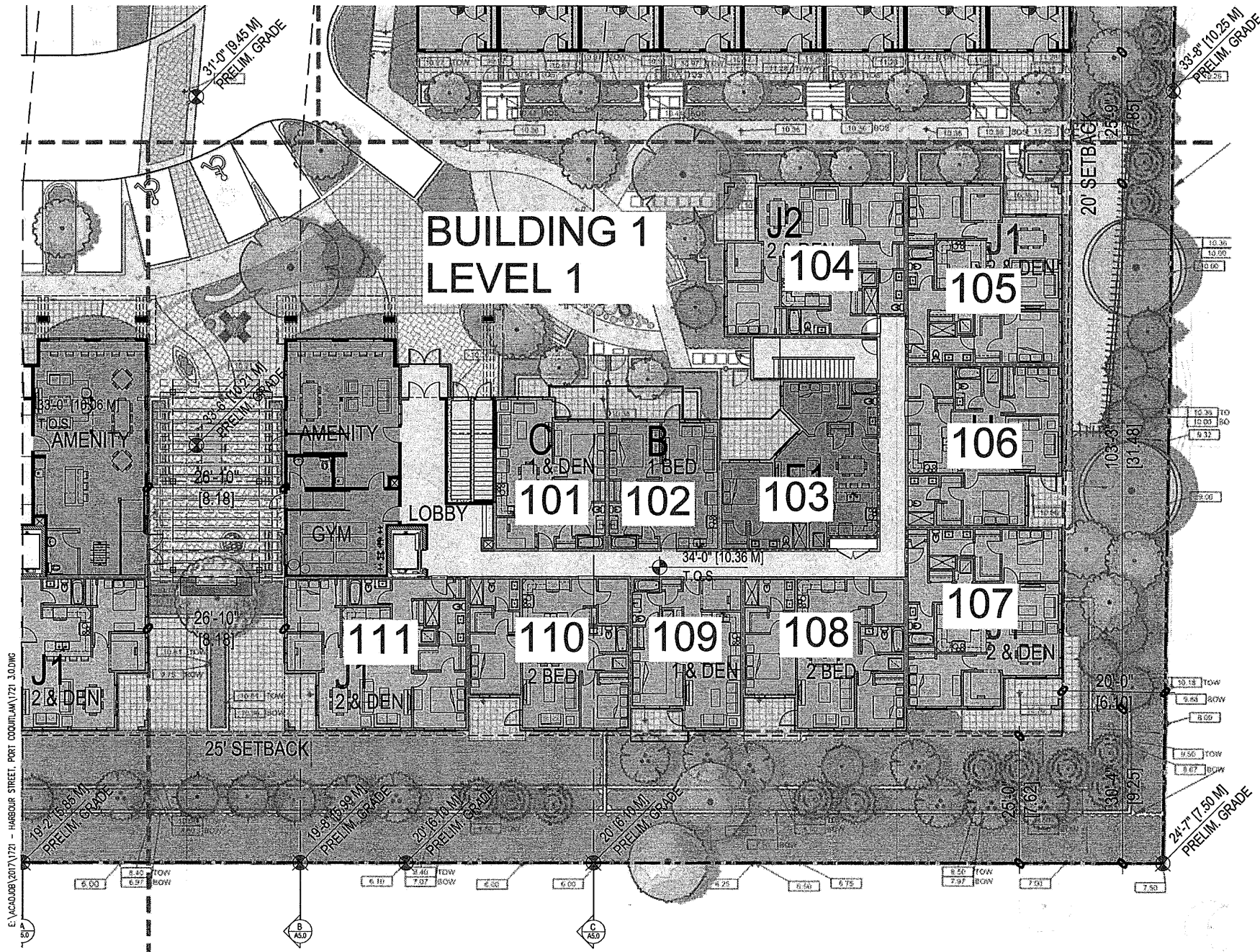
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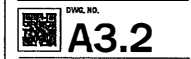
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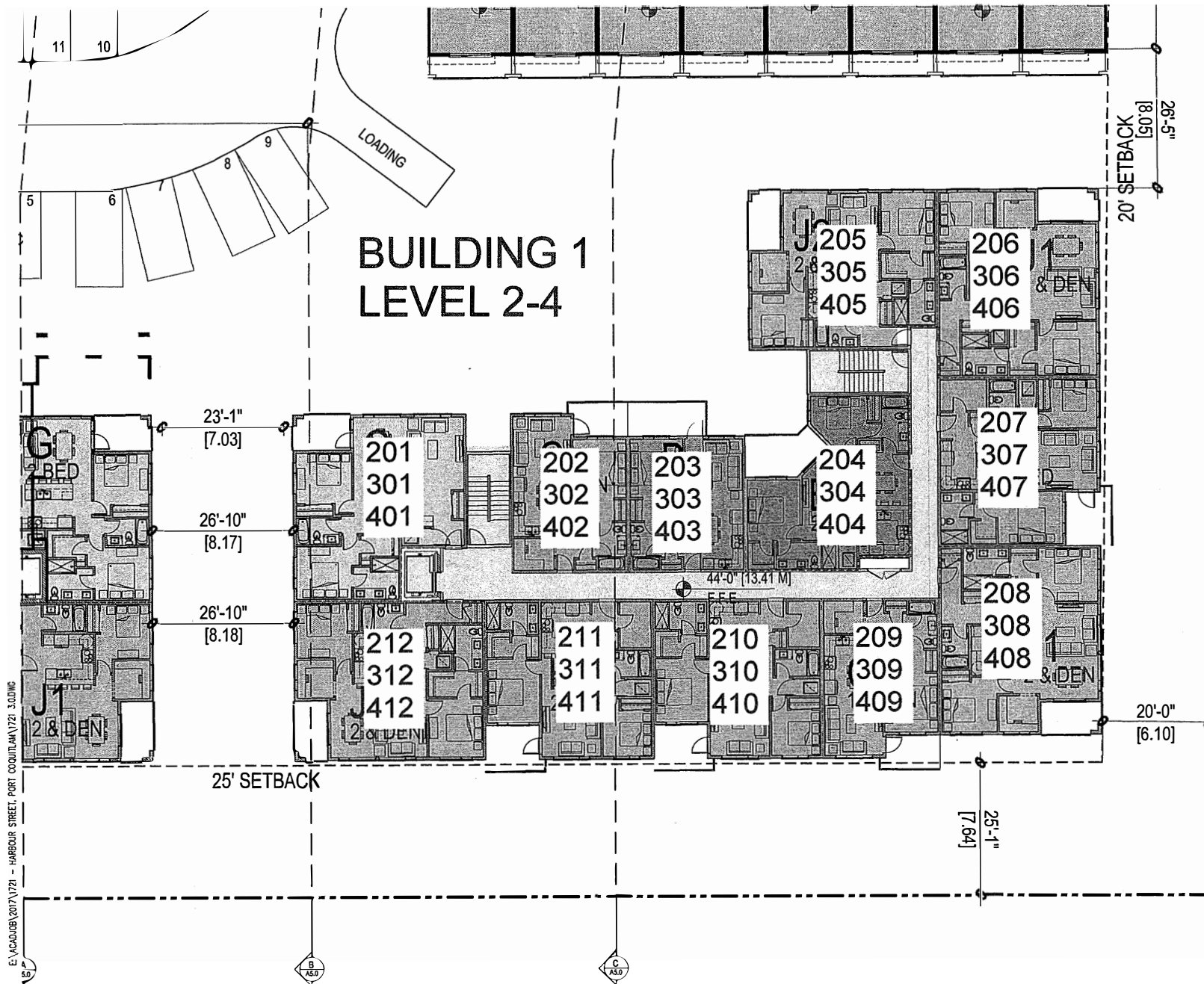
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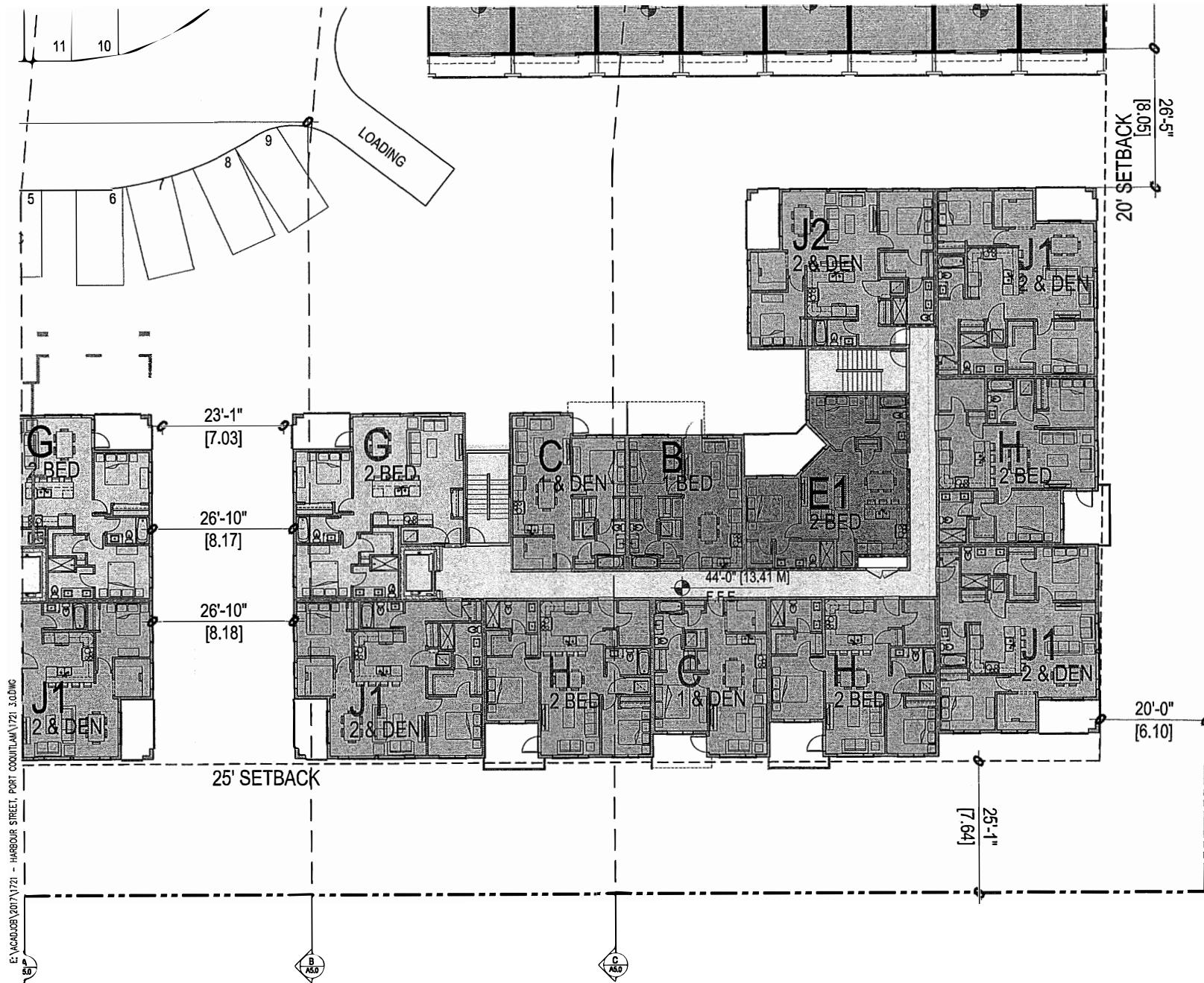
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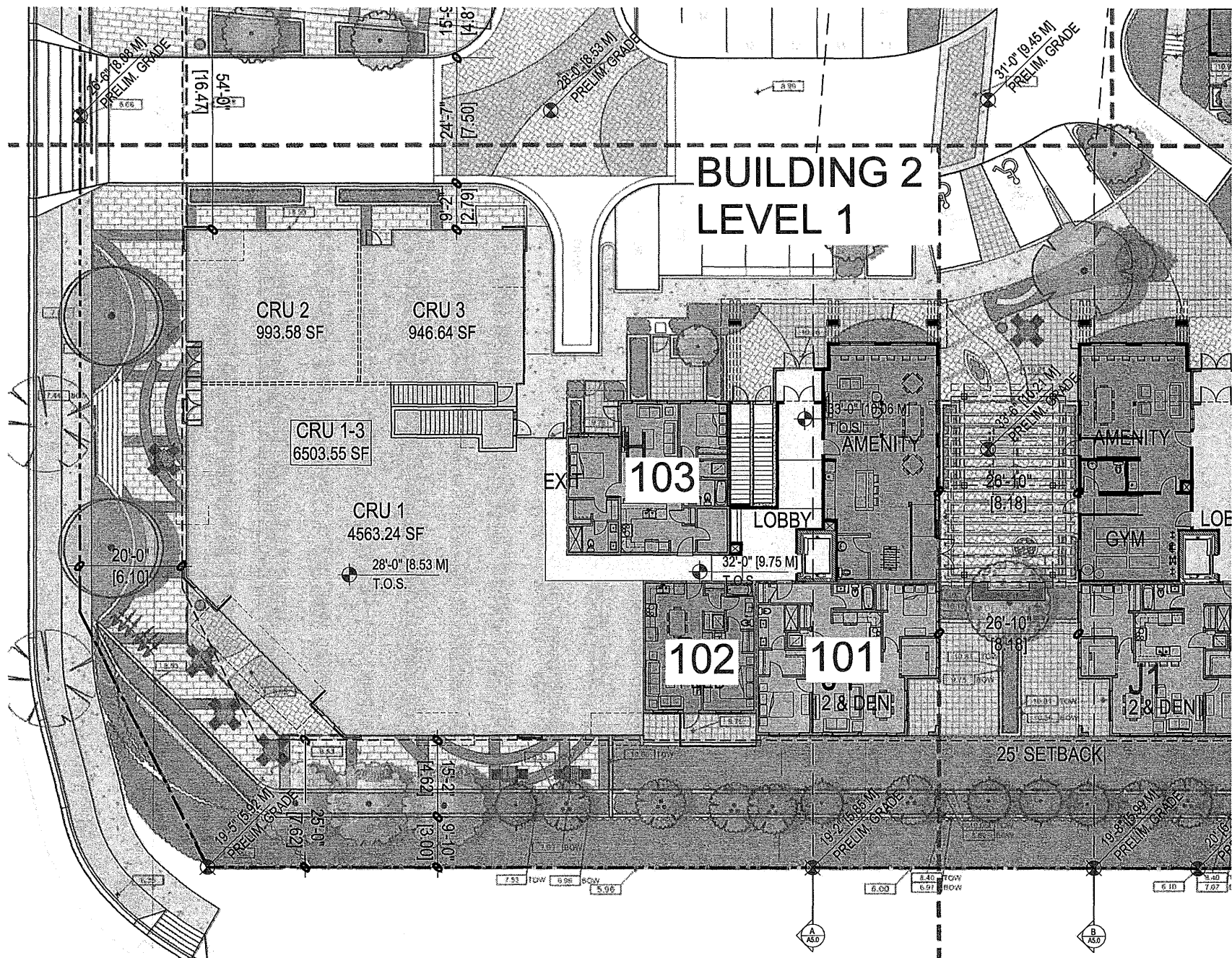
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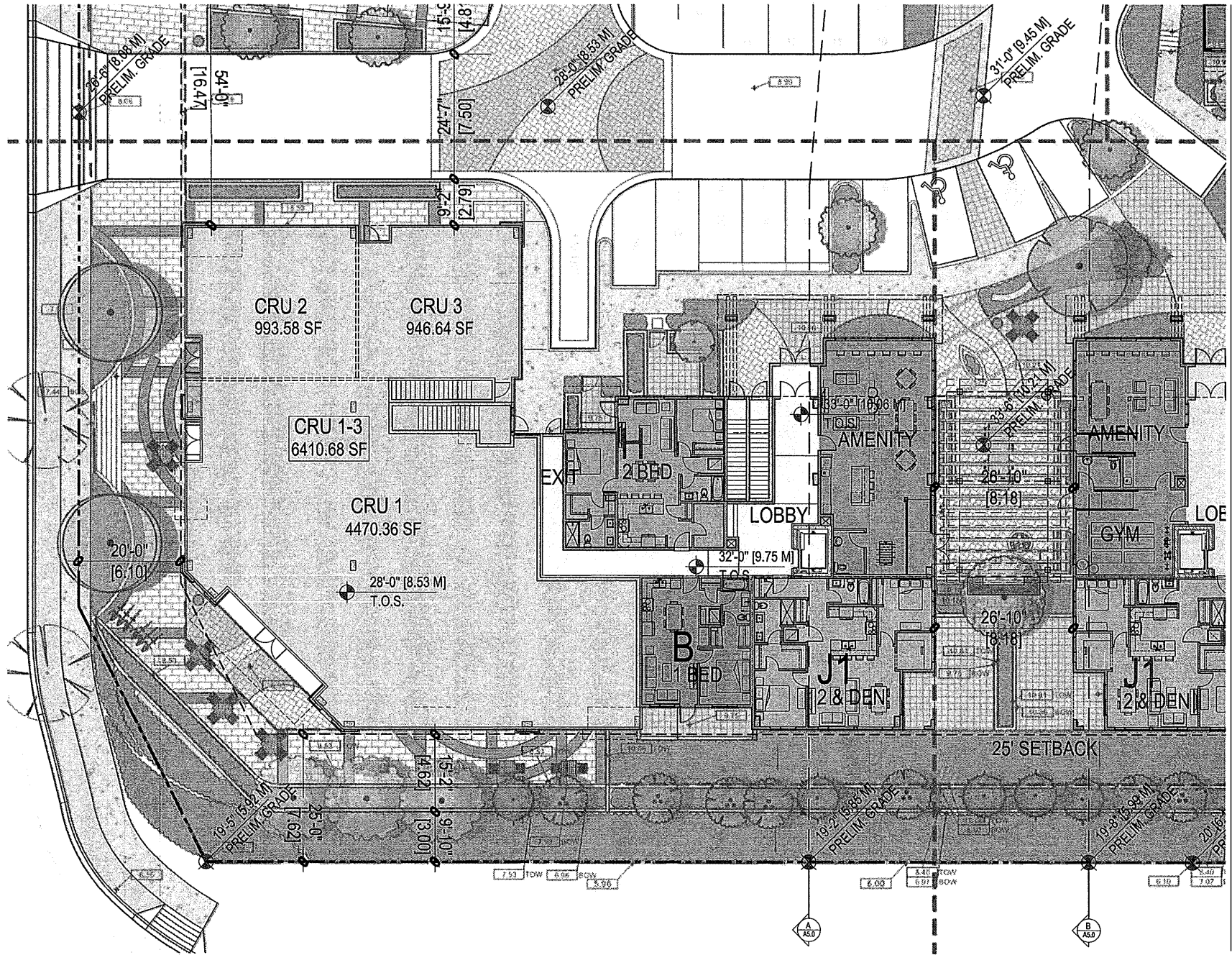


PROJECT:
Greystone Village
 HARBOUR STREET,
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 DRAWING TITLE:
APARTMENT 2
LEVEL 1

DATABASE: 1721_3.0.dwg
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PROJECT NO. **1721**

DWG. NO. **A3.4**
 D.P.A. No.:
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120 Powell Street, Unit 10
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DRAWING TITLE:
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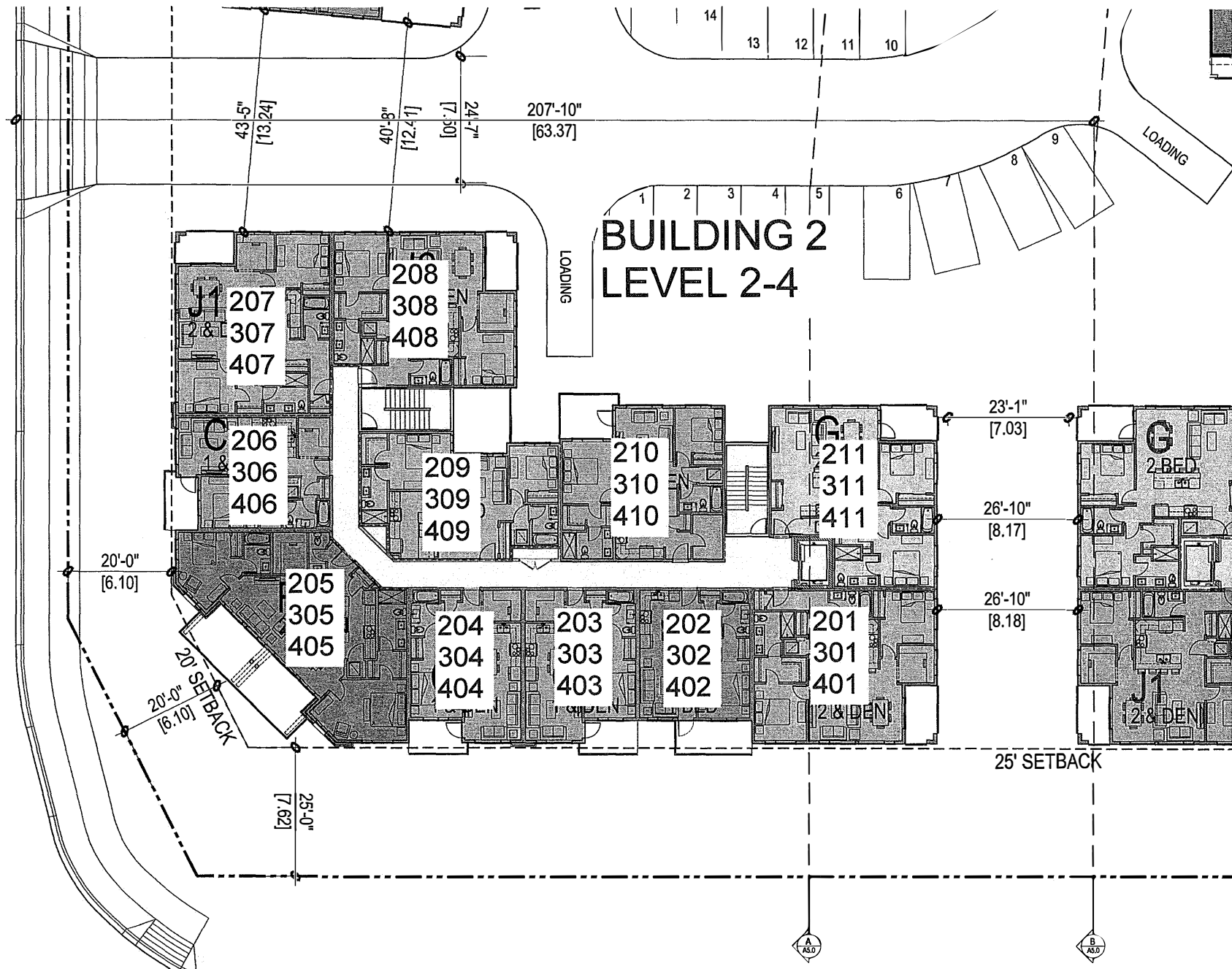
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DWG. NO. **A3.4**

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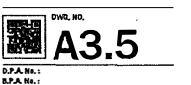


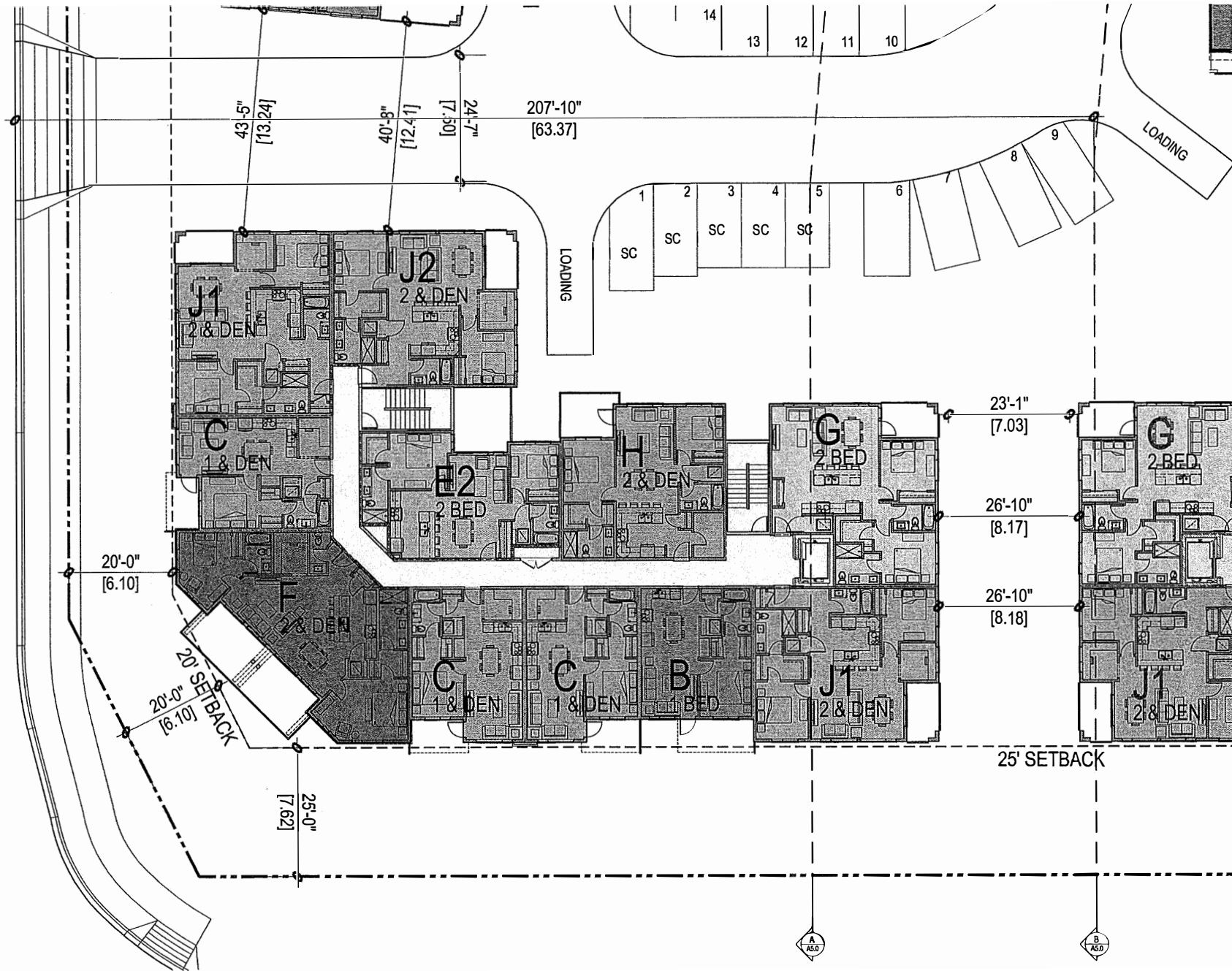
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DRAWING TITLE:
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LEVEL 2-4

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PROJECT NO. 1721





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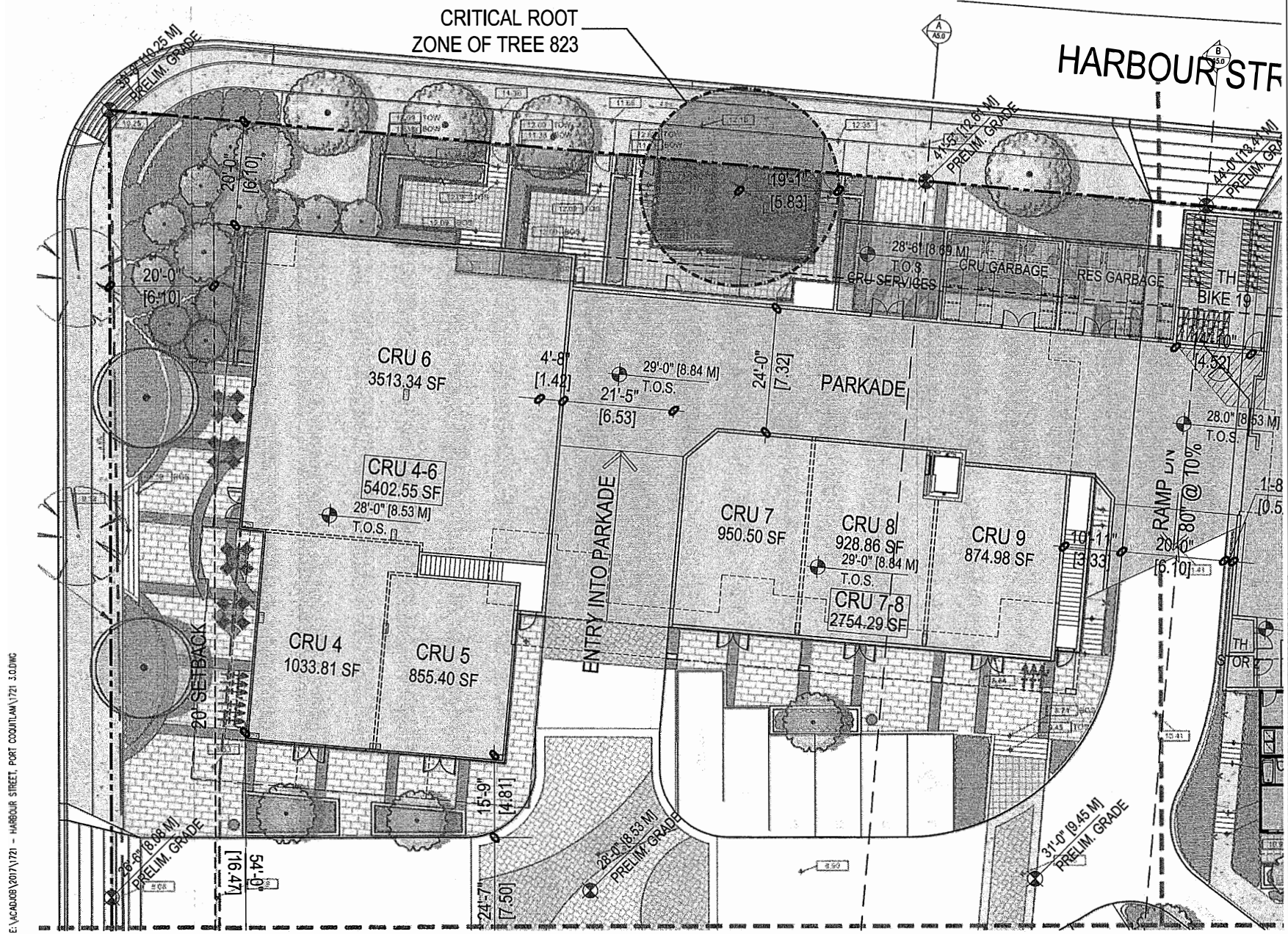
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APARTMENT 2
LEVEL 2-4

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PLOT DATE: 01 OCT 2019
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PROJECT NO. 1721

DWG. NO. **A3.5**

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PROJECT:
Greystone Village
HARBOUR STREET,
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DRAWING TITLE:
APARTMENT 3
LEVEL 1

DATABASE: 1721_3.0.dwg
SCALE: 1/8"=1'-0"
PLOT DATE: 01 OCT 2019
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PROJECT NO. 1721

 DWG. NO. **A3.6**D.P.A. No.:
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HARBOUR ST

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CRITICAL ROOT
ZONE OF TREE 823

BUILDING 3 LEVEL 2-4



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PROJECT:
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DRAWING TITLE:
**APARTMENT 3
LEVEL 2-4**

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PROJECT NO. **1721**

DWG. NO. **A3.7**
S.P.A. No.:
S.P.A. No.:

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CRITICAL ROOT
ZONE OF TREE 823

HARBOUR STB



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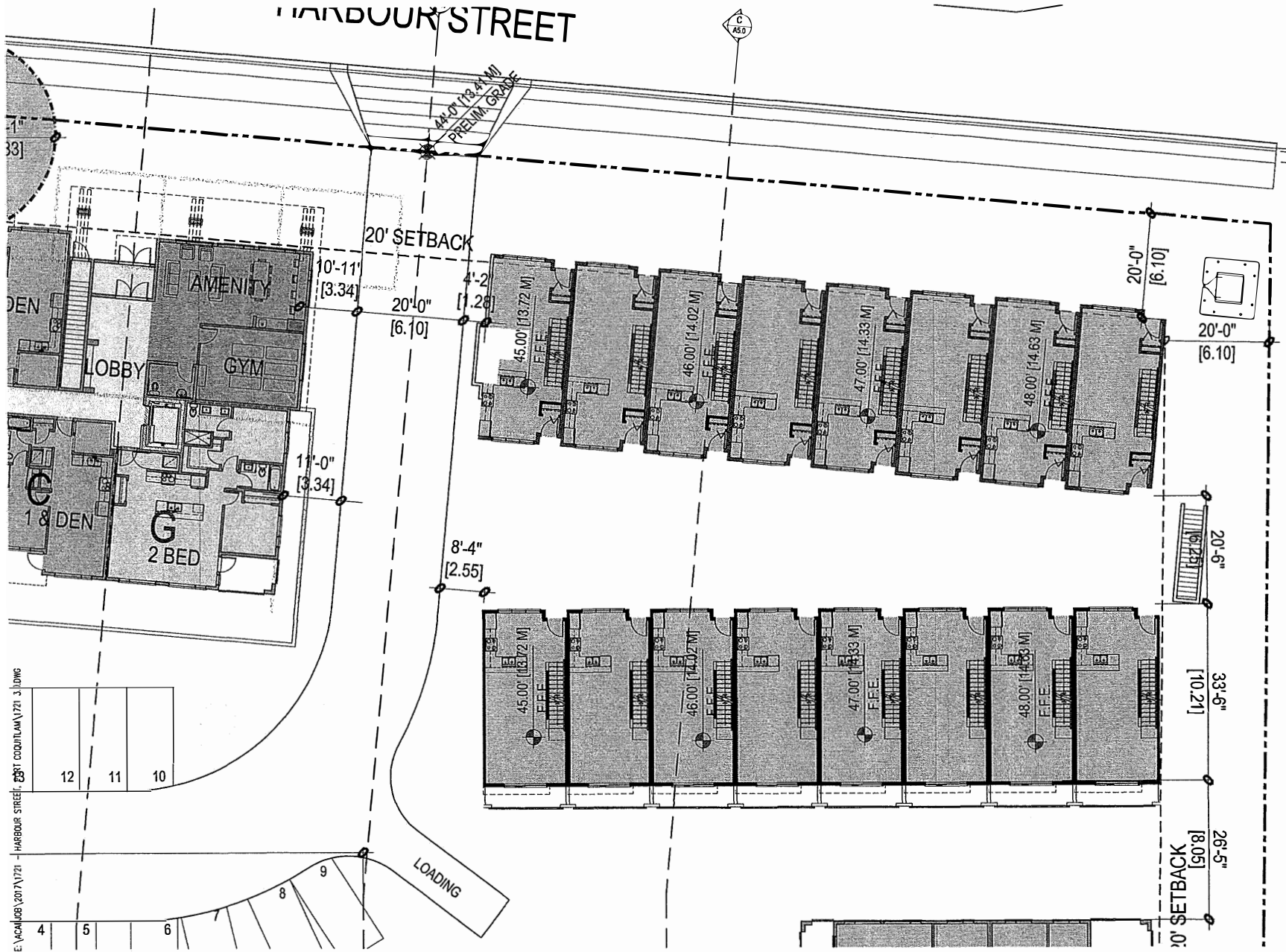
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LEVEL 2-4

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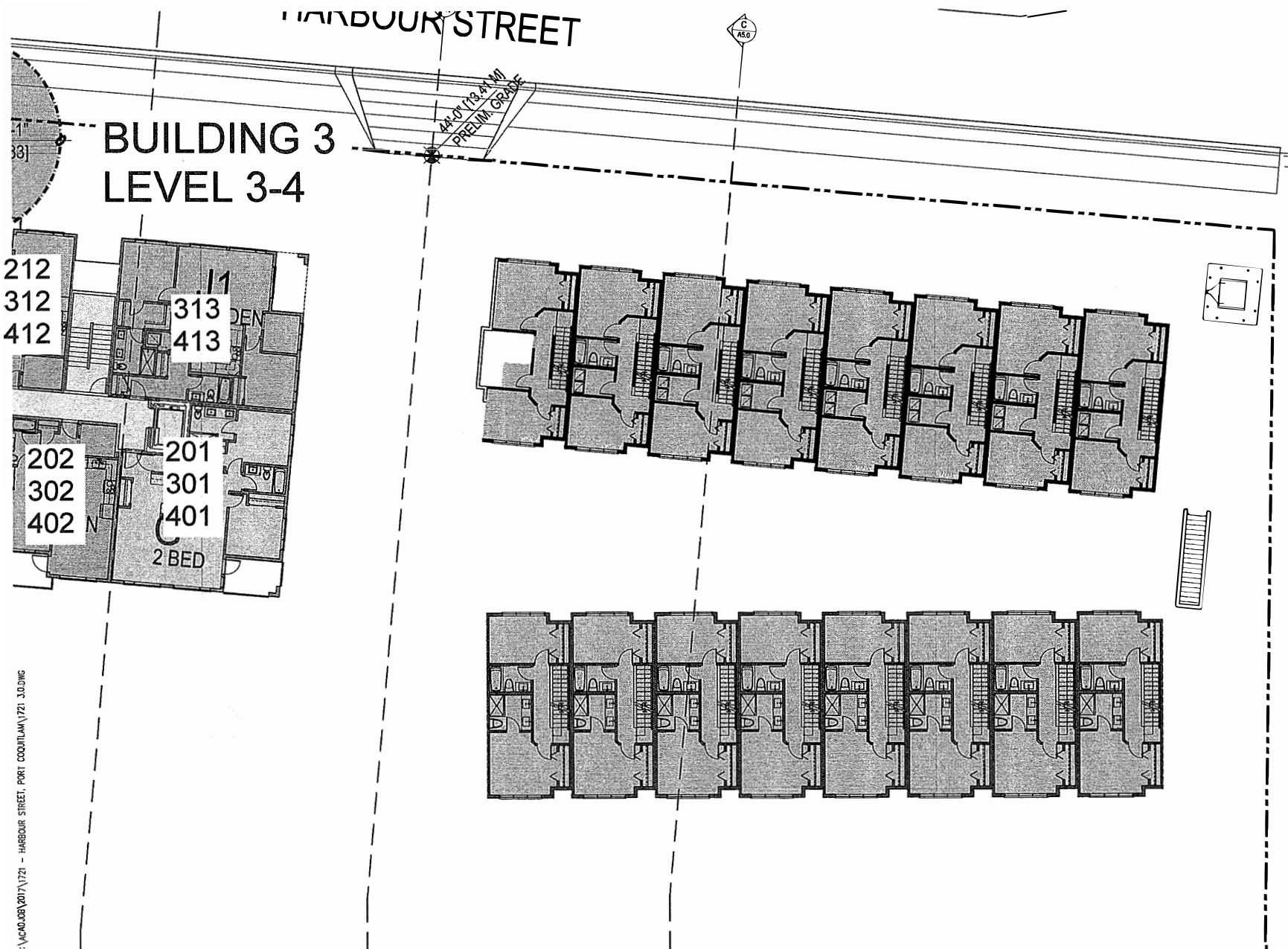
DRAWING TITLE:
TOWNHOMES
LEVEL 2

DATABASE: 1721_3.0.dwg
SCALE: 1/8" = 1'-0"
PLOT DATE: 01 OCT 2019
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PROJECT NO.
1721

DWG. NO.
A3.9

D.P.A. No.:
B.P.A. No.:



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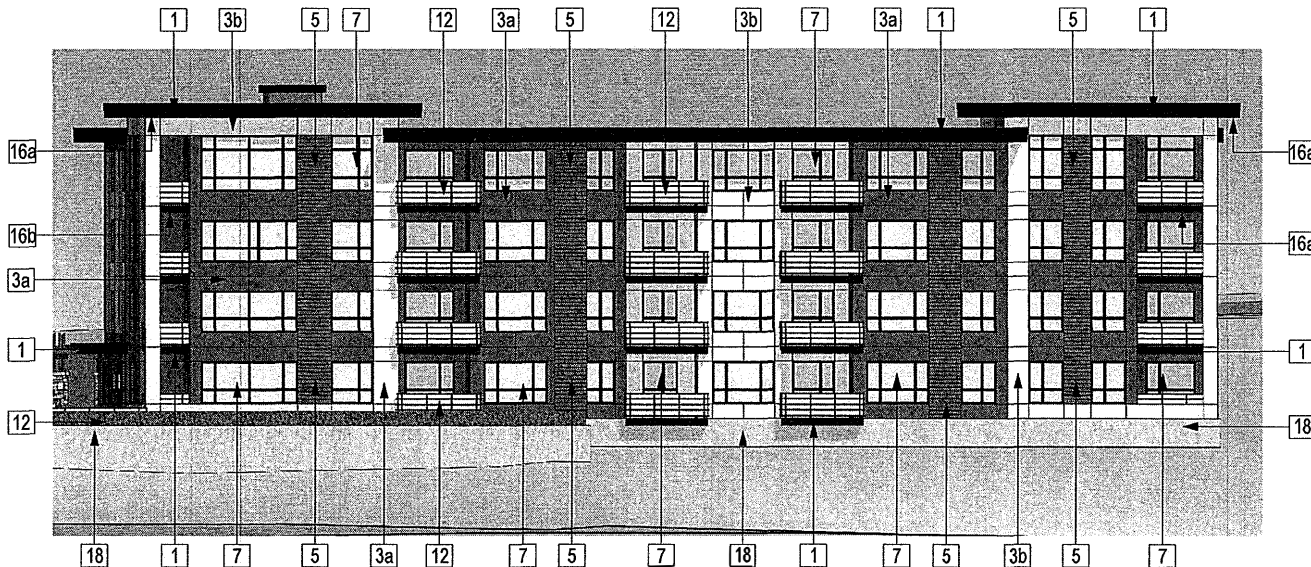
PROJECT:
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DRAWING TITLE:
TOWNHOMES
LEVEL 3

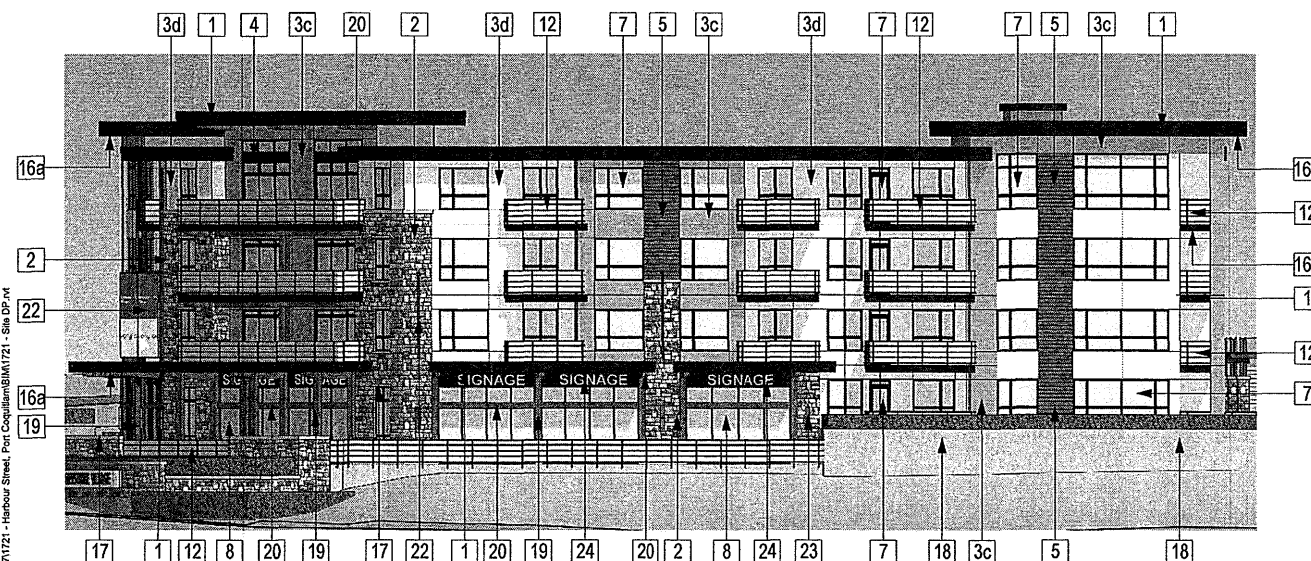
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PROJECT NO. 1721

DWG. NO. **A3.10**
D.P.A. No.:
S.P.A. No.:



MATERIALS - APARTMENT 1



MATERIALS - APARTMENT 2

BUILDING MATERIAL LEGEND

1	PAINTED WOOD FASCIA - BM - TWILIGHT ZONE "2127-10"
2	CULTURED STONE - GRAY COBBLEFIELD
3a	CEMENTITIOUS PANEL - SMOOTH - JHAGED PEWTER
3b	CEMENTITIOUS PANEL - SMOOTH - JH COBBLESTONE
3c	CEMENTITIOUS PANEL - SMOOTH - JHAUTUMTAN
3d	CEMENTITIOUS PANEL - SMOOTH - JHSAILCLOTH
3e	CEMENTITIOUS PANEL - SMOOTH - PAINTED - BM - TWILIGHT ZONE "2127-10"
4	ACM PANEL - AL13 SD333 GALAXY BLACK
5	VINYL LAP SIDING SAGIPER - KNOTTY MAPLE
6a	PAINTED WOOD TRIM - BM - TWILIGHT ZONE "2127-10"
6b	PAINTED WOOD TRIM - TOMATCHAGED PEWTER
6c	PAINTED WOOD TRIM - TO SAIL CLOTH
7	VINYL WINDOWS / DOORS WITH BLACK FRAMES
7b	VINYL FROSTED WINDOWS WITH BLACK FRAMES
8	ALUMINUM FRAME STOREFRONT WINDOWS AND DOORS - BLACK
9	EXTERIOR ENTRY DOORS - RUSTIC BROWN STAINED
10	PAINTED METAL DOOR - BM CC344 "OVERCOAT"
11	OH GARAGE DOOR - BLACK
12	ALUMINUM GUARDRAIL WITH GLASS - BLACK
13	ALUMINUM PICKET FENCE / GATE - BLACK
14	PATIO GATE WITH GLASS - BLACK
15	PRIVACY SCREEN - POWDER COATED ALUMINUM WITH FROSTED GLASS
16a	SOFFIT - LONGBOARD WOOD TONE MAPLE
16b	SOFFIT - VINYLWHITE
16c	SOFFIT - VINYL WOOD TONE - KNOTTY MAPLE
17	CONCRETE CAP, HEADERS & SILLSAT CULTURED STONE - NATURAL CONCRETE
18	PAINTED CONCRETE WALL (BM - GRANITE TRAIL "AF 660")
19	STAINED WOOD COLUMNS - RUSTIC BROWN STAINED
20	STAINED WOOD BRACKETS, BEAMS AND ARCHITECTURAL DETAILS - RUSTIC BROWN STAINED
21	WOOD BRACKETON METAL HANGERS - RUSTICBROWN STAINED
22	ALUMINUM ROD BLADE SIGN - BLACK
23	EXTERIOR LIGHTING
24	CRU SIGNAGE



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120 Powell Street, Unit 10
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T 604.669.6002
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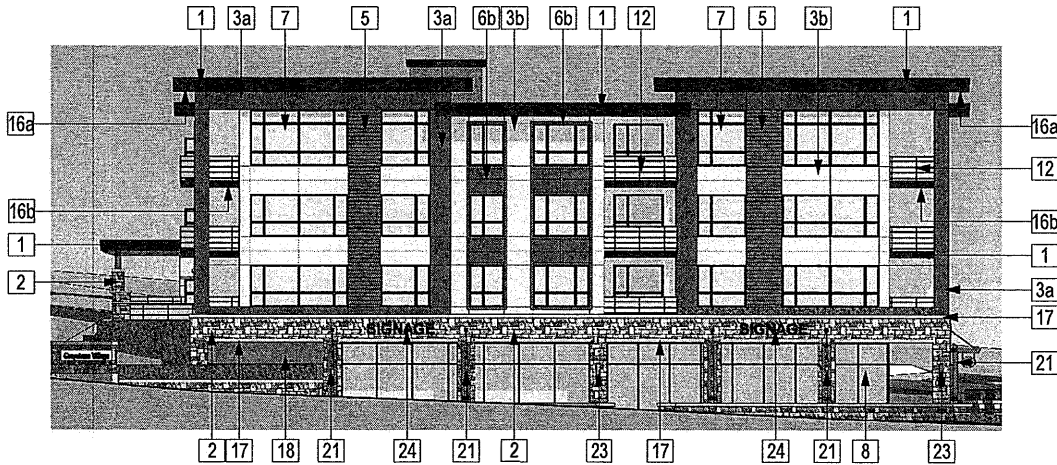
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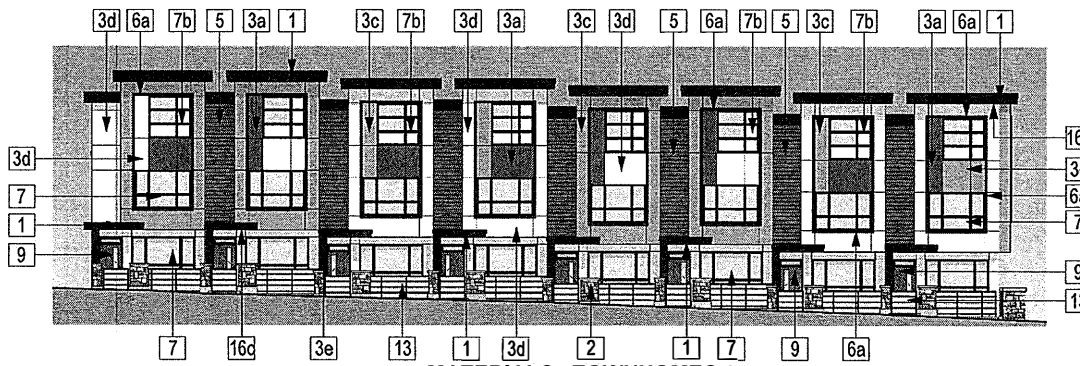
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DRAWING TITLE:
MATERIALS

BASE FILE: 1721-Site DP.rvt
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PLOT DATE: JULY 31, 2019
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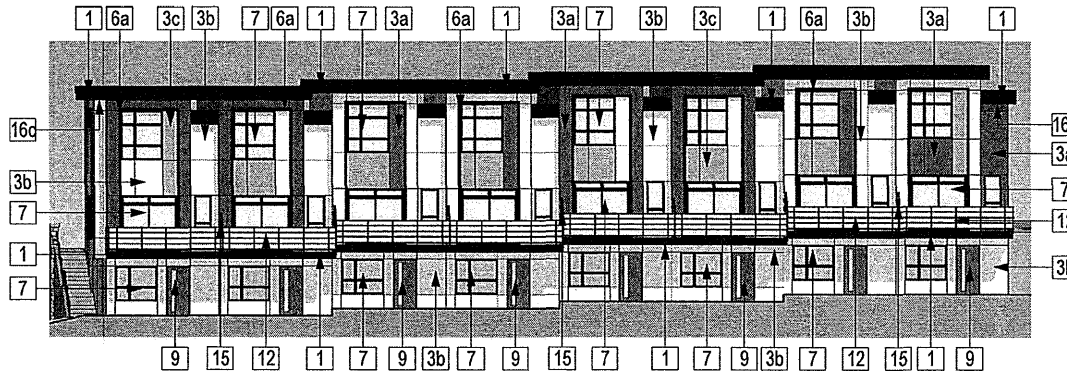
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MATERIALS - APARTMENT 3



MATERIALS - TOWNHOMES 1



MATERIALS - TOWNHOMES 2

BUILDING MATERIAL LEGEND

1	PAINTED WOOD FASCIA - BM - TWILIGHT ZONE "2127-10"
2	CULTURED STONE - GRAY COBBLEFIELD
3a	CEMENTITIOUS PANEL - SMOOTH - JH AGED PEWTER
3b	CEMENTITIOUS PANEL - SMOOTH - JH COBBLESTONE
3c	CEMENTITIOUS PANEL - SMOOTH - JH AUTUMN TAN
3d	CEMENTITIOUS PANEL - SMOOTH - JH SAIL CLOTH
3e	CEMENTITIOUS PANEL - SMOOTH - PAINTED - BM - TWILIGHT ZONE "2127-10"
4	ACM PANEL - AL13 SD333 GALAXY BLACK
5	VINYL LAP SIDING SAGIPER - KNOTTY MAPLE
6a	PAINTED WOOD TRIM - BM - TWILIGHT ZONE "2127-10"
6b	PAINTED WOOD TRIM - TO MATCH AGED PEWTER
6c	PAINTED WOOD TRIM - TO SAIL CLOTH
7	VINYL WINDOWS / DOORS WITH BLACK FRAMES
7b	VINYL FROSTED WINDOWS WITH BLACK FRAMES
8	ALUMINUM FRAME STOREFRONT WINDOWS AND DOORS - BLACK
9	EXTERIOR ENTRY DOORS - RUSTIC BROWN STAINED
10	PAINTED METAL DOOR - BM CC544 "OVERCOAT"
11	OH GARAGE DOOR - BLACK
12	ALUMINUM GUARDRAIL WITH GLASS - BLACK
13	ALUMINUM PICKET FENCE / GATE - BLACK
14	PATIO GATE WITH GLASS - BLACK
15	PRIVACY SCREEN - POWDER COATED ALUMINUM WITH FROSTED GLASS
16a	SOFFIT - LONGBOARD WOOD TONE MAPLE
16b	SOFFIT - VINYL WHITE
16c	SOFFIT - VINYLWOOD TONE - KNOTTY MAPLE
17	CONCRETE CAP, HEADERS & SILLS AT CULTURED STONE - NATURAL CONCRETE
18	PAINTED CONCRETE WALL (BM - GRANITE TRAIL "AF 680")
19	STAINED WOOD COLUMNS - RUSTIC BROWN STAINED
20	STAINED WOOD BRACKETS, BEAMS AND ARCHITECTURAL DETAILS - RUSTIC BROWN STAINED
21	WOOD BRACKET ON METAL HANGERS - RUSTIC BROWN STAINED
22	ALUMINUM ROD BLADE SIGN - BLACK
23	EXTERIOR LIGHTING
24	CRU SIGNAGE



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120 Powell Street, Unit 10
Vancouver, BC Canada
V6A1G1

T 604.669.6002
F 604.669.1091

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DRAWING TITLE:
MATERIALS

BASE FILE: 1721 - Site DP-11
SCALE: As Indicated
PLOT DATE: JULY 31, 2019
DRAWN: JB
CHECKED: BR
PROJECT NO. **1721**

DWG. NO. **A4.1**
D.P. No.: DE
S.P. No.: BL

TABLE 1A: GREYSTONE VILLAGE, PORT COQUITLAM.
Typical Interior Noise Level Calculation
(Analysis ref. NRC's IBANA-Calc)

12-AUG-19
Revised: 25-SEP-19
Revised: 30-SEP-19

#/UNIT ELEM	LOCATION / SUITE	ROOM TYPE	ROOM ABSORP (A) sq.m	FACE	EXT. DESIGN TRAFFIC NOISE LEVEL (dB)	FACADE AREA (S) sq.m	S/A	S/A (dB)	TYPE OF FACADE	NOISE REDUCT'N (dB)	INTERIOR LEVEL (dB)	DESIGN CRITERION (dB)	MARGIN (dB)
1.	Apt. 2 Lev. 2-4 Suite Type C (1Bed&den) -5x6 window.	Bedroom	10.1	Mary Hill	73 Window: Cladding:	2.8 6.0	0.28 0.59	-5.6 -2.3	G36 fcW38	41.6 40.3	31.4 32.7	6Lam-13-6 thermal glazing Fiber cement cladding w. 2x int. GWB	
										TOTAL Lp=	35	35	0
2.	Apt. 2 Lev. 2-4 Suite Type C (1Bed&den) -9x6 window.	Liv/Din	12.7	Mary Hill & balc.	73 Window: Sw. Door: Cladding:	5.0 2.0 7.3	0.39 0.15 0.57	-4.0 -8.1 -2.4	G33 swD32 fcW36	37.0 40.1 38.4	36.0 32.9 34.6	6-13-4 thermal glazing Swing door w. 6/4 glazing Fiber cement cladding	
										TOTAL Lp=	39	40	1
3.	Apt. 2 Lev. 2-3 Suite Type F (2Bed&den) -Full stone cladding c/w 2x GWB inside.	Master	12.6	Mary Hill	73 Window: Hv. Clad:	5.6 19.9	0.44 1.58	-3.5 2.0	G39 W45	42.5 43.0	30.5 30.0	OITC 35 rated fenestration. Stone cladding + 2x GWB.	
										TOTAL Lp=	33	35	2

Design noise reduction data ref. NRC's IBANA-Calc, related Validation Studies and statistical traffic source data normalized to future design conditions.

G29: Standard thermal glazing (3-13-3 min.)
G33: 6-13-4 or 6-13-6 thermal glazing (OITC 29)
G34: 6Lam-11-4 thermal glazing (OITC 30).
G36: 6Lam-13-6 thermal glazing (OITC 32).
G39: OITC 35 rated fenestration (stringent design req't).

File: c:\ARF\2019\9SEPT\BYPASS\Table1A.pln

W34: Standard lightweight exterior construction, e.g. vinyl siding, etc.
W36: with 2x interior GWB, or equivalent.
fcW36: Fibre cement cladding w. 1x interior GWB, or equivalent weight cladding (min. 2-3psf)
fcW38: Fibre cement cladding w. 2x interior GWB.
fcW41: Fibre cement cladding w. 2x interior GWB on resilient furring.
SW36: Insul. spandrel panel w. ~50% insulated framing & 1x 5/8" GWB, or equivalent.
SW38: with 2x 5/8" interior GWB, or equivalent.
W45: Heavy ext. finish (e.g. conventional brick, etc), or equivalent.

sLD27: Standard sliding glass door with standard thermal glazing (OITC 24).
sLD30: Sliding glass door w. 6/4 thermal glazing (OITC 27).
sLD31: Sliding glass door w. 6Lam/4 thermal glazing (OITC 28).
sLD35: OITC 32 rated slider (stringent design req't).
swD29: Standard exterior swing door with standard thermal glazing (OITC 26)
swD32: Swing door with 6/4 thermal glazing (OITC 29).
swD33: Swing door with 6Lam/4 thermal glazing (OITC 31).

TABLE 1B: GREYSTONE VILLAGE, PORT COQUITLAM.
Typical Interior Noise Level Calculation
(Analysis ref. NRC's IBANA-Calc)

12-AUG-19
Revised: 25-SEP-19
Revised: 30-SEP-19

#/UNIT ELEM	LOCATION / SUITE	ROOM TYPE	ROOM ABSORP (A) sq.m	FACE	EXT. DESIGN TRAFFIC NOISE LEVEL (dB)	FACADE AREA (S) sq.m	S/A	S/A (dB)	TYPE OF FACADE	NOISE REDUCT'N (dB)	INTERIOR LEVEL (dB)	DESIGN CRITERION (dB)	MARGIN (dB)
4.	Apt. 2 Lev. 2-3 Suite Type J1 (2Bed&den) -6x6 window.	Master	10.1	Mary Hill	73 Window: Cladding:	3.3 9.2	0.33 0.91	-4.9 -0.4	G36 fcW41	40.9 41.4	32.1 31.6	6Lam-13-6 thermal glazing Fiber cement cladding, 2x GWB on Res.	
										TOTAL Lp=	35	35	0
	Lev. 4 similar - higher clg. c/w 6x8 window.		10.1 (est.)	Mary Hill	73 Window: Hv. Clad:	4.5 13.0	0.44 1.29	-3.6 1.1	G39 fcW41	42.6 39.9	30.4 33.1	OITC 35 rated fenestration. Fiber cement cladding, 2x GWB on Res.	
										TOTAL Lp=	35	35	0
5.	Apt. 2 Lev. 2-3 Suite Type J1 (2Bed&den) - 2x 7x6 windows, slider & transom.	Liv/Din	15.0	Mary Hill	73 Window: Cladding: Slider: Window: Cladding:	7.8 9.8 3.9 0.6 6.8	0.52 0.65 0.26 0.04 0.45	-2.8 -1.8 -5.9 -14.0 -3.4	G36 fcW38 sLD31 G36 fcW38	38.8 39.8 36.9 50.0 41.4	34.2 33.2 36.1 23.0 31.6	6Lam-13-6 thermal glazing Fiber cement cladding w. 2x int. GWB Slider w. 6Lam/4 glazing 6Lam-13-6 thermal glazing Fiber cement cladding w. 2x int. GWB	
										TOTAL Lp=	40	40	0

Design noise reduction data ref. NRC's IBANA-Calc, related Validation Studies and statistical traffic source data normalized to future design conditions.

G29: Standard thermal glazing (3-13-3 min.)
G33: 6-13-4 or 6-13-6 thermal glazing (OITC 29)
G34: 6Lam-11-4 thermal glazing (OITC 30).
G36: 6Lam-13-6 thermal glazing (OITC 32).
G39: OITC 35 rated fenestration (stringent design req't).

File: c:\ARF\2019\9SEPT\BYPASS\Table1B.pln

W34: Standard lightweight exterior construction, e.g. vinyl siding, etc.
W36: with 2x interior GWB, or equivalent.
fcW36: Fibre cement cladding w. 1x interior GWB, or equivalent weight cladding (min. 2-3psf)
fcW38: Fibre cement cladding w. 2x interior GWB.
fcW41: Fibre cement cladding w. 2x interior GWB on resilient furring.
SW36: Insul. spandrel panel w. ~50% insulated framing & 1x 5/8" GWB, or equivalent.
SW38: with 2x 5/8" interior GWB, or equivalent.
W45: Heavy ext. finish (e.g. brick, etc), or equivalent.

sLD27: Standard sliding glass door with standard thermal glazing (OITC 24).
sLD30: Sliding glass door w. 6/4 thermal glazing (OITC 27).
sLD31: Sliding glass door w. 6Lam/4 thermal glazing (OITC 28).
sLD35: OITC 32 rated slider (stringent design req't).
swD29: Standard exterior swing door with standard thermal glazing (OITC 26)
swD32: Swing door with 6/4 thermal glazing (OITC 29).
swD33: Swing door with 6Lam/4 thermal glazing (OITC 31).

REVERBERATION TIME ANALYSIS

FILE:C-BED.RVB

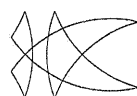
Apartment 2 - Unit Type C (1bed&Den) - Bedroom.

FLOOR AREA 10.2 sq m. LENGTH 3.4 m. WIDTH 3.0 m.
VOLUME 28.0 cu m. HEIGHT 2.7 m.

INDEX	MATERIAL	LIB#	AREA	125	250	500	1kHz	2kHz	4kHz
N-S WALLS									
11-Drywall on Studs, 16"oc	18	11	3.4	1.4	0.7	0.6	0.6	0.6	0.6
12-Glass, double glazed	44	3	0.6	0.6	0.4	0.2	0.1	0.1	0.1
13-10% Opening	96	3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
GROUP 1 TOTALS		17	4.2	2.2	1.4	1.0	1.0	0.9	
E-W WALLS									
21-Drywall on Studs, 16"oc	18	17	5.0	2.0	1.0	0.8	0.8	0.8	0.8
22-Interior Door	30	2	0.3	0.2	0.2	0.1	0.1	0.1	0.1
GROUP 2 TOTALS		18	5.3	2.2	1.2	1.0	0.9	1.0	
FLOOR-CLG									
31-Typical carpet	1	7	0.6	0.7	1.4	1.8	2.2	2.5	
32-Drywall ceiling.	23	10	1.5	1.0	0.5	0.5	0.5	0.5	
GROUP 3 TOTALS		17	2.2	1.7	1.9	2.3	2.7	3.0	
COMMON									
41-Double Bed 2m x 1.5m	17	1	4.5	5.0	5.5	6.0	6.0	6.0	6.0
42-AIR, 60% RH, per 1000 m ³	101	0	0.1	0.1	0.1	0.1	0.3	0.8	
GROUP 4 TOTALS			4.6	5.1	5.6	6.1	6.3	6.8	
TOTAL ABSORPTION			53	16.3	11.2	10.1	10.4	10.8	11.7
ROOM CONSTANTS			53	23.6	14.2	12.5	12.9	13.7	15.1

SABINE REVERB TIME				0.28	0.40	0.45	0.43	0.42	0.38
FITZROY REVERB TIME				0.28	0.39	0.45	0.46	0.45	0.43
NORRIS E REVERB TIME				0.25	0.39	0.44	0.43	0.41	0.38

1-Typical carpet				0.09	0.10	0.20	0.25	0.30	0.35
17-Double Bed 2m x 1.5m				4.50	5.00	5.50	6.00	6.00	6.00
18-Drywall on Studs, 16"oc				0.30	0.12	0.06	0.05	0.05	0.05
23-Drywall ceiling.				0.15	0.10	0.05	0.05	0.05	0.05
30-Interior Door				0.15	0.11	0.10	0.07	0.06	0.07
44-Glass, double glazed				0.20	0.20	0.15	0.07	0.05	0.03
96-10% Opening				0.10	0.10	0.10	0.10	0.10	0.10
101-AIR, 60% RH, per 1000 m ³				3.30	3.30	3.30	3.30	10.00	30.00



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REVERBERATION TIME ANALYSIS

FILE:C-LIV.RVB

Apartment 2 - Unit Type C (1bed&den) - Living room.

FLOOR AREA 11.8 sq m. LENGTH 3.5 m. WIDTH 3.4 m.
VOLUME 32.5 cu m. HEIGHT 2.7 m.

INDEX	MATERIAL	LIB#	AREA	125	250	500	1kHz	2kHz	4kHz
N-S WALLS									
	11-Drywall on Studs, 16"oc	18	6	1.9	0.7	0.4	0.3	0.3	0.3
	12-Glass, double glazed	44	5	1.0	1.0	0.8	0.3	0.3	0.1
	13-10% Opening	96	7	0.7	0.7	0.7	0.7	0.7	0.7
	GROUP 1 TOTALS		18	3.6	2.5	1.8	1.4	1.3	1.2

E-W WALLS									
	21-Drywall on Studs, 16"oc	18	17	5.2	2.1	1.0	0.9	0.9	0.9
	22-Glass, double glazed	44	2	0.4	0.4	0.3	0.1	0.1	0.1
	GROUP 2 TOTALS		19	5.6	2.5	1.3	1.0	1.0	0.9

FLOOR-CLG									
	31-Hardwood Floor.	8	5	0.7	0.5	0.5	0.3	0.3	0.3
	32-Carpet on hardwood floor	15	3	0.6	0.7	0.9	1.3	1.4	1.4
	33-Drywall ceiling.	23	12	1.8	1.2	0.6	0.6	0.6	0.6
	GROUP 3 TOTALS		20	3.1	2.4	2.0	2.2	2.3	2.4

COMMON									
	41-Misc. Furn. 2m x 1m	33	2	6.0	7.0	8.0	8.0	8.0	8.0
	42-AIR, 60% RH, per 1000 m ³	101	0	0.1	0.1	0.1	0.1	0.3	1.0
	GROUP 4 TOTALS			6.1	7.1	8.1	8.1	8.3	9.0

TOTAL ABSORPTION	57	18.4	14.5	13.2	12.7	12.9	13.4
ROOM CONSTANTS	57	27.1	19.3	17.2	16.3	16.6	17.6

SABINE REVERB TIME	0.28	0.36	0.40	0.41	0.41	0.39
FITZROY REVERB TIME	0.28	0.35	0.39	0.42	0.42	0.40
NORRIS E REVERB TIME	0.26	0.35	0.39	0.41	0.40	0.38

8-Hardwood Floor.	0.15	0.11	0.10	0.07	0.06	0.07
15-Carpet on hardwood floor	0.21	0.24	0.30	0.42	0.48	0.48
18-Drywall on Studs, 16"oc	0.30	0.12	0.06	0.05	0.05	0.05
23-Drywall ceiling.	0.15	0.10	0.05	0.05	0.05	0.05
33-Misc. Furn. 2m x 1m	3.00	3.50	4.00	4.00	4.00	4.00
44-Glass, double glazed	0.20	0.20	0.15	0.07	0.05	0.03
96-10% Opening	0.10	0.10	0.10	0.10	0.10	0.10
101-AIR, 60% RH, per 1000 m ³	3.30	3.30	3.30	3.30	10.00	30.00



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REVERBERATION TIME ANALYSIS

FILE:F-MBED.RVB

Apt. 2 - Lev. 2 & 3 - Suite Type F (2Bed&den) - Master Bedroom.

FLOOR AREA 17.0 sq m. LENGTH 3.6 m. WIDTH 5.6 m.
VOLUME 46.5 cu m. HEIGHT 2.7 m.

INDEX	MATERIAL	LIB#	AREA	125	250	500	1kHz	2kHz	4kHz
N-S WALLS									
11-Drywall on Studs, 16"oc		18	21	6.2	2.5	1.2	1.0	1.0	1.0
12-Interior Door		30	2	0.2	0.2	0.2	0.1	0.1	0.1
13-Glass, double glazed		44	6	1.1	1.1	0.8	0.4	0.3	0.2
GROUP 1 TOTALS			28	7.5	3.8	2.2	1.5	1.4	1.3
E-W WALLS									
21-Drywall on Studs, 16"oc		18	16	4.7	1.9	0.9	0.8	0.8	0.8
22-Interior Door		30	2	0.2	0.2	0.2	0.1	0.1	0.1
GROUP 2 TOTALS			17	4.9	2.1	1.1	0.9	0.9	0.9
FLOOR-CLG									
31-Typical carpet		1	14	1.3	1.4	2.8	3.5	4.2	4.9
32-Drywall ceiling.		23	17	2.6	1.7	0.9	0.9	0.9	0.9
GROUP 3 TOTALS			31	3.8	3.1	3.7	4.3	5.1	5.8
COMMON									
41-Double Bed 2m x 1.5m		17	1	4.5	5.0	5.5	6.0	6.0	6.0
42-AIR, 60% RH, per 1000 m ³		101	0	0.2	0.2	0.2	0.2	0.5	1.4
GROUP 4 TOTALS				4.7	5.2	5.7	6.2	6.5	7.4
TOTAL ABSORPTION			76	20.9	14.1	12.6	12.9	13.8	15.3
ROOM CONSTANTS			76	28.9	17.3	15.2	15.6	16.9	19.2
SABINE REVERB TIME				0.36	0.53	0.59	0.58	0.54	0.49
FITZROY REVERB TIME				0.37	0.52	0.60	0.63	0.62	0.58
NORRIS E REVERB TIME				0.33	0.51	0.58	0.56	0.53	0.47
1-Typical carpet				0.09	0.10	0.20	0.25	0.30	0.35
17-Double Bed 2m x 1.5m				4.50	5.00	5.50	6.00	6.00	6.00
18-Drywall on Studs, 16"oc				0.30	0.12	0.06	0.05	0.05	0.05
23-Drywall ceiling.				0.15	0.10	0.05	0.05	0.05	0.05
30-Interior Door				0.15	0.11	0.10	0.07	0.06	0.07
44-Glass, double glazed				0.20	0.20	0.15	0.07	0.05	0.03
101-AIR, 60% RH, per 1000 m ³				3.30	3.30	3.30	3.30	10.00	30.00



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REVERBERATION TIME ANALYSIS

FILE:J1-MBED.RVB

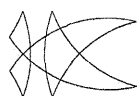
Apt. 2 - Lev. 2 & 3 - Suite Type J1 (2Bed+den) - Master Bedroom.

FLOOR AREA 10.2 sq m. LENGTH 3.4 m. WIDTH 3.0 m.
VOLUME 28.0 cu m. HEIGHT 2.7 m.

INDEX	MATERIAL	LIB#	AREA	125	250	500	1kHz	2kHz	4kHz
N-S WALLS									
11-Drywall on Studs, 16"oc	18	12	3.5	1.4	0.7	0.6	0.6	0.6	0.6
12-Interior Door	30	2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
13-Glass, double glazed	44	3	0.7	0.7	0.5	0.2	0.2	0.2	0.1
GROUP 1 TOTALS		17	4.4	2.3	1.4	0.9	0.9	0.8	0.8
E-W WALLS									
21-Drywall on Studs, 16"oc	18	17	5.0	2.0	1.0	0.8	0.8	0.8	0.8
22-Interior Door	30	2	0.3	0.2	0.2	0.1	0.1	0.1	0.1
GROUP 2 TOTALS		18	5.3	2.2	1.2	1.0	0.9	1.0	1.0
FLOOR-CLG									
31-Typical carpet	1	7	0.6	0.7	1.4	1.8	2.2	2.5	2.5
32-Drywall ceiling.	23	10	1.5	1.0	0.5	0.5	0.5	0.5	0.5
GROUP 3 TOTALS		17	2.2	1.7	1.9	2.3	2.7	3.0	3.0
COMMON									
41-Double Bed 2m x 1.5m	17	1	4.5	5.0	5.5	6.0	6.0	6.0	6.0
42-AIR, 60% RH, per 1000 m ³	101	0	0.1	0.1	0.1	0.1	0.3	0.3	0.8
GROUP 4 TOTALS			4.6	5.1	5.6	6.1	6.3	6.3	6.8
TOTAL ABSORPTION			53	16.5	11.3	10.1	10.3	10.7	11.6
ROOM CONSTANTS			53	24.0	14.4	12.5	12.8	13.5	14.9

SABINE REVERB TIME				0.27	0.40	0.45	0.44	0.42	0.39
FITZROY REVERB TIME				0.28	0.39	0.45	0.46	0.46	0.43
NORRIS E REVERB TIME				0.25	0.39	0.44	0.43	0.41	0.38

1-Typical carpet				0.09	0.10	0.20	0.25	0.30	0.35
17-Double Bed 2m x 1.5m				4.50	5.00	5.50	6.00	6.00	6.00
18-Drywall on Studs, 16"oc				0.30	0.12	0.06	0.05	0.05	0.05
23-Drywall ceiling.				0.15	0.10	0.05	0.05	0.05	0.05
30-Interior Door				0.15	0.11	0.10	0.07	0.06	0.07
44-Glass, double glazed				0.20	0.20	0.15	0.07	0.05	0.03
101-AIR, 60% RH, per 1000 m ³				3.30	3.30	3.30	3.30	10.00	30.00



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REVERBERATION TIME ANALYSIS

FILE:J1-LIV.RVB

Apartment 2 - Lev. 2 & 3 - Type J1 - Liv/Din Room.

FLOOR AREA	20.9 sq m.	LENGTH	3.8 m.	WIDTH	5.5 m.
VOLUME	57.3 cu m.	HEIGHT	2.7 m.		

INDEX	MATERIAL	LIB#	AREA	125	250	500	1kHz	2kHz	4kHz
N-S WALLS									
11-	Drywall on Studs, 16"oc	18	8	2.4	1.0	0.5	0.4	0.4	0.4
12-	Glass, double glazed	44	8	1.6	1.6	1.2	0.5	0.4	0.2
13-	10% Opening	96	14	1.4	1.4	1.4	1.4	1.4	1.4
GROUP 1 TOTALS			30	5.4	4.0	3.1	2.4	2.2	2.1

E-W WALLS									
21-	Drywall on Studs, 16"oc	18	15	4.5	1.8	0.9	0.7	0.7	0.7
22-	Interior Door	30	2	0.2	0.2	0.2	0.1	0.1	0.1
23-	Glass, double glazed	44	4	0.9	0.9	0.7	0.3	0.2	0.1
GROUP 2 TOTALS			21	5.6	2.9	1.7	1.2	1.1	1.0

FLOOR-CLG									
31-	Hardwood Floor.	8	14	2.1	1.5	1.4	1.0	0.8	1.0
32-	Carpet on hardwood floor	15	3	0.6	0.7	0.9	1.3	1.4	1.4
33-	Drywall ceiling.	23	21	3.1	2.1	1.0	1.0	1.0	1.0
GROUP 3 TOTALS			38	5.9	4.3	3.3	3.3	3.3	3.5

COMMON									
41-	Misc. Furn. 2m x 1m	33	2	6.0	7.0	8.0	8.0	8.0	8.0
42-	AIR, 60% RH, per 1000 m ³	101	0	0.2	0.2	0.2	0.2	0.6	1.7
GROUP 4 TOTALS				6.2	7.2	8.2	8.2	8.6	9.7

TOTAL ABSORPTION	89	23.0	18.3	16.3	15.0	15.2	16.2
ROOM CONSTANTS	89	31.1	23.1	20.0	18.1	18.3	19.9

SABINE REVERB TIME	0.40	0.50	0.57	0.61	0.61	0.57
FITZROY REVERB TIME	0.38	0.48	0.55	0.61	0.61	0.58
NORRIS E REVERB TIME	0.37	0.48	0.55	0.60	0.60	0.56

8-Hardwood Floor.	0.15	0.11	0.10	0.07	0.06	0.07
15-Carpet on hardwood floor	0.21	0.24	0.30	0.42	0.48	0.48
18-Drywall on Studs, 16"oc	0.30	0.12	0.06	0.05	0.05	0.05
23-Drywall ceiling.	0.15	0.10	0.05	0.05	0.05	0.05
30-Interior Door	0.15	0.11	0.10	0.07	0.06	0.07
33-Misc. Furn. 2m x 1m	3.00	3.50	4.00	4.00	4.00	4.00
44-Glass, double glazed	0.20	0.20	0.15	0.07	0.05	0.03
96-10% Opening	0.10	0.10	0.10	0.10	0.10	0.10
101-AIR, 60% RH, per 1000 m ³	3.30	3.30	3.30	3.30	10.00	30.00


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BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: a-s-sel

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 1: Future traffic noise at south facade, SE

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	22.5m	1.2	35.0m	-0.7	110.0m	-5.6
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	180 deg	0.0	180 deg	0.0	60 deg	-4.8
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	115.0m	1.0	115.0m	1.0	115.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		70.4dB		68.8dB		49.8dB

 TOTAL TRAFFIC NOISE LEVEL: 73dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: a-s-sw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 1: Future traffic noise at south facade, SW

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	23.5m	1.1	36.0m	-0.8	80.0m	-4.3
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	180 deg	0.0	180 deg	0.0	60 deg	-4.8
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	87.0m	1.0	87.0m	1.0	87.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		70.3dB		68.7dB		51.1dB

 TOTAL TRAFFIC NOISE LEVEL: 73dB Leq (24hr)



Brown Strachan Associates
 Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: a-e-se1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 1: Future traffic noise at east facade, SE.

Mary Hill Wbd Mary Hill Ebd

POSTED SPEED..	70 kph	46.1	70 kph	46.1
VOLUME PER DAY	36100	45.6	41900	46.2
% OF TRUCKS...	5.0%	2.2	5.0%	2.2
DISTANCE.....	28.0m	0.3	40.5m	-1.3
GROUND EFFECT.	(N)	0.0	(N)	0.0
INCLUDED ANGLE	120 deg	-1.8	120 deg	-1.8
GRADIENT.....	1.0%	0.3	0.0%	0.0
INTERSECTION..	122.0m	1.0	122.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0
		-----		-----
		67.7dB		66.4dB

 TOTAL TRAFFIC NOISE LEVEL: 70dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: a-e-ne1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 1: Future traffic noise at east facade, NE.

Mary Hill Wbd Mary Hill Ebd

POSTED SPEED..	70 kph	46.1	70 kph	46.1
VOLUME PER DAY	36100	45.6	41900	46.2
% OF TRUCKS...	5.0%	2.2	5.0%	2.2
DISTANCE.....	48.0m	-2.0	60.5m	-3.0
GROUND EFFECT.	(N)	0.0	(N)	0.0
INCLUDED ANGLE	90 deg	-3.0	90 deg	-3.0
GRADIENT.....	1.0%	0.3	0.0%	0.0
INTERSECTION..	130.0m	1.0	130.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0
		-----		-----
		64.2dB		63.5dB

 TOTAL TRAFFIC NOISE LEVEL: 67dB Leq (24hr)



Brown Strachan Associates
 Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: a-w-sw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 1: Future traffic noise at west facade, SW.

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5	
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3	
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7	
DISTANCE.....	29.0m	0.1	41.5m	-1.4	74.0m	-3.9	
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0	
INCLUDED ANGLE	120 deg	-1.8	120 deg	-1.8	60 deg	-4.8	-Allows for refl.
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7	between bldgs.
INTERSECTION..	84.0m	1.0	84.0m	1.0	84.0m	1.0	
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0	
		67.5dB		66.3dB		51.5dB	

 TOTAL TRAFFIC NOISE LEVEL: 70dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: b-s-sw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 2: Future traffic noise at south facade, SW

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5	
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3	
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7	
DISTANCE.....	25.0m	0.8	37.5m	-1.0	38.0m	-1.0	
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0	
INCLUDED ANGLE	180 deg	0.0	180 deg	0.0	60 deg	-4.8	
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7	
INTERSECTION..	52.0m	2.0	52.0m	2.0	52.0m	2.0	
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0	
		71.0dB		69.5dB		55.4dB	

 TOTAL TRAFFIC NOISE LEVEL: 73dB Leq (24hr)



Brown Strachan Associates
 Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
RUN DATE: 15-OCT-18
File: b-a-s1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 2: Future traffic noise at angled facade, S

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	28.5m	0.2	41.0m	-1.4	27.0m	0.5
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	135 deg	-1.2	135 deg	-1.2	150 deg	-0.8
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	46.0m	2.0	46.0m	2.0	46.0m	2.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		69.2dB		67.9dB		60.9dB

TOTAL TRAFFIC NOISE LEVEL: 72dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
RUN DATE: 15-OCT-18
File: b-a-n1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 2: Future traffic noise at angled facade, N

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	37.5m	-1.0	50.0m	-2.2	19.0m	2.0
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	135 deg	-1.2	135 deg	-1.2	150 deg	-0.8
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	50.0m	2.0	50.0m	2.0	50.0m	2.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		68.0dB		67.1dB		62.4dB

TOTAL TRAFFIC NOISE LEVEL: 71dB Leq (24hr)



Brown Strachan Associates
Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: b-w-nw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 2: Future traffic noise at west facade, NW.

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	50.0m	-2.2	62.5m	-3.2	16.0m	2.7
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	90 deg	-3.0	90 deg	-3.0	180 deg	0.0
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	60.0m	1.0	60.0m	1.0	60.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		64.0dB		63.3dB		62.9dB

 TOTAL TRAFFIC NOISE LEVEL: 68dB Leq (24hr)



Brown Strachan Associates
 Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: c-w-sw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 3: Future traffic noise at west facade, SW

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	78.0m	-4.1	90.5m	-4.8	17.0m	2.5
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	90 deg	-3.0	90 deg	-3.0	180 deg	0.0
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	88.0m	1.0	88.0m	1.0	88.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		62.1dB		61.7dB		62.7dB

 TOTAL TRAFFIC NOISE LEVEL: 67dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: c-w-nw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 3: Future traffic noise at west facade, NW

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	98.0m	-5.1	110.5m	-5.7	17.0m	2.5
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	90 deg	-3.0	90 deg	-3.0	180 deg	0.0
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	107.0m	1.0	107.0m	1.0	107.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		61.1dB		60.8dB		62.7dB

 TOTAL TRAFFIC NOISE LEVEL: 66dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: c-s-sw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 3: Future traffic noise at south facade, SW

Mary Hill Wbd Mary Hill Ebd Pitt River Rd

POSTED SPEED..	70 kph	46.1	70 kph	46.1	50 kph	42.5
VOLUME PER DAY	36100	45.6	41900	46.2	10800	40.3
% OF TRUCKS...	5.0%	2.2	5.0%	2.2	1.0%	0.7
DISTANCE.....	71.0m	-3.7	83.5m	-4.4	24.0m	1.0
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	90 deg	-3.0	90 deg	-3.0	90 deg	-3.0
GRADIENT.....	1.0%	0.3	0.0%	0.0	5.0%	1.7
INTERSECTION..	83.0m	1.0	83.0m	1.0	83.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		62.5dB		62.1dB		58.2dB

 TOTAL TRAFFIC NOISE LEVEL: 66dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 15-OCT-18
 File: c-n-nw1

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Bldg. 3: Future traffic noise at north facade, NW

Mary Hill E+W Pitt River Rd Harbour St.

POSTED SPEED..	70 kph	46.1	50 kph	42.5	50 kph	42.5
VOLUME PER DAY	78000	48.9	10800	40.3	1500	31.8
% OF TRUCKS...	5.0%	2.2	1.0%	0.7	1.0%	0.7
DISTANCE.....	108.0m	-5.6	22.0m	1.3	13.5m	3.5
GROUND EFFECT.	(N)	0.0	(N)	0.0	(N)	0.0
INCLUDED ANGLE	30 deg	-7.8	90 deg	-3.0	180 deg	0.0
GRADIENT.....	1.0%	0.3	5.0%	1.7	4.0%	1.3
INTERSECTION..	113.0m	1.0	113.0m	1.0	27.0m	2.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	#3 (N)	0.0
		-----		-----		-----
		59.1dB		58.5dB		55.8dB

 TOTAL TRAFFIC NOISE LEVEL: 63dB Leq (24hr)



Brown Strachan Associates
 Consulting Engineers in Acoustics

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 11-OCT-18
 File: predict

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Predicted traffic noise level at Test Location.

Mary Hill Wbd Mary Hill Ebd

POSTED SPEED..	70 kph	46.1	70 kph	46.1
VOLUME PER DAY	38880	45.9	51000	47.1
% OF TRUCKS...	9.0%	3.4	7.0%	2.8
DISTANCE.....	16.5m	2.6	29.0m	0.1
GROUND EFFECT.	(N)	0.0	(N)	0.0
INCLUDED ANGLE	150 deg	-0.8	150 deg	-0.8
GRADIENT.....	1.0%	0.5	0.0%	0.0
INTERSECTION..	98.0m	1.0	98.0m	1.0
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0
		-----		-----
		72.7dB		70.3dB

 TOTAL TRAFFIC NOISE LEVEL: 75dB Leq (24hr)

BSA CMHC ROAD AND RAIL NOISE v4.3g
 RUN DATE: 11-OCT-18
 File: pred-2

ROSITCH HEMPHILL ARCHITECTS

PROJECT NUMBER: A04.182

Predicted traffic noise level at Test Location (est.speed).

Mary Hill Wbd Mary Hill Ebd

POSTED SPEED..	60 kph	44.5	70 kph	46.1	- Estimated traffic speed.
VOLUME PER DAY	38880	45.9	51000	47.1	W.bnd slowing to light at
% OF TRUCKS...	9.0%	3.5	7.0%	2.8	Pitt River Road.
DISTANCE.....	16.5m	2.6	29.0m	0.1	
GROUND EFFECT.	(N)	0.0	(N)	0.0	
INCLUDED ANGLE	150 deg	-0.8	150 deg	-0.8	
GRADIENT.....	1.0%	0.5	0.0%	0.0	
INTERSECTION..	98.0m	1.0	98.0m	1.0	
BARRIER EFFECT	#1 (N)	0.0	#2 (N)	0.0	
		-----		-----	
		71.2dB		70.3dB	

 TOTAL TRAFFIC NOISE LEVEL: 74dB Leq (24hr)

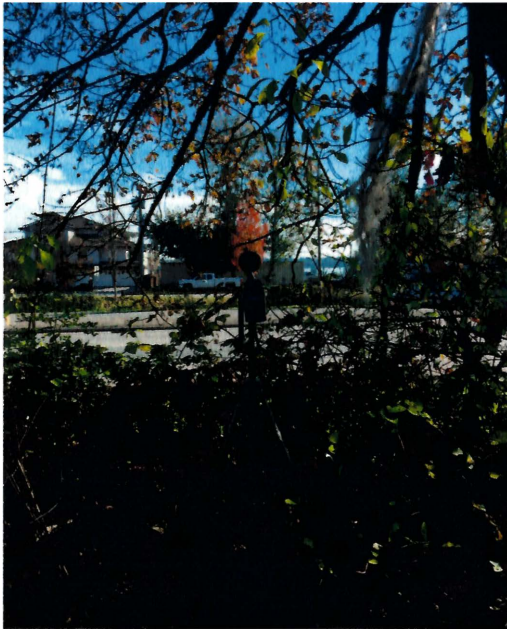


Brown Strachan Associates
 Consulting Engineers in Acoustics

Measurement Test Location.

TABLE 2: Measured samples of daytime traffic noise level approximately 1.5m north of south property line and 28m west of east property line (11-Oct-18, ~2:00pm).
 Conditions: Effective view to traffic on Mary Hill Bypass ~150 deg. W.Bnd traffic moving slower than 70km/h posted speed limit (Est. 60 km/h).

2 min. Leq Samples



74.5	Dump truck c/w jake brake W.Bnd
72.9	
74.3	
73.8	
73.1	
74.2	
72.2	
76.2	Loud motorbike W.Bnd
74.0	
72.8	Aircraft overhead
72.7	
74.2	
73.5	
73.5	Bus W.Bnd (#791)
74.0	
73.3	

=====

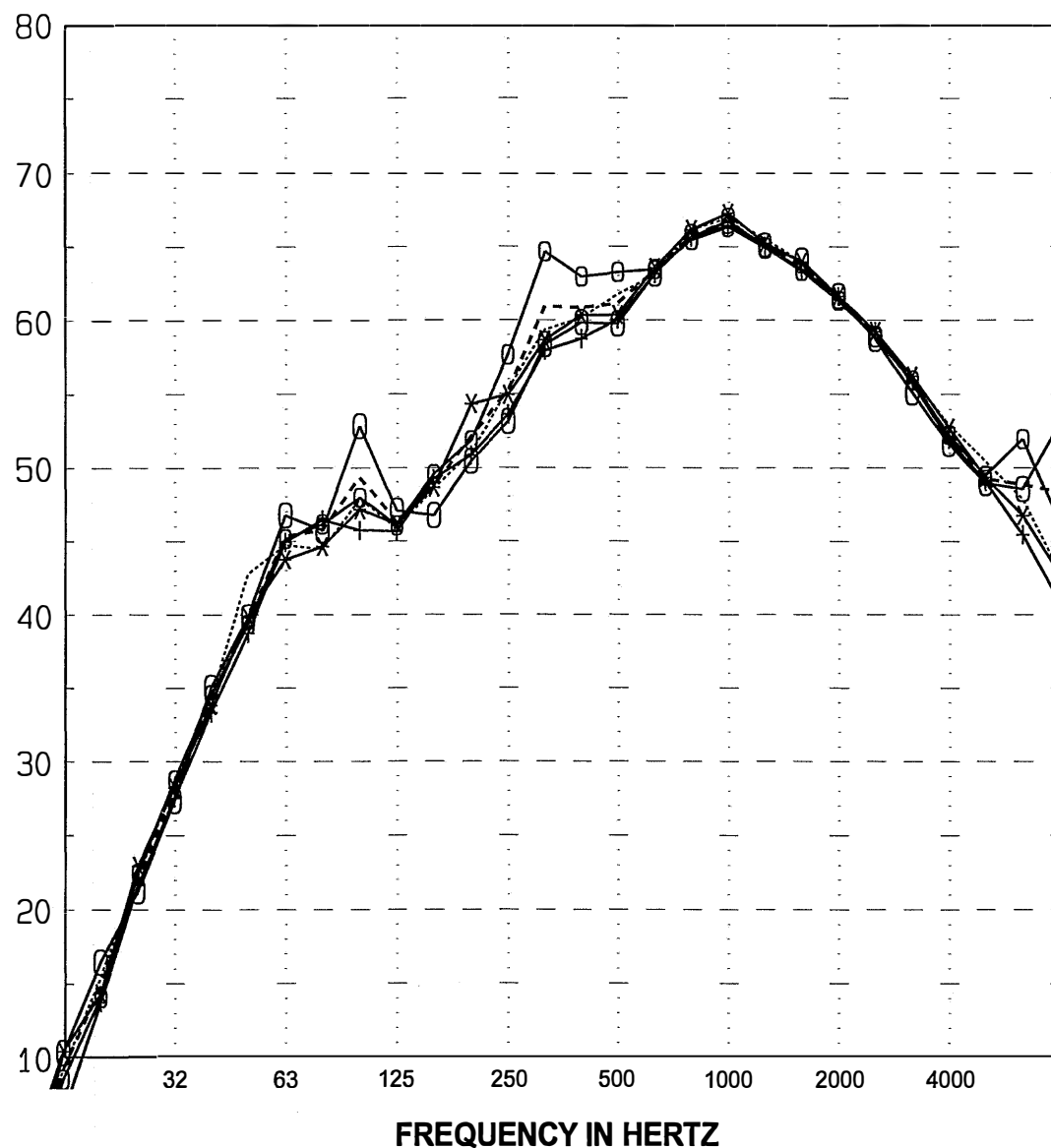
AVERAGE: 74 dBA

Traffic Counts on Mary Hill Bypass:

Direction	VPH	% Heavy Veh. *	Equiv. 24 hour Volume
Westbound:	1620	9	38,880
Eastbound:	2125	7	51,000

* Higher percentage of heavy traffic during sample period re. daily average, attributed to larger volume of trucks travelling between rushhour periods (ref. 1999 Lower Mainland Truck Freight Study).
 Daily design = 5% heavy vehicles, consist with CTS data (appended).

A-Weighted Third Octave Band Levels (dB re 20 uPa)



LEGEND

- x—x Avg. Leq from Graph: 1. 74 dBA
- o—o Graph: 2. 74 dBA
- +—+ Graph: 3. 73 dBA
- o—o Graph: 4. 74 dBA
- Overall Avg. Leq= 74 dBA
- Add. Leq (20min) = 74 dBA

Third octave band analysis of daytime traffic noise level at Test Location along Mary Hill Bypass, ~1.5m north of south property line & 28m west of the east P.L. (~2pm, 11-OCT-18).

PROJECT

ROSITCH HEMPHILL ARCHITECTS
Re: Greystone, Port Coquitlam

GRAPH TITLE

Evaluation of Traffic Noise Levels at Test Location.

GRAPH NUMBER

FILE: SUMMARY

SUMM

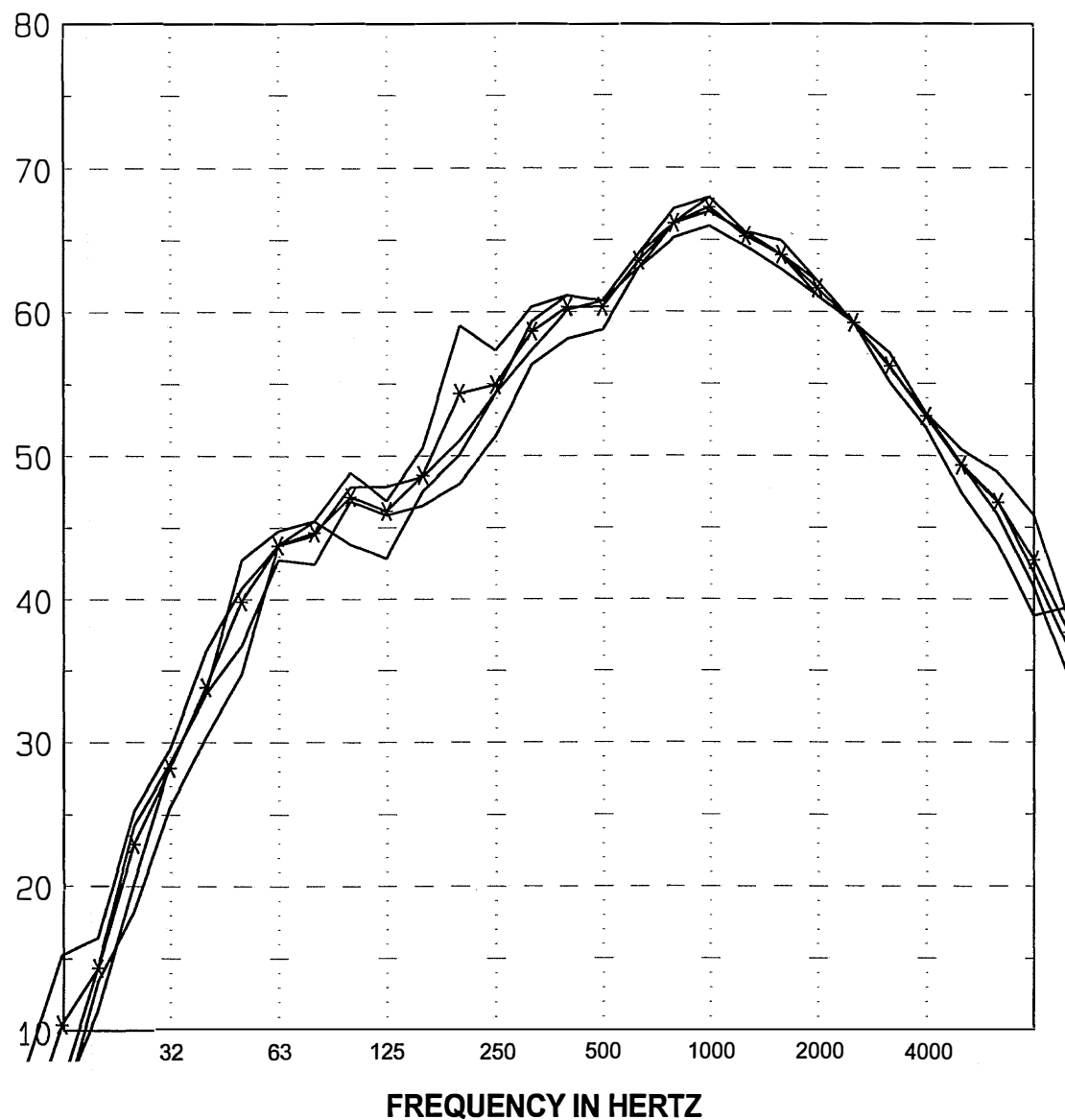
PROJECT NUMBER

A04.182

DATE

11-OCT-18

A-Weighted Third Octave Band Levels (dB re 20 uPa)



LEGEND

— Measured samples of daytime traffic noise level at Test Location.

— Average Leq = 74 dBA.

Leq(2min) samples.

PROJECT

ROSITCH HEMPHILL ARCHITECTS
Re: Greystone, Port Coquitlam

GRAPH TITLE

Evaluation of Traffic Noise Levels at Test Location.

GRAPH NUMBER

1

FILE: 1

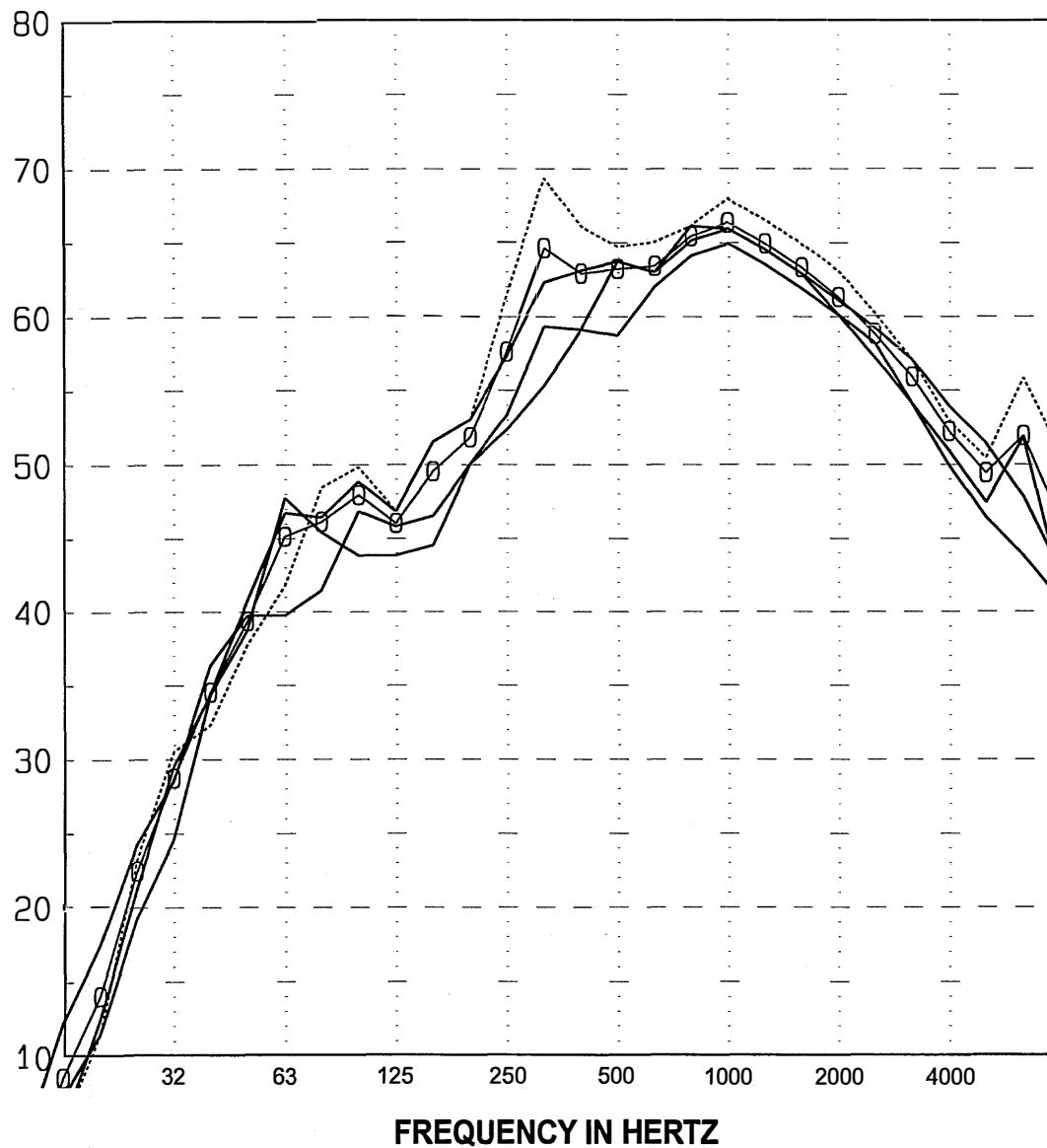
PROJECT NUMBER

A04.182

DATE

11-OCT-18

A-Weighted Third Octave Band Levels (dB re 20 uPa)



LEGEND

- Additional samples of daytime traffic noise level at Test Location.
- Motorbike W.Bnd 76 dBA.
- Average Leq = 74 dBA.

PROJECT
ROSITCH HEMPHILL ARCHITECTS
Re: Greystone, Port Coquitlam

GRAPH TITLE
Evaluation of Traffic Noise Levels at Test Location.

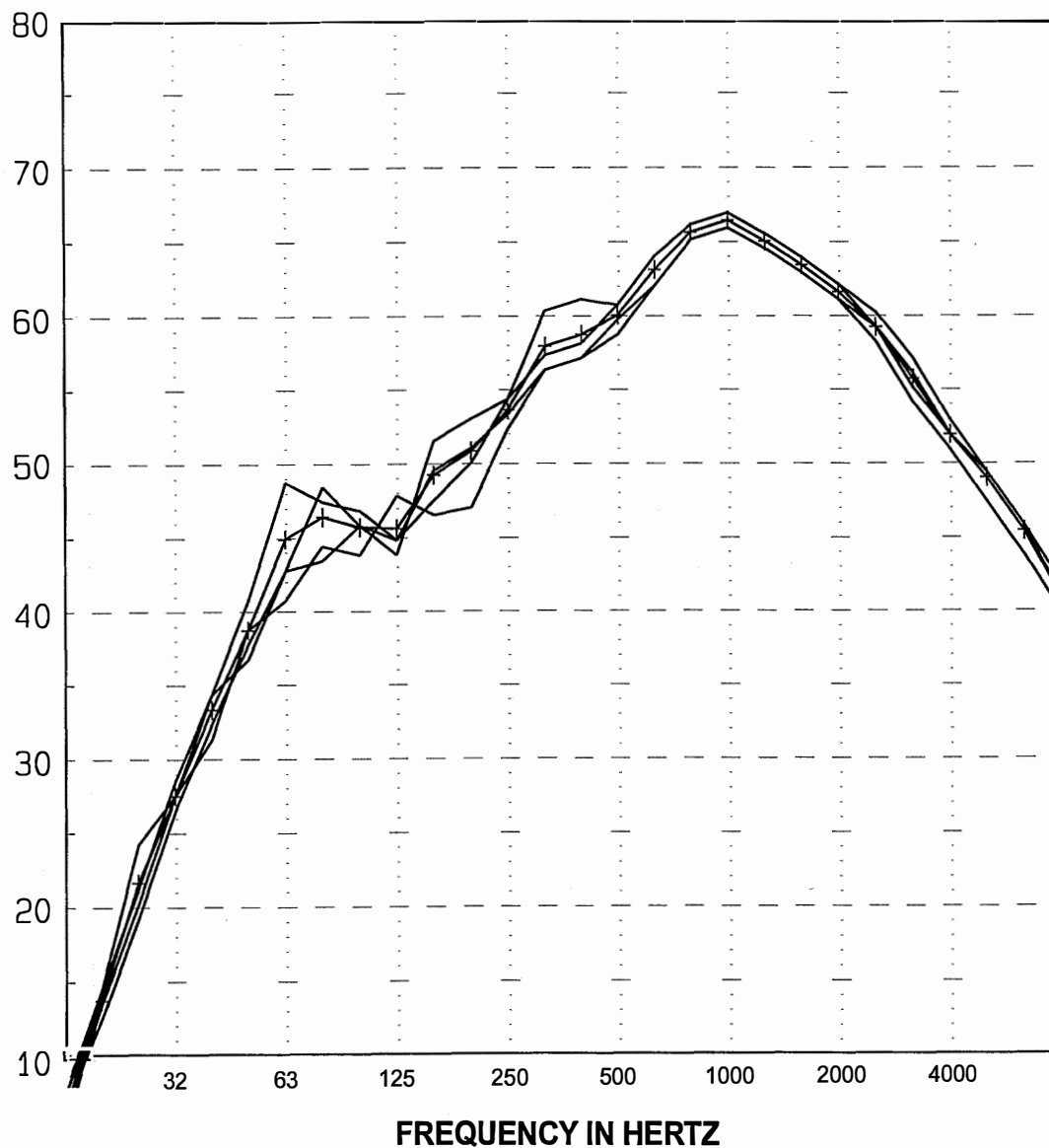
GRAPH NUMBER **2**

FILE: 2

PROJECT NUMBER
A04.182

DATE
11-OCT-18

A-Weighted Third Octave Band Levels (dB re 20 uPa)



LEGEND

— Additional samples of traffic noise level at Test Location.

+ Average Leq = 73 dBA.

PROJECT
ROSITCH HEMPHILL ARCHITECTS
Re: Greystone, Port Coquitlam

GRAPH TITLE
Evaluation of Traffic Noise Levels at Test Location.

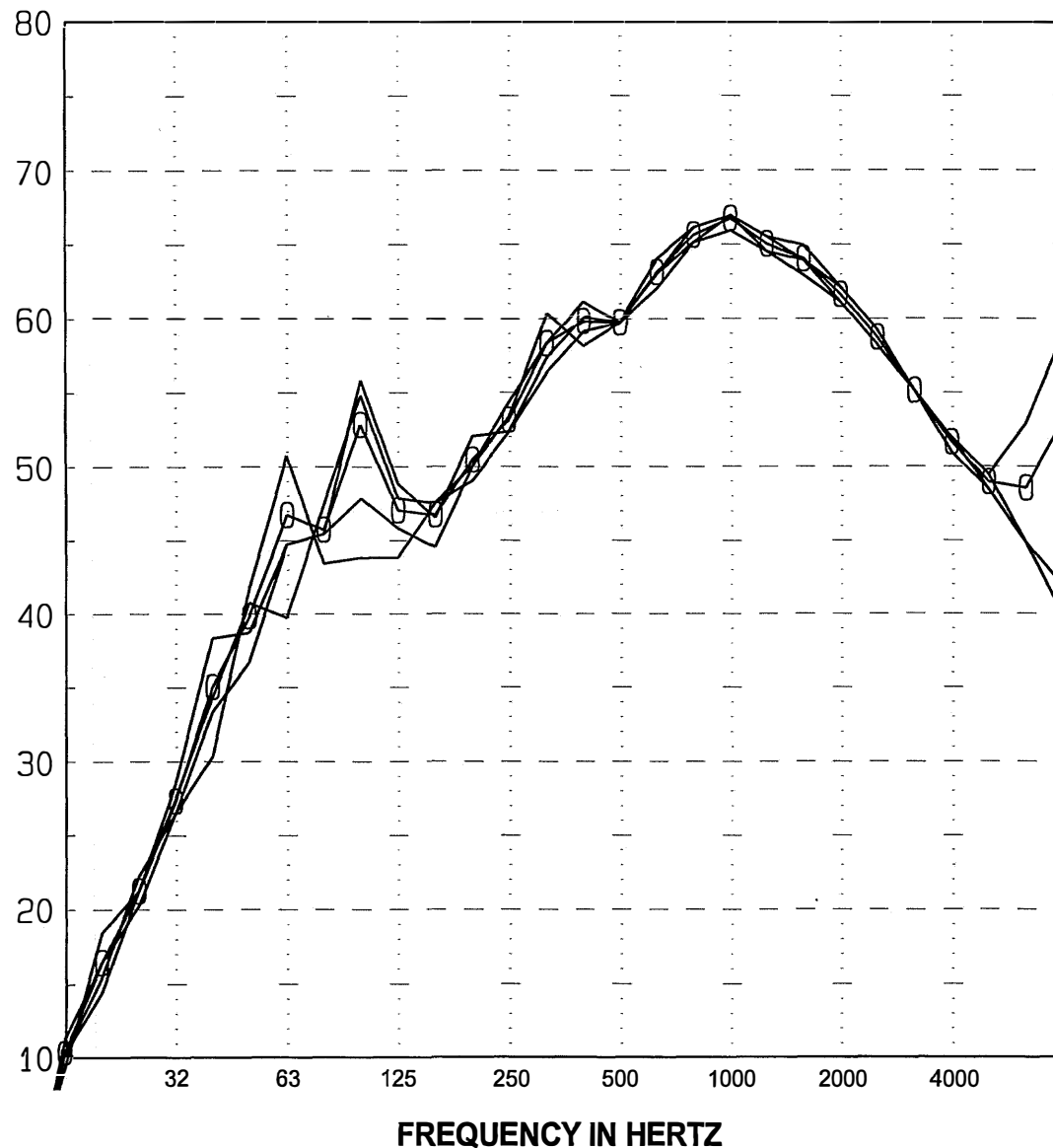
GRAPH NUMBER **3**

FILE: 3

PROJECT NUMBER
A04.182

DATE
11-OCT-18

A-Weighted Third Octave Band Levels (dB re 20 uPa)



LEGEND

- Additional samples of daytime traffic noise level at Test Location.
- Average Leq = 74 dBA.

PROJECT

ROSITCH HEMPHILL ARCHITECTS
Re: Greystone, Port Coquitlam

GRAPH TITLE

Evaluation of Traffic Noise Levels at Test Location.

GRAPH NUMBER

4

FILE: 4

PROJECT NUMBER

A04.182

DATE

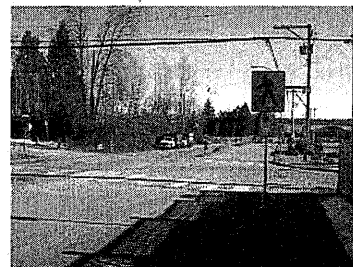
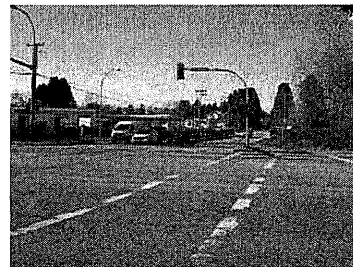
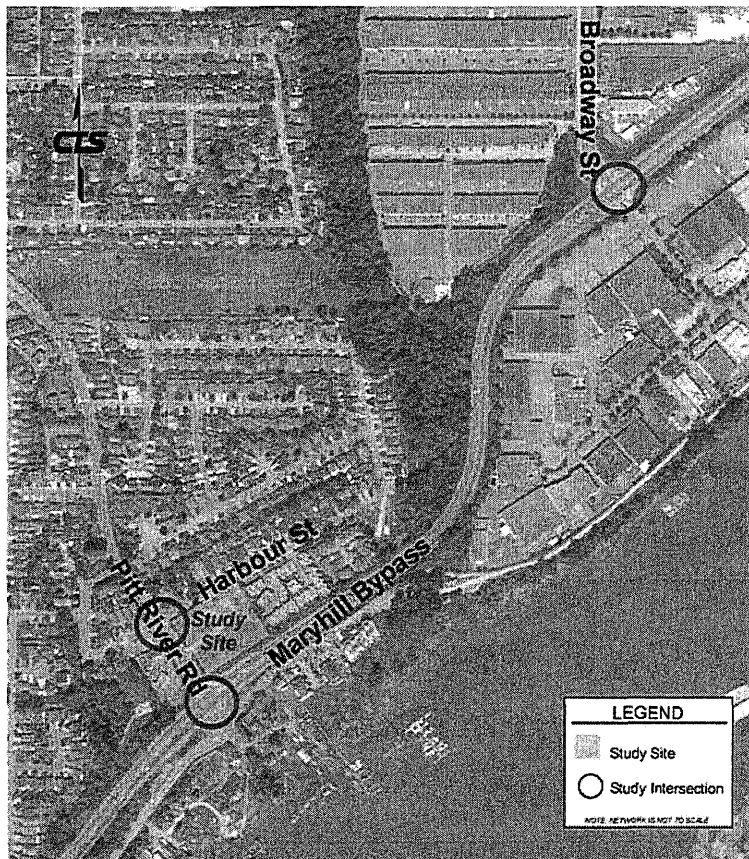
11-OCT-18

Greystone Development Traffic Impact Assessment



Prepared for:

Schmidt & Associates Development Planning Ltd.



Prepared by:

CTS CREATIVE
TRANSPORTATION
SOLUTIONS LTD.

APRIL 2018

84a moody street
port moody, bc
canada v3h 2p5

☎ 604.936.6190

FAX 604.936.6175

🌐 www.cts-bc.com

Date: April 5, 2018

Our File No: 5776-01

BY EMAIL

Laurie Schmidt
Schmidt & Associates Development Planning Ltd.
Suite 1440, 1166 Alberni Street
Vancouver, BC
V6E 3Z3

Dear Mr. Schmidt,

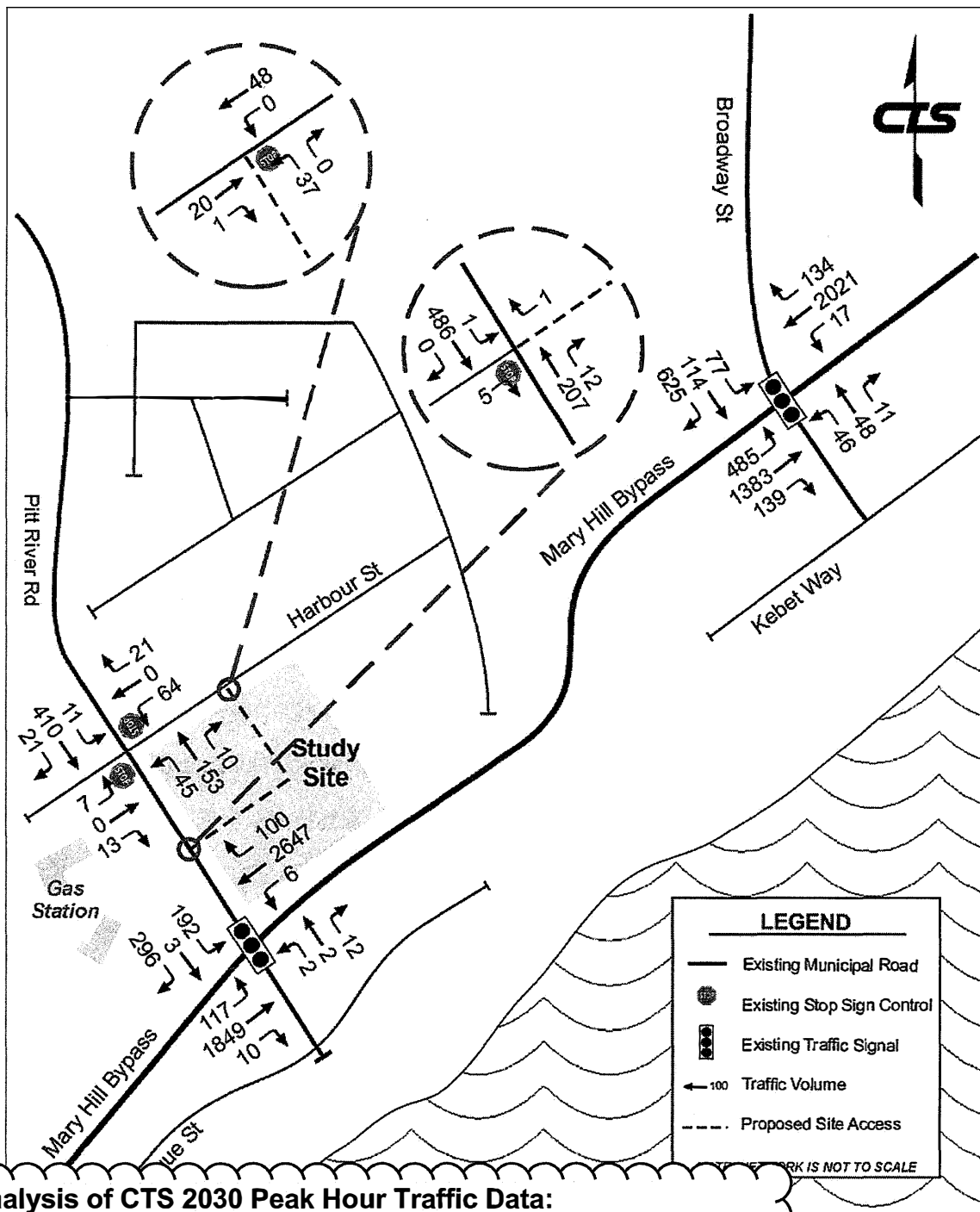
Re: Greystone Development, Port Coquitlam - FINAL Traffic Impact Assessment

Creative Transportation Solutions Ltd. (CTS) is pleased to submit this FINAL Traffic Impact Assessment for the proposed mixed-use Greystone Development in the City of Port Coquitlam.

The primary objectives of this assignment were:

1. To conduct a traffic impact assessment of the proposed mixed-use Greystone Development; and
2. To prepare a report that documents the technical analysis, key findings and recommendations (if any) to meet the transportation requirements of development as set out by the City of Port Coquitlam and Ministry of Transportation and Infrastructure (MOTI).

FIGURE 18
2030 (Build-out + 10 Years) Weekday Morning Peak Hour Base + Site Traffic Volumes



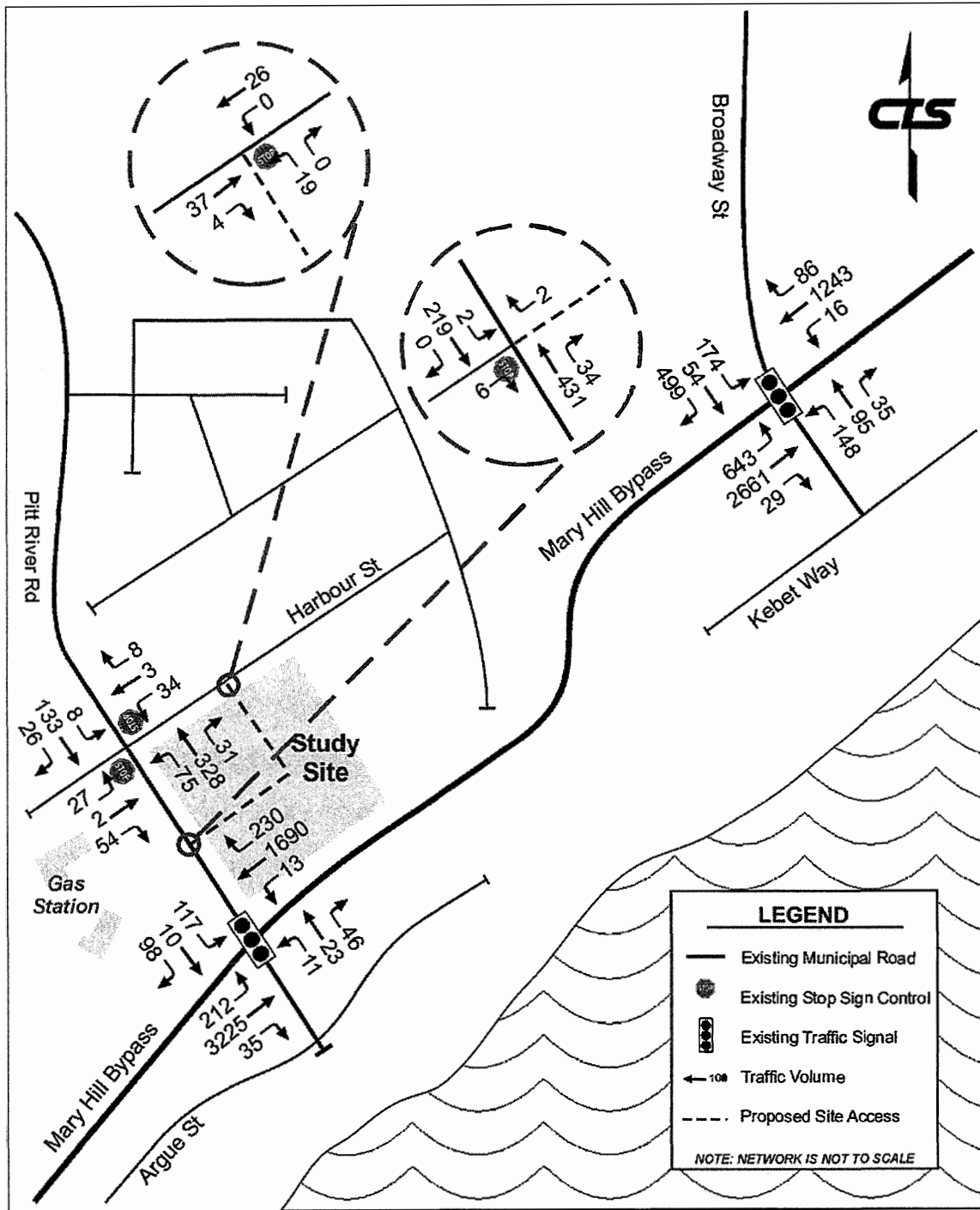
BSA Analysis of CTS 2030 Peak Hour Traffic Data:

	a.m.	p.m.	a.m. + p.m.	Est. Daily Volume*
Mary Hill W.Bnd:	2753	1933	4686	~36,100 vpd
Mary Hill E.Bnd:	2053	3388	5441	~41,900 vpd
Pitt River (total):	710	690	1400	~10,800 vpd
Harbour (total):	106	86	192	~1,500 vpd.

(p.m. next page)

*Est. based on a.m. + p.m. peak hour data being equivalent to 13% of the daily total traffic (data appended).

FIGURE 19
2030 (Build-out + 10 Years) Weekday Afternoon Peak Hour Base + Site Traffic Volumes



British Columbia Ministry of Transportation

Daily Volume from 08/18/2007 through 08/23/2007

Site Names: 16-191EW

County:

Funct. Class:

Location: Route 7B (Marv Hill Bypass). 0.8 Km East Of United Boulevard. Coquitlam

Seasonal Factor Type: Consistent

Daily Factor Type: Consistent

Axle Factor Type:

Growth Factor Type: Consistent

	08/19/2007			08/20/2007			08/21/2007			08/22/2007			08/23/2007			08/24/2007			08/25/2007		
	Road	Neg	Pos	Road	Neg	Pos	Road	Neg	Pos	Road	Neg	Pos	Road	Neg	Pos	Road	Neg	Pos	Road	Neg	Pos
00:00	1,139	401	738	608	201	407	550	174	376	658	207	451	680	205	475						
01:00	757	288	469	320	99	221	327	94	233	378	130	248	416	143	273						
02:00	517	188	329	231	102	129	285	128	157	289	128	161	334	171	163						
03:00	326	118	208	250	149	101	258	162	96	270	163	107	333	187	146						
04:00	294	161	133	598	438	160	594	425	169	584	432	152									
05:00	524	313	211	2,178	1,737	441	2,239	1,746	493	2,321	1,814	507									
06:00	782	472	310	3,145	2,072	1,073	3,068	1,948	1,120	3,060	1,966	1,094									
07:00	959	606	353	3,276	1,985	1,291	3,383	1,980	1,403	3,365	2,037	1,328									
08:00	1,158	723	435	3,069	1,819	1,250	3,068	1,847	1,221	3,274	1,924	1,350									
09:00	1,623	1,034	589	2,829	1,654	1,175	3,152	1,912	1,240	3,064	1,816	1,248									
10:00	2,183	1,416	767	3,068	1,793	1,275	2,970	1,729	1,241	3,165	1,871	1,294									
11:00	2,564	1,473	1,091	3,177	1,760	1,417	3,292	1,822	1,470	3,230	1,738	1,492									
12:00	2,874	1,613	1,261	3,198	1,718	1,480	3,404	1,772	1,632	3,326	1,773	1,553									
13:00	3,065	1,681	1,384	3,223	1,661	1,562	3,521	1,746	1,775	3,543	1,727	1,816									
14:00	3,206	1,604	1,602	3,744	1,676	2,068	3,926	1,712	2,214	4,119	1,780	2,339									
15:00	3,055	1,378	1,677	4,342	1,652	2,690	4,041	1,671	2,370	4,542	1,817	2,725									
16:00	3,054	1,372	1,682	4,549	1,612	2,937	4,558	1,623	2,935	4,631	1,581	3,050									
17:00	3,049	1,372	1,677	4,220	1,403	2,817	4,398	1,475	2,923	4,340	1,457	2,883									
18:00	2,601	1,138	1,463	3,272	1,142	2,130	3,708	1,299	2,409	3,658	1,336	2,322									
19:00	2,146	1,001	1,145	2,441	1,019	1,422	2,808	1,114	1,694	2,872	1,211	1,661									
20:00	2,036	1,014	1,022	1,899	756	1,143	2,210	959	1,251	2,402	958	1,444									
21:00	1,915	868	1,047	1,725	686	1,039	1,971	788	1,183	2,213	909	1,304									
22:00	1,474	606	868	1,395	530	865	1,513	569	944	1,704	652	1,052									
23:00	903	321	582	954	300	654	1,121	351	770	1,082	382	700									
Volume	42,204	21,161	21,043	57,711	27,964	29,747	60,365	29,046	31,316	62,090	29,809	32,281	1,763	706	1,057						
AM Peak Vol	2,564	1,473	1,090	3,281	2,085	1,415	3,383	2,053	1,479	3,516	2,131	1,492									
AM Peak Fct	0.87	0.93	0.79	0.54	0.96	0.91	0.92	0.97	0.92	0.93	0.92	0.90									
AM Peak Hr	11:00	11:00	11:00	6:30	5:45	11:00	7:00	6:15	11:00	7:30	7:15	11:00									
PM Peak Vol	3,206	1,689	1,719	4,577	1,730	2,978	4,615	1,776	3,021	4,706	1,817	3,050									
PM Peak Fct	0.97	0.98	0.97	0.95	0.92	0.98	0.97	0.95	0.97	0.97	0.95	0.95									
PM Peak Hr	14:00	12:30	15:30	16:30	12:30	16:30	16:30	14:15	16:15	15:15	15:00	16:00									
Seasonal Fct	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940						
Daily Fct	1.168	1.168	1.168	1.041	1.041	1.041	0.984	0.984	0.984	0.960	0.960	0.960	0.941	0.941	0.941						
Axle Fct	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500						
Pulse Fct	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000						

*BSA Analysis of MoTI Traffic Data:
AM + PM peak hour data are
equivalent to 13% of daily traffic.*



Pitt River Rd & Mary Hill Bypass

Tuesday, January 09, 2018

Vehicle Classification Summary

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	7,531	302				7,833
	%	96.1%	3.9%				100.0%
Midday (11:00 - 13:00)	Volume	5,315	447				5,762
	%	92.2%	7.8%				100.0%
Afternoon (15:00 - 18:00)	Volume	12,665	270				12,935
	%	97.9%	2.1%				100.0%
Total (7 Hours)	Volume	25,511	1,019				26,530
	%	96.2%	3.8%				100.0%

Mary Hill Design Volume = 5%



Pitt River Rd & Harbour St - Harbour Ave

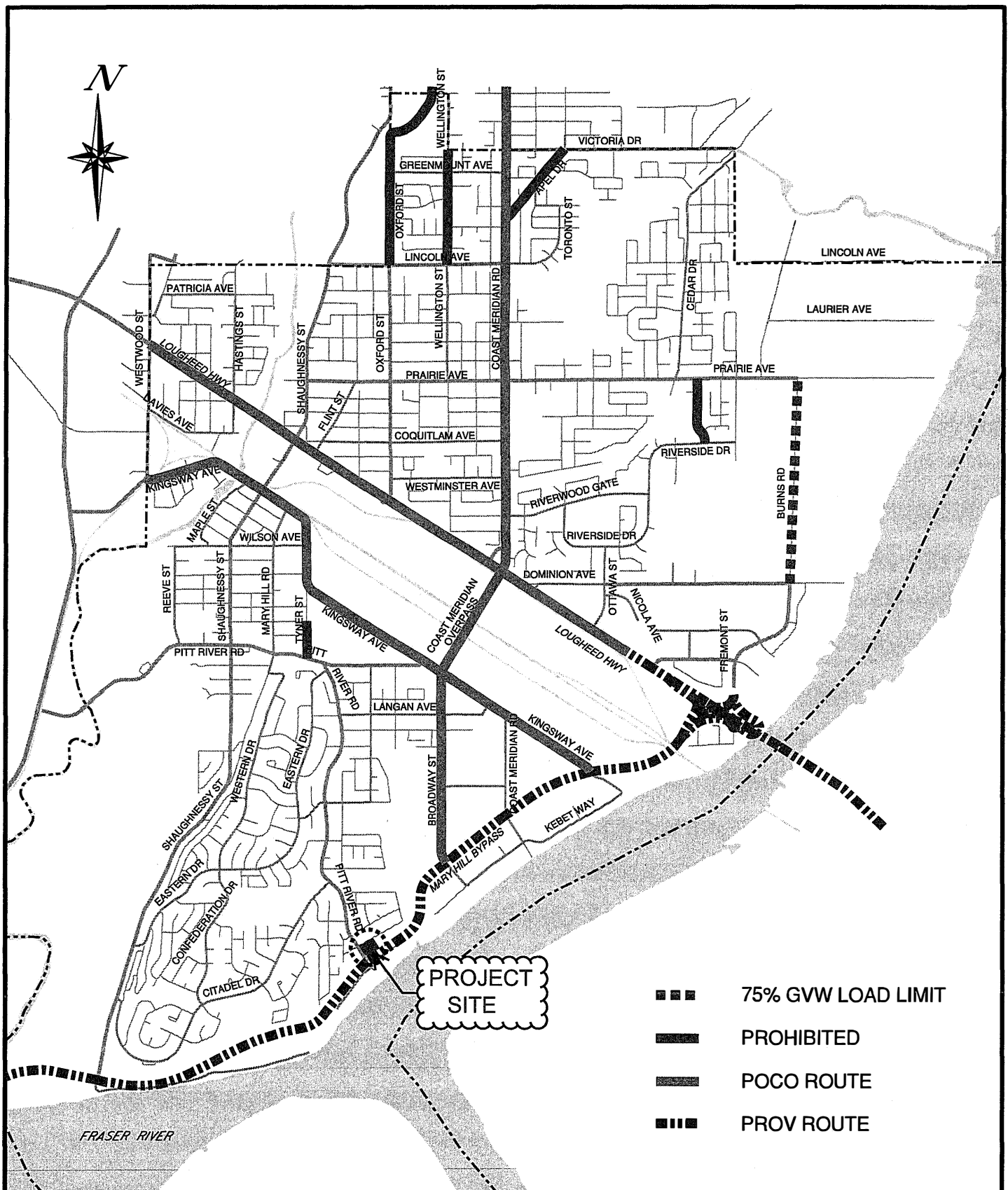
Tuesday, January 09, 2018

Vehicle Classification Summary

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	1,115	5				1,120
	%	99.6%	0.4%				100.0%
Midday (11:00 - 13:00)	Volume	748	0				748
	%	100.0%	0.0%				100.0%
Afternoon (15:00 - 18:00)	Volume	1,957	0				1,957
	%	100.0%	0.0%				100.0%
Total (7 Hours)	Volume	3,820	5				3,825
	%	99.9%	0.1%				100.0%

Pitt River Rd. & Harbour St. Design Volume = 1%



TITLE:
TRUCK ROUTE MAP

NOTE:
The City of Port Coquitlam makes no representations as to, and does not warrant, the accuracy or completeness of the data and the City of Port Coquitlam is not responsible for any errors or omissions in the data.

The User waives any right to claim damages or pursue any other remedy against the City of Port Coquitlam that arise out of or in connection with the delivery or use of the data.

DRAWING NO:

SCALE:
NTS

DATE:
May 13, 2015





August 29, 2018

Laurie Schmidt
Schmidt and Associates Development Planning
1440-1166 Alberni Street
Vancouver, BC V6E 3Z3

VIA EMAIL

Dear Mr. Schmidt:

Re: **1884-1930 Harbour Street, 1887-1911 Prince Street, 1155 Pitt River Road
Official Community Plan Application OCP00025 and Rezoning Application RZ000159**

The City has completed its review of your Official Community Plan (OCP) amendment and rezoning applications received April 10, 2018. Staff's comments and requests for further information and revisions are included in this letter and its attachment.

Please be advised we anticipate submitting a report to the September 4th, 2018 meeting of the Smart Growth Committee to address early consultation.

OCP Policy Amendments

The OCP sets policies for how the community is intended to develop as well as designates lands for uses in keeping with these policies. For commercial uses, the applicable policies of the Plan include:

- support for community commercial uses (small retail, office, and personal services) within existing community commercial nodes and in areas with increased residential density and close to transit
- provision to respond to a community desire for small pedestrian-oriented neighborhood commercial sites to serve a local population, particularly in the Citadel area.

For residential uses, applicable policies include:

- designation of the site for townhouse use
- support for higher density residential uses in areas close to community services and transit.

Your application to amend the OCP needs to indicate why the amendment would be in the public interest. As submitted, it does not provide a sufficient rationale to support the requested policy changes and change in land use designation.

With respect to the amendment to commercial policies, we are concerned that the size of the proposed commercial components could impact established commercial areas and that commercial uses could adopt a highway orientation to the Mary Hill Bypass. This outcome would be incompatible with surrounding residential uses and transportation plans. To address these concerns, we request that a retail impact assessment be provided to identify the expected trade area and provide an analysis of

Section C — Recommended Levels of Traffic Noise

The acceptance of noise depends on both the characteristics of that noise and the activities of the listeners. The activities most affected by noise fall into two categories, corresponding to two different criteria. For activities similar to speech communication (including listening to radio and television), the first requirement is that the noise level does not interfere significantly with comfortable speech communication or with listening to soft music. The other important category is sleeping: noise, especially at night, should not interfere with normal sleep patterns.

To deal with the fluctuating noise level from road or rail traffic, it is convenient to describe it in terms of the equivalent level (L_{eq}). This is the level of a steady sound having the same energy, at a given time, as the fluctuating sound. For the purposes of this document, the A-weighted 24-hour equivalent sound level is used as the basic noise descriptor. This noise measure has been extensively tested in numerous social surveys. Of the commonly used noise descriptors, it is among the easiest to measure or to predict accurately, and no other descriptor has been shown to provide a significantly better prediction of the community response to noise.

Hereafter "noise level" expressed in decibels (dB) should be taken to mean the A-weighted 24-hour equivalent sound level.

The maximum equivalent level that will not impair sustained conversational speech is 40 dB. Noise above this level causes people to raise their voices and therefore is not acceptable for a quiet indoor environment. In order to hear quieter passages of music, a level of about 35 dB would be preferred. Communication in a slightly raised voice is acceptable in kitchens and bathrooms and usually in outdoor recreation areas.

Sleep arousal and interference with going to sleep depend on the level of noise and on the fluctuations in level or character that occur. A useful criterion is that the maximum levels should not exceed the indoor background level by more than about 5 dB. Quiet interior levels range from 25 to 35 dB. Normally night-time traffic is less than day-time traffic and the 24-hour average level provides a fair measure of maximum night-time levels. The maximum level acceptable in bedrooms is 35 dB.

Outdoor noise levels should be considered as well as indoor because residential areas ought to include some space for outdoor recreation, such as patios, balconies and play areas. Experience indicates that somewhat higher noise levels are generally more acceptable outside than inside. An appropriate outdoor noise level is 55 dB, which would correspond typically to an indoor level of 40 dB. These levels would permit conversation at close range or in a slightly raised voice most of the time. Such background noise may serve the purpose of masking more specific sounds, such as conversation on a neighbour's patio.

To meet these various criteria of acceptable noise levels, the levels given in Table 1 are recommended:

Table 1

Maximum acceptable levels of road and rail traffic noise in dwellings and in outdoor recreation areas.

Room	Noise Level
Bedrooms.....	35 dB
Living, dining, recreation rooms.....	40 dB
Kitchens, bathrooms, hallways, utility rooms.....	45 dB
Outdoor recreation area.....	55 dB



Note:

In downtown apartment projects where, because of site restrictions, adequate noise reduction measures are not always possible, it is recognized that noise levels above 55 dB do not make open space completely ineligible for inclusion as amenity space. To provide a flexible approach, a sliding scale may be used in which for each 2 dB over the acceptable limit, 10% of the area of a balcony or other open space is ineligible, e.g., a balcony of 30 m² with a level of 61 dB would have 21 m² eligible amenity area; at 65 dB the eligible area would be 15 m².

In an ordinary dwelling complying with Residential Standards, the indoor noise level should be at least 20 dB below the outdoor level when windows are closed. If the outdoor noise level is not more than 55 dB, then all the proposed requirements could normally be met if the construction complies with Residential Standards, although it might still be prudent to locate bedrooms on the quieter side of the building.

In noisier locations, some shelter is needed for outdoor recreational space so that it meets the 55 dB requirements. The shelter might take the form of a barrier wall, solid fence, or berm between the road and the recreational space. In some layouts, the building itself, row housing for example, may form an adequate barrier to protect outdoor space on the sheltered side. Generally, however, a reduction of 20 dB is the maximum that can be expected from a barrier. It follows that outdoor space which is quiet enough cannot be achieved at sites where the noise level is greater than 75 dB.

ACOUSTICAL EVALUATION REPORTS - BACKGROUND INFORMATION

Development applications for housing, hotels, childcare facilities and institutional projects often include a requirement to demonstrate that the proposed construction satisfies acoustical design criteria set by the municipality. The criteria are generally defined by By-laws, Guidelines or Restrictive Covenants, e.g. OCPs, CMHC, NRC, BS, HUD, etc. On the basis that subjective reaction to noise varies significantly, full disclosure should be made to prospective residents that the building is subject to noise and vibration which may be annoying to some individuals, as outlined below.

Municipal design criteria are inside noise levels based on an Leq acoustical analysis. Monitored site measurements are used to check the analysis and site conditions. BSA Acoustical Evaluation reports (reports) recommend facade upgrades necessary to satisfy the design criteria for sources such as future road traffic, rail and aircraft noise. An outline of the design process to determine the effect of design revisions is documented in the reports. To satisfy the criteria, an analysis of third octave acoustical data from a representative ASTM E90 test of the proposed fenestration is required (not an OITC rating only). Aircraft and train noise generally require a higher OITC rated facade than traffic. Increased glazing in a given room generally results in a higher OITC requirement. Fenestration performance can vary significantly between similar products. Unless significant design margin exists, a generic description of proposed fenestration is not adequate to demonstrate compliance with the design criteria.

Where commercial and industrial sources are a primary consideration, such sources are evaluated based on the maximum levels allowed under local By-laws unless measurements on site and/or other operational data indicate lower noise levels. Construction sources are generally covered under local By-laws and are not considered representative of the future noise environment.

The analysis appended to a report does not consider potential noise issues other than as described above, e.g. unusual traffic, rail or aircraft conditions, peak sound transmission from individual vehicles, ground or airborne transmitted vibration, changes to existing infrastructure other than as indicated on drawings evaluated, emergency signals, construction or maintenance related activity, public utilities noise, privacy between suites (e.g. Code 5.8 & 9.11), isolation of suites from CRUs, offices, common or amenity areas, music rooms, fitness rooms, pools, water features, parkades, garbage, recycling, building services such as HVAC or plumbing systems, elevators, mechanical or electrical equipment, terraces or balconies, subjective reaction, non-acoustical items (e.g. failure of facade or glazing from any cause, infiltration of precipitation, condensation, mould, mildew or other fungus), etc. BSA does not undertake unmonitored 24 hour measurements as a design basis because of the risk of design deficiencies introduced by unusual conditions such as traffic diversions, extraneous sources, etc.

BSA reports and related correspondence are supporting documents for registered professionals, as defined in the Code (BCBC Div. C, 2.3.1.2, 2018). A report and related documentation such as review of window and door shop drawings, fenestration acoustical data, covenants, disclosure statements, etc., are not a BSA certification of on-site noise levels or any aspect of the construction details. BSA does not undertake the responsibility of the Architect, Coordinating Registered Professional, Registered Professional of Record or Building Envelope Professional. BSA does not provide Schedule B or C services, etc., or field review services. Other professionals should be retained for overall project co-ordination, field review, Code related advice, co-ordination of BSA's recommendations with contractors, trades, suppliers, etc.



Greystone Development Traffic Impact Assessment



Prepared for:

Schmidt & Associates Development Planning Ltd.



Prepared by:



APRIL 2018

84a moody street
port moody, bc
canada v3h 2p5

604.936.6190

604.936.6175

www.cts-bc.com

Date: April 5, 2018
Our File No: 5776-01

BY EMAIL

Laurie Schmidt
Schmidt & Associates Development Planning Ltd.
Suite 1440, 1166 Alberni Street
Vancouver, BC
V6E 3Z3

Dear Mr. Schmidt,

Re: Greystone Development, Port Coquitlam - FINAL Traffic Impact Assessment

Creative Transportation Solutions Ltd. (CTS) is pleased to submit this FINAL Traffic Impact Assessment for the proposed mixed-use Greystone Development in the City of Port Coquitlam.

The primary objectives of this assignment were:

1. To conduct a traffic impact assessment of the proposed mixed-use Greystone Development; and
2. To prepare a report that documents the technical analysis, key findings and recommendations (if any) to meet the transportation requirements of development as set out by the City of Port Coquitlam and Ministry of Transportation and Infrastructure (MOTI).

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APPENDIX A – Site Plan

APPENDIX B – Traffic Count Data

APPENDIX C – Capacity Analysis

1.0 BACKGROUND

1.1 Site

The Greystone Development is proposed to be developed as 132 residential units and 12,000 ft² (1,114.84 m²) of commercial/retail. The site is comprised of eight properties:

1904, 1912, 1920 and 1930 Harbour Street;

1887, 1893 and 1911 Prince Street; and

1155 Pitt River Road;

And a segment of the Prince Street right-of-way, to be consolidated. The legal descriptions are:

Lots 12, 12 and 14, District Lot 232, New Westminster District, Plan NWP20011;

Lot 19, Block 1, District Lot 232, New Westminster District, Plan NWP20011; and

Lots 553, 554, 555 and 556, District Lot 232, New Westminster District, Plan NWP64266,

The zoning is RS1 – Residential Single Dwelling.



Photo 1 – Greystone Development Site Looking From Mary Hill Bypass

The property is proposed to be rezoned as a Comprehensive Development.

1.2 Study Area

The site is bounded by Harbour Street to the north, Mary Hill Bypass to the south and Pitt River Road to the west. The study area included the following intersections:

- 1) Mary Hill Bypass and Broadway Street;
- 2) Mary Hill Bypass and Pitt River Road; and
- 3) Pitt River Road and Harbour Street.

The site location and proposed study area are illustrated in **FIGURE 1**. A copy of the site plan is included as **APPENDIX A**.

FIGURE 1
Site and Study Area



2.0 EXISTING CONDITIONS

During a site visit performed on Thursday February 22nd, 2018, the following was noted.

2.1 Road Network

Mary Hill Bypass

Mary Hill Bypass is a suburban multi-lane divided highway with an asphalt open shoulder, connecting Lougheed Highway in the east and Highway 1 in the west. Mary Hill Bypass is posted at 70 km/h. Adjacent to the site the laning eastbound is two through lanes and; the laning westbound is a left turn lane, two through lanes and a channelized right turn lane. There is street lighting along both sides of Mary Hill Bypass. There is "NO STOPPING" along both sides of Mary Hill Bypass.

Pitt River Road

Pitt River Road is a collector road posted at 50 km/h. Adjacent to the site the laning northbound is a single through lane and; the laning southbound is a left turn lane, a through lane and a channelized right turn lane. Pitt River Road is divided by a concrete median. There is a gravel open shoulder along the east side of Pitt River Road and concrete curb and gutter and sidewalk along the west side of Pitt River Road. There is street lighting along the west side of Pitt River Road. There is "NO PARKING" along the west side of Pitt River Road.

Harbour Street

Harbour Road is a two lane local road posted at 50 km/h. There is a gravel open shoulder along both sides of Harbour Street east side of Pitt River Road. There is street lighting along the north side of Harbour Street. There is "NO PARKING" along the south side of Harbour Street.

Intersection of Mary Hill Bypass and Pitt River Road

The intersection of Mary Hill Bypass and Pitt River Road is a fully signalized intersection with audible pedestrian signals. There are marked crosswalks with curb ramps as required, on all four approaches to the intersection. There is right turn channelization on the north and east approaches. The intersection is illuminated.

Intersection of Mary Hill Bypass and Broadway Street

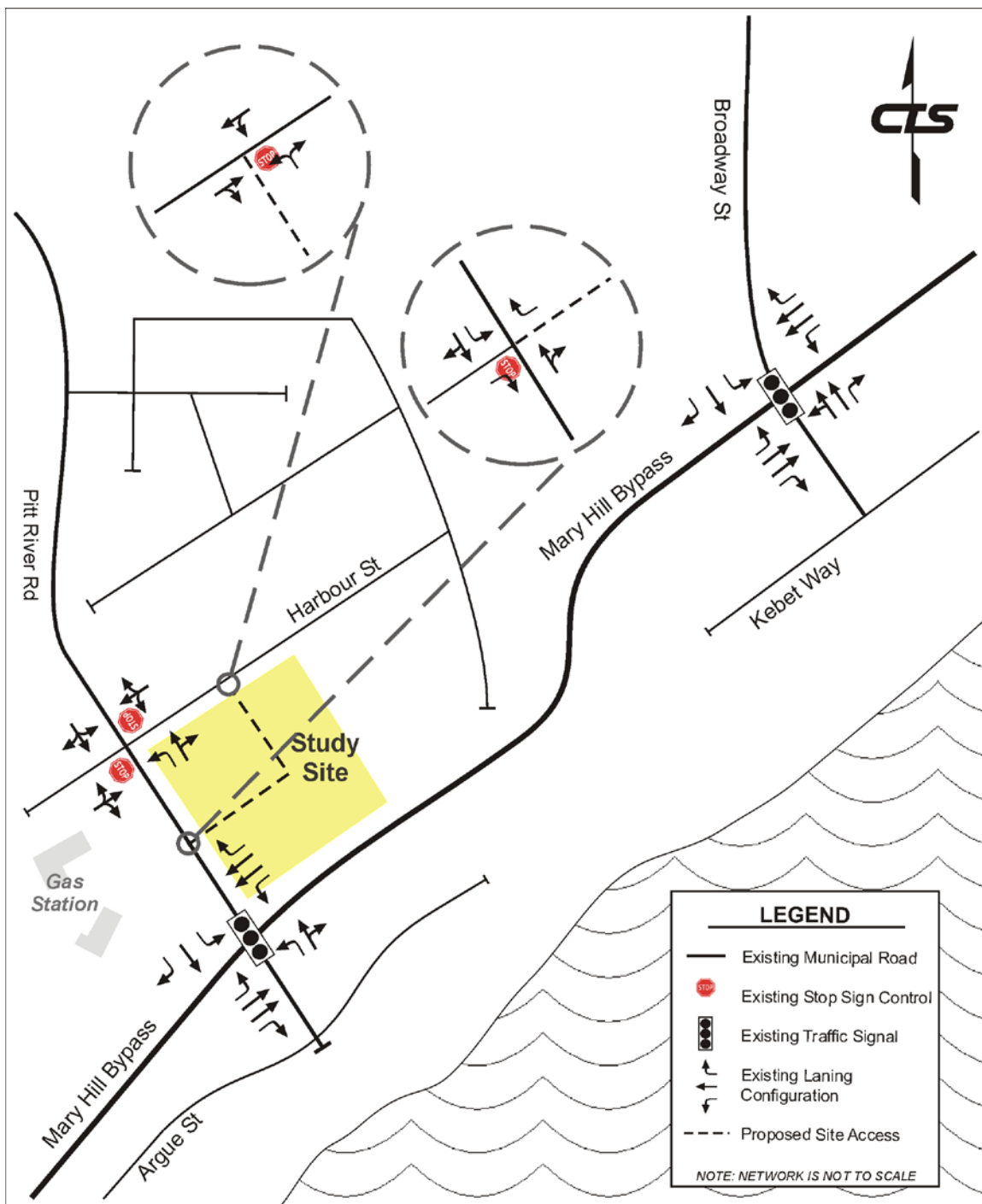
The intersection of Mary Hill Bypass and Broadway Street is a fully signalized intersection with pedestrian signals. There are marked crosswalks with curb ramps as required, on the north, south and east approaches to the intersection. There is right turn channelization on all four approaches to the intersection. The intersection is illuminated.

Intersection of Pitt River Road and Harbour Street

The intersection of Pitt River Road and Harbour Street is STOP controlled on the east and west approaches. There are signed and marked crosswalks with curb ramps as required, on the north and south approaches. The intersection is illuminated.

The laning configurations for the intersections within the study are illustrated by **FIGURE 2**.

FIGURE 2
Laning Configuration



2.2 Transportation Infrastructure

Pedestrians

There are signed and marked crosswalks with curb ramps as required, on the north and south approaches to the intersection of Pitt River Road and Harbour Street and concrete sidewalk along the west side of Pitt River Road between Harbour Street and Mary Hill Bypass connecting to transit and the Traboulay PoCo Trail. See **FIGURE 3**. The intersections and sidewalk are illuminated.

There are no sidewalks along either side of Harbour Street adjacent to the site.

Cyclists

There are no bikeways on Pitt River Road or Harbour Street adjacent to the site. However, the site is in very close proximity to the Traboulay PoCo Trail. See **FIGURE 3**.

FIGURE 3
Traboulay PoCo Trail



Transit

The closest transit stops to the site are on Citadel Drive, an approximate 8 minute walk. The transit stops provide access to:

#159 – Coquitlam Central Station/Braid Station with service every 30 minutes Monday to Saturday and every hour Sundays and Holidays, during peak periods.

2.3 Base Traffic

CTS conducted traffic counts at all three study intersections on Tuesday January 9, 2018 from 0700 to 0900, 1100 to 1300 and 1500 to 1800 and Wednesday February 28, 2018 from 0700 to 0900 and 1500 to 1800.

The 2018 base traffic volumes for the weekday morning and afternoon peak hours are illustrated by **FIGURE 4** and **FIGURE 5** respectively. Traffic count data is included as **APPENDIX B**.

FIGURE 4
2018 Weekday Morning Peak Hour Base Traffic Volumes

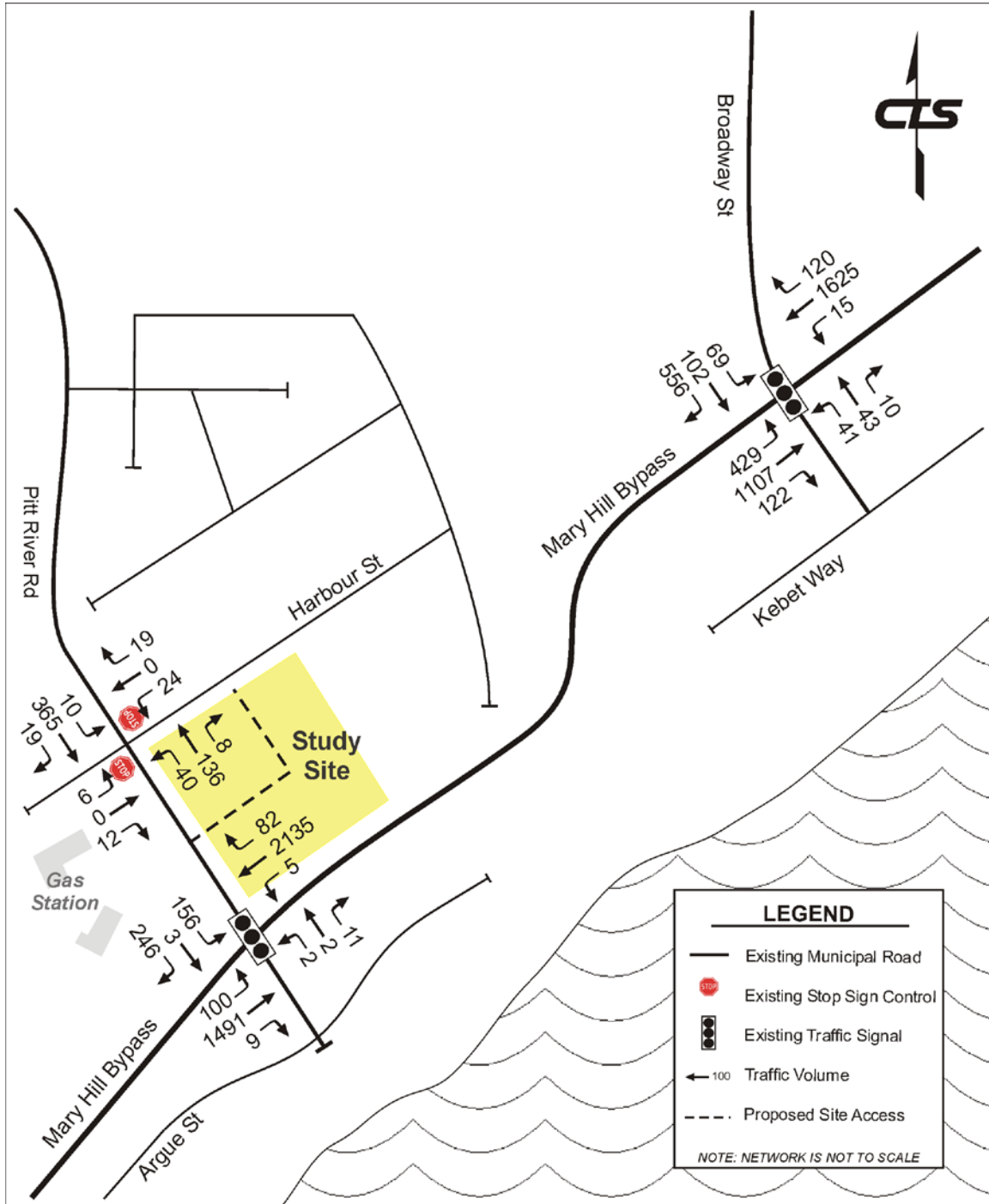
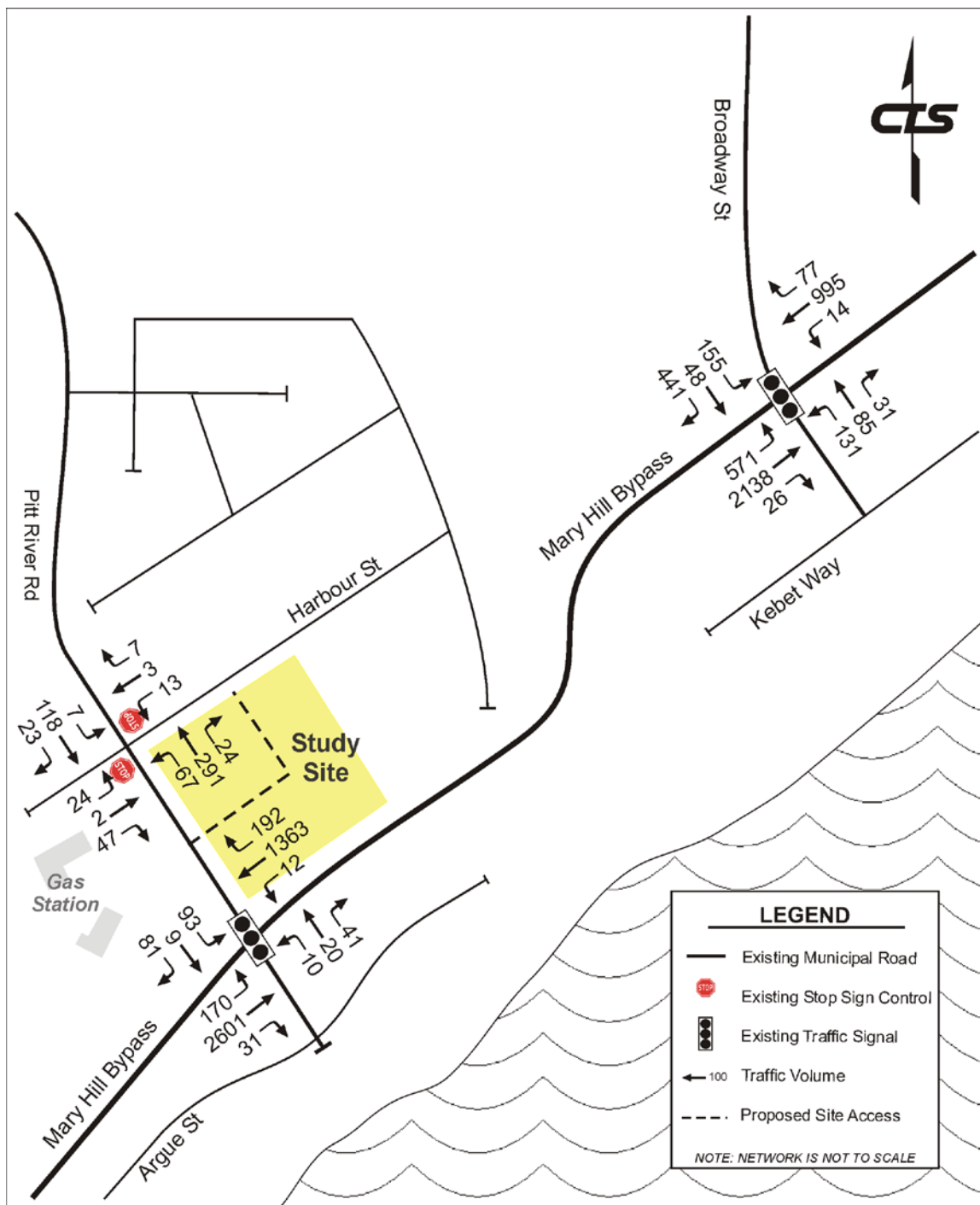


FIGURE 5
2018 Weekday Afternoon Peak Hour Base Traffic Volumes



3.0 FUTURE CONDITIONS

3.1 Future Base Traffic

Future base traffic volumes on the adjacent street network were projected based on application of a linear (simple straight line) growth rate of 2% for vehicle through movements on Mary Hill Bypass and 1% for all other vehicle turning movements.

The 2020 (build-out) base traffic volumes for the weekday morning and afternoon peak hours are illustrated by **FIGURE 6** and **FIGURE 7** respectively.

The 2025 (build-out+5 years) base traffic volumes for the weekday morning and afternoon peak hours are illustrated by **FIGURE 8** and **FIGURE 9** respectively.

The 2030 (build-out+10 years) base traffic volumes for the weekday morning and afternoon peak hours are illustrated by **FIGURE 10** and **FIGURE 11** respectively.

FIGURE 6
2020 (Build-out) Weekday Morning Peak Hour Base Traffic Volumes

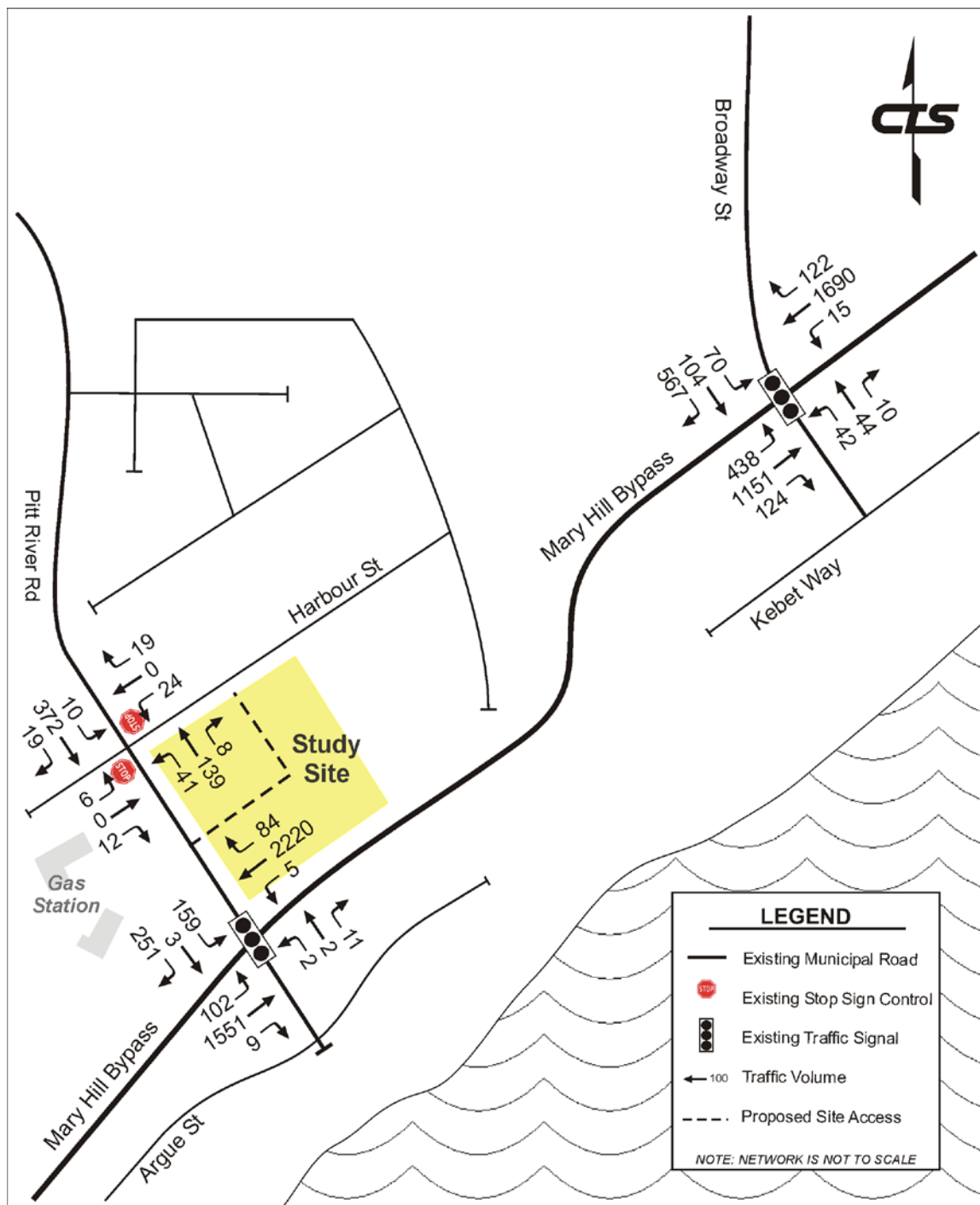


FIGURE 7
2020 (Build-out) Weekday Afternoon Peak Hour Base Traffic Volumes

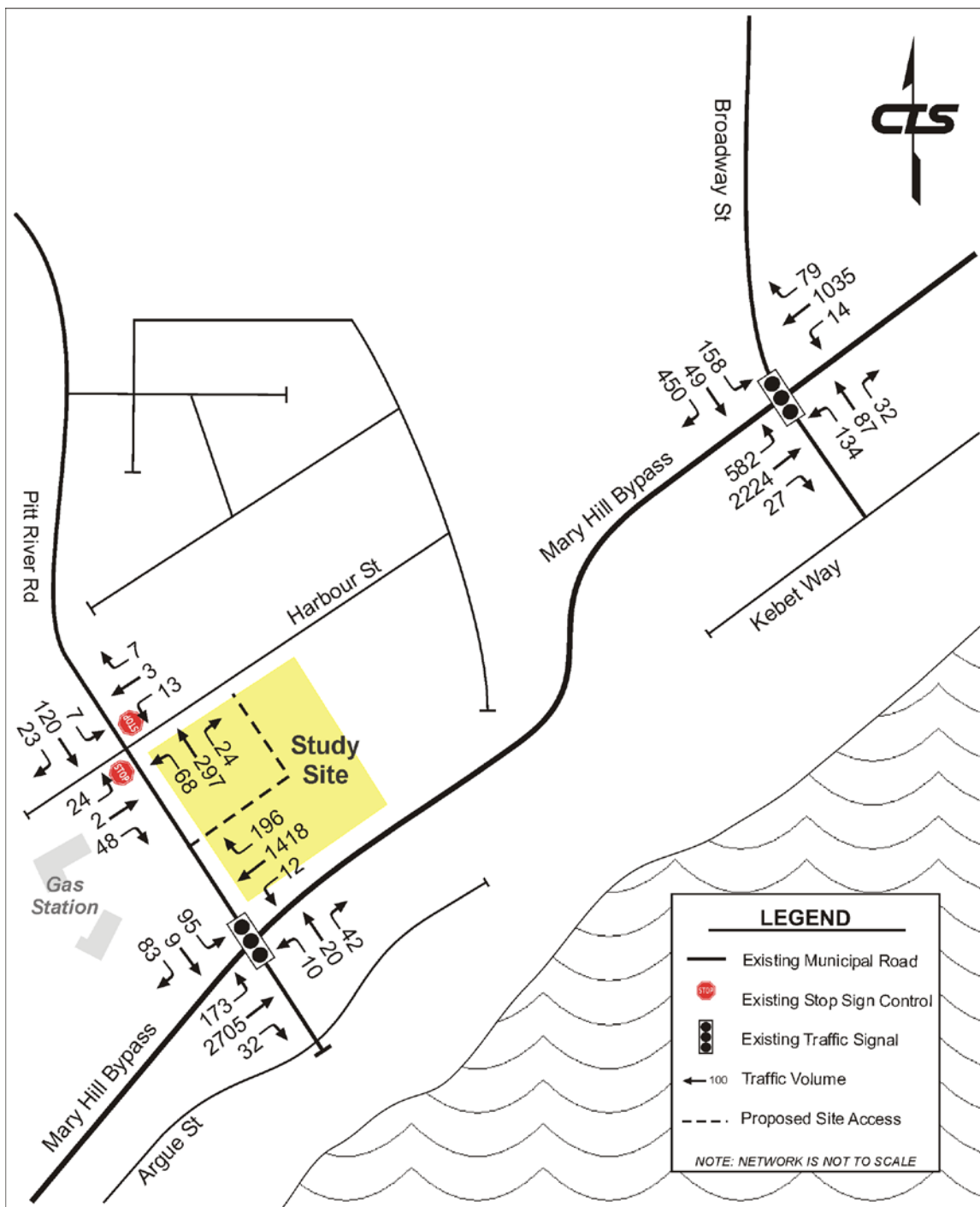


FIGURE 8
2025 (Build-out+5 years) Weekday Morning Peak Hour Base Traffic Volumes

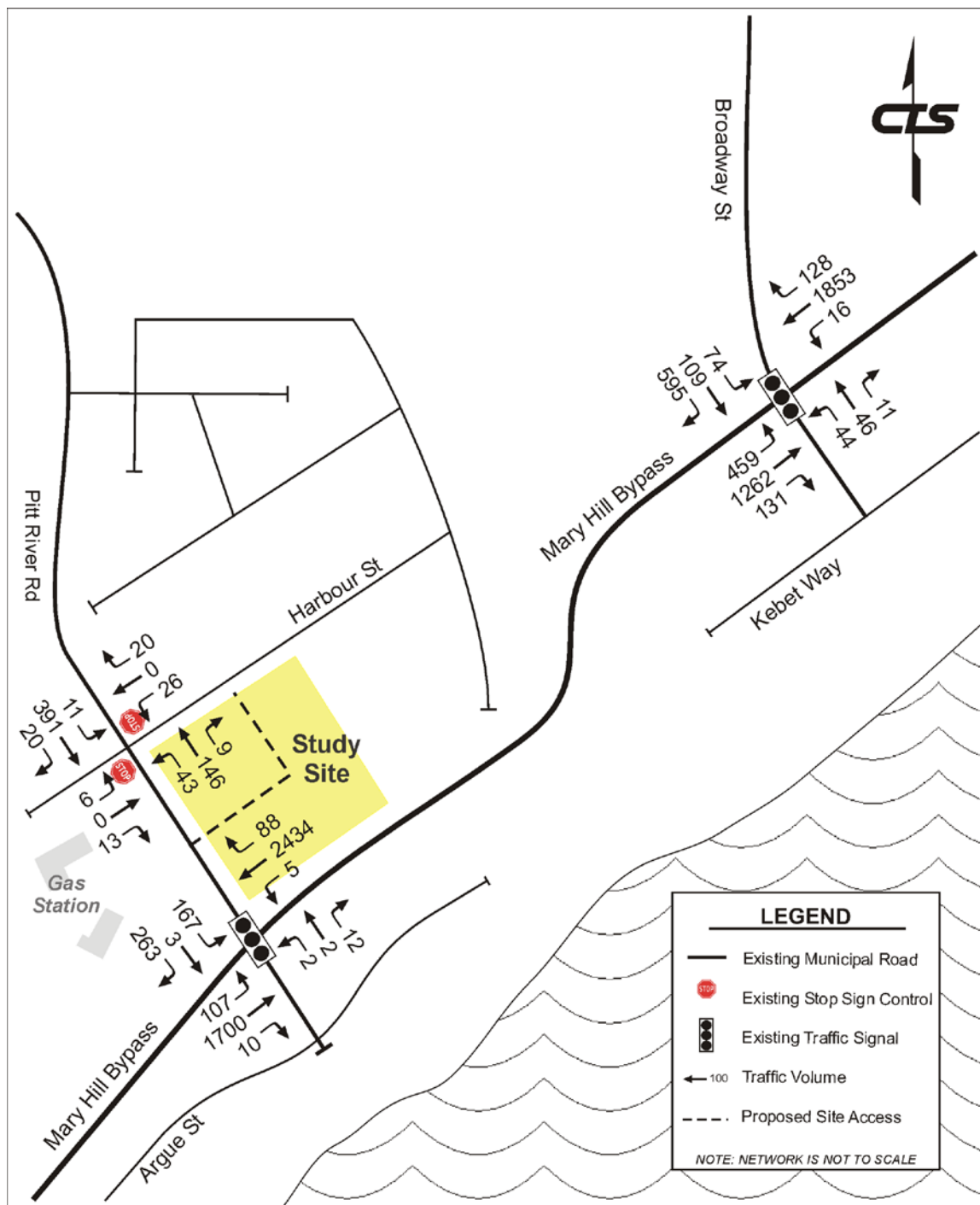


FIGURE 9
2025 (Build-out+5 years) Weekday Afternoon Peak Hour Base Traffic Volumes

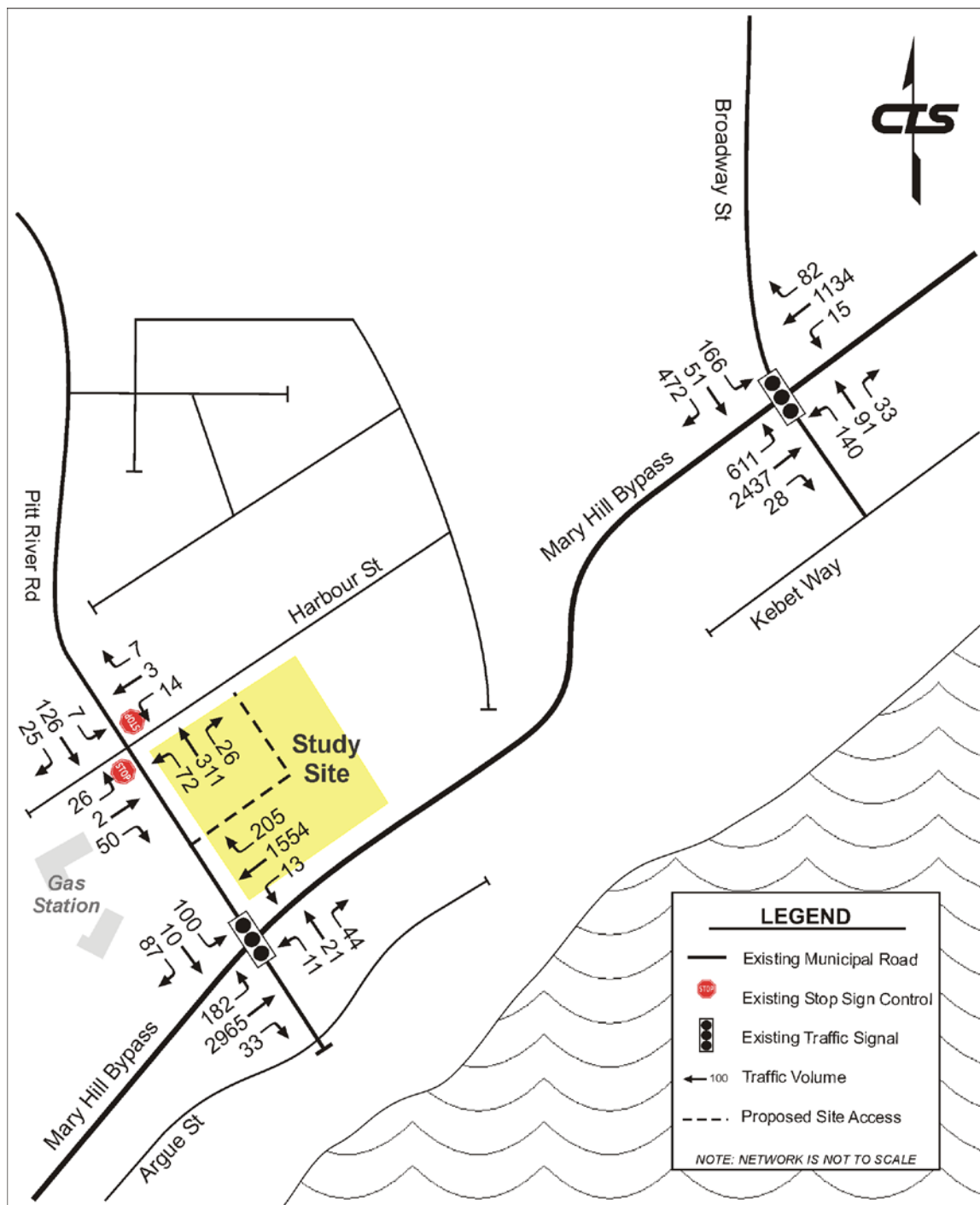


FIGURE 10
2030 (Build-out + 10 years) Weekday Morning Peak Hour Base Traffic Volumes

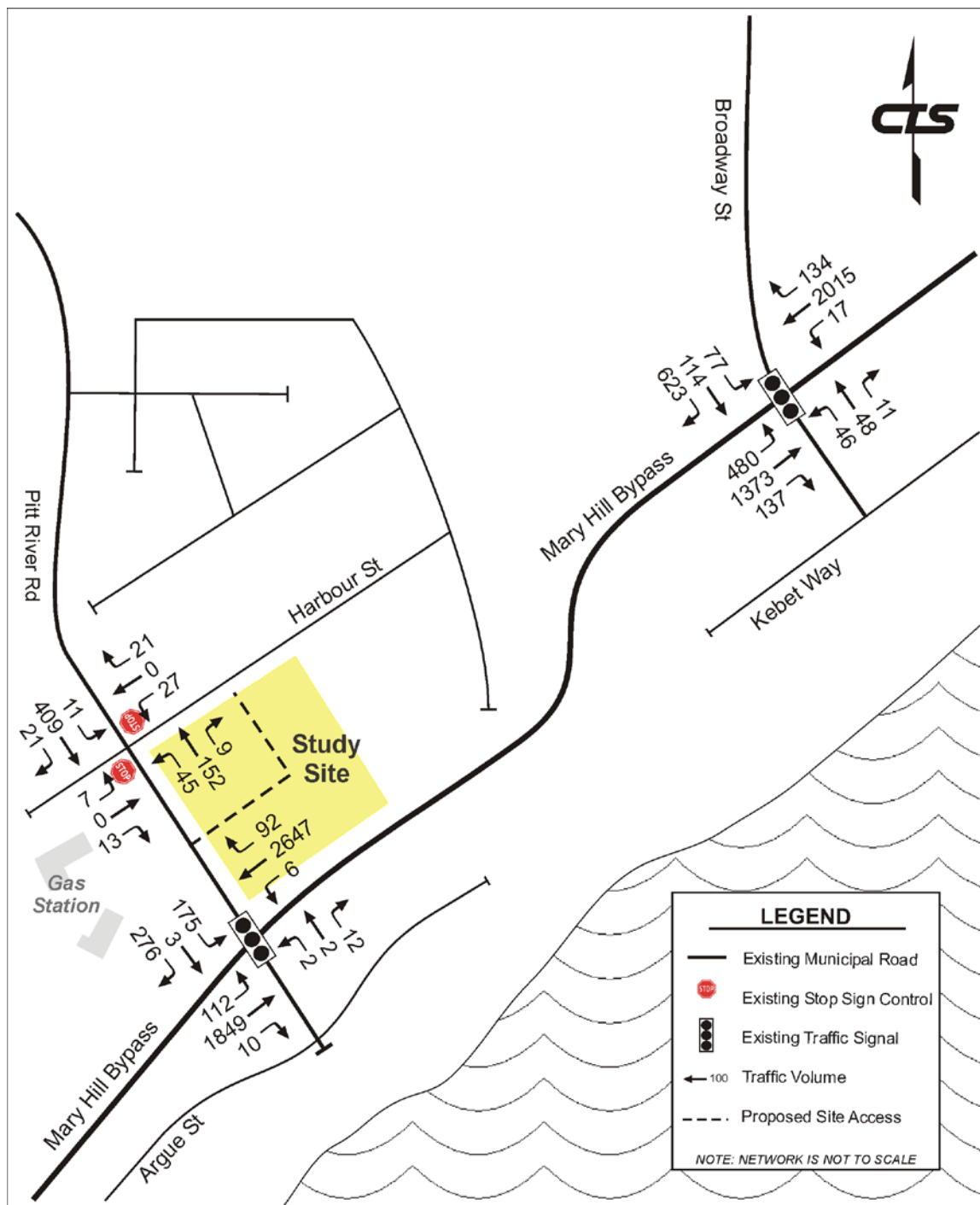
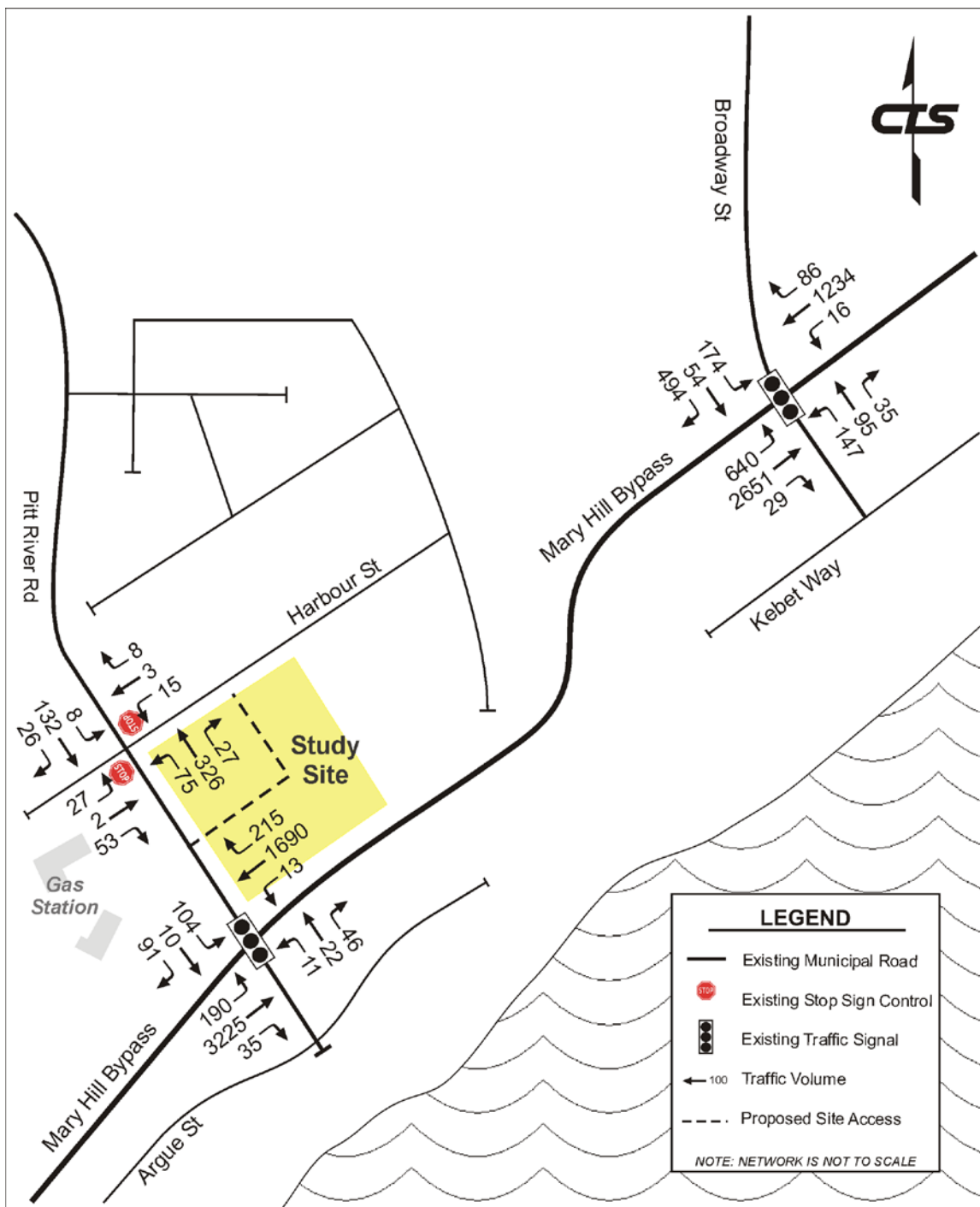


FIGURE 11
2030 (Build-out + 10 years) Weekday Afternoon Peak Hour Base Traffic Volumes



3.2 Site Traffic Generation

The proposed mixed-use Greystone Development will have 132 residential units and 12,000 ft² of commercial/retail. **TABLE 1** summarizes the projected site generated traffic with reference to the Institute of Transportation Engineers *Trip Generation Manual 10th Edition*.

Note - The Institute of Transportation Engineers *Trip Generation Manual 10th Edition*, Code 231 – Apartment with Commercial at Grade was applied as the commercial/retail is intended to service the development and immediate neighbourhood only. The 9th Edition, Code 820 Shopping Centre as applied, is intended for larger sites having a regional catchment.

TABLE 1
Trip Generation

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
Townhouse	Weekday Morning	Dwelling Units	16.00	0.46	ITE 10th Editon, Code 220	23%	77%	2	6	8
	Weekday Afternoon			0.56		63%	37%	6	3	9
Apartment A	Weekday Morning	Dwelling Units	50.00	0.36	ITE 10th Editon, Code 221	26%	74%	5	13	18
	Weekday Afternoon			0.44		61%	39%	13	9	22
Apartment B - Commercial at grade	Weekday Morning	Dwelling Units	38.00	0.30	ITE 10th Editon, Code 231	28%	72%	3	9	12
	Weekday Afternoon			0.36		70%	30%	10	4	14
Apartment C - Commercial at grade	Weekday Morning	Dwelling Units	44.00	0.30	ITE 10th Editon, Code 231	28%	72%	4	10	14
	Weekday Afternoon			0.36		70%	30%	11	5	16
TOTAL WEEKDAY MORNING PEAK HOUR								14	38	52
TOTAL WEEKDAY AFTERNOON PEAK HOUR								40	21	61

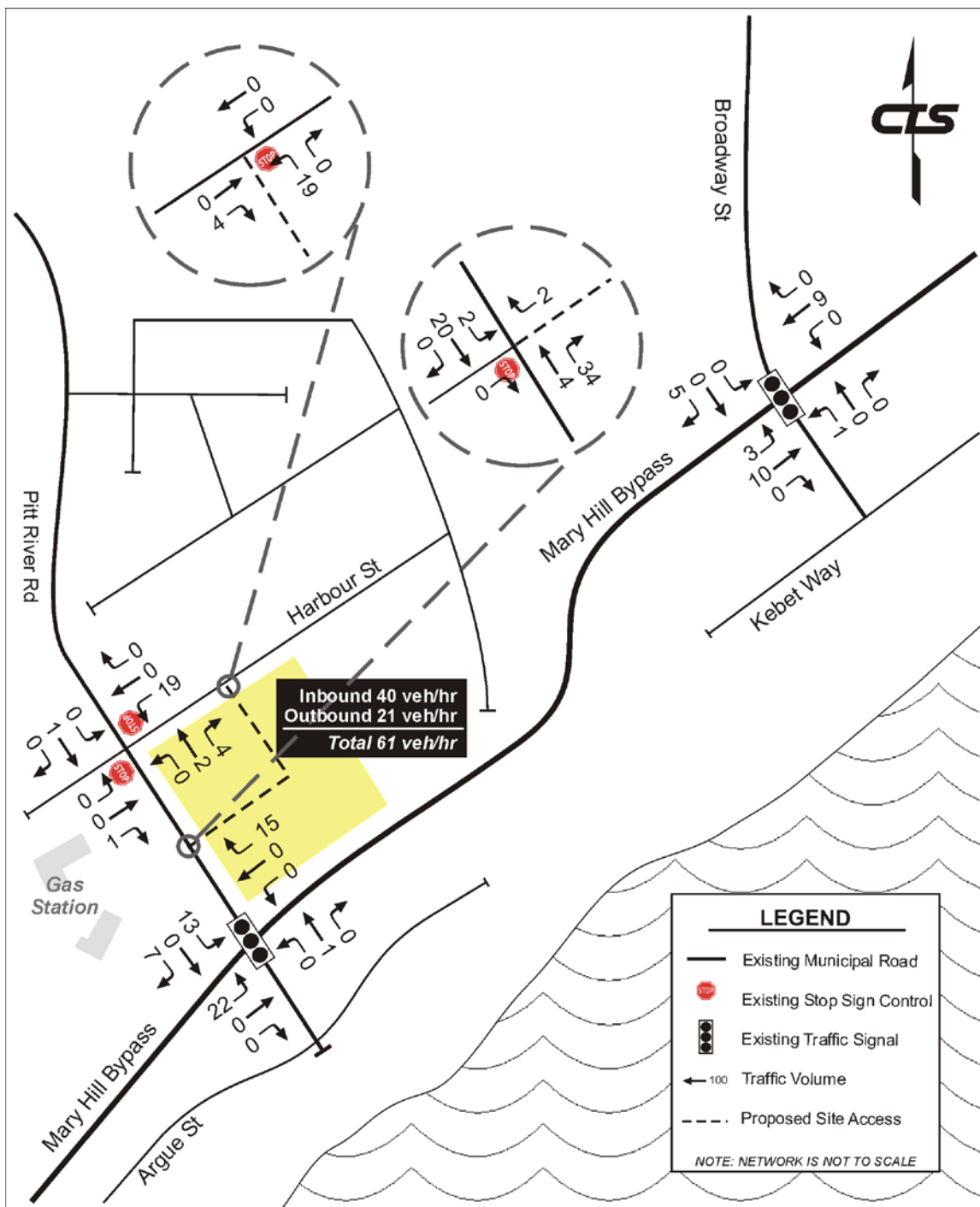
The proposed mixed-use Greystone Development is forecast to generate an additional 52 vehicle trips (14 inbound, 38 outbound) in the morning peak hour and 61 vehicle trips (40 inbound, 21 outbound) in the afternoon peak hour. That is approximately one trip every minute in the morning and afternoon peak hours.

3.3 Site Traffic Distribution

Traffic generated by the proposed mixed-use Greystone Development, was distributed proportionally to the adjacent street network based on the traffic volumes reported in

Section 2.3 – Base Traffic. **FIGURE 12** and **FIGURE 13** illustrate the site generated traffic distributed to the adjacent street network.

FIGURE 13
2018 Weekday Afternoon Site Generated Traffic Volumes



3.4 Base and Site Traffic

FIGURE 14 and **FIGURE 15** illustrate the total of base and site generated traffic distributed to the adjacent street network for 2020 (build-out).

FIGURE 16 and **FIGURE 17** illustrate the total of base and site generated traffic distributed to the adjacent street network for 2025 (build-out + 5 years).

FIGURE 18 and **FIGURE 19** illustrate the total of base and site generated traffic distributed to the adjacent street network for 2030 (build-out + 10 years).

FIGURE 14
2020 (Build-out) Weekday Morning Peak Hour Base + Site Traffic Volumes

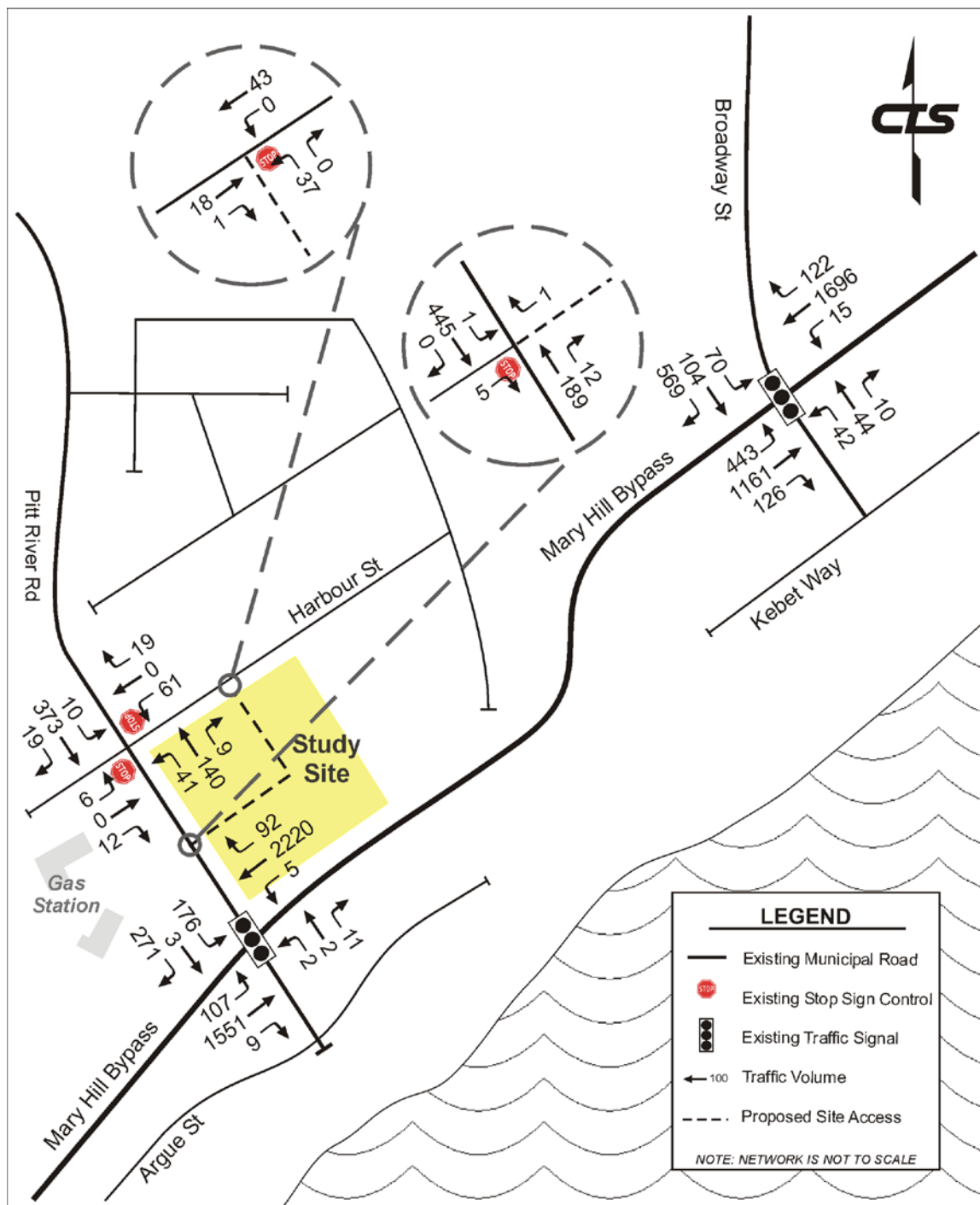


FIGURE 15
2020 (Build-out) Weekday Afternoon Peak Hour Base + Site Traffic Volumes

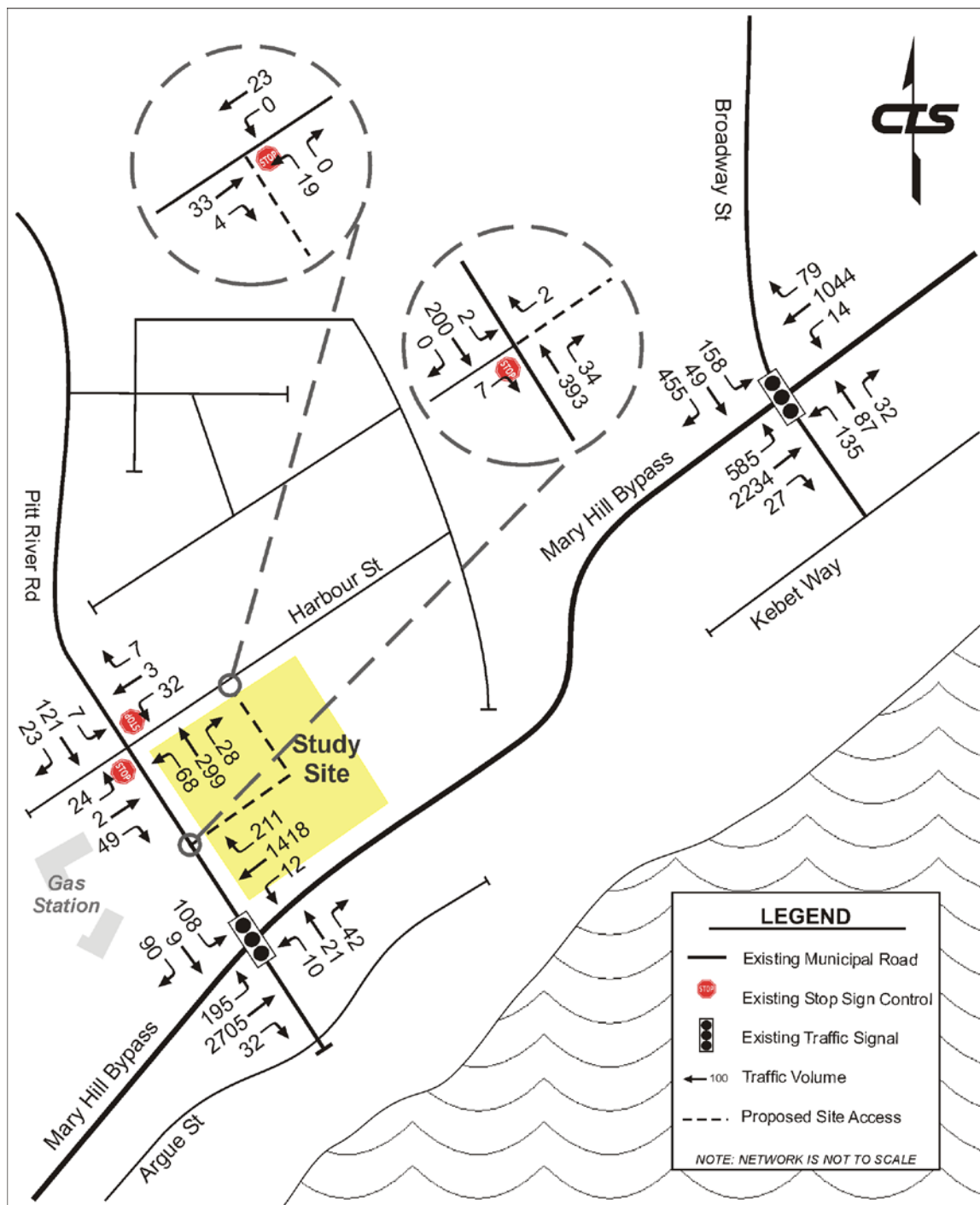


FIGURE 16
2025 (Build-out + 5 Years) Weekday Morning Peak Hour Base + Site Traffic Volumes

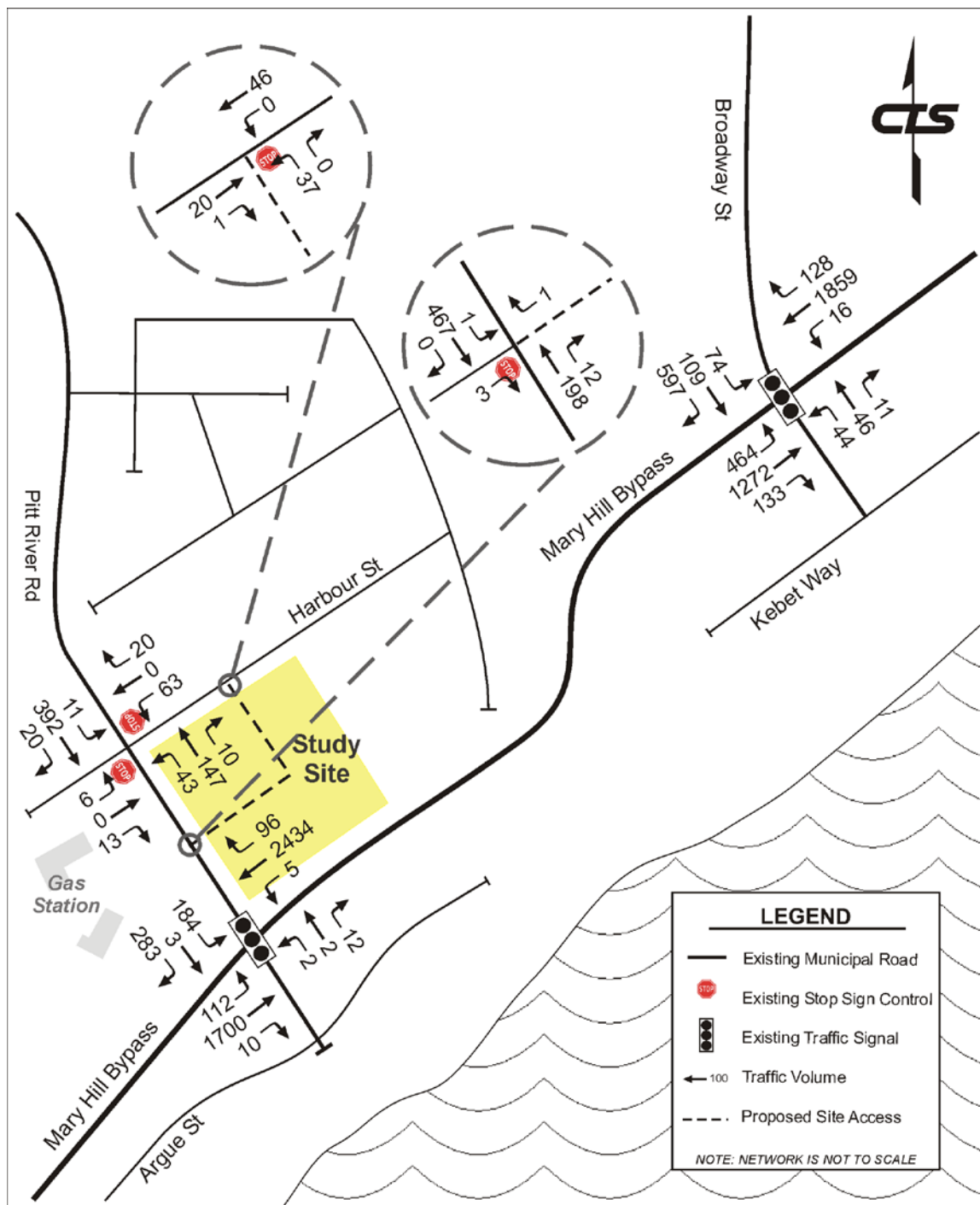


FIGURE 17
2025 (Build-out + 5 Years) Weekday Afternoon Peak Hour Base + Site Traffic Volumes

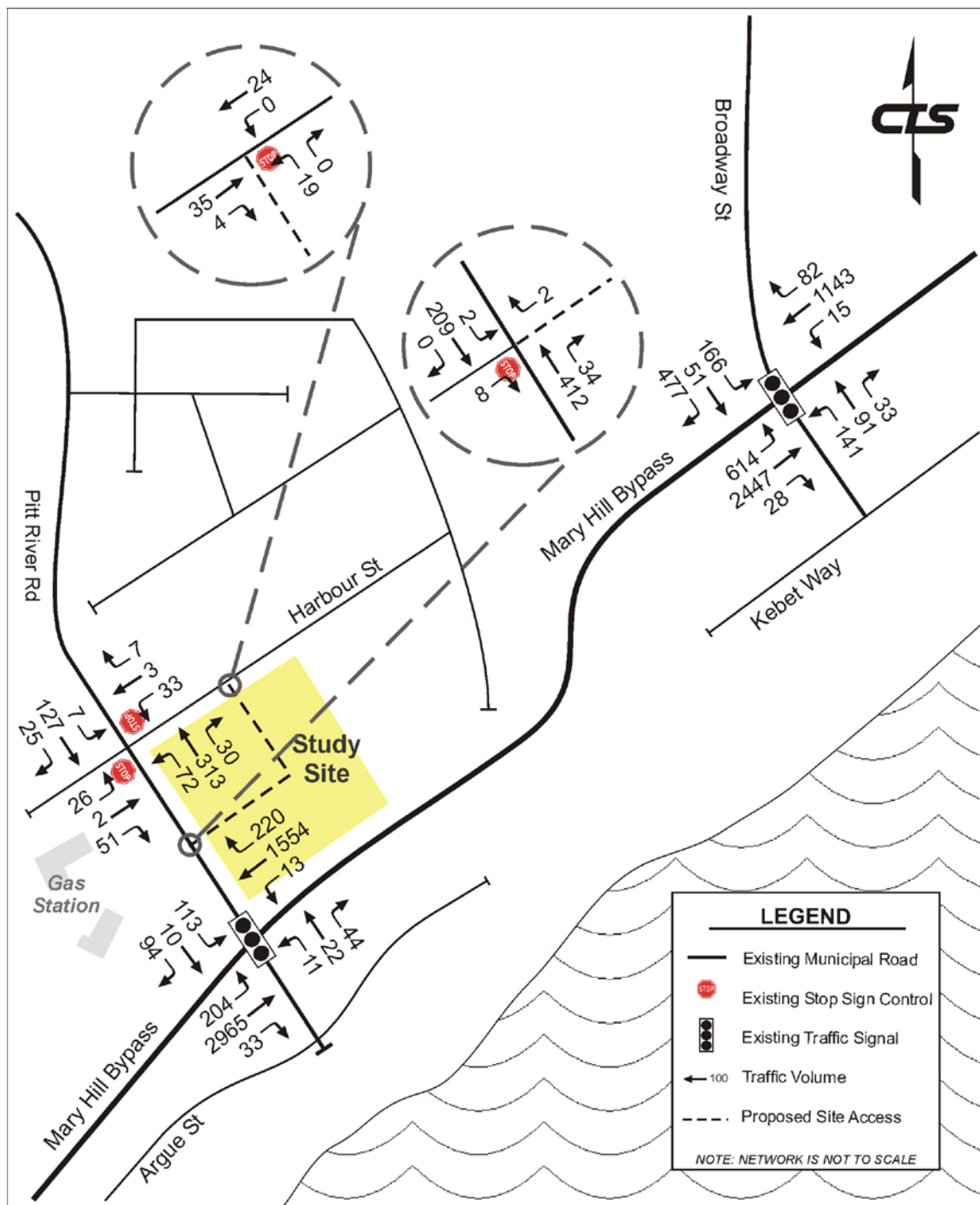


FIGURE 18
2030 (Build-out + 10 Years) Weekday Morning Peak Hour Base + Site Traffic Volumes

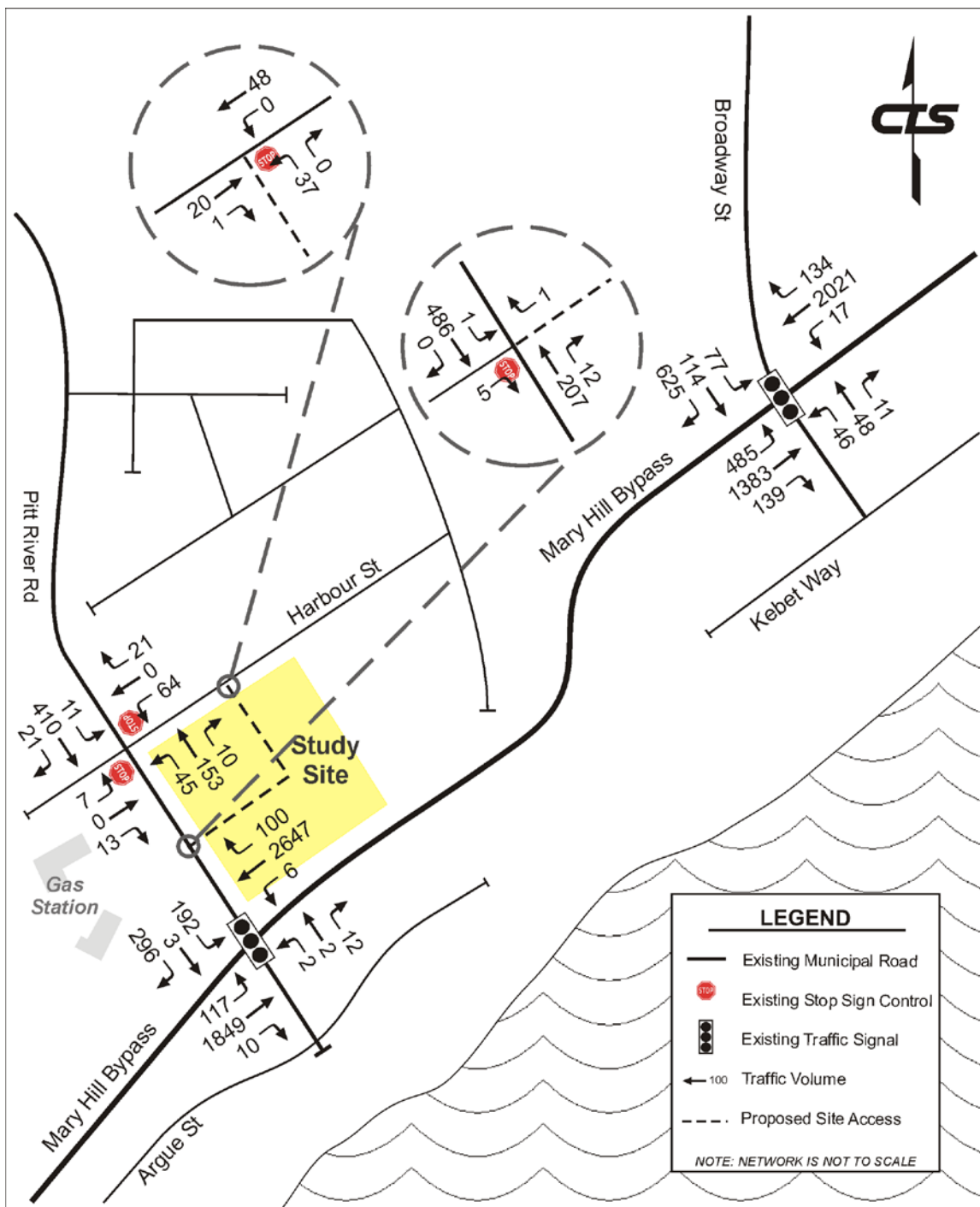
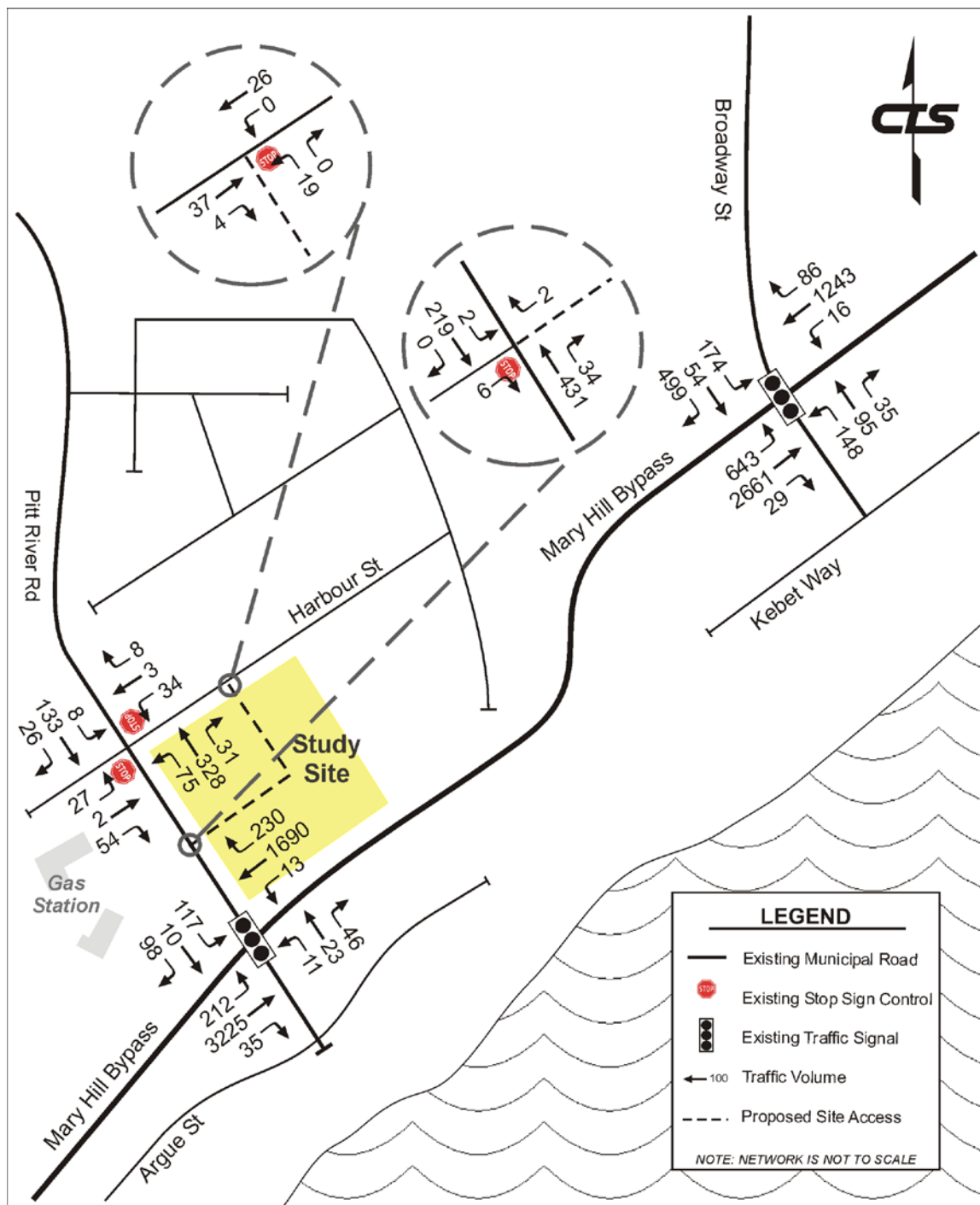


FIGURE 19
2030 (Build-out + 10 Years) Weekday Afternoon Peak Hour Base + Site Traffic Volumes



4.0 CAPACITY ANALYSIS

Capacity analysis was performed at each study intersection to determine the overall intersection and individual movement Level 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 "E" (Capacity). A LOS of "F" indicates that an intersection or movement is failing because the intersection or movement is over capacity and delays are excessive. A LOS of "D" or better is considered acceptable by many public agencies for overall intersection and through and right turn movements and a LOS of "E" or better is considered acceptable for left turn movements, at signalized intersections.

Synchro (Version 8.0) was used to analyse the intersection and movement level of service for signalized intersections. Highway Capacity Software (HCS) was used to analyse the intersection and movement Level of Service for unsignalized intersections.

With respect to the intersection and movement analysis, the following assumptions were made:

- Saturation flow rate → 1,900 passenger cars/hour of green/lane (pcphgpl).
- Truck percentage → 2% was used for all movements.
- Peak Hour Factor (PHF) → 0.89 for the weekday morning peak hour and 0.92 for the weekday afternoon peak hour which were the average PHF's from the traffic turning movement counts.

TABLE 2 summarizes and compares the delay time in seconds and the 95th percentile queue for each signalized intersection. **TABLE 3** summarizes and compares the delay time in seconds and the 95th percentile queue for each unsignalized intersection. The capacity analysis worksheets are included as **APPENDIX C**.

TABLE 2
Signalized Intersection Capacity Analysis Summary

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		
Pitt River Road (N/S) and Mary Hill Bypass (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	100	1491	9	5	2135	82	2	2	11	156	3	246	D	Existing traffic signal timing. EBLT & SB are approaching capacity. WBTH is failed.
			V/C	0.86	0.63	0.01	0.07	1.03	0.09	0.04	0.06	0.06	0.89	0.86	0.06		
		2020 Base	Volumes	102	1551	9	5	2220	84	2	2	11	159	3	251	D	Existing traffic signal timing. EBLT & SB are approaching capacity. WBTH is failed.
			V/C	0.89	0.65	0.01	0.07	1.07	0.09	0.04	0.06	0.06	0.90	0.88	0.06		
		2025 Base	Volumes	107	1700	10	5	2434	88	2	2	12	167	3	263	E	Existing traffic signal timing. EBLT & SB are approaching capacity. WBTH is failed.
			V/C	0.93	0.72	0.01	0.07	1.17	0.09	0.04	0.06	0.06	0.93	0.91	0.06		
		2030 Base	Volumes	112	1849	10	6	2647	92	2	2	12	175	3	276	F	Existing traffic signal timing. EBLT & SB are approaching capacity. WBTH is failed.
			V/C	0.98	0.78	0.01	0.09	1.28	0.10	0.04	0.06	0.06	0.97	0.96	0.06		
		2020 Base + Site	Volumes	107	1551	9	5	2220	92	2	2	11	176	3	271	E	Optimized traffic signal timing. SBTHRT are approaching capacity. EBLT & WBTH are failed.
			V/C	1.04	0.67	0.01	0.08	1.09	0.10	0.04	0.05	0.05	0.80	0.91	0.05		
		2025 Base + Site	Volumes	112	1700	10	5	2434	96	2	2	12	184	3	283	F	Optimized traffic signal timing. SBTHRT are approaching capacity. EBLT & WBTH are failed.
			V/C	1.10	0.74	0.01	0.08	1.21	0.10	0.04	0.05	0.05	0.82	0.94	0.05		
		2030 Base + Site	Volumes	117	1849	10	6	2647	100	2	2	12	192	3	296	F	Optimized traffic signal timing. SBTHRT are approaching capacity. EBLT & WBTH are failed.
			V/C	1.15	0.81	0.01	0.10	1.32	0.11	0.04	0.05	0.05	0.83	0.97	0.05		
		2030 Base + Site (Without RT Traffic)	Volumes	117	1849	10	6	2647	0	2	2	12	192	3	0	F	Optimized traffic signal timing. SBTLT is approaching capacity. EBLT & WBTH are failed.
			V/C	1.14	0.80	0.01	0.10	1.30	0.00	0.01	0.05	0.05	0.88	0.01	0.01		
	Weekday Afternoon Peak Hour	2018 Base	Volumes	170	2601	31	12	1363	192	10	20	41	93	9	81	C	Existing traffic signal timing. EBTH & SBLT are approaching capacity
			V/C	0.75	0.99	0.03	0.21	0.62	0.19	0.12	0.34	0.34	0.86	0.42	0.42		
		2020 Base	Volumes	173	2705	32	12	1418	196	10	20	42	95	9	83	D	Existing traffic signal timing. SBLT is approaching capacity, EBTH is over capacity.
			V/C	0.75	1.03	0.03	0.21	0.64	0.20	0.12	0.35	0.35	0.87	0.43	0.43		
		2025 Base	Volumes	182	2965	33	13	1554	205	11	21	44	100	10	87	E	Existing traffic signal timing. SBLT is approaching capacity, EBTH is over capacity.
			V/C	0.76	1.14	0.03	0.22	0.71	0.21	0.13	0.35	0.35	0.91	0.44	0.44		
		2030 Base	Volumes	190	3225	35	13	1690	215	11	22	46	104	10	91	F	Existing traffic signal timing. SBLT is approaching capacity, EBTH is over capacity.
			V/C	0.77	1.24	0.03	0.22	0.78	0.22	0.14	0.37	0.37	0.96	0.45	0.45		
		2020 Base + Site	Volumes	195	2705	32	12	1418	211	10	21	42	108	9	90	E	Optimized traffic signal timing. EBTH is over capacity.
			V/C	0.81	1.11	0.03	0.15	0.73	0.23	0.07	0.26	0.26	0.66	0.37	0.37		
		2025 Base + Site	Volumes	204	2965	33	13	1554	220	11	22	44	113	10	94	F	Optimized traffic signal timing. EBTH is over capacity.
			V/C	0.82	1.22	0.03	0.16	0.81	0.25	0.08	0.27	0.27	0.68	0.37	0.37		
		2030 Base + Site	Volumes	212	3225	35	13	1690	230	11	23	46	117	10	98	F	Optimized traffic signal timing. EBLT & WBTH are approaching capacity. EBTH is over capacity.
			V/C	0.93	1.33	0.03	0.16	0.86	0.25	0.08	0.28	0.28	0.70	0.38	0.38		
		2030 Base + Site (Without RT Traffic)	Volumes	212	3225	35	13	1690	0	11	23	46	117	10	0	F	Optimized traffic signal timing. EBLT & WBTH are approaching capacity. EBTH is over capacity.
			V/C	0.93	1.33	0.03	0.16	0.86	0.00	0.06	0.27	0.27	0.70	0.04	0.04		

V/C = Volume to Capacity Ratio

Intersection approaching capacity (LOS 'D' or 'E'); or approach demand near capacity (v/c 0.85 to 0.99)

Intersection equals or exceeds capacity (LOS 'F'); or approach demand exceeds capacity (v/c ≥ 1.00)

TABLE 2 (Continued)
Signalized Intersection Capacity Analysis Summary

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		
Broadway Street (N/S) and Mary Hill Bypass (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	429	1107	122	15	1625	120	41	43	10	69	102	556	E	Existing traffic signal timing. EBLT & SBRT are failed. WBTH is approaching capacity.
			V/C	1.12	0.42	0.10	0.07	0.86	0.14	0.58	0.28	0.06	0.62	0.66	1.50		
		2020 Base	Volumes	438	1151	124	15	1690	122	42	44	10	70	104	567	E	Existing traffic signal timing. EBLT & SBRT are failed. WBTH is approaching capacity.
			V/C	1.15	0.43	0.10	0.07	0.89	0.14	0.62	0.29	0.06	0.64	0.68	1.55		
		2025 Base	Volumes	459	1262	131	16	1853	128	44	46	11	74	109	595	F	Existing traffic signal timing. EBLT & SBRT are failed. WBTH is approaching capacity.
			V/C	1.23	0.47	0.11	0.08	0.97	0.14	0.70	0.31	0.07	0.68	0.72	1.65		
		2030 Base	Volumes	480	1373	137	17	2015	134	46	48	11	77	114	623	F	Existing traffic signal timing. EBLT, WBTH & SBRT are failed.
			V/C	1.28	0.51	0.11	0.10	1.05	0.15	0.80	0.32	0.07	0.71	0.76	1.73		
		2020 Base + Site	Volumes	443	1161	126	15	1696	122	42	44	10	70	104	569	E	Optimized traffic signal timing. EBLT, WBTH & SBRT are failed.
			V/C	1.20	0.50	0.12	0.09	1.10	0.16	0.21	0.14	0.03	0.31	0.33	1.13		
		2025 Base + Site	Volumes	464	1272	133	16	1859	128	44	46	11	74	109	597	F	Optimized traffic signal timing. EBLT, WBTH & SBRT are failed.
			V/C	1.27	0.55	0.12	0.11	1.20	0.17	0.22	0.14	0.03	0.31	0.33	1.18		
	Weekday Afternoon Peak Hour	2030 Base + Site	Volumes	485	1383	139	17	2021	134	46	48	11	77	114	625	F	Optimized traffic signal timing. EBLT, WBTH & SBRT are failed.
			V/C	1.30	0.60	0.13	0.13	1.30	0.18	0.24	0.15	0.03	0.32	0.35	1.22		
		2030 Base + Site (Without RT Traffic)	Volumes	485	1383	0	17	2021	0	46	48	0	77	114	0	E	Optimized traffic signal timing. EBLT, WBTH are failed.
			V/C	1.22	0.54	0.00	0.11	1.15	0.00	0.48	0.24	0.00	0.55	0.58	0.00		
		2018 Base	Volumes	571	2138	26	14	995	77	131	85	31	155	48	441	C	Existing traffic signal timing. EBTH are approaching capacity, EBLT is over capacity.
			V/C	1.01	0.86	0.02	0.32	0.69	0.11	0.60	0.28	0.11	0.80	0.16	0.74		
		2020 Base	Volumes	582	2224	27	14	1035	79	134	87	32	158	49	450	D	Existing traffic signal timing. EBTH are approaching capacity, EBLT is over capacity.
			V/C	1.06	0.90	0.02	0.32	0.72	0.11	0.61	0.29	0.11	0.81	0.16	0.76		
		2025 Base	Volumes	611	2437	28	15	1134	82	140	91	33	166	51	472	D	Existing traffic signal timing. EBLT/TH are over capacity.
			V/C	1.18	1.00	0.03	0.35	0.79	0.12	0.62	0.29	0.11	0.83	0.16	0.79		
		2030 Base	Volumes	640	2651	29	16	1234	86	147	95	35	174	54	494	E	Existing traffic signal timing. WBTH is approaching capacity, EBLT/TH are over capacity.
			V/C	1.29	1.09	0.03	0.37	0.87	0.13	0.62	0.29	0.11	0.84	0.17	0.82		
		2020 Base + Site	Volumes	585	2234	27	14	1044	79	135	87	32	158	49	455	D	Optimized traffic signal timing. EBLT & WBTH are approaching capacity. EBLT is over capacity.
			V/C	1.00	0.97	0.03	0.19	0.94	0.14	0.58	0.27	0.10	0.70	0.15	0.71		
		2025 Base + Site	Volumes	614	2447	28	15	1143	82	141	91	33	166	51	477	D	Optimized traffic signal timing. WBTH & SBLT are approaching capacity. EBLT/TH are over capacity.
			V/C	1.05	0.99	0.02	0.28	0.89	0.13	0.70	0.33	0.12	0.90	0.18	0.76		
		2030 Base + Site	Volumes	643	2661	29	16	1243	86	148	95	35	174	54	499	E	Optimized traffic signal timing. WBTH is approaching capacity. EBLT/TH & SBLT are over capacity.
			V/C	1.06	1.06	0.03	0.32	0.97	0.14	0.76	0.35	0.13	1.03	0.20	0.80		
		2030 Base + Site (Without RT Traffic)	Volumes	643	2661	0	16	1243	0	148	95	0	174	54	0	E	Optimized traffic signal timing. WBTH is approaching capacity. EBLT/TH & SBLT are over capacity.
			V/C	1.06	1.06	0.03	0.32	0.96	0.00	0.77	0.35	0.00	1.03	0.20	0.00		

V/C = Volume to Capacity Ratio

Intersection approaching capacity (LOS 'D' or 'E'); or approach demand near capacity (v/c 0.85 to 0.99)

Intersection equals or exceeds capacity (LOS 'F'); or approach demand exceeds capacity (v/c ≥ 1.00)

TABLE 3
Unsignalized Intersection Capacity Analysis Summary

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		
Pitt River Road (N/S) & Harbour Street (E/W)	Weekday Morning Peak Hour	2018 Base	Volumes	6	0	12	24	0	19	40	136	8	10	365	19	A	Okay.
			Delay	12.9			14.0			8.3			0.0				
		2020 Base	Volumes	6	0	12	24	0	19	41	139	8	10	372	19	A	Okay.
			Delay	13.0			14.2			8.4			0.0				
		2025 Base	Volumes	6	0	13	26	0	20	43	146	9	11	391	20	A	Okay.
			Delay	13.3			14.9			8.4			0.0				
		2030 Base	Volumes	7	0	13	27	0	21	45	152	9	11	409	21	A	Okay.
			Delay	13.9			15.5			8.5			0.0				
		2020 Base + Site	Volumes	6	0	12	61	0	19	41	140	9	10	373	19	A	Okay
			Delay	13.0			17.8			8.4			0.0				
		2025 Base + Site	Volumes	6	0	13	63	0	20	43	147	10	11	392	20	A	Okay.
			Delay	13.3			18.9			8.4			0.0				
	Weekday Afternoon Peak Hour	2018 Base	Volumes	24	2	47	13	3	7	67	291	24	7	118	23	A	Okay.
			Delay	12.3			14.9			7.7			0.0				
		2020 Base	Volumes	24	2	48	13	3	7	68	297	24	7	120	23	A	Okay.
			Delay	12.3			15.1			7.7			0.0				
		2025 Base	Volumes	26	2	50	14	3	7	72	311	26	7	126	25	A	Okay.
			Delay	12.8			15.8			7.7			0.0				
		2030 Base	Volumes	27	2	53	15	3	8	75	326	27	8	132	26	A	Okay.
			Delay	13.2			16.4			7.8			0.0				
		2020 Base + Site	Volumes	24	2	49	32	3	7	68	299	28	7	121	23	A	Okay
			Delay	12.4			17.0			7.7			0.0				
		2025 Base + Site	Volumes	26	2	51	33	3	7	72	313	30	7	127	25	A	Okay.
			Delay	12.8			17.9			7.7			0.0				
		2030 Base + Site	Volumes	27	2	54	34	3	8	75	328	31	8	133	26	A	Okay
			Delay	13.2			18.7			7.8			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)

TABLE 3 (Continued)
Unsignalized Intersection Capacity Analysis Summary

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		
Site Access (N/S) & Harbour Street (E/W)	Weekday Morning Peak Hour	2020 Base + Site	Volumes		18	1	0	43		37		0				A	Okay.
			Delay		0.0		7.3			9.0						A	Okay.
		2025 Base + Site	Volumes		20	1	0	46		37		0				A	Okay.
			Delay		0.0		7.3			9.1						A	Okay.
		2030 Base + Site	Volumes		20	1	0	48		37		0				A	Okay.
			Delay		0.0		7.3			9.1						A	Okay.
	Weekday Afternoon Peak Hour	2020 Base + Site	Volumes		33	4	0	23		19		0				A	Okay.
			Delay		0.0		7.3			8.9						A	Okay.
		2025 Base + Site	Volumes		35	4	0	24		19		0				A	Okay.
			Delay		0.0		7.3			8.9						A	Okay.
		2030 Base + Site	Volumes		37	4	0	26		19		0				A	Okay.
			Delay		0.0		7.3			8.9						A	Okay.
Pitt River Road (N/S) & Site Access (E/W)	Weekday Afternoon Peak Hour	2020 Base + Site	Volumes			5			1		189	12	1	445	0	A	Okay.
			Delay			11.5			9.5		0.0		7.7	0.0		A	Okay.
		2025 Base + Site	Volumes			3			1		198	12	1	467	0	A	Okay.
			Delay			11.7			9.6		0.0		7.8	0.0		A	Okay.
		2030 Base + Site	Volumes			5			1		207	12	1	486	0	A	Okay.
			Delay			11.9			9.7		0.0		7.8	0.0		A	Okay.
	Weekday Afternoon Peak Hour	2020 Base + Site	Volumes			7			2		393	34	2	200	0	A	Okay.
			Delay			9.5			11.1		0.0		8.4	0.0		A	Okay.
		2025 Base + Site	Volumes			8			2		412	34	2	209	0	A	Okay.
			Delay			9.6			11.3		0.0		8.4	0.0		A	Okay.
		2030 Base + Site	Volumes			6			2		431	34	2	219	0	A	Okay.
			Delay			9.6			11.5		0.0		8.5	0.0		A	Okay.

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)

Based on the analysis summarized by **TABLE 2** and **TABLE 3**, the following can be stated:

Mary Hill Bypass and Broadway Street

This intersection currently operates at an overall intersection level of service LOS E (Poor) during morning peak hour and LOS C (Good) during the afternoon peak hour.

For the 2020 base condition, the overall intersection level of service is LOS E (Poor) during morning peak hour and LOS D (Fair) during the afternoon peak hour. The morning westbound through movement and the afternoon eastbound movement are approaching capacity. Also, the eastbound left-turn and southbound right-turn movements are over capacity in the morning peak hour, and the eastbound left-turn movement is over capacity in the afternoon peak hour.

For the 2025 base condition, the overall intersection level of service is LOS F (Fail) during morning peak hour and LOS D (Fair) during the afternoon peak. The westbound through movement is approaching capacity and the eastbound left-turn and southbound right-turn movements are over capacity in the morning peak hour. The eastbound left-turn and through movements are over capacity in the afternoon peak hour.

For the 2030 base condition, the overall intersection level of service is LOS F (Fail) during morning peak hour and LOS E (Poor) during afternoon peak hour. The westbound through, eastbound left-turn and southbound right-turn movements are over capacity in the morning peak hour and the eastbound left-turn and through movements are over capacity in the afternoon peak hour.

Addition of site traffic to the 2020 base condition does not change the overall intersection level of service for the morning and afternoon peak hours. The eastbound left-turn, westbound through, and southbound right-turn movements are over capacity in the morning. The eastbound through and westbound through movement are approaching capacity and the eastbound left-turn is over capacity in the afternoon peak hour.

For the 2025 (build-out + 5 years) the overall intersection level of service remains at LOS F (Fail) during morning peak hour and LOS D (Poor) during afternoon peak hour. The eastbound left-turn and westbound through movements are over capacity in the morning. The eastbound left-turn movement is over capacity in the afternoon peak hour.

For the year 2030 (build-out + 10 years) the overall intersection level of service remains at LOS F (Fail) during morning peak hour and LOS E (Poor) during afternoon peak hour. The eastbound left-turn, westbound through, and southbound right-turn movements are over capacity in the morning peak hour. The eastbound left/through and southbound left-turn movements are over capacity in the afternoon peak hour.

Note - Addition of the site traffic volume in 2020 (build-out) represents a 0.6% (25 vehicles) increase in the morning peak hour and a 0.7% (34 vehicles) increase in the afternoon peak hour, total intersection traffic volume. From a traffic engineering perspective, those increases in traffic volume are not considered to be significant

Mary Hill Bypass and Pitt River Road

This location currently operates at an overall intersection level of service LOS D (poor) and LOS C (good) during the morning and afternoon peak hour.

For the 2020 base condition, the overall intersection level of service is LOS D (Poor) during both the morning and afternoon peak hours. The morning westbound through movement and the afternoon eastbound through movement are over capacity.

For the 2025 base condition the overall intersection level of service is E (Poor) during both the morning and afternoon peak hours. The westbound through movement is over capacity during the morning peak hour and the eastbound through movement is over capacity during the afternoon peak hour.

For the 2030 base condition, the overall intersection level of service is F (Fail) during both the morning and afternoon peak hours. The westbound through movement is over capacity during the morning peak hour and the eastbound movement is over capacity during the afternoon peak hour.

Addition of site traffic to the 2020 base condition results in an overall intersection level of service LOS E (Poor) for both morning and afternoon peak hours. The eastbound left-turn and westbound through movements are over capacity during the morning peak hour and the eastbound through movement is over capacity during the afternoon peak hour.

For the 2025 (build-out + 5 years) and 2030 (build-out + 10 years) the overall intersection level of service is LOS F (fail) for the morning and afternoon peak hours. The eastbound left-turn and westbound through movements are over capacity during the morning peak hour and the eastbound through movement is over capacity during the afternoon peak hour.

Note - Addition of site traffic volume in 2020 (build-out) represents a 1.1% (50 vehicles) increase in the morning peak hour and a 1.2% (58 vehicles) increase in the afternoon peak hour, total intersection traffic volume. From a traffic engineering perspective, those increases in traffic volume are not considered to be significant

Pitt River Road and Harbour Street

The intersection of Pitt River Road and Harbour Street is projected to operate at a LOS A (Excellent) for all scenarios.

Pitt River Road and Site Access

The intersection of Pitt River Road and Site Access is projected to operate at a LOS A (Excellent) for all scenarios.

Note – The southbound left turn at this site access is required though, not for capacity but as a secondary access in the event the primary access on Harbour Street is blocked or inaccessible.

Harbour Street and Site Access

The intersection of Harbour Street and Site Access is projected to operate at a LOS A (Excellent) for all scenarios.

5.0 PARKING

5.1 Vehicle Parking

With reference to the City of Port Coquitlam *Parking and Development Management Bylaw No. 3525, Section 6 – Required Off-Street Parking Spaces*, 297 vehicle parking spaces are required and 309 vehicle parking spaces are being provided. **TABLE 4** summarizes the vehicle parking requirement and provision.

TABLE 4
Vehicle Parking Summary

Use	Rate	Scope	Required	Provided	Difference
Apartment	1.3 parking spaces per unit with one bedroom	35 units	46		
	1.5 parking spaces per unit with two bedrooms	85 units	128		
	2.0 parking spaces per unit with three+ bedrooms	12 units	24		
Townhouse	2.0 parking spaces per unit with two+ bedrooms	16 units	32		
Commercial/Retail	1.0 parking space per 323ft ² gross floor area	12,000ft ²	37		
Visitor	1.0 parking spaces per five units	148 units	30		
Total			297	309	+12

The vehicle parking requirement is exceeded by 12 parking spaces.

The City of Port Coquitlam references the *BC Building Code 2012* for the provision of accessible parking spaces. As per *Division B-Part 3, Section 3.8.3.4*, nine accessible parking spaces are required and nine accessible parking spaces are provided.

5.2 Bicycle Parking

With reference to the City of Coquitlam *Zoning Bylaw No. 3630, Section 10 – Bicycle Facilities*, six short term bicycle parking spaces and one long term bicycle parking space per unit are required. Six short term bicycle parking spaces and 136 long term bicycle parking spaces are provided.

5.3 Loading

With reference to the City of Port Coquitlam *Parking and Development Management Bylaw No. 3525, Section 11 – Required Off-Street Loading Spaces*, two loading spaces are required for 4951.39ft² to 24,756.97 ft² gross floor area. Three loading spaces are provided.

5.4 Access

Vehicle ingress to/egress from the site shall be via a driveway crossing on the east side of Pitt River Road and a driveway crossing on the south side of Harbour Street. Both driveway crossings shall be designed with sufficient width and throat length to accommodate turning movements for a garbage truck and/or fire truck and to ensure no queue spill back onto the adjacent street.

Internally, the drive aisle shall be of sufficient width to accommodate turning movements for a garbage truck and/or fire truck.

6.0 SUMMARY AND CONCLUSIONS

CTS conducted a traffic impact assessment of the proposed mixed-use Greystone Development in the City of Port Coquitlam.

Based on the analysis and findings, the following can be stated:

- The site is very well serviced by the local street network.
- Transportation modal infrastructure adjacent to the site provides some localized access to walking, cycling and transit.
- The number of vehicle trips generated by the site is at the municipal threshold and well below the MOTI threshold, typically requiring a capacity analysis. The vehicle trips generated by the site are approximately one per minute in the morning and afternoon peak periods.
- Concerning the intersection of Mary Hill Bypass and Broadway Street, addition of the site traffic volume in 2020 (build-out) represents a 0.6% (25 vehicles) increase in the morning peak hour and a 0.7% (34 vehicles) increase in the afternoon peak hour, total intersection traffic volume. From a traffic engineering perspective, those increases in traffic volume are not considered to be significant.
- Concerning the intersection of Mary Hill Bypass and Pitt River Road, addition of site traffic volume in 2020 (build-out) represents a 1.1% (50 vehicles) increase in the morning peak hour and a 1.2% (58 vehicles) increase in the afternoon peak hour, total intersection traffic volume. From a traffic engineering perspective, those increases in traffic volume are not considered to be significant.
- The intersection of Pitt River Road and Harbour Street and both site accesses are projected to operate at a LOS A (Excellent) for all scenarios.
- The southbound left turn at the Pitt River Road site access is required though, not for capacity but as a secondary access in the event the primary access on Harbour Street is blocked or inaccessible.
- As per the City of Port Coquitlam *Parking and Development Management Bylaw No. 3525, Section 6 – Required Off-Street Parking Spaces and BC Building Code Division B-Part 3, Section 3.8.3.4*, the vehicle parking space, accessible parking space, bicycle parking space and loading space requirements are met.

7.0 RECOMMENDATIONS

The following is recommended:

1. That the traffic and parking related findings of this report in support of the proposed mixed-use Greystone Development, be accepted by the City of Port Coquitlam and MOTI; and
2. That no off-site transportation improvements are required other than sidewalk along the Pitt River Road and Harbour Street frontages.

In closing, CTS would like to thank you for the opportunity to assist you and your team with this unique assignment.

Please call the undersigned should you have any questions and/or comments concerning this report or its contents.

Yours truly,

CREATIVE TRANSPORTATION SOLUTIONS LTD.

A handwritten signature in black ink, appearing to read "BADOZZI". The signature is stylized with a large "B", a small "A", and a long, sweeping "D" followed by "OZZI".

Brent A. Dozzi, P.Eng.
Senior Traffic Engineer

Phone: (604) 936-6190 x227
Email: bdozzi@cts-bc.com

Appendices

In closing, CTS would like to thank you for the opportunity to assist you and your team with this unique assignment.

Please call the undersigned should you have any questions and/or comments concerning this report or its contents.

Yours truly,

CREATIVE TRANSPORTATION SOLUTIONS LTD.



Brent A. Dozzi, P.Eng.
Senior Traffic Engineer

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Email: bdozzi@cts-bc.com



Appendices

APPENDIX A

Site Plan



Rositch Hemphill Architects
 120 Powell Street, Unit 10 Vancouver, BC Canada V6A 1G1
 t 604.669.6002 f 604.669.1091 www.rharchitects.ca

PROJECT:
GREYSTONE
 HARBOUR STREET, PORT COQUITLAM, BC

DRAWING TITLE:
SITE PLAN - Typical Plate 2-3/4

DATABASE: 1721
 PROJECT NO: 1721
 DATE: 01 MAR 2018
 SCALE: 1" = 50'-0"

0.10

APPENDIX B

Traffic Count Data



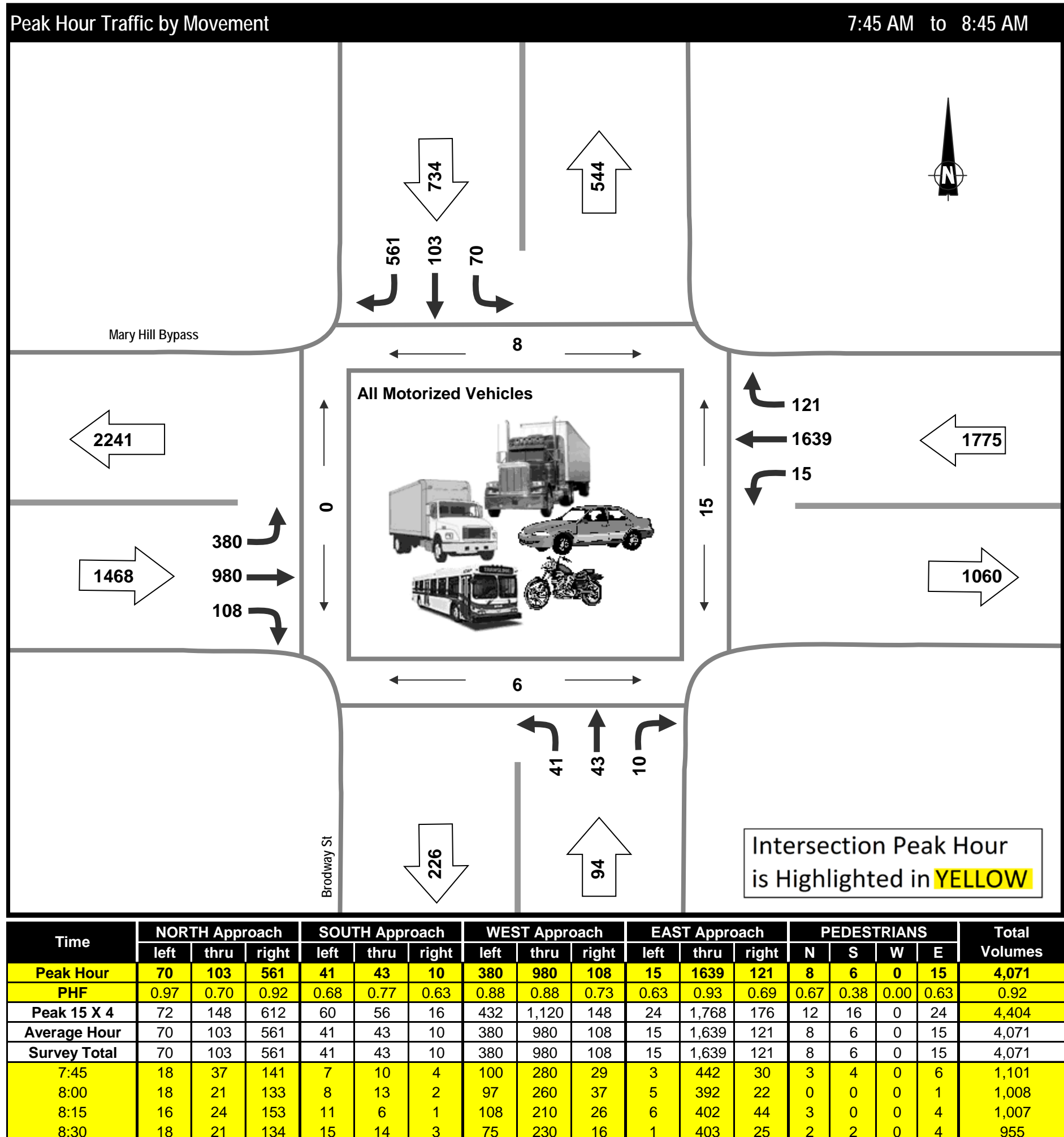
Vehicle Classification Summary

Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:45 - 08:45)	Volume	3,894	177				4,071
	%	95.7%	4.3%				100.0%
Afternoon (15:15 - 16:15)	Volume	4,321	144				4,465
	%	96.8%	3.2%				100.0%
Total (2 Hours)	Volume	8,215	321				8,536
	%	96.2%	3.8%				100.0%

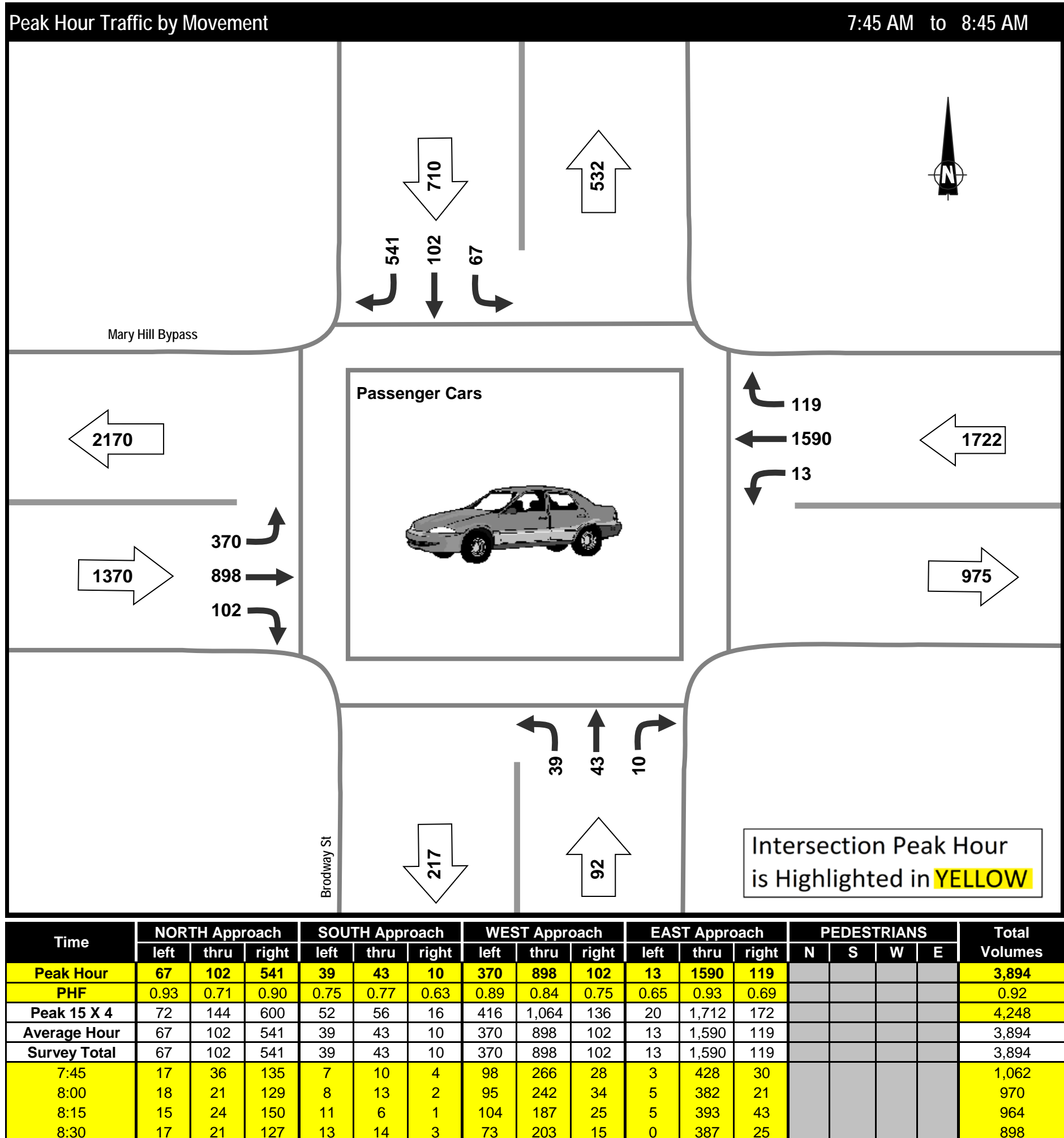
Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: All Motorized Vehicles

Morning Peak Period



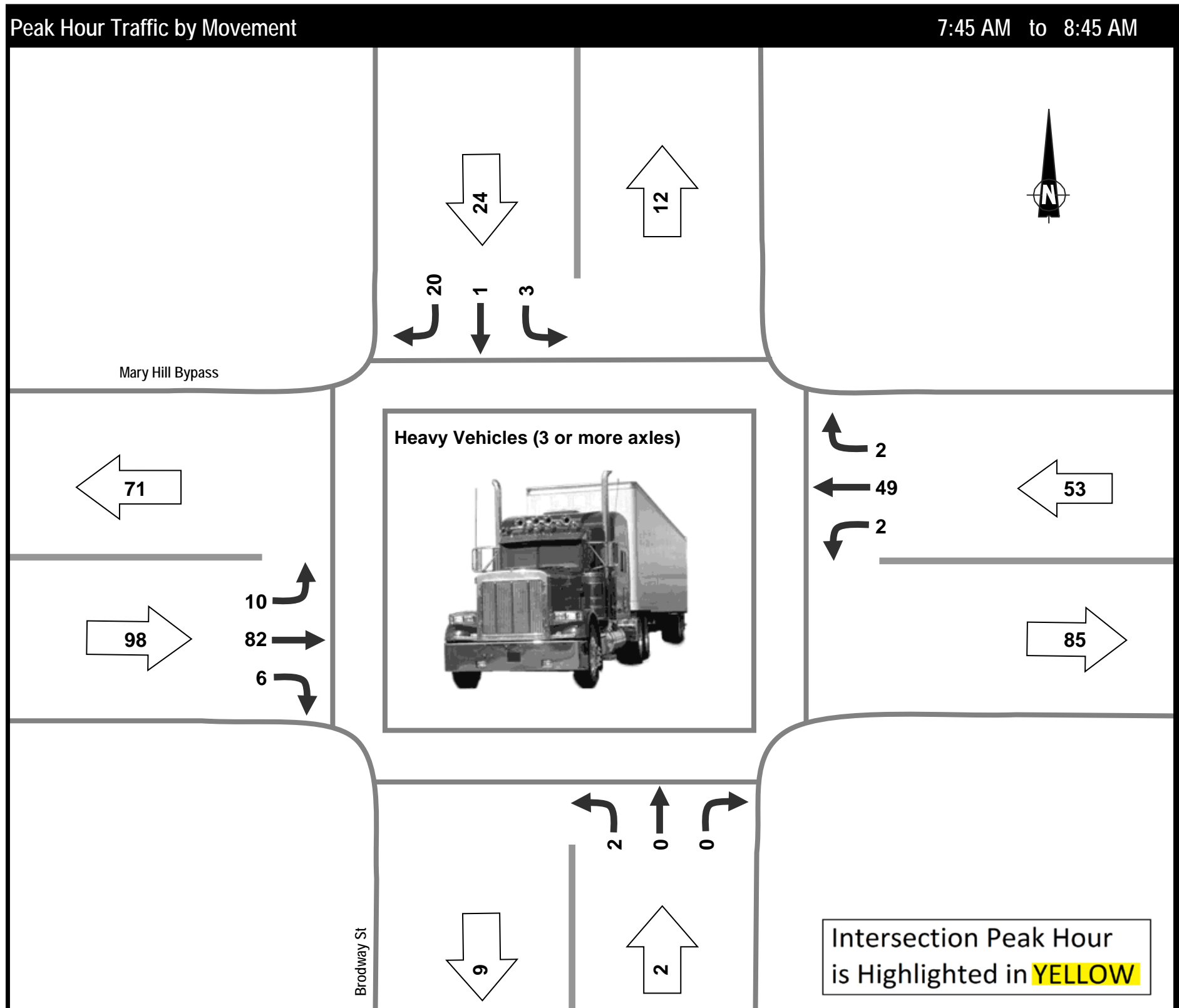
Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Passenger Cars

Morning Peak Period



Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Heavy Vehicles (3 or more axles)

Morning Peak Period

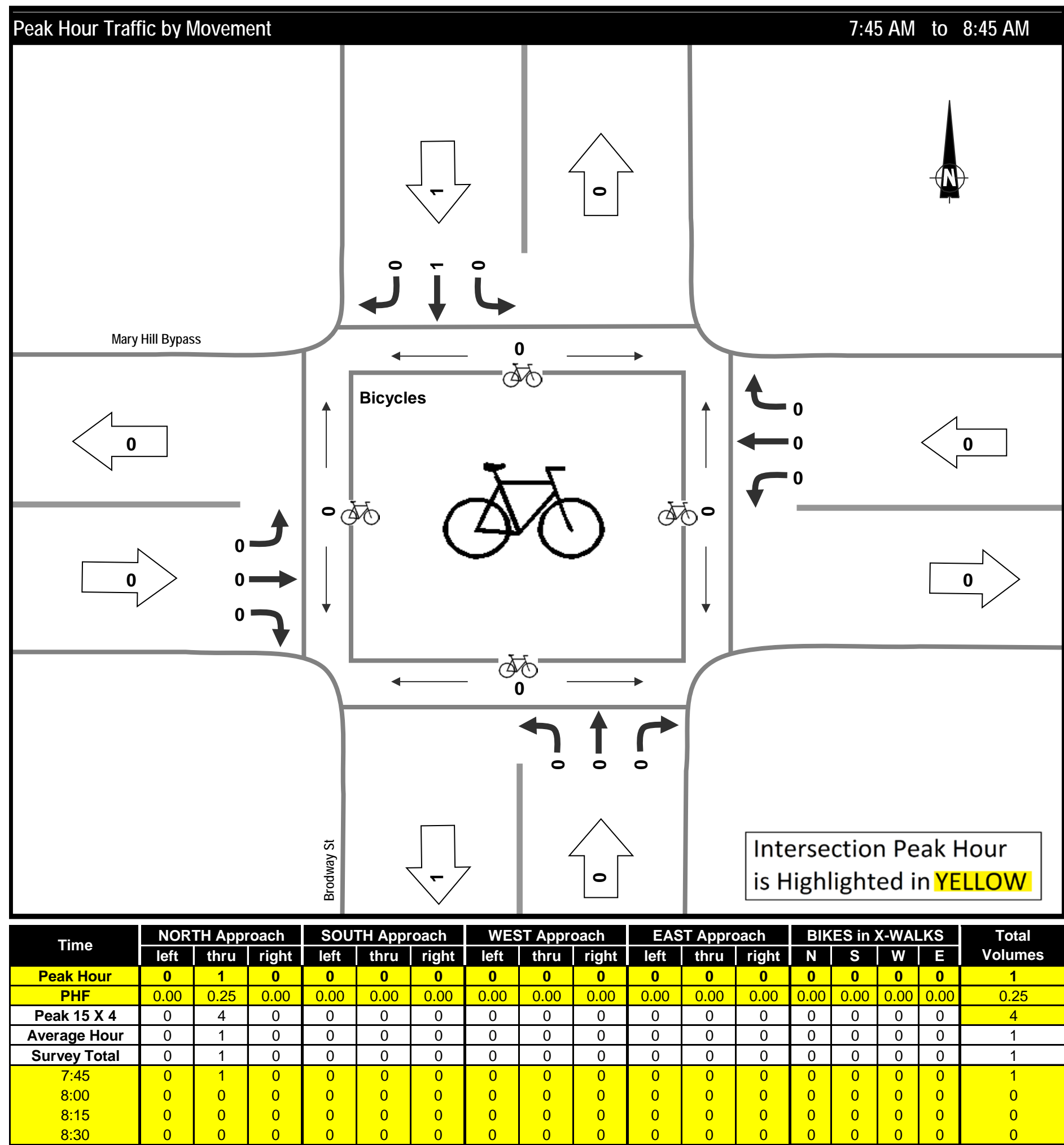


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	3	1	20	2	0	0	10	82	6	2	49	2					177
PHF	0.75	0.25	0.71	0.25	0.00	0.00	0.63	0.76	0.50	0.50	0.77	0.50					0.78
Peak 15 X 4	4	4	28	8	0	0	16	108	12	4	64	4					228
Average Hour	3	1	20	2	0	0	10	82	6	2	49	2					177
Survey Total	3	1	20	2	0	0	10	82	6	2	49	2					177
7:45	1	1	6	0	0	0	2	14	1	0	14	0					39
8:00	0	0	4	0	0	0	2	18	3	0	10	1					38
8:15	1	0	3	0	0	0	4	23	1	1	9	1					43
8:30	1	0	7	2	0	0	2	27	1	1	16	0					57

Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Bicycles

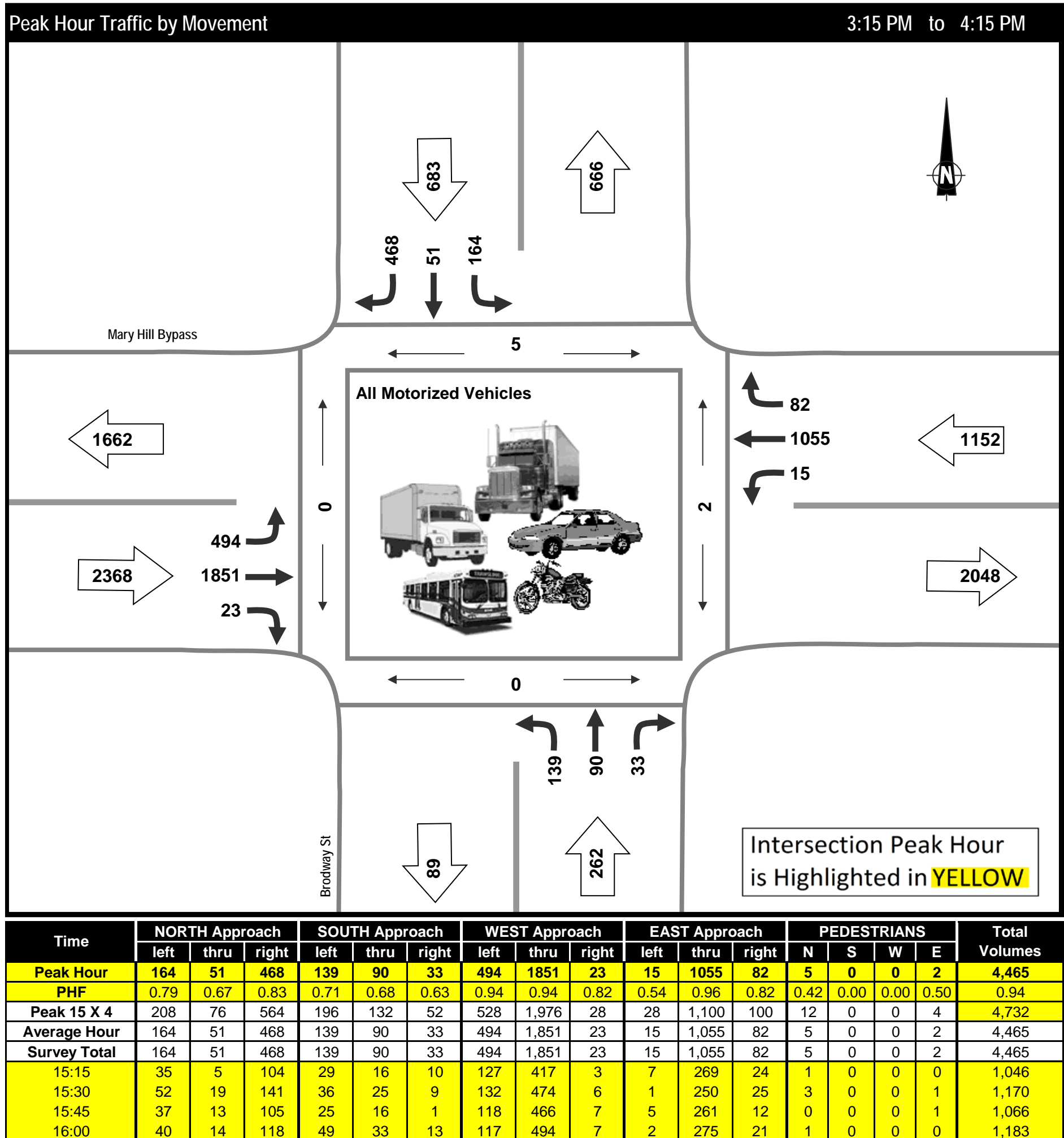
Morning Peak Period

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



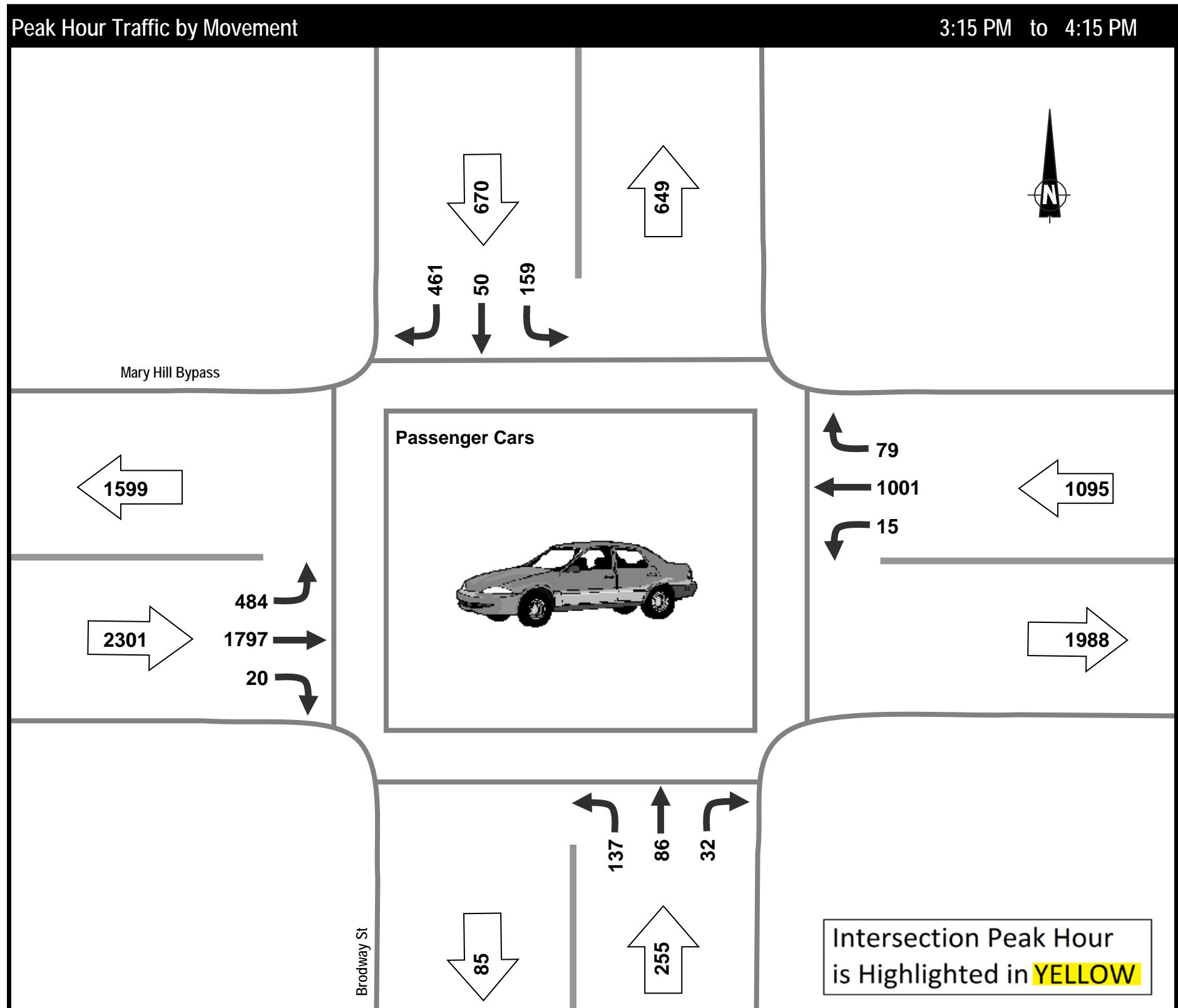
Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: All Motorized Vehicles

Afternoon Peak Period



Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Passenger Cars

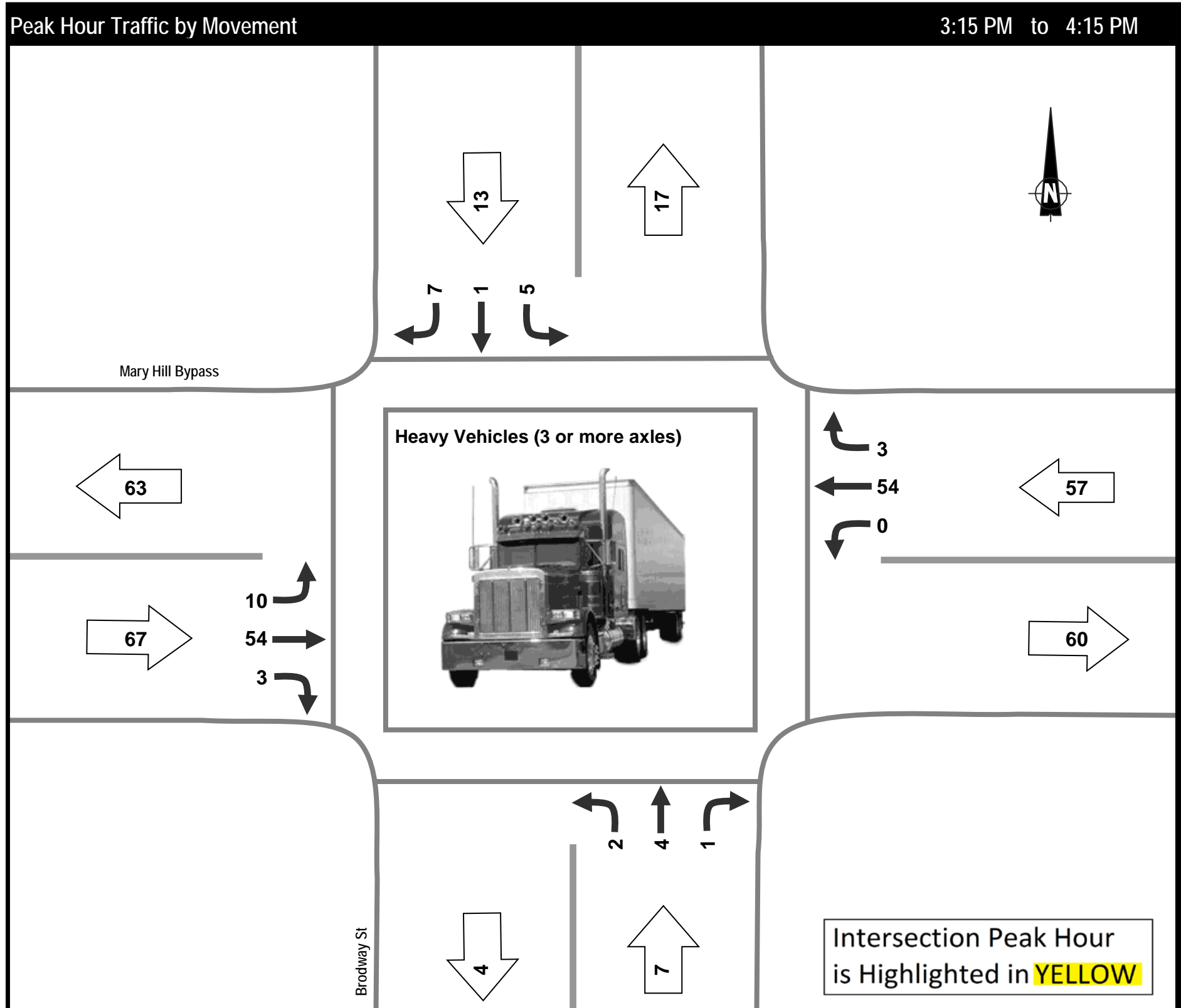
Afternoon Peak Period



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	159	50	461	137	86	32	484	1797	20	15	1001	79					4,321
PHF	0.78	0.66	0.82	0.70	0.67	0.62	0.94	0.93	0.83	0.54	0.96	0.82					0.94
Peak 15 X 4	204	76	564	196	128	52	516	1,936	24	28	1,044	96					4,604
Average Hour	159	50	461	137	86	32	484	1,797	20	15	1,001	79					4,321
Survey Total	159	50	461	137	86	32	484	1,797	20	15	1,001	79					4,321
15:15	33	5	102	28	16	9	125	398	3	7	253	23					1,002
15:30	51	19	141	35	23	9	129	461	5	1	242	24					1,140
15:45	35	13	101	25	15	1	117	454	6	5	245	11					1,028
16:00	40	13	117	49	32	13	113	484	6	2	261	21					1,151

Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Heavy Vehicles (3 or more axles)

Afternoon Peak Period

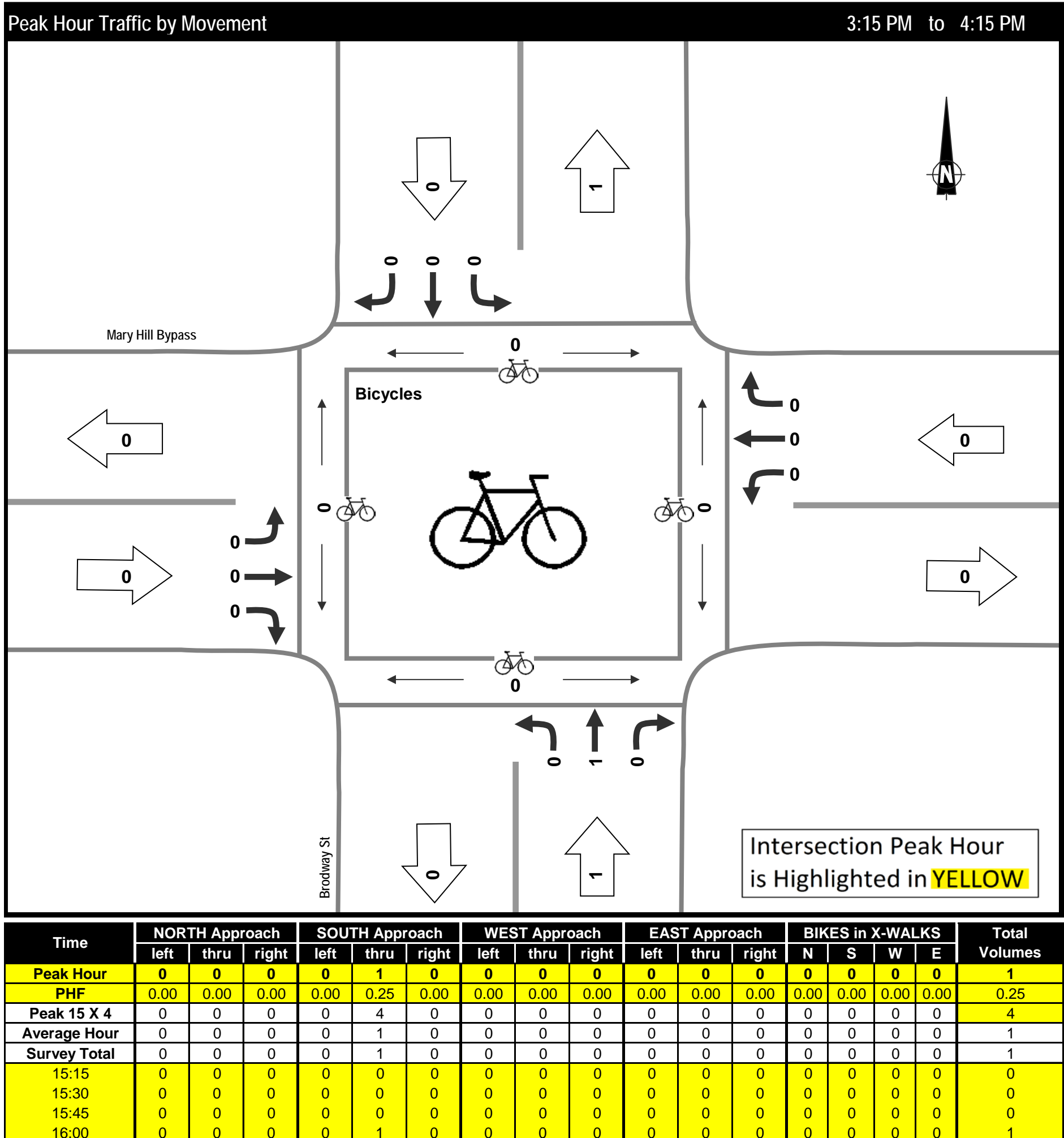


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	5	1	7	2	4	1	10	54	3	0	54	3					144
PHF	0.63	0.25	0.44	0.50	0.50	0.25	0.63	0.71	0.75	0.00	0.84	0.75					0.82
Peak 15 X 4	8	4	16	4	8	4	16	76	4	0	64	4					176
Average Hour	5	1	7	2	4	1	10	54	3	0	54	3					144
Survey Total	5	1	7	2	4	1	10	54	3	0	54	3					144
15:15	2	0	2	1	0	1	2	19	0	0	16	1					44
15:30	1	0	0	1	2	0	3	13	1	0	8	1					30
15:45	2	0	4	0	1	0	1	12	1	0	16	1					38
16:00	0	1	1	0	1	0	4	10	1	0	14	0					32

Project: #5776: Greystone Development TIA
Municipality: Port Coquitlam
Weather: Rain
Vehicle Class: Bicycles

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: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	7,531	302				7,833
	%	96.1%	3.9%				100.0%
Midday (11:00 - 13:00)	Volume	5,315	447				5,762
	%	92.2%	7.8%				100.0%
Afternoon (15:00 - 18:00)	Volume	12,665	270				12,935
	%	97.9%	2.1%				100.0%
Total (7 Hours)	Volume	25,511	1,019				26,530
	%	96.2%	3.8%				100.0%



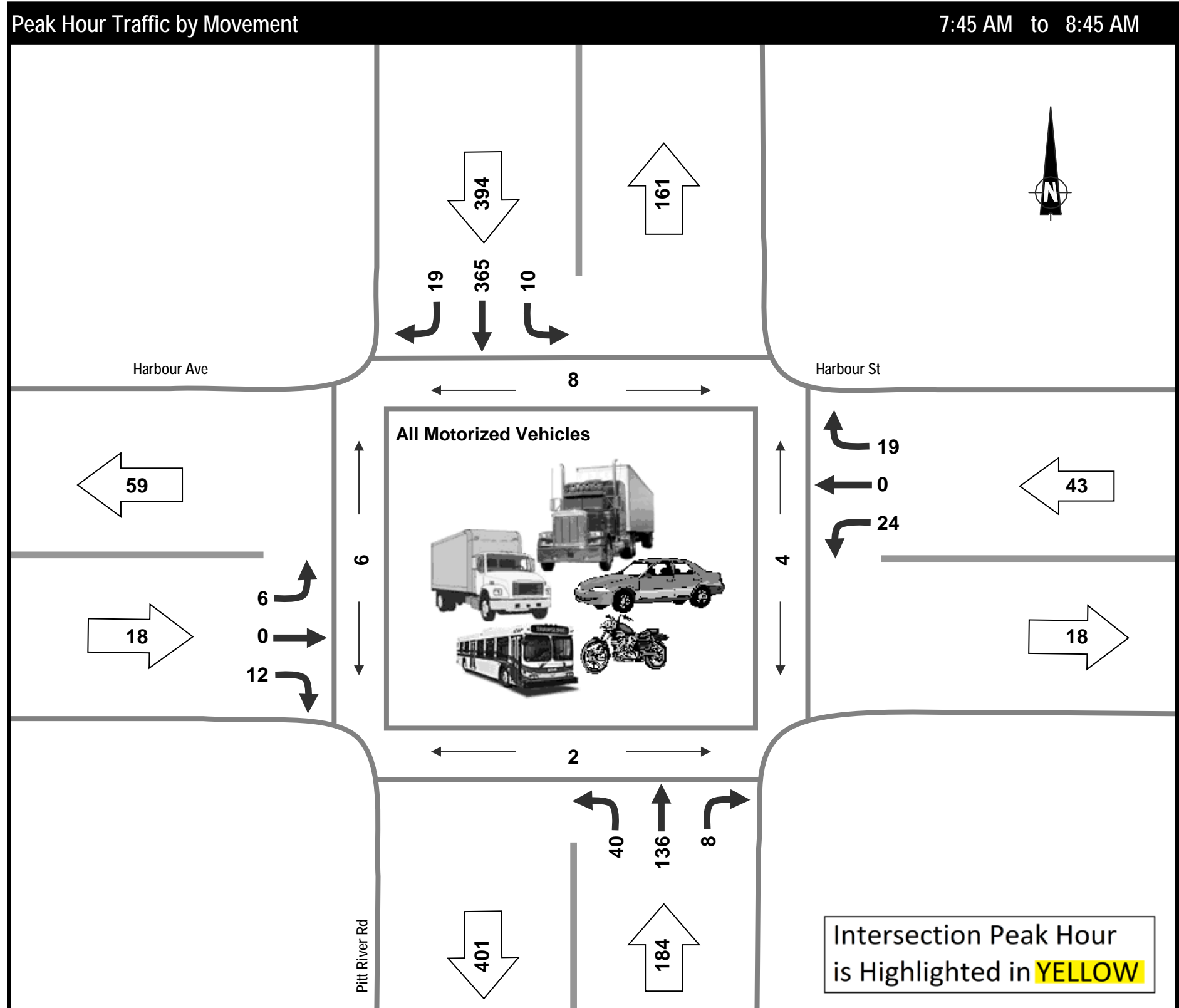
Vehicle Classification Summary

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (07:00 - 09:00)	Volume	1,115	5				1,120
	%	99.6%	0.4%				100.0%
Midday (11:00 - 13:00)	Volume	748	0				748
	%	100.0%	0.0%				100.0%
Afternoon (15:00 - 18:00)	Volume	1,957	0				1,957
	%	100.0%	0.0%				100.0%
Total (7 Hours)	Volume	3,820	5				3,825
	%	99.9%	0.1%				100.0%

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: All Motorized Vehicles

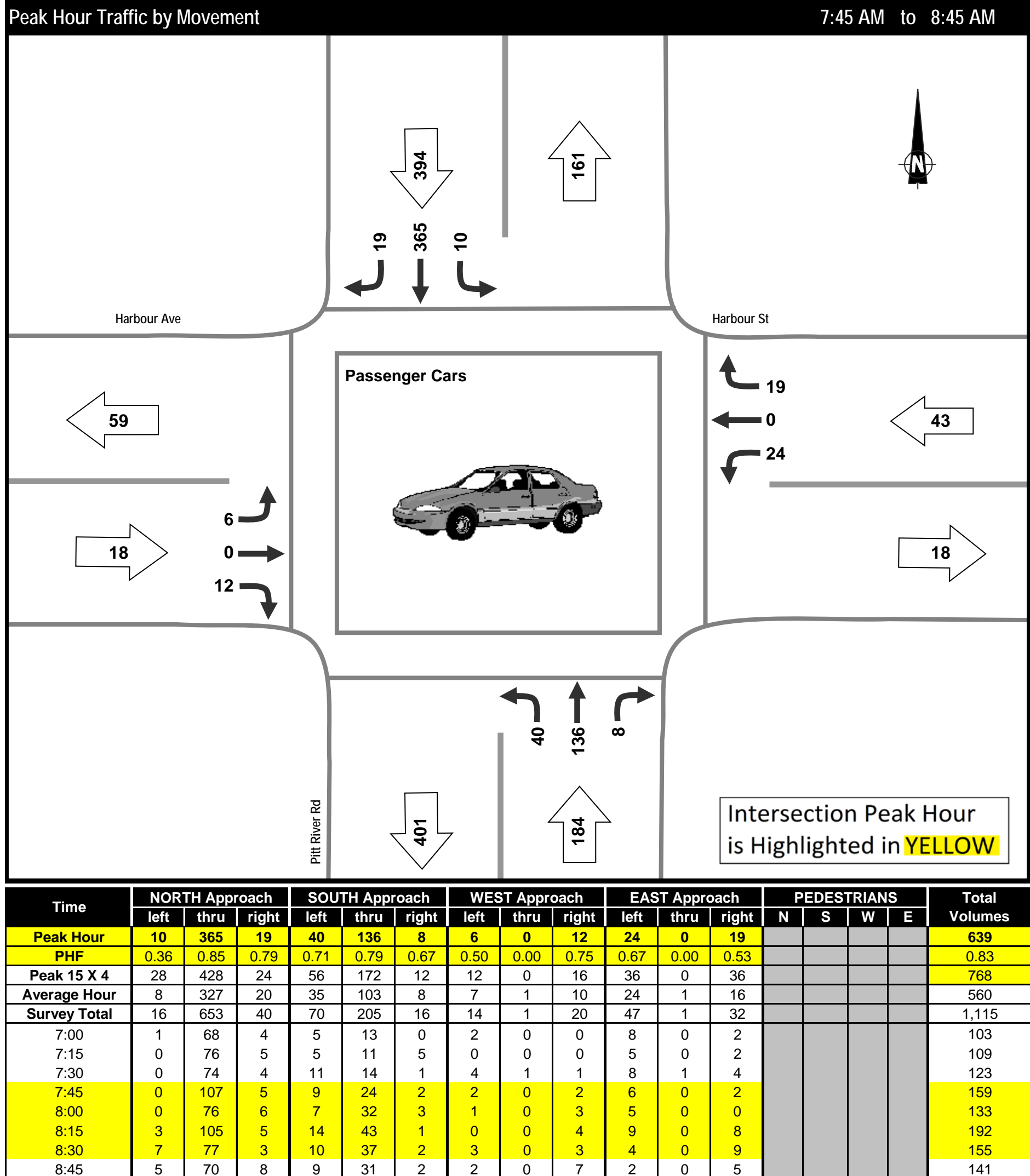
Morning Peak Period



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	
Peak Hour	10	365	19	40	136	8	6	0	12	24	0	19	8	2	6	4	639
PHF	0.36	0.85	0.79	0.71	0.79	0.67	0.50	0.00	0.75	0.67	0.00	0.53	0.29	0.50	0.25	0.25	0.83
Peak 15 X 4	28	428	24	56	172	12	12	0	16	36	0	36	28	4	24	16	768
Average Hour	8	327	20	36	103	8	8	1	11	24	1	16	4	1	6	3	563
Survey Total	16	654	40	71	205	16	15	1	22	47	1	32	8	2	11	5	1,120
7:00	1	68	4	5	13	0	3	0	0	8	0	2	0	0	0	0	104
7:15	0	76	5	6	11	5	0	0	0	5	0	2	0	0	2	1	110
7:30	0	74	4	11	14	1	4	1	2	8	1	4	0	0	2	0	124
7:45	0	107	5	9	24	2	2	0	2	6	0	2	0	0	0	0	159
8:00	0	76	6	7	32	3	1	0	3	5	0	0	7	0	0	4	133
8:15	3	105	5	14	43	1	0	0	4	9	0	8	1	1	0	0	192
8:30	7	77	3	10	37	2	3	0	3	4	0	9	0	1	6	0	155
8:45	5	71	8	9	31	2	2	0	8	2	0	5	0	0	1	0	143

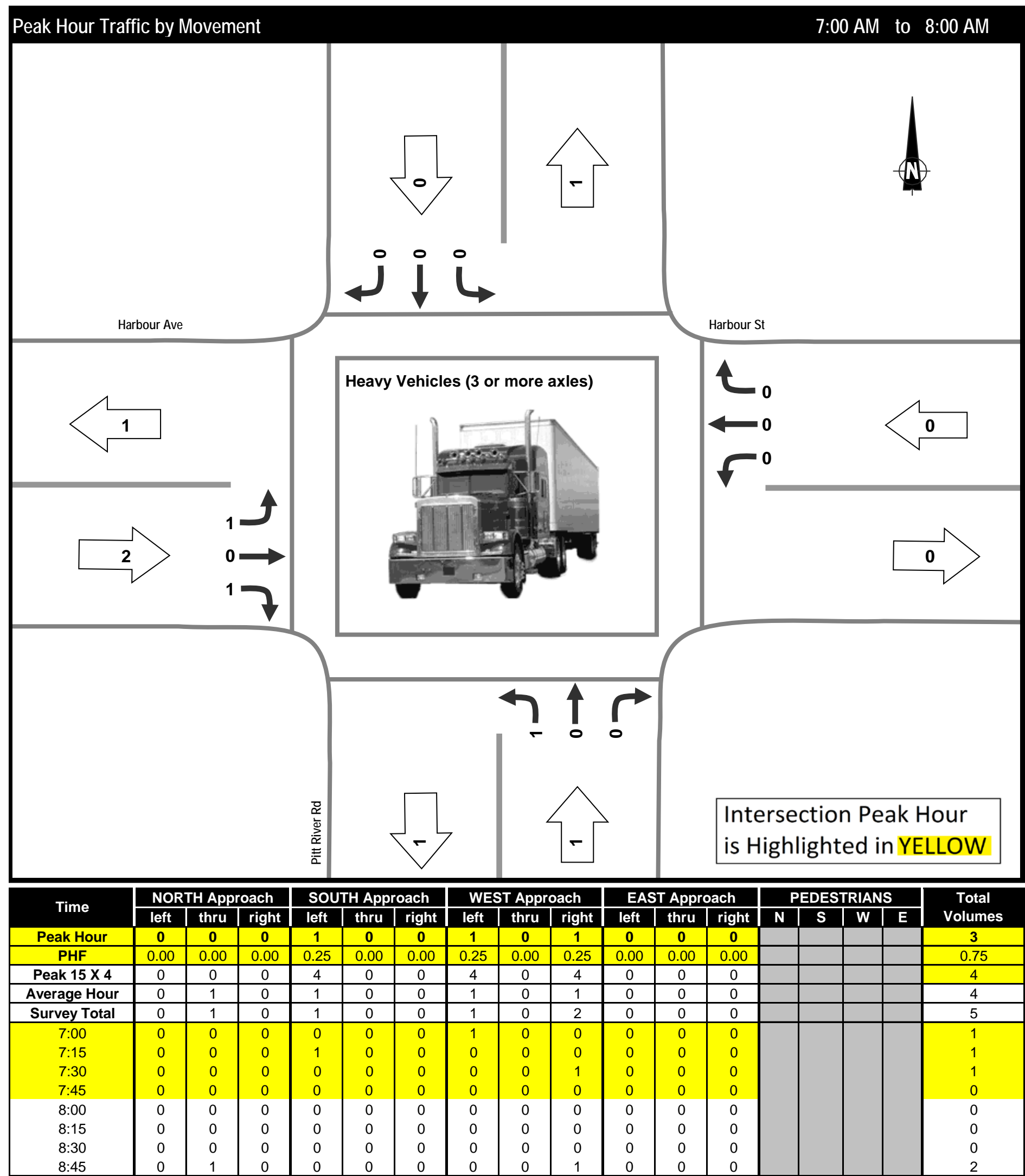
Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Passenger Cars

Morning Peak Period



Project: #5776: Greystone Mixed Use Traffic Impact Assessment
 Municipality: Port Coquitlam
 Weather: Cloudy, Sunny
 Vehicle Class: Heavy Vehicles (3 or more axles)

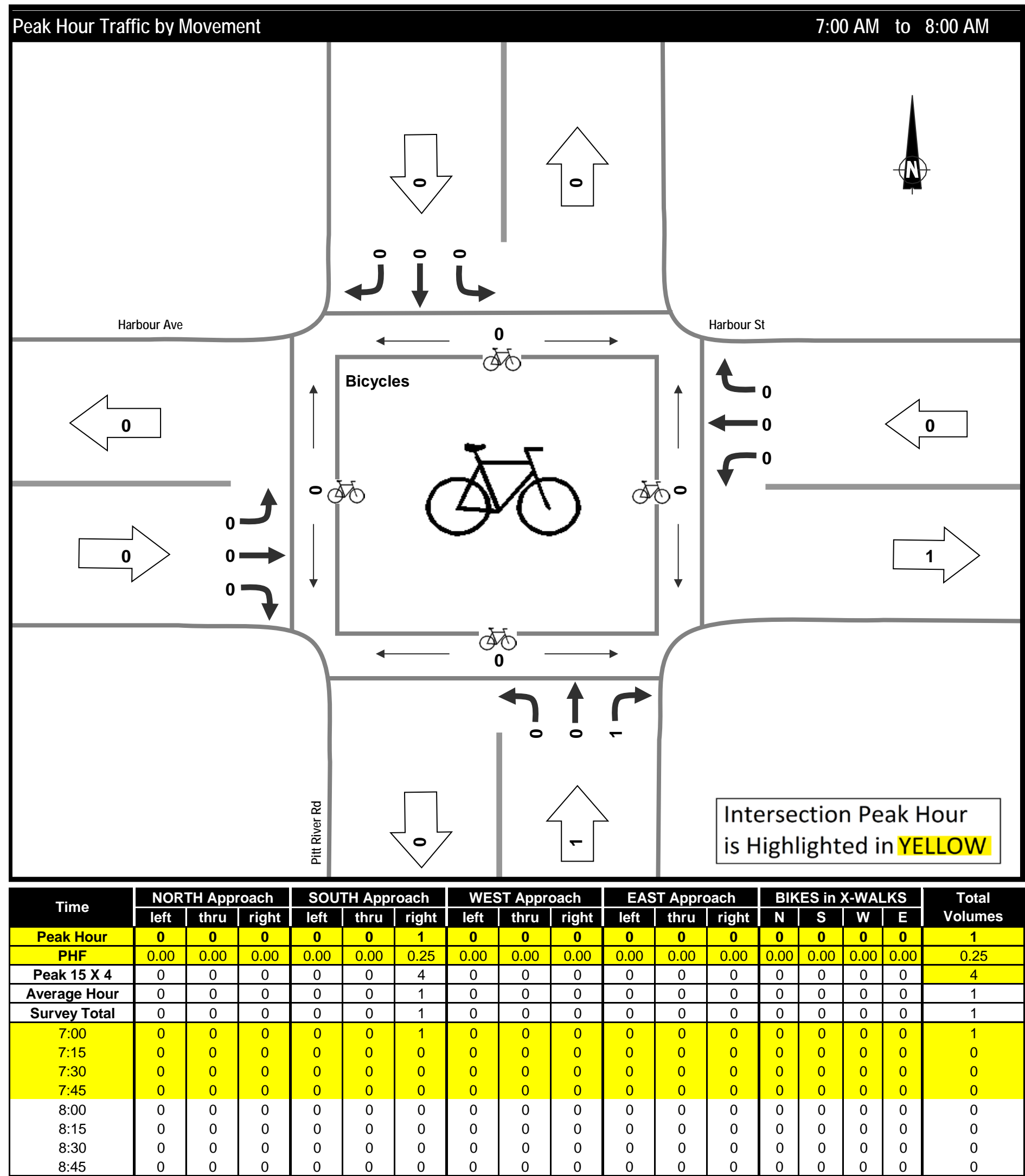
Morning Peak Period



Project: #5776: Greystone Mixed Use Traffic Impact Assessment
 Municipality: Port Coquitlam
 Weather: Cloudy, Sunny
 Vehicle Class: Bicycles

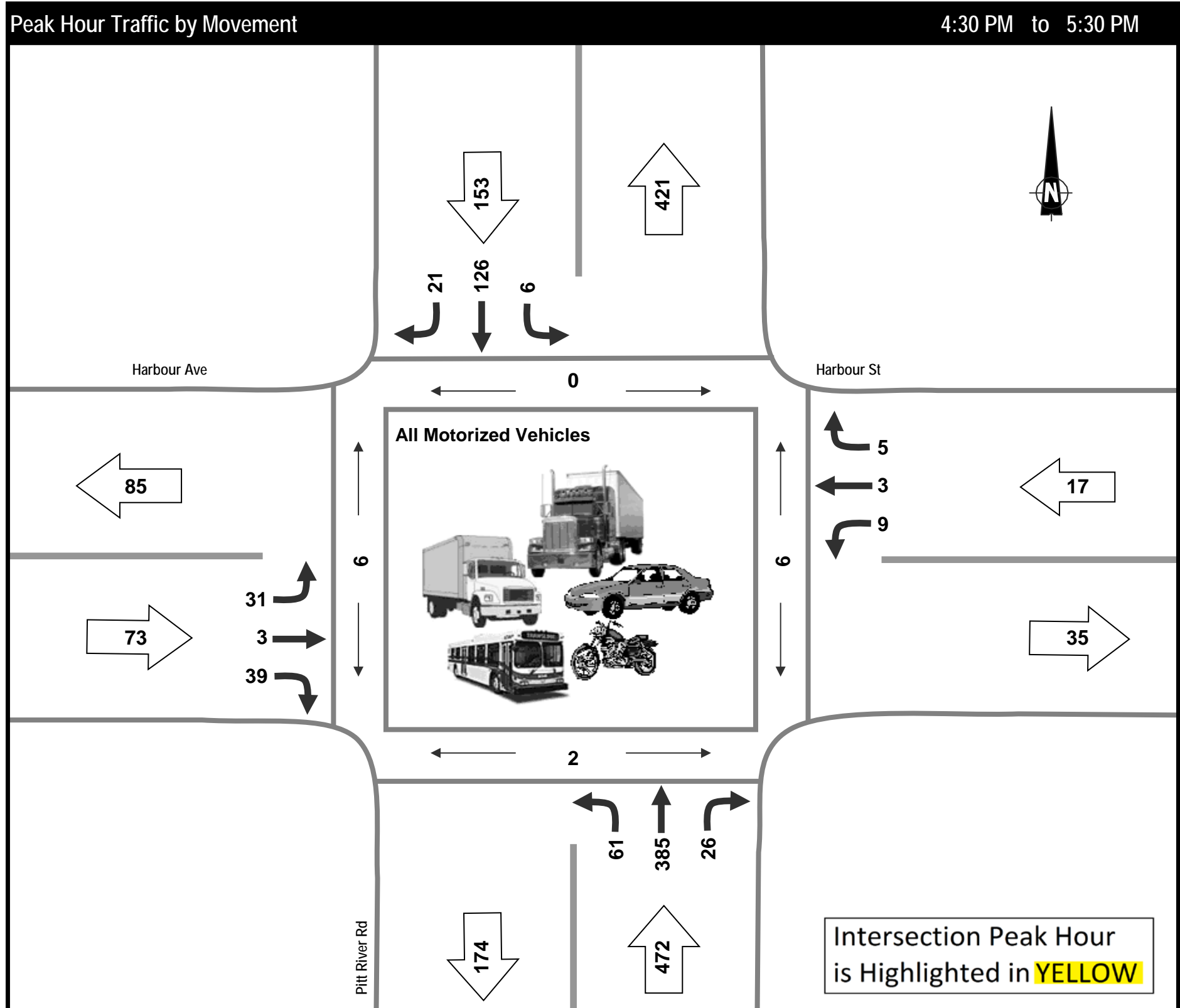
Morning Peak Period

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



Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: All Motorized Vehicles

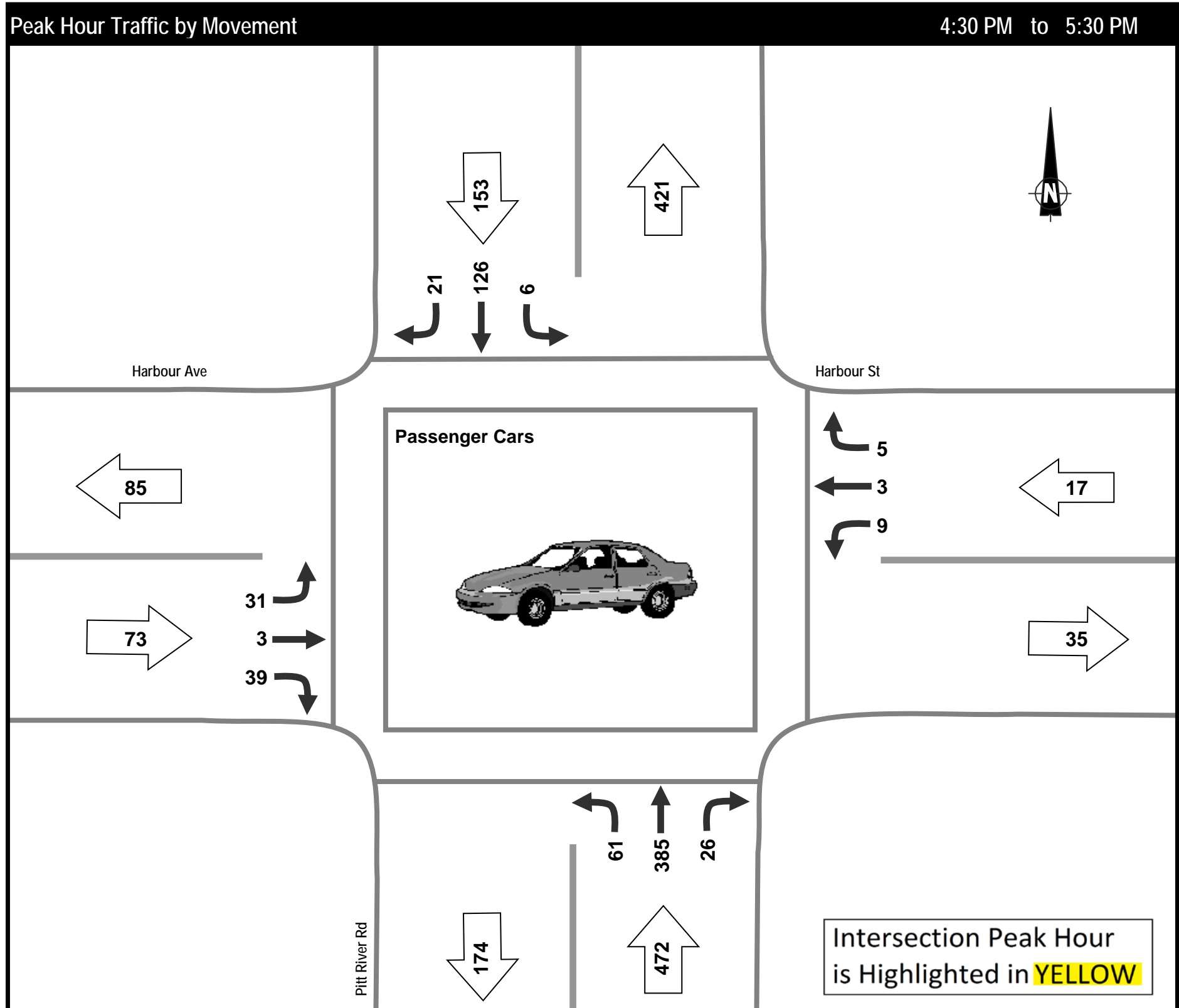
Afternoon Peak Period



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	126	21	61	385	26	31	3	39	9	3	5	0	2	6	6	715
PHF	0.50	0.67	0.75	0.73	0.91	0.72	0.86	0.38	0.75	0.75	0.75	0.63	0.00	0.50	0.50	0.50	0.95
Peak 15 X 4	12	188	28	84	424	36	36	8	52	12	4	8	0	4	12	12	756
Average Hour	8	130	18	56	325	23	28	2	43	11	3	6	4	3	7	5	653
Survey Total	24	389	55	167	976	68	83	7	128	33	8	19	13	8	22	16	1,957
15:00	4	54	3	11	60	5	7	0	12	4	1	2	1	0	4	0	163
15:15	2	23	7	20	57	8	6	1	10	4	0	3	2	2	5	1	141
15:30	2	30	5	11	71	5	7	1	16	3	2	1	9	3	4	6	154
15:45	3	34	5	8	80	5	6	0	4	3	0	1	0	1	0	0	149
16:00	0	31	6	28	83	6	5	0	17	3	1	2	1	0	0	0	182
16:15	3	25	4	7	87	3	6	1	16	3	0	1	0	0	0	3	156
16:30	1	47	3	15	96	9	8	2	6	0	1	1	0	0	3	0	189
16:45	0	23	4	21	106	5	9	0	13	3	1	2	0	1	3	3	187
17:00	2	29	7	11	86	3	9	1	12	3	0	2	0	0	0	0	165
17:15	3	27	7	14	97	9	5	0	8	3	1	0	0	1	0	3	174
17:30	3	32	2	14	95	7	8	1	8	2	0	1	0	0	1	0	173
17:45	1	34	2	7	58	3	7	0	6	2	1	3	0	0	2	0	124

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Passenger Cars

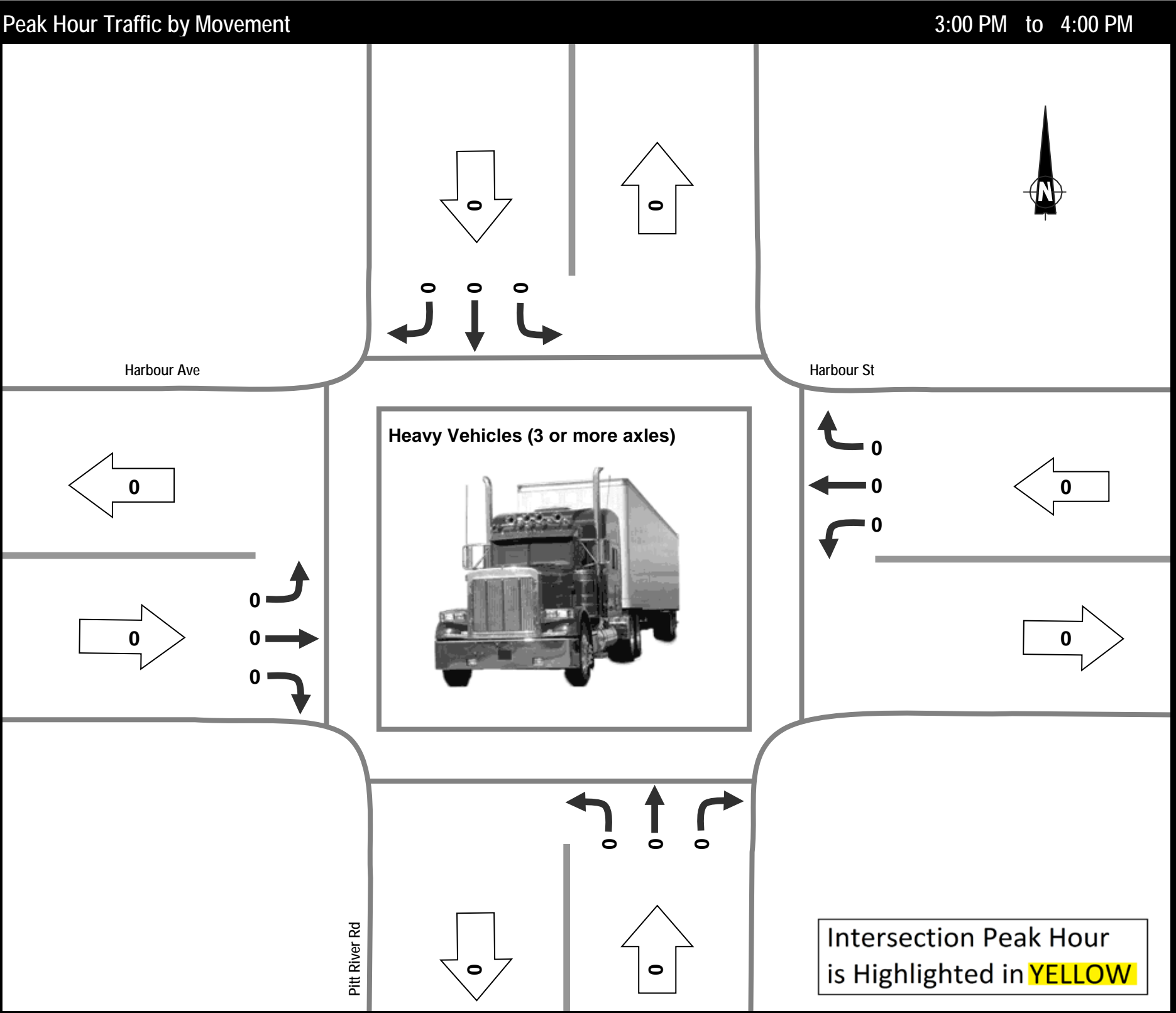
Afternoon Peak Period



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	6	126	21	61	385	26	31	3	39	9	3	5					715
PHF	0.50	0.67	0.75	0.73	0.91	0.72	0.86	0.38	0.75	0.75	0.75	0.63					0.95
Peak 15 X 4	12	188	28	84	424	36	36	8	52	12	4	8					756
Average Hour	8	130	18	56	325	23	28	2	43	11	3	6					653
Survey Total	24	389	55	167	976	68	83	7	128	33	8	19					1,957
15:00	4	54	3	11	60	5	7	0	12	4	1	2					163
15:15	2	23	7	20	57	8	6	1	10	4	0	3					141
15:30	2	30	5	11	71	5	7	1	16	3	2	1					154
15:45	3	34	5	8	80	5	6	0	4	3	0	1					149
16:00	0	31	6	28	83	6	5	0	17	3	1	2					182
16:15	3	25	4	7	87	3	6	1	16	3	0	1					156
16:30	1	47	3	15	96	9	8	2	6	0	1	1					189
16:45	0	23	4	21	106	5	9	0	13	3	1	2					187
17:00	2	29	7	11	86	3	9	1	12	3	0	2					165
17:15	3	27	7	14	97	9	5	0	8	3	1	0					174
17:30	3	32	2	14	95	7	8	1	8	2	0	1					173
17:45	1	34	2	7	58	3	7	0	6	2	1	3					124

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
 Municipality: Port Coquitlam
 Weather: Cloudy, 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	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

Project: #5776: Greystone Mixed Use Traffic Impact Assessment

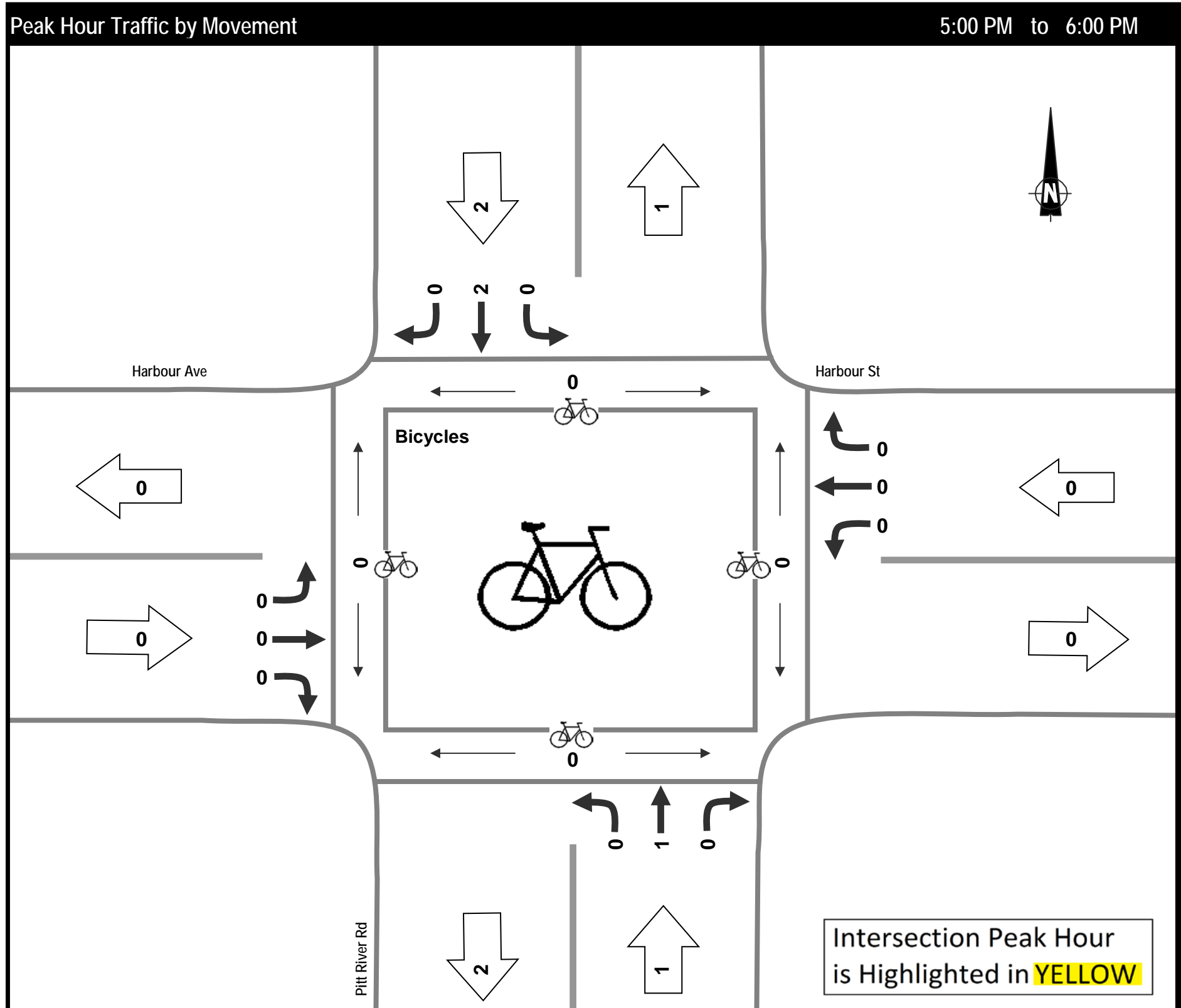
Municipality: Port Coquitlam

Weather: Cloudy, Sunny

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

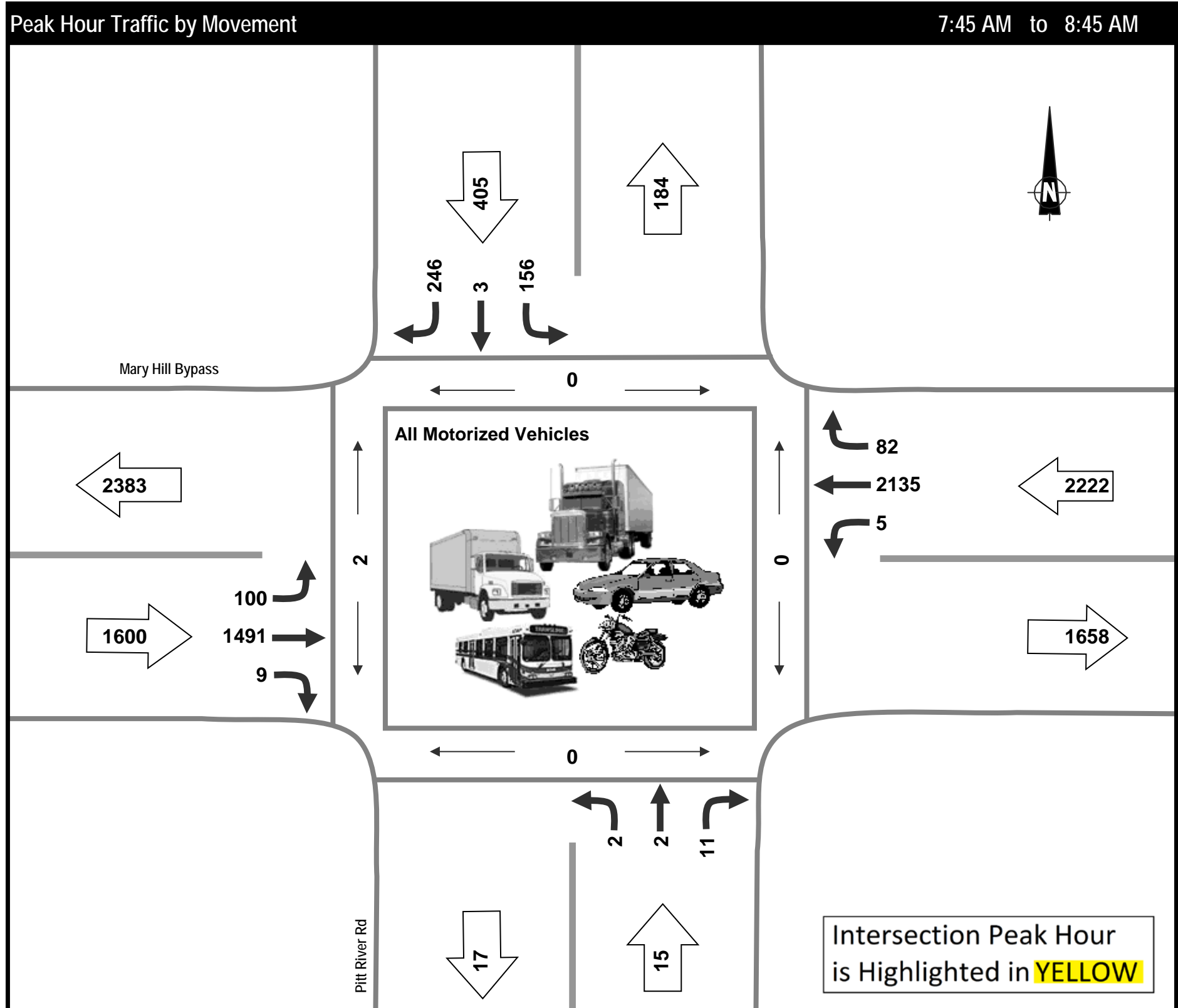
Afternoon Peak Period



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	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
PHF	0.00	0.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
Peak 15 X 4	0	8	0	0	4	0	0	0	0	0	0	0	0	0	0	0	8
Average Hour	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3
Survey Total	0	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	6
15:00	0	0	0	0	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	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
15:45	0	0	0	0	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	0	0	0	0
16:15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
16:45	0	0	0	0	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	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
17:45	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: All Motorized Vehicles

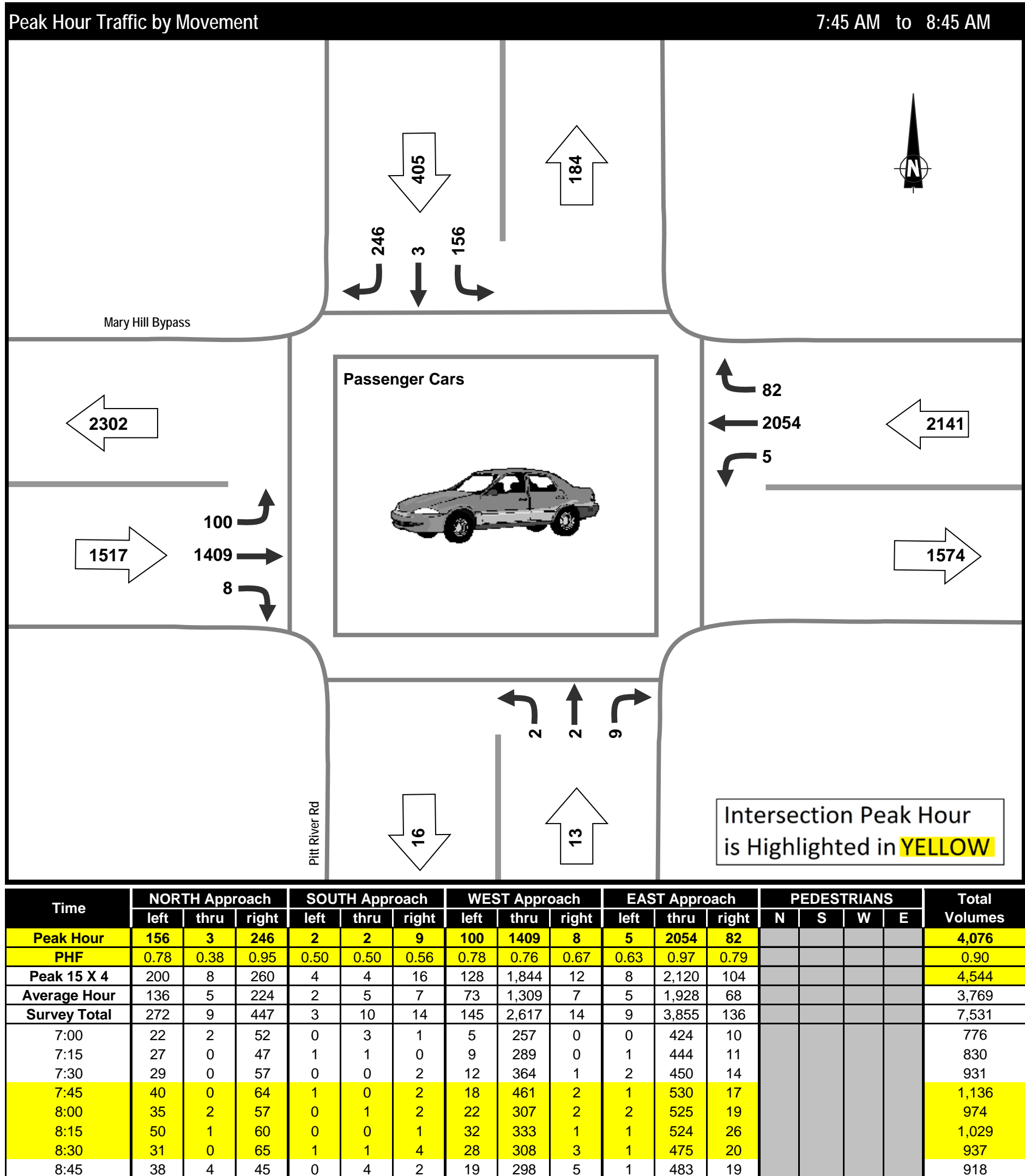
Morning Peak Period



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	
Peak Hour	156	3	246	2	2	11	100	1491	9	5	2135	82	0	0	2	0	4,242
PHF	0.78	0.38	0.95	0.50	0.50	0.55	0.78	0.78	0.75	0.63	0.97	0.79	0.00	0.00	0.25	0.00	0.91
Peak 15 X 4	200	8	260	4	4	20	128	1,900	12	8	2,192	104	0	0	8	0	4,672
Average Hour	136	5	224	2	5	9	73	1,381	8	5	2,003	68	0	0	4	1	3,919
Survey Total	272	9	448	3	10	17	146	2,762	16	9	4,005	136	0	0	8	1	7,833
7:00	22	2	52	0	3	1	5	271	1	0	438	10	0	0	0	1	805
7:15	27	0	47	1	1	0	10	303	0	1	459	11	0	0	2	0	860
7:30	29	0	58	0	0	3	12	380	1	2	470	14	0	0	2	0	969
7:45	40	0	64	1	0	2	18	475	2	1	548	17	0	0	0	0	1,168
8:00	35	2	57	0	1	2	22	327	3	2	544	19	0	0	0	0	1,014
8:15	50	1	60	0	0	2	32	359	1	1	541	26	0	0	0	0	1,073
8:30	31	0	65	1	1	5	28	330	3	1	502	20	0	0	2	0	987
8:45	38	4	45	0	4	2	19	317	5	1	503	19	0	0	2	0	957

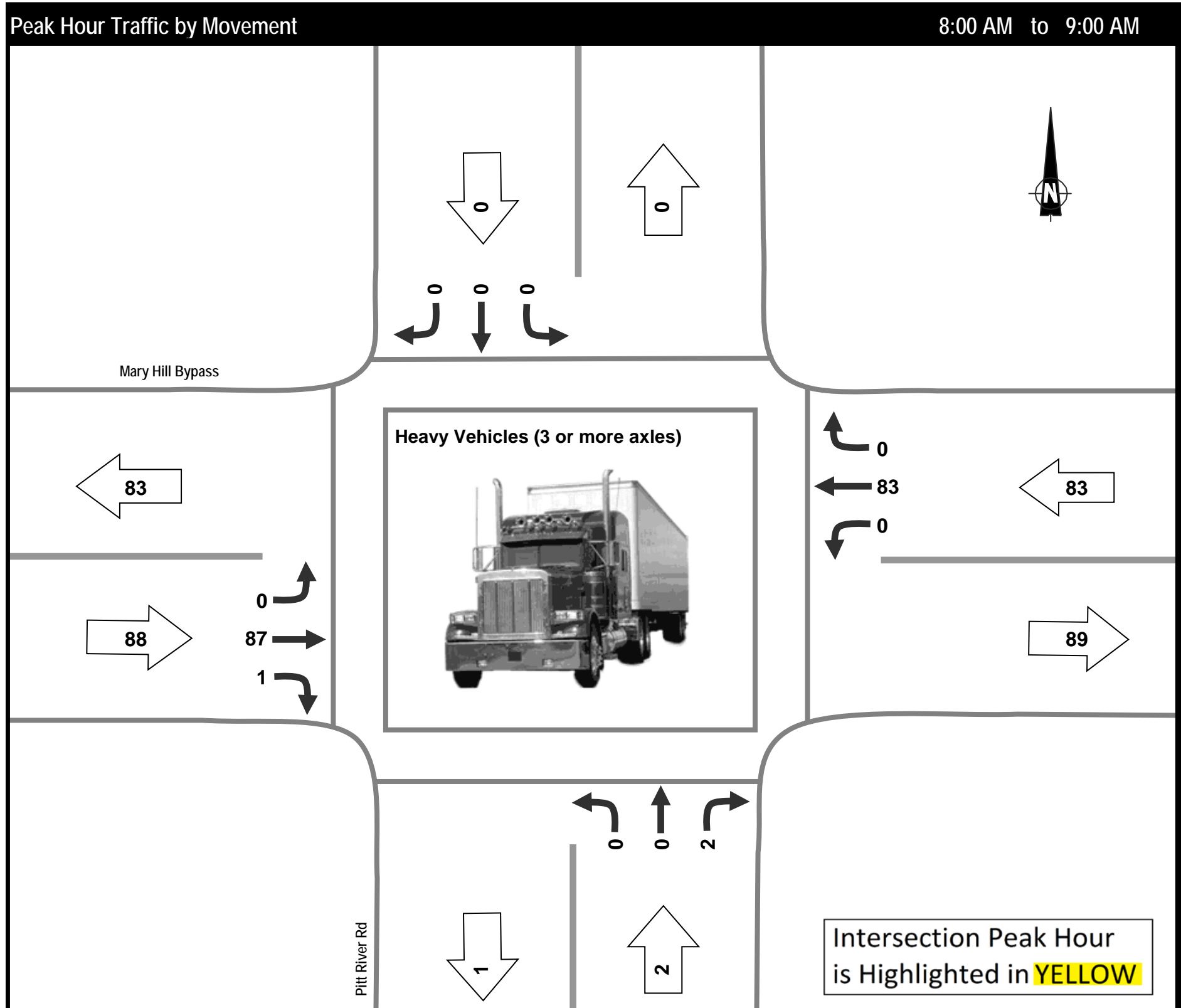
Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Passenger Cars

Morning Peak Period



Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Heavy Vehicles (3 or more axles)

Morning Peak Period

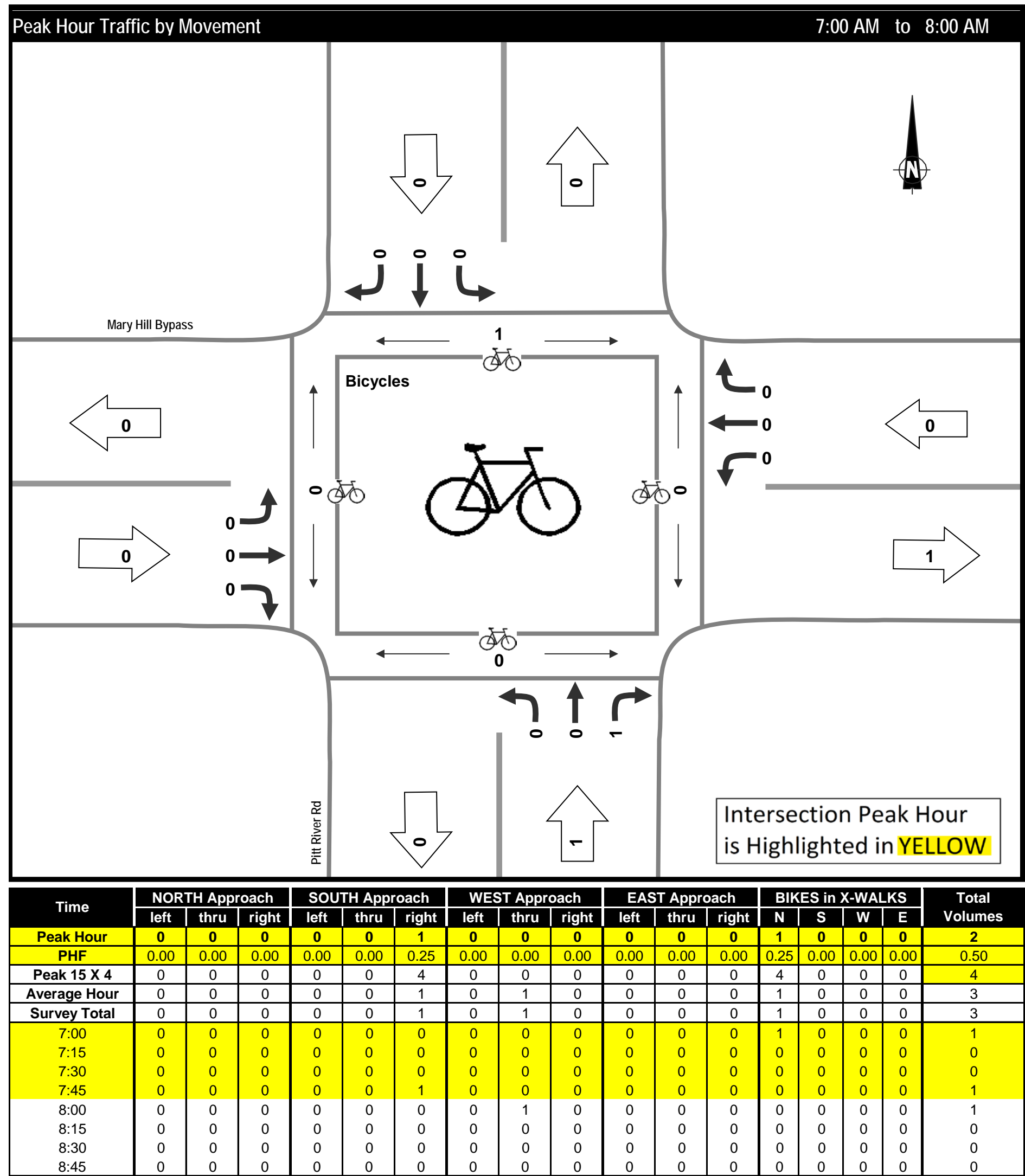


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0	0	0	0	0	2	0	87	1	0	83	0					173
PHF	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.84	0.25	0.00	0.77	0.00					0.87
Peak 15 X 4	0	0	0	0	0	4	0	104	4	0	108	0					200
Average Hour	0	0	1	0	0	2	1	73	1	0	75	0					153
Survey Total	0	0	1	0	0	3	1	145	2	0	150	0					302
7:00	0	0	0	0	0	0	0	14	1	0	14	0					29
7:15	0	0	0	0	0	0	1	14	0	0	15	0					30
7:30	0	0	1	0	0	1	0	16	0	0	20	0					38
7:45	0	0	0	0	0	0	0	14	0	0	18	0					32
8:00	0	0	0	0	0	0	0	20	1	0	19	0					40
8:15	0	0	0	0	0	1	0	26	0	0	17	0					44
8:30	0	0	0	0	0	1	0	22	0	0	27	0					50
8:45	0	0	0	0	0	0	0	19	0	0	20	0					39

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
 Municipality: Port Coquitlam
 Weather: Cloudy, Sunny
 Vehicle Class: Bicycles

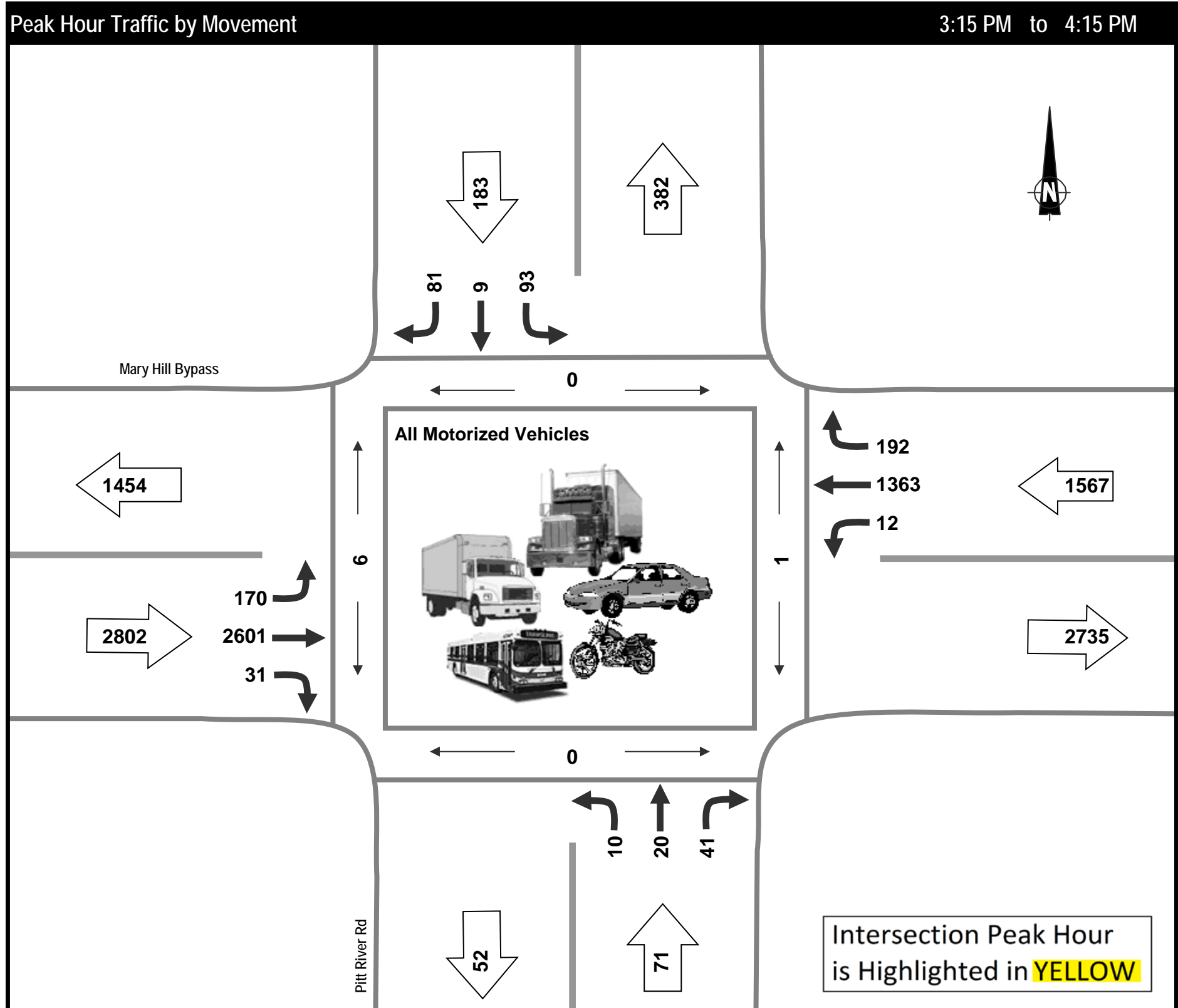
Morning Peak Period

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



Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: All Motorized Vehicles

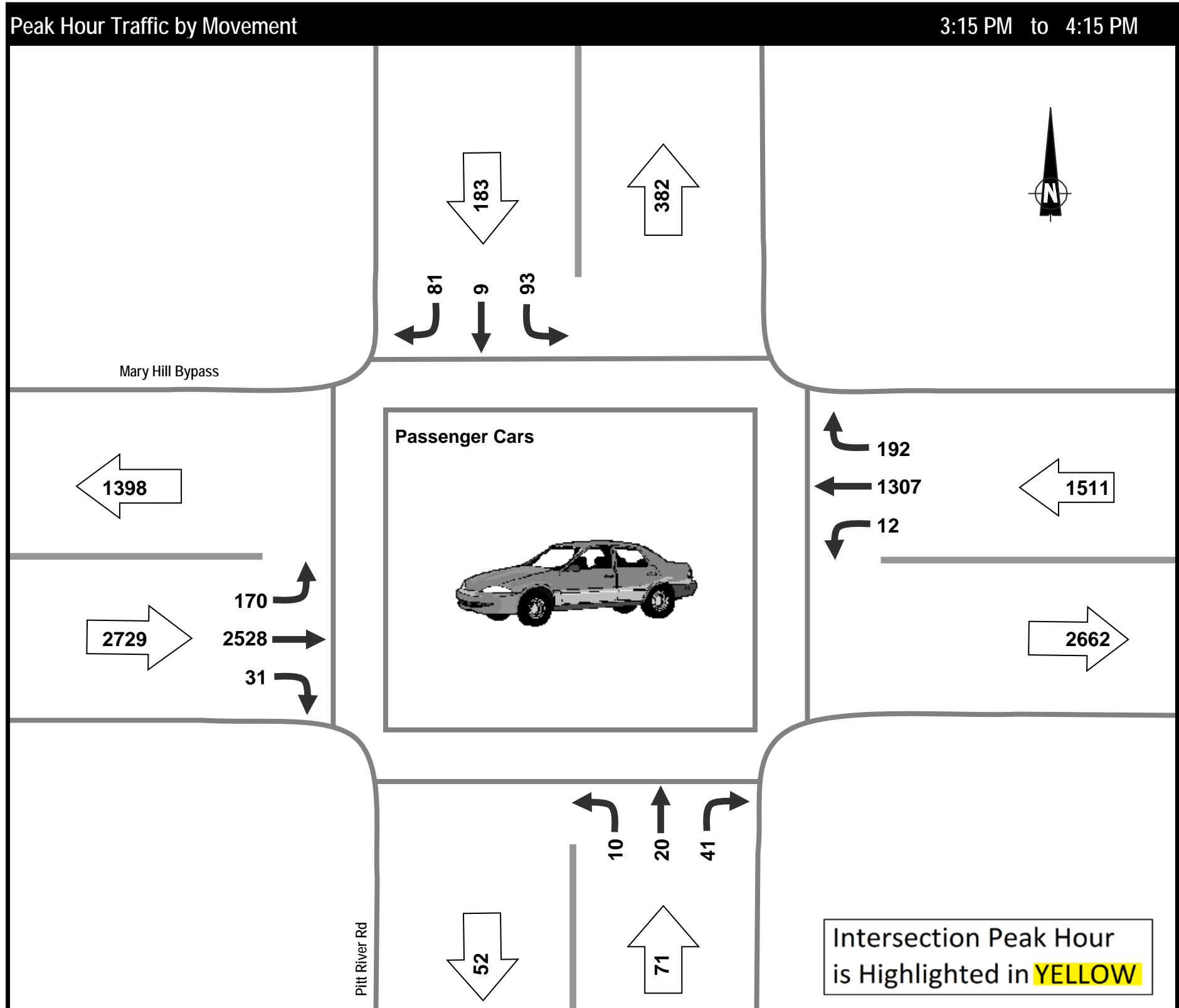
Afternoon Peak Period



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	93	9	81	10	20	41	170	2601	31	12	1363	192	0	0	6	1	4,623
PHF	0.80	0.56	0.68	0.63	0.63	0.64	0.77	0.97	0.65	0.38	0.90	0.89	0.00	0.00	0.50	0.25	0.96
Peak 15 X 4	116	16	120	16	32	64	220	2,688	48	32	1,516	216	0	0	12	4	4,792
Average Hour	99	11	82	6	21	31	193	2,348	27	10	1,293	189	0	0	6	2	4,310
Survey Total	296	34	247	19	64	94	580	7,045	80	30	3,879	567	0	1	18	6	12,935
15:00	39	5	38	1	6	7	41	561	6	5	322	29	0	0	0	0	1,060
15:15	18	4	21	2	1	6	38	666	7	1	379	46	0	0	2	0	1,189
15:30	29	0	12	1	6	13	40	652	12	1	351	41	0	0	3	1	1,158
15:45	27	2	18	3	5	16	37	611	7	2	299	51	0	0	1	0	1,078
16:00	19	3	30	4	8	6	55	672	5	8	334	54	0	0	0	0	1,198
16:15	23	2	16	3	6	8	59	642	10	1	299	32	0	0	0	0	1,101
16:30	24	4	22	2	7	7	63	539	8	5	371	50	0	0	4	2	1,102
16:45	24	3	16	1	7	9	52	612	5	1	354	73	0	0	2	0	1,157
17:00	25	2	13	0	5	7	43	564	6	2	284	52	0	0	1	2	1,003
17:15	21	4	14	1	5	3	60	538	5	2	317	55	0	1	3	1	1,025
17:30	19	1	26	0	5	8	58	531	5	1	293	53	0	0	0	0	1,000
17:45	28	4	21	1	3	4	34	457	4	1	276	31	0	0	2	0	864

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Passenger Cars

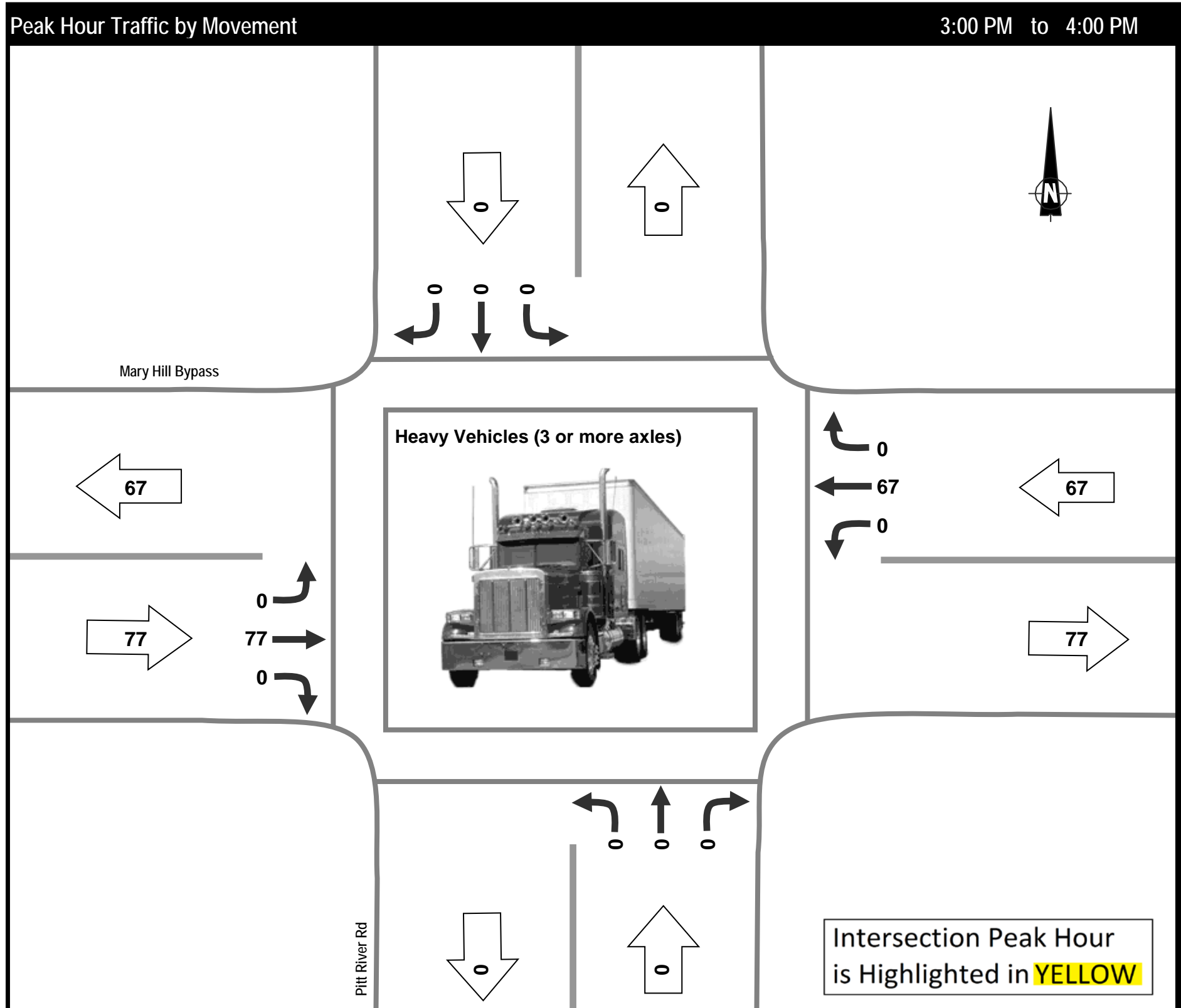
Afternoon Peak Period



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	93	9	81	10	20	41	170	2528	31	12	1307	192					4,494
PHF	0.80	0.56	0.68	0.63	0.63	0.64	0.77	0.96	0.65	0.38	0.91	0.89					0.95
Peak 15 X 4	116	16	120	16	32	64	220	2,636	48	32	1,436	216					4,708
Average Hour	99	11	82	6	21	31	193	2,301	27	10	1,250	189					4,220
Survey Total	296	34	247	19	64	94	580	6,903	80	30	3,751	567					12,665
15:00	39	5	38	1	6	7	41	544	6	5	303	29					1,024
15:15	18	4	21	2	1	6	38	639	7	1	359	46					1,142
15:30	29	0	12	1	6	13	40	634	12	1	337	41					1,126
15:45	27	2	18	3	5	16	37	596	7	2	285	51					1,049
16:00	19	3	30	4	8	6	55	659	5	8	326	54					1,177
16:15	23	2	16	3	6	8	59	632	10	1	290	32					1,082
16:30	24	4	22	2	7	7	63	530	8	5	369	50					1,091
16:45	24	3	16	1	7	9	52	604	5	1	344	73					1,139
17:00	25	2	13	0	5	7	43	554	6	2	279	52					988
17:15	21	4	14	1	5	3	60	534	5	2	308	55					1,012
17:30	19	1	26	0	5	8	58	528	5	1	281	53					985
17:45	28	4	21	1	3	4	34	449	4	1	270	31					850

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Heavy Vehicles (3 or more axles)

Afternoon Peak Period

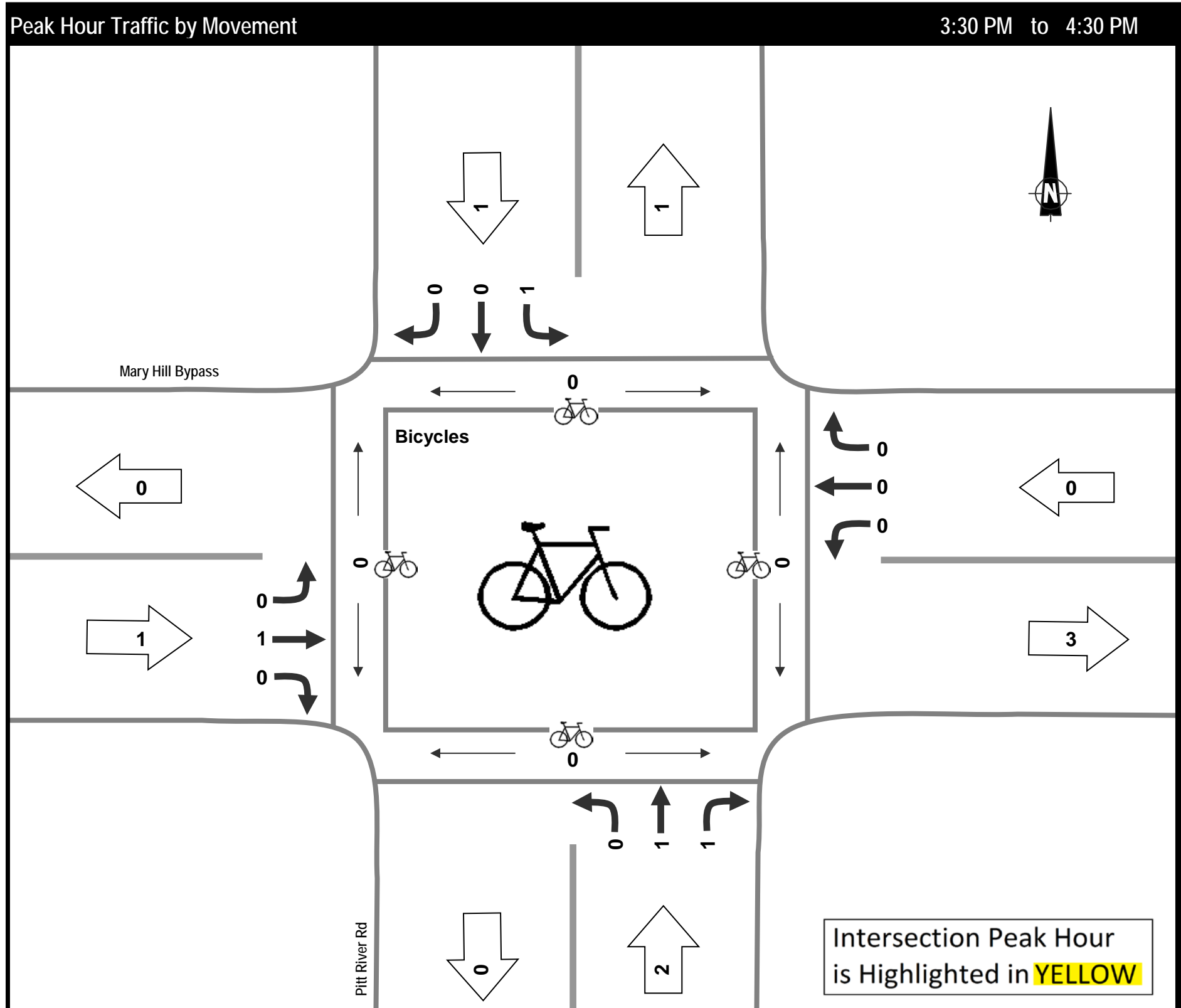


Time	NORTH Approach			SOUTH Approach			WEST Approach			EAST Approach			PEDESTRIANS				Total Volumes
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	N	S	W	E	
Peak Hour	0	0	0	0	0	0	0	77	0	0	67	0					144
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.84	0.00					0.77
Peak 15 X 4	0	0	0	0	0	0	0	108	0	0	80	0					188
Average Hour	0	0	0	0	0	0	0	47	0	0	43	0					90
Survey Total	0	0	0	0	0	0	0	142	0	0	128	0					270
15:00	0	0	0	0	0	0	0	17	0	0	19	0					36
15:15	0	0	0	0	0	0	0	27	0	0	20	0					47
15:30	0	0	0	0	0	0	0	18	0	0	14	0					32
15:45	0	0	0	0	0	0	0	15	0	0	14	0					29
16:00	0	0	0	0	0	0	0	13	0	0	8	0					21
16:15	0	0	0	0	0	0	0	10	0	0	9	0					19
16:30	0	0	0	0	0	0	0	9	0	0	2	0					11
16:45	0	0	0	0	0	0	0	8	0	0	10	0					18
17:00	0	0	0	0	0	0	0	10	0	0	5	0					15
17:15	0	0	0	0	0	0	0	4	0	0	9	0					13
17:30	0	0	0	0	0	0	0	3	0	0	12	0					15
17:45	0	0	0	0	0	0	0	8	0	0	6	0					14

Project: #5776: Greystone Mixed Use Traffic Impact Assessment
Municipality: Port Coquitlam
Weather: Cloudy, Sunny
Vehicle Class: Bicycles

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



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	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	4
PHF	0.25	0.00	0.00	0.00	0.25	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Peak 15 X 4	4	0	0	0	4	4	0	4	0	0	0	0	0	0	0	0	8
Average Hour	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
Survey Total	1	1	0	0	1	2	0	1	0	0	2	0	0	0	1	0	9
15:00	0	0	0	0	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	0	0	0	0
15:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
15:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
16:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
16:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
17:00	0	0	0	0	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	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
17:45	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

APPENDIX C

Capacity Analysis

Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2018 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	429	1107	122	15	1625	120	41	43	10	69	102	556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.040			0.225			0.460			0.726		
Satd. Flow (perm)	75	3539	1583	419	3539	1583	857	1863	1583	1352	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			137			125			45			296
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	482	1244	137	17	1826	135	46	48	11	78	115	625
Shared Lane Traffic (%)												
Lane Group Flow (vph)	482	1244	137	17	1826	135	46	48	11	78	115	625
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	39.7	145.1	145.1	105.1	105.1	105.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (%)	24.0%	87.8%	87.8%	63.6%	63.6%	63.6%	12.2%	12.2%	12.2%	12.2%	12.2%	12.2%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	136.5	136.1	136.1	96.4	96.4	96.4	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.85	0.84	0.84	0.60	0.60	0.60	0.09	0.09	0.09	0.09	0.09	0.09

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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2018 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.12	0.42	0.10	0.07	0.86	0.14	0.58	0.28	0.06	0.62	0.66	1.50
Control Delay	127.0	3.5	0.4	14.3	32.4	2.8	100.2	74.4	0.6	93.6	90.6	261.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.0	3.5	0.4	14.3	32.4	2.8	100.2	74.4	0.6	93.6	90.6	261.6
LOS	F	A	A	B	C	A	F	E	A	F	F	F
Approach Delay		35.2			30.2			78.0				221.5
Approach LOS		D			C			E				F
Queue Length 50th (m)	-176.3	43.1	0.0	2.3	260.0	1.3	15.6	15.8	0.0	26.5	39.2	-202.6
Queue Length 95th (m)	#247.2	48.9	2.9	6.4	288.2	10.2	#34.5	30.3	0.0	#49.2	#64.8	#277.0
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	431	3076	1393	260	2203	1032	79	173	187	125	173	416
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.40	0.10	0.07	0.83	0.13	0.58	0.28	0.06	0.62	0.66	1.50

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 161.4

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.50

Intersection Signal Delay: 66.1

Intersection LOS: E

Intersection Capacity Utilization 97.9%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

↔ p2	↔ p4
145.1 s	20.1 s
↔ p5	↔ p6
29.7 s	105.1 s
↔ p7	↔ p8
20.1 s	20.1 s

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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩↩	↩	↩	↩↩	↩	↩	↩	↩	↩	↩	↩
Volume (vph)	438	1151	124	15	1690	122	42	44	10	70	104	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.039			0.214			0.446			0.725		
Satd. Flow (perm)	73	3539	1583	399	3539	1583	831	1863	1583	1350	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			122			45			293
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	492	1293	139	17	1899	137	47	49	11	79	117	637
Shared Lane Traffic (%)												
Lane Group Flow (vph)	492	1293	139	17	1899	137	47	49	11	79	117	637
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	39.7	145.1	145.1	105.1	105.1	105.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (%)	24.0%	87.8%	87.8%	63.6%	63.6%	63.6%	12.2%	12.2%	12.2%	12.2%	12.2%	12.2%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	138.1	137.7	137.7	98.0	98.0	98.0	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.85	0.85	0.85	0.60	0.60	0.60	0.09	0.09	0.09	0.09	0.09	0.09

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.15	0.43	0.10	0.07	0.89	0.14	0.62	0.29	0.06	0.64	0.68	1.55
Control Delay	139.7	3.6	0.4	14.4	34.6	3.1	104.8	74.7	0.6	95.2	92.4	280.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.7	3.6	0.4	14.4	34.6	3.1	104.8	74.7	0.6	95.2	92.4	280.8
LOS	F	A	A	B	C	A	F	E	A	F	F	F
Approach Delay		38.1			32.3			80.3				236.7
Approach LOS		D			C			F				F
Queue Length 50th (m)	-184.5	45.8	0.0	2.3	282.4	2.0	15.9	16.1	0.0	26.8	39.9	-213.3
Queue Length 95th (m)	#255.4	51.8	3.0	6.5	312.6	11.0	#36.8	31.0	0.0	#50.0	#67.0	#288.5
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	426	3043	1380	245	2180	1022	76	171	186	124	171	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.42	0.10	0.07	0.87	0.13	0.62	0.29	0.06	0.64	0.68	1.55

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 162.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.55

Intersection Signal Delay: 70.3

Intersection LOS: E

Intersection Capacity Utilization 100.4%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩
Volume (vph)	443	1161	126	15	1696	122	42	44	10	70	104	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.058			0.211			0.621			0.725		
Satd. Flow (perm)	108	3539	1583	393	3539	1583	1157	1863	1583	1350	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			119			57			322
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	498	1304	142	17	1906	137	47	49	11	79	117	639
Shared Lane Traffic (%)												
Lane Group Flow (vph)	498	1304	142	17	1906	137	47	49	11	79	117	639
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	31.0	100.0	100.0	69.0	69.0	69.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	23.8%	76.9%	76.9%	53.1%	53.1%	53.1%	23.1%	23.1%	23.1%	23.1%	23.1%	23.1%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	95.3	94.9	94.9	63.9	63.9	63.9	24.9	24.9	24.9	24.9	24.9	24.9
Actuated g/C Ratio	0.73	0.73	0.73	0.49	0.49	0.49	0.19	0.19	0.19	0.19	0.19	0.19

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.20	0.50	0.12	0.09	1.10	0.16	0.21	0.14	0.03	0.31	0.33	1.13
Control Delay	147.5	8.3	1.0	19.2	85.2	4.7	47.3	44.9	0.2	49.0	48.4	104.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.5	8.3	1.0	19.2	85.2	4.7	47.3	44.9	0.2	49.0	48.4	104.7
LOS	F	A	A	B	F	A	D	D	A	D	D	F
Approach Delay		43.4			79.3			41.4				91.5
Approach LOS		D			E			D				F
Queue Length 50th (m)	-146.8	70.3	0.0	2.4	-305.5	2.4	10.8	11.1	0.0	18.5	27.5	-125.6
Queue Length 95th (m)	#213.4	82.5	5.2	7.1	#343.0	13.2	22.5	22.8	0.0	34.1	46.0	#196.7
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	415	2583	1193	193	1739	838	221	356	349	258	356	563
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.50	0.12	0.09	1.10	0.16	0.21	0.14	0.03	0.31	0.33	1.13

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 66.4

Intersection LOS: E

Intersection Capacity Utilization 100.7%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	459	1262	131	16	1853	128	44	46	11	74	109	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.038			0.188			0.416			0.723		
Satd. Flow (perm)	71	3539	1583	350	3539	1583	775	1863	1583	1347	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			117			45			289
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	516	1418	147	18	2082	144	49	52	12	83	122	669
Shared Lane Traffic (%)												
Lane Group Flow (vph)	516	1418	147	18	2082	144	49	52	12	83	122	669
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	39.7	145.1	145.1	105.1	105.1	105.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (%)	24.0%	87.8%	87.8%	63.6%	63.6%	63.6%	12.2%	12.2%	12.2%	12.2%	12.2%	12.2%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	140.2	139.8	139.8	100.1	100.1	100.1	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.85	0.85	0.85	0.61	0.61	0.61	0.09	0.09	0.09	0.09	0.09	0.09

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.23	0.47	0.11	0.08	0.97	0.14	0.70	0.31	0.07	0.68	0.72	1.65
Control Delay	167.3	3.8	0.4	14.8	44.5	3.7	117.5	75.5	0.6	99.3	96.3	324.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	3.8	0.4	14.8	44.5	3.7	117.5	75.5	0.6	99.3	96.3	324.6
LOS	F	A	A	B	D	A	F	E	A	F	F	F
Approach Delay		44.1			41.7			85.8				271.4
Approach LOS		D			D			F				F
Queue Length 50th (m)	-202.8	53.3	0.0	2.5	348.5	3.6	16.7	17.1	0.0	28.3	41.8	-239.1
Queue Length 95th (m)	#274.5	59.7	3.0	6.8	#391.4	12.9	#40.7	32.1	0.0	#53.6	#71.3	#315.1
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	420	3002	1365	212	2150	1008	70	169	184	122	169	406
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.47	0.11	0.08	0.97	0.14	0.70	0.31	0.07	0.68	0.72	1.65

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 165

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.65

Intersection Signal Delay: 81.4

Intersection LOS: F

Intersection Capacity Utilization 106.6%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

↰ p2	↱ p4
145.1 s	20.1 s
↰ p5	↱ p6
29.7 s	105.1 s
↰ p7	↱ p8
20.1 s	20.1 s

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	464	1272	133	16	1859	128	44	46	11	74	109	597
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.054			0.186			0.604			0.723		
Satd. Flow (perm)	101	3539	1583	346	3539	1583	1125	1863	1583	1347	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			106			53			320
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	521	1429	149	18	2089	144	49	52	12	83	122	671
Shared Lane Traffic (%)												
Lane Group Flow (vph)	521	1429	149	18	2089	144	49	52	12	83	122	671
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	33.0	107.0	107.0	74.0	74.0	74.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	23.6%	76.4%	76.4%	52.9%	52.9%	52.9%	23.6%	23.6%	23.6%	23.6%	23.6%	23.6%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	102.3	101.9	101.9	68.9	68.9	68.9	27.9	27.9	27.9	27.9	27.9	27.9
Actuated g/C Ratio	0.73	0.73	0.73	0.49	0.49	0.49	0.20	0.20	0.20	0.20	0.20	0.20

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.27	0.55	0.12	0.11	1.20	0.17	0.22	0.14	0.03	0.31	0.33	1.18
Control Delay	175.9	9.7	1.0	21.2	128.8	6.6	50.1	47.5	0.2	51.6	50.9	121.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	175.9	9.7	1.0	21.2	128.8	6.6	50.1	47.5	0.2	51.6	50.9	121.5
LOS	F	A	A	C	F	A	D	D	A	D	D	F
Approach Delay		50.3			120.1			43.6			105.0	
Approach LOS		D			F			D			F	
Queue Length 50th (m)	-175.1	90.1	0.0	2.7	-387.6	5.6	12.1	12.6	0.0	20.9	30.8	-154.0
Queue Length 95th (m)	#243.8	103.9	5.5	7.9	#422.3	17.3	24.5	24.9	0.0	37.4	49.9	#226.4
Internal Link Dist (m)		916.9			288.0			203.0			477.9	
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	411	2575	1192	170	1741	832	224	371	357	268	371	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.55	0.13	0.11	1.20	0.17	0.22	0.14	0.03	0.31	0.33	1.18

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.27

Intersection Signal Delay: 88.6

Intersection LOS: F

Intersection Capacity Utilization 106.9%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	480	1371	137	17	2015	134	46	48	11	77	114	623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.038			0.166			0.387			0.722		
Satd. Flow (perm)	71	3539	1583	309	3539	1583	721	1863	1583	1345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154			112			45			287
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	539	1540	154	19	2264	151	52	54	12	87	128	700
Shared Lane Traffic (%)												
Lane Group Flow (vph)	539	1540	154	19	2264	151	52	54	12	87	128	700
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	39.7	145.1	145.1	105.1	105.1	105.1	20.1	20.1	20.1	20.1	20.1	20.1
Total Split (%)	24.0%	87.8%	87.8%	63.6%	63.6%	63.6%	12.2%	12.2%	12.2%	12.2%	12.2%	12.2%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	140.3	139.9	139.9	100.2	100.2	100.2	15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.85	0.85	0.85	0.61	0.61	0.61	0.09	0.09	0.09	0.09	0.09	0.09

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.28	0.51	0.11	0.10	1.05	0.15	0.80	0.32	0.07	0.71	0.76	1.73
Control Delay	188.1	4.1	0.4	15.4	67.6	4.4	136.5	75.9	0.6	102.6	99.7	361.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.1	4.1	0.4	15.4	67.6	4.4	136.5	75.9	0.6	102.6	99.7	361.8
LOS	F	A	A	B	E	A	F	E	A	F	F	F
Approach Delay		48.2			63.2			94.9			300.5	
Approach LOS		D			E			F			F	
Queue Length 50th (m)	-220.1	61.3	0.0	2.6	-448.7	5.2	18.0	17.8	0.0	29.8	44.1	-263.5
Queue Length 95th (m)	#291.9	68.6	3.0	7.1	#477.4	14.9	#44.6	33.2	0.0	#58.0	#76.3	#338.9
Internal Link Dist (m)		916.9			288.0			203.0			477.9	
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	420	3001	1366	187	2150	1005	65	169	184	122	169	404
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.51	0.11	0.10	1.05	0.15	0.80	0.32	0.07	0.71	0.76	1.73

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 165.1

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.73

Intersection Signal Delay: 96.1

Intersection LOS: F

Intersection Capacity Utilization 112.9%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	485	1383	139	17	2021	134	46	48	11	77	114	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%			0%			0%			0%		
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.051			0.164			0.583			0.722		
Satd. Flow (perm)	95	3539	1583	305	3539	1583	1086	1863	1583	1345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			96			49			326
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	545	1554	156	19	2271	151	52	54	12	87	128	702
Shared Lane Traffic (%)												
Lane Group Flow (vph)	545	1554	156	19	2271	151	52	54	12	87	128	702
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	36.0	115.0	115.0	79.0	79.0	79.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	24.0%	76.7%	76.7%	52.7%	52.7%	52.7%	23.3%	23.3%	23.3%	23.3%	23.3%	23.3%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	110.3	109.9	109.9	73.9	73.9	73.9	29.9	29.9	29.9	29.9	29.9	29.9
Actuated g/C Ratio	0.74	0.73	0.73	0.49	0.49	0.49	0.20	0.20	0.20	0.20	0.20	0.20

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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.30	0.60	0.13	0.13	1.30	0.18	0.24	0.15	0.03	0.32	0.35	1.22
Control Delay	190.8	10.7	1.0	23.5	173.7	8.6	54.0	50.8	0.2	55.4	54.7	139.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	190.8	10.7	1.0	23.5	173.7	8.6	54.0	50.8	0.2	55.4	54.7	139.8
LOS	F	B	A	C	F	A	D	D	A	E	D	F
Approach Delay		53.6			162.3			47.1				119.9
Approach LOS		D			F			D				F
Queue Length 50th (m)	-202.1	110.5	0.0	3.2	-478.0	8.9	13.9	14.1	0.0	23.6	34.9	-182.6
Queue Length 95th (m)	#272.5	125.5	5.8	8.9	#509.4	21.6	27.3	27.1	0.0	40.9	55.2	#257.0
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	419	2592	1201	150	1743	828	216	371	354	268	371	576
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.60	0.13	0.13	1.30	0.18	0.24	0.15	0.03	0.32	0.35	1.22

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 110.4

Intersection LOS: F

Intersection Capacity Utilization 113.1%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street



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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site (Without RT traffic)

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩
Volume (vph)	485	1383	0	17	2021	0	46	48	0	77	114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1863	1770	3539	1863	1770	1863	1863	1770	1863	1863
Flt Permitted	0.047			0.164			0.490			0.722		
Satd. Flow (perm)	88	3539	1863	305	3539	1863	913	1863	1863	1345	1863	1863
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	545	1554	0	19	2271	0	52	54	0	87	128	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	545	1554	0	19	2271	0	52	54	0	87	128	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	37.0	122.9	122.9	85.9	85.9	85.9	27.1	27.1	27.1	27.1	27.1	27.1
Total Split (%)	24.7%	81.9%	81.9%	57.3%	57.3%	57.3%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min				None	None	None	None	None	None
Act Effect Green (s)	118.3	117.9		80.8	80.8		17.2	17.2		17.2	17.2	
Actuated g/C Ratio	0.81	0.81		0.56	0.56		0.12	0.12		0.12	0.12	

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site (Without RT traffic)

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.22	0.54		0.11	1.15		0.48	0.24		0.55	0.58	
Control Delay	159.3	5.7		18.6	106.5		74.9	60.4		73.3	71.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	159.3	5.7		18.6	106.5		74.9	60.4		73.3	71.3	
LOS	F	A		B	F		E	E		E	E	
Approach Delay		45.6			105.7			67.5			72.1	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	-187.5	71.1		2.7	-427.6		14.9	15.1		25.2	37.3	
Queue Length 95th (m)	#268.3	96.5		8.0	#481.6		29.8	29.0		43.7	59.1	
Internal Link Dist (m)		916.9			288.0			203.0			477.9	
Turn Bay Length (m)	85.0			65.0			75.0			45.0		
Base Capacity (vph)	445	2870		169	1969		138	282		203	282	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.22	0.54		0.11	1.15		0.38	0.19		0.43	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 145.3

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.22

Intersection Signal Delay: 76.5

Intersection LOS: E

Intersection Capacity Utilization 106.1%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2018 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	571	2138	26	14	995	77	131	85	31	155	48	441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.123			0.057			0.723			0.649		
Satd. Flow (perm)	229	3539	1583	106	3539	1583	1347	1863	1583	1209	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			22			84			45			447
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	621	2324	28	15	1082	84	142	92	34	168	52	479
Shared Lane Traffic (%)												
Lane Group Flow (vph)	621	2324	28	15	1082	84	142	92	34	168	52	479
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	49.7	125.1	125.1	75.1	75.1	75.1	40.1	40.1	40.1	40.1	40.1	40.1
Total Split (%)	30.1%	75.7%	75.7%	45.5%	45.5%	45.5%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	120.6	120.2	120.2	70.4	70.4	70.4	27.7	27.7	27.7	27.7	27.7	27.7
Actuated g/C Ratio	0.76	0.76	0.76	0.45	0.45	0.45	0.18	0.18	0.18	0.18	0.18	0.18

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2018 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.01	0.86	0.02	0.32	0.69	0.11	0.60	0.28	0.11	0.80	0.16	0.74
Control Delay	77.7	19.1	2.7	53.9	38.6	5.5	70.9	58.1	9.0	88.3	55.4	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.7	19.1	2.7	53.9	38.6	5.5	70.9	58.1	9.0	88.3	55.4	14.4
LOS	E	B	A	D	D	A	E	E	A	F	E	B
Approach Delay		31.2			36.5			58.7				35.2
Approach LOS		C			D			E				D
Queue Length 50th (m)	-181.6	267.0	0.5	3.2	152.0	0.0	43.8	26.7	0.0	53.9	14.8	9.0
Queue Length 95th (m)	#276.6	353.5	3.6	13.2	189.3	11.3	69.1	44.7	7.3	83.1	28.0	49.6
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	613	2690	1208	47	1576	751	298	413	386	268	413	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.86	0.02	0.32	0.69	0.11	0.48	0.22	0.09	0.63	0.13	0.69

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 158.1

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 34.4

Intersection LOS: C

Intersection Capacity Utilization 95.4%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	582	2224	27	14	1035	79	134	87	32	158	49	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.109			0.057			0.722			0.642		
Satd. Flow (perm)	203	3539	1583	106	3539	1583	1345	1863	1583	1196	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			22			86			45			444
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	633	2417	29	15	1125	86	146	95	35	172	53	489
Shared Lane Traffic (%)												
Lane Group Flow (vph)	633	2417	29	15	1125	86	146	95	35	172	53	489
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	49.7	125.1	125.1	75.1	75.1	75.1	40.1	40.1	40.1	40.1	40.1	40.1
Total Split (%)	30.1%	75.7%	75.7%	45.5%	45.5%	45.5%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	120.6	120.2	120.2	70.4	70.4	70.4	28.3	28.3	28.3	28.3	28.3	28.3
Actuated g/C Ratio	0.76	0.76	0.76	0.44	0.44	0.44	0.18	0.18	0.18	0.18	0.18	0.18

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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.06	0.90	0.02	0.32	0.72	0.11	0.61	0.29	0.11	0.81	0.16	0.76
Control Delay	91.9	22.1	2.8	54.1	40.0	5.5	71.1	58.0	9.4	89.9	55.3	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.9	22.1	2.8	54.1	40.0	5.5	71.1	58.0	9.4	89.9	55.3	15.8
LOS	F	C	A	D	D	A	E	E	A	F	E	B
Approach Delay		36.3			37.7			58.8				36.6
Approach LOS		D			D			E				D
Queue Length 50th (m)	-201.0	308.0	0.5	3.3	162.4	0.0	45.2	27.6	0.0	55.5	15.1	12.8
Queue Length 95th (m)	#294.0	399.4	3.7	13.2	199.8	11.3	70.7	46.0	7.6	85.5	28.6	56.2
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	599	2680	1204	47	1570	750	296	411	384	264	411	695
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.90	0.02	0.32	0.72	0.11	0.49	0.23	0.09	0.65	0.13	0.70

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 158.7

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 37.8

Intersection LOS: D

Intersection Capacity Utilization 98.0%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street



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Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	585	2234	27	14	1044	79	135	87	32	158	49	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.106			0.122			0.722			0.695		
Satd. Flow (perm)	197	3539	1583	227	3539	1583	1345	1863	1583	1295	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			86			74			495
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	636	2428	29	15	1135	86	147	95	35	172	53	495
Shared Lane Traffic (%)												
Lane Group Flow (vph)	636	2428	29	15	1135	86	147	95	35	172	53	495
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	35.0	72.9	72.9	37.9	37.9	37.9	27.1	27.1	27.1	27.1	27.1	27.1
Total Split (%)	35.0%	72.9%	72.9%	37.9%	37.9%	37.9%	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	68.3	67.9	67.9	32.9	32.9	32.9	18.3	18.3	18.3	18.3	18.3	18.3
Actuated g/C Ratio	0.71	0.70	0.70	0.34	0.34	0.34	0.19	0.19	0.19	0.19	0.19	0.19

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Synchro 8 Report
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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2020 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.00	0.97	0.03	0.19	0.94	0.14	0.58	0.27	0.10	0.70	0.15	0.71
Control Delay	64.2	28.3	2.0	32.1	47.6	6.1	44.9	34.9	1.7	52.2	32.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	28.3	2.0	32.1	47.6	6.1	44.9	34.9	1.7	52.2	32.9	9.3
LOS	E	C	A	C	D	A	D	C	A	D	C	A
Approach Delay		35.5			44.6			36.0			21.3	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	-121.3	226.7	0.0	2.2	117.2	0.0	26.4	16.0	0.0	31.8	8.7	0.0
Queue Length 95th (m)	#194.9	#319.7	2.7	8.3	#166.4	10.6	46.7	30.3	1.6	54.8	19.3	29.1
Internal Link Dist (m)		916.9			288.0			203.0			477.9	
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	634	2491	1123	77	1205	596	307	425	418	295	425	743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.97	0.03	0.19	0.94	0.14	0.48	0.22	0.08	0.58	0.12	0.67

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 96.5

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 35.7

Intersection LOS: D

Intersection Capacity Utilization 98.3%

ICU Level of Service F

Analysis Period (min) 15

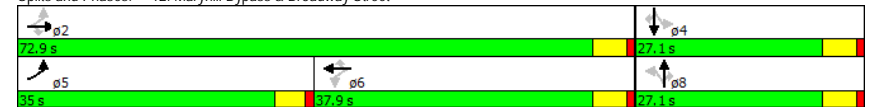
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street



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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	611	2437	28	15	1134	82	140	91	33	166	51	472
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.076			0.057			0.721			0.634		
Satd. Flow (perm)	142	3539	1583	106	3539	1583	1343	1863	1583	1181	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			21			83			45			439
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	664	2649	30	16	1233	89	152	99	36	180	55	513
Shared Lane Traffic (%)												
Lane Group Flow (vph)	664	2649	30	16	1233	89	152	99	36	180	55	513
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	49.7	125.1	125.1	75.1	75.1	75.1	40.1	40.1	40.1	40.1	40.1	40.1
Total Split (%)	30.1%	75.7%	75.7%	45.5%	45.5%	45.5%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	120.6	120.2	120.2	70.4	70.4	70.4	29.4	29.4	29.4	29.4	29.4	29.4
Actuated g/C Ratio	0.75	0.75	0.75	0.44	0.44	0.44	0.18	0.18	0.18	0.18	0.18	0.18

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.18	1.00	0.03	0.35	0.79	0.12	0.62	0.29	0.11	0.83	0.16	0.79
Control Delay	136.3	36.6	3.0	57.2	43.7	6.5	71.1	57.9	10.2	92.0	55.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.3	36.6	3.0	57.2	43.7	6.5	71.1	57.9	10.2	92.0	55.1	19.6
LOS	F	D	A	E	D	A	E	E	B	F	E	B
Approach Delay		56.1			41.4			58.9				39.6
Approach LOS		E			D			E				D
Queue Length 50th (m)	-248.6	-470.8	0.7	3.6	190.2	1.2	47.3	28.9	0.0	58.6	15.7	21.7
Queue Length 95th (m)	#338.4	#548.6	4.0	13.7	227.7	12.7	73.4	47.7	8.2	#93.1	29.5	71.5
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	565	2661	1195	46	1559	743	294	408	382	259	408	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.00	0.03	0.35	0.79	0.12	0.52	0.24	0.09	0.69	0.13	0.74

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 159.8

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 50.6

Intersection LOS: D

Intersection Capacity Utilization 104.3%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

Phase	Duration (s)
g2	125.1
g3	40.1
g4	40.1
g5	49.7
g6	75.1
g7	40.1
g8	40.1

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	614	2447	28	15	1143	82	141	91	33	166	51	477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.072			0.079			0.721			0.654		
Satd. Flow (perm)	134	3539	1583	147	3539	1583	1343	1863	1583	1218	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			89			57			503
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	667	2660	30	16	1242	89	153	99	36	180	55	518
Shared Lane Traffic (%)												
Lane Group Flow (vph)	667	2660	30	16	1242	89	153	99	36	180	55	518
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	47.0	102.9	102.9	55.9	55.9	55.9	27.1	27.1	27.1	27.1	27.1	27.1
Total Split (%)	36.2%	79.2%	79.2%	43.0%	43.0%	43.0%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	98.2	97.8	97.8	50.8	50.8	50.8	21.2	21.2	21.2	21.2	21.2	21.2
Actuated g/C Ratio	0.76	0.76	0.76	0.39	0.39	0.39	0.16	0.16	0.16	0.16	0.16	0.16

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2025 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.05	0.99	0.02	0.28	0.89	0.13	0.70	0.32	0.12	0.90	0.18	0.76
Control Delay	84.3	31.9	1.5	42.7	46.3	5.5	68.4	50.9	5.5	95.6	48.1	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.3	31.9	1.5	42.7	46.3	5.5	68.4	50.9	5.5	95.6	48.1	13.1
LOS	F	C	A	D	D	A	E	D	A	F	D	B
Approach Delay		42.0			43.5			54.5			35.4	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	-179.9	328.6	0.1	2.9	163.9	0.0	39.1	23.7	0.0	47.9	12.9	3.4
Queue Length 95th (m)	#256.7	#431.6	2.4	10.9	#198.6	11.0	#67.4	41.6	5.1	#91.3	25.7	42.6
Internal Link Dist (m)		916.9			288.0			203.0			477.9	
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	637	2679	1205	57	1391	676	228	317	317	207	317	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.99	0.02	0.28	0.89	0.13	0.67	0.31	0.11	0.87	0.17	0.76

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 129.2

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 42.1

Intersection LOS: D

Intersection Capacity Utilization 104.6%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩↩	↩	↩	↩↩	↩	↩	↩	↩	↩	↩	↩
Volume (vph)	640	2651	29	16	1234	86	147	95	35	174	54	494
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.053			0.057			0.719			0.628		
Satd. Flow (perm)	99	3539	1583	106	3539	1583	1339	1863	1583	1170	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			21			80			45			435
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	696	2882	32	17	1341	93	160	103	38	189	59	537
Shared Lane Traffic (%)												
Lane Group Flow (vph)	696	2882	32	17	1341	93	160	103	38	189	59	537
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	49.7	125.1	125.1	75.1	75.1	75.1	40.1	40.1	40.1	40.1	40.1	40.1
Total Split (%)	30.1%	75.7%	75.7%	45.5%	45.5%	45.5%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	120.5	120.1	120.1	70.4	70.4	70.4	30.9	30.9	30.9	30.9	30.9	30.9
Actuated g/C Ratio	0.75	0.74	0.74	0.44	0.44	0.44	0.19	0.19	0.19	0.19	0.19	0.19

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.29	1.09	0.03	0.37	0.87	0.13	0.62	0.29	0.11	0.84	0.17	0.82
Control Delay	183.1	70.8	3.2	60.2	49.1	7.7	71.0	57.6	11.1	93.3	54.9	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	183.1	70.8	3.2	60.2	49.1	7.7	71.0	57.6	11.1	93.3	54.9	23.5
LOS	F	E	A	E	D	A	E	E	B	F	D	C
Approach Delay		91.9			46.5			58.9				42.6
Approach LOS		F			D			E				D
Queue Length 50th (m)	-293.5	-599.5	1.0	4.0	223.5	2.6	50.2	30.1	0.0	62.2	16.8	33.9
Queue Length 95th (m)	#376.7	#633.5	4.2	14.9	258.4	14.5	77.1	49.3	9.0	#101.8	31.0	87.4
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	540	2635	1184	46	1544	735	290	404	378	253	404	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.09	0.03	0.37	0.87	0.13	0.55	0.25	0.10	0.75	0.15	0.79

Intersection Summary

Area Type: Other

Cycle Length: 165.2

Actuated Cycle Length: 161.3

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 73.3

Intersection Capacity Utilization 110.7%

Analysis Period (min) 15

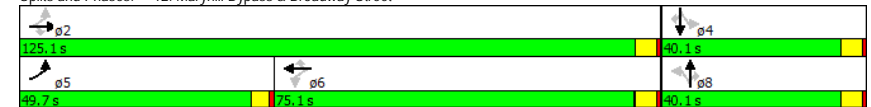
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	643	2661	29	16	1243	86	148	95	35	174	54	499
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%			0%			0%			0%		
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.067			0.073			0.719			0.626		
Satd. Flow (perm)	125	3539	1583	136	3539	1583	1339	1863	1583	1166	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			89			53			513
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		940.9			312.0			227.0			501.9	
Travel Time (s)		56.5			18.7			16.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	699	2892	32	17	1351	93	161	103	38	189	59	542
Shared Lane Traffic (%)												
Lane Group Flow (vph)	699	2892	32	17	1351	93	161	103	38	189	59	542
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	52.6	112.8	112.8	60.2	60.2	60.2	27.2	27.2	27.2	27.2	27.2	27.2
Total Split (%)	37.6%	80.6%	80.6%	43.0%	43.0%	43.0%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	108.1	107.7	107.7	55.1	55.1	55.1	22.1	22.1	22.1	22.1	22.1	22.1
Actuated g/C Ratio	0.77	0.77	0.77	0.39	0.39	0.39	0.16	0.16	0.16	0.16	0.16	0.16

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.06	1.06	0.03	0.32	0.97	0.14	0.76	0.35	0.13	1.03	0.20	0.80
Control Delay	90.0	54.4	1.4	49.4	59.7	6.2	79.7	56.4	7.7	130.4	53.4	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.0	54.4	1.4	49.4	59.7	6.2	79.7	56.4	7.7	130.4	53.4	15.6
LOS	F	D	A	D	E	A	E	E	A	F	D	B
Approach Delay		60.8			56.2			62.7				45.9
Approach LOS		E			E			E				D
Queue Length 50th (m)	-206.9	-487.1	0.2	3.4	201.6	0.7	45.5	27.1	0.0	-58.6	15.2	7.4
Queue Length 95th (m)	#286.1	#523.7	2.5	12.2	#253.2	12.3	#81.2	46.2	6.8	#110.0	29.3	51.9
Internal Link Dist (m)		916.9			288.0			203.0				477.9
Turn Bay Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		
Base Capacity (vph)	659	2722	1224	53	1392	676	211	294	294	184	294	681
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.06	0.03	0.32	0.97	0.14	0.76	0.35	0.13	1.03	0.20	0.80

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 57.9

Intersection LOS: E

Intersection Capacity Utilization 110.9%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

g2	g4
112.8 s	27.2 s
g5	g6
52.6 s	60.2 s
	27.2 s

























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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site (Without Right-turn traffic)

Timing Plan: Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	643	2661	0	16	1243	0	148	95	0	174	54	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%			0%			0%			0%		
Storage Length (m)	85.0		90.0	65.0		120.0	75.0		75.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1863	1770	3539	1863	1770	1863	1863	1770	1863	1863
Flt Permitted	0.067			0.072			0.719			0.626		
Satd. Flow (perm)	125	3539	1863	134	3539	1863	1339	1863	1863	1166	1863	1863
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60			60			50			50		
Link Distance (m)	940.9			312.0			227.0			501.9		
Travel Time (s)	56.5			18.7			16.3			36.1		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%			0%			0%			0%		
Adj. Flow (vph)	699	2892	0	17	1351	0	161	103	0	189	59	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	699	2892	0	17	1351	0	161	103	0	189	59	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.7	21.1	21.1	21.1	21.1	21.1	27.1	27.1	27.1	12.1	12.1	12.1
Total Split (s)	52.4	112.9	112.9	60.5	60.5	60.5	27.1	27.1	27.1	27.1	27.1	27.1
Total Split (%)	37.4%	80.6%	80.6%	43.2%	43.2%	43.2%	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%
Yellow Time (s)	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	Min	Min	Min	Min	Min	None	None	None	None	None	None
Act Effect Green (s)	108.2	107.8		55.4	55.4		22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.77	0.77		0.40	0.40		0.16	0.16		0.16	0.16	

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Lanes, Volumes, Timings

12: Maryhill Bypass & Broadway Street

2030 Base + Site (Without Right-turn traffic)

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.06	1.06		0.32	0.96		0.77	0.35		1.03	0.20	
Control Delay	91.1	53.9		49.3	58.4		80.2	56.6		131.9	53.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.1	53.9		49.3	58.4		80.2	56.6		131.9	53.5	
LOS	F	D		D	E		F	E		F	D	
Approach Delay	61.1			58.3			71.0			113.2		
Approach LOS	E			E			E			F		
Queue Length 50th (m)	-207.6	-486.7		3.4	200.8		45.6	27.2		-58.9	15.2	
Queue Length 95th (m)	#286.7	#523.3		12.3	#252.0		#81.5	46.3		#110.3	29.4	
Internal Link Dist (m)	916.9			288.0			203.0			477.9		
Turn Bay Length (m)	85.0			65.0			75.0			45.0		
Base Capacity (vph)	657	2725		53	1400		210	292		183	292	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.06	1.06		0.32	0.96		0.77	0.35		1.03	0.20	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 63.2

Intersection LOS: E

Intersection Capacity Utilization 110.9%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 12: Maryhill Bypass & Broadway Street

g2	g4
112.9 s	27.1 s
g5	g6
52.4 s	60.5 s
	27.1 s

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2018 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	100	1491	9	5	2135	82	2	2	11	156	3	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%				0%
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5				7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.871			0.852	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1622	0	1770	1587	0
Flt Permitted	0.950			0.950			0.207			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	385	1622	0	1393	1587	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64			64		12			115	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	112	1675	10	6	2399	92	2	2	12	175	3	276
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1675	10	6	2399	92	2	14	0	175	279	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.3	95.8	95.8	15.5	95.8	95.8	25.7	25.7		25.7	25.7	
Total Split (%)	11.2%	69.9%	69.9%	11.3%	69.9%	69.9%	18.8%	18.8%		18.8%	18.8%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	10.0	102.8	102.8	6.3	90.0	90.0	19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.07	0.75	0.75	0.05	0.66	0.66	0.14	0.14		0.14	0.14	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2018 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.86	0.63	0.01	0.07	1.03	0.09	0.04	0.06		0.89	0.86	
Control Delay	111.3	9.8	0.0	64.2	49.0	3.4	52.0	26.0		97.3	58.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	111.3	9.8	0.0	64.2	49.0	3.4	52.0	26.0		97.3	58.2	
LOS	F	A	A	E	D	A	D	C		F	E	
Approach Delay		16.0			47.3			29.3			73.3	
Approach LOS		B			D			C			E	
Queue Length 50th (m)	32.1	94.8	0.0	1.7	-383.7	2.6	0.5	0.5		49.3	47.1	
Queue Length 95th (m)	#67.5	162.8	0.0	6.7	#416.0	8.7	3.1	7.3		#90.4	#93.9	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	130	2672	1211	130	2344	1070	56	248		204	331	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.86	0.63	0.01	0.05	1.02	0.09	0.04	0.06		0.86	0.84	

Intersection Summary

Area Type: Other

Cycle Length: 137

Actuated Cycle Length: 136.2

Natural Cycle: 150

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 37.9

Intersection LOS: D

Intersection Capacity Utilization 93.9%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	102	1551	9	5	2220	84	2	2	11	159	3	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%				0%
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.871			0.852	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1622	0	1770	1587	0
Flt Permitted	0.950			0.950			0.205			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	381	1622	0	1393	1587	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64			64		12			114	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	115	1743	10	6	2494	94	2	2	12	179	3	282
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1743	10	6	2494	94	2	14	0	179	285	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.3	95.8	95.8	15.5	95.8	95.8	25.7	25.7		25.7	25.7	
Total Split (%)	11.2%	69.9%	69.9%	11.3%	69.9%	69.9%	18.8%	18.8%		18.8%	18.8%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	10.0	102.8	102.8	6.3	90.0	90.0	19.5	19.5		19.5	19.5	
Actuated g/C Ratio	0.07	0.75	0.75	0.05	0.66	0.66	0.14	0.14		0.14	0.14	

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Creative Transportation Solutions Ltd

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.89	0.65	0.01	0.07	1.07	0.09	0.04	0.06		0.90	0.88	
Control Delay	115.9	10.3	0.0	64.2	63.5	3.4	52.0	26.0		99.8	61.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	115.9	10.3	0.0	64.2	63.5	3.4	52.0	26.0		99.8	61.3	
LOS	F	B	A	E	E	A	D	C		F	E	
Approach Delay		16.7			61.4			29.3			76.1	
Approach LOS		B			E			C			E	
Queue Length 50th (m)	33.0	102.4	0.0	1.7	-413.2	2.8	0.5	0.5		50.6	49.5	
Queue Length 95th (m)	#69.3	175.9	0.0	6.7	#444.3	9.0	3.1	7.3		#93.4	#98.0	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	129	2669	1209	129	2342	1069	55	248		204	330	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.89	0.65	0.01	0.05	1.06	0.09	0.04	0.06		0.88	0.86	

Intersection Summary

Area Type: Other

Cycle Length: 137

Actuated Cycle Length: 136.3

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 45.8

Intersection LOS: D

Intersection Capacity Utilization 96.7%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↩	↩↩	↩	↩	↩↩	↩	↩	↩	↩	↩	↩	↩
Volume (vph)	107	1551	9	5	2220	92	2	2	11	176	3	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.871			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1622	0	1770	1585	0
Flt Permitted	0.950			0.950			0.153			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	285	1622	0	1393	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			60		12			69	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	120	1743	10	6	2494	103	2	2	12	198	3	304
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	1743	10	6	2494	103	2	14	0	198	307	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.0	104.8	104.8	11.5	101.3	101.3	33.7	33.7		33.7	33.7	
Total Split (%)	10.0%	69.9%	69.9%	7.7%	67.5%	67.5%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	9.7	108.3	108.3	6.0	95.6	95.6	26.2	26.2		26.2	26.2	
Actuated g/C Ratio	0.07	0.73	0.73	0.04	0.64	0.64	0.18	0.18		0.18	0.18	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.04	0.67	0.01	0.08	1.09	0.10	0.04	0.05		0.80	0.91	
Control Delay	159.7	13.2	0.0	72.0	76.7	5.0	52.5	25.1		82.4	77.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	159.7	13.2	0.0	72.0	76.7	5.0	52.5	25.1		82.4	77.2	
LOS	F	B	A	E	E	A	D	C		F	E	
Approach Delay		22.5			73.9			28.5			79.3	
Approach LOS		C			E			C			E	
Queue Length 50th (m)	-40.8	134.6	0.0	1.9	-467.1	4.8	0.5	0.5		59.5	75.0	
Queue Length 95th (m)	#83.0	203.9	0.0	7.2	#495.5	12.1	3.2	7.1		#95.4	#126.5	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	115	2584	1171	71	2280	1041	54	316		263	355	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.04	0.67	0.01	0.08	1.09	0.10	0.04	0.04		0.75	0.86	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 148.3

Natural Cycle: 150

Control Type: Semi Act-Uncooord

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 55.0

Intersection LOS: E

Intersection Capacity Utilization 98.2%

ICU Level of Service F

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	107	1700	10	5	2434	88	2	2	12	167	3	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.870			0.852	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1621	0	1770	1587	0
Flt Permitted	0.950			0.950			0.200			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	372	1621	0	1393	1587	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64			64						112
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	120	1910	11	6	2735	99	2	2	13	188	3	296
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	1910	11	6	2735	99	2	15	0	188	299	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.3	95.8	95.8	15.5	95.8	95.8	25.7	25.7		25.7	25.7	
Total Split (%)	11.2%	69.9%	69.9%	11.3%	69.9%	69.9%	18.8%	18.8%		18.8%	18.8%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	10.0	102.8	102.8	6.3	90.0	90.0	20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.07	0.75	0.75	0.05	0.66	0.66	0.15	0.15		0.15	0.15	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.93	0.72	0.01	0.07	1.17	0.09	0.04	0.06		0.93	0.91	
Control Delay	124.7	11.9	0.0	64.2	108.0	3.6	52.5	24.8		104.3	68.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	124.7	11.9	0.0	64.2	108.0	3.6	52.5	24.8		104.3	68.2	
LOS	F	B	A	E	F	A	D	C		F	E	
Approach Delay		18.5			104.2			28.1			82.1	
Approach LOS		B			F			C			F	
Queue Length 50th (m)	34.6	124.1	0.0	1.7	-488.1	3.3	0.5	0.5		53.6	54.9	
Queue Length 95th (m)	#73.4	211.6	0.0	6.7	#516.7	9.6	3.1	7.6		#99.9	#108.6	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	129	2660	1205	129	2334	1065	54	248		203	327	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.93	0.72	0.01	0.05	1.17	0.09	0.04	0.06		0.93	0.91	

Intersection Summary

Area Type: Other

Cycle Length: 137

Actuated Cycle Length: 136.8

Natural Cycle: 150

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.17

Intersection Signal Delay: 69.5

Intersection LOS: E

Intersection Capacity Utilization 103.6%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	112	1700	10	5	2434	96	2	2	12	184	3	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%				0%
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.870			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1621	0	1770	1585	0
Flt Permitted	0.950			0.950			0.148			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	275	1621	0	1393	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			60		13			67	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	126	1910	11	6	2735	108	2	2	13	207	3	318
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	1910	11	6	2735	108	2	15	0	207	321	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.0	104.8	104.8	11.5	101.3	101.3	33.7	33.7		33.7	33.7	
Total Split (%)	10.0%	69.9%	69.9%	7.7%	67.5%	67.5%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	9.7	108.2	108.2	6.0	95.5	95.5	27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.07	0.73	0.73	0.04	0.64	0.64	0.18	0.18		0.18	0.18	

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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base + Site

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.10	0.74	0.01	0.08	1.21	0.10	0.04	0.05		0.82	0.94	
Control Delay	174.1	15.3	0.0	72.0	123.9	5.2	52.5	24.2		83.8	82.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	174.1	15.3	0.0	72.0	123.9	5.2	52.5	24.2		83.8	82.6	
LOS	F	B	A	E	F	A	D	C		F	F	
Approach Delay		25.0			119.3			27.6			83.1	
Approach LOS		C			F			C			F	
Queue Length 50th (m)	-44.6	162.7	0.0	1.9	-549.5	5.4	0.5	0.5		62.7	81.0	
Queue Length 95th (m)	#87.5	245.6	0.0	7.2	#574.7	12.9	3.2	7.4		#101.9	#137.4	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	115	2570	1165	71	2268	1036	51	315		262	352	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.10	0.74	0.01	0.08	1.21	0.10	0.04	0.05		0.79	0.91	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 149

Natural Cycle: 150

Control Type: Semi Act-Uncooord

Maximum v/c Ratio: 1.21

Intersection Signal Delay: 80.0

Intersection LOS: F

Intersection Capacity Utilization 105.2%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Creative Transportation Solutions Ltd

Synchro 8 Report
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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	112	1849	10	6	2647	92	2	2	12	175	3	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.870			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1621	0	1770	1585	0
Flt Permitted	0.950			0.950			0.200			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	372	1621	0	1393	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64			64		13			111	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	126	2078	11	7	2974	103	2	2	13	197	3	310
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	2078	11	7	2974	103	2	15	0	197	313	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.3	95.8	95.8	15.5	95.8	95.8	25.7	25.7		25.7	25.7	
Total Split (%)	11.2%	69.9%	69.9%	11.3%	69.9%	69.9%	18.8%	18.8%		18.8%	18.8%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	10.0	102.7	102.7	6.4	90.0	90.0	20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.07	0.75	0.75	0.05	0.66	0.66	0.15	0.15		0.15	0.15	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.98	0.78	0.01	0.09	1.28	0.10	0.04	0.06		0.97	0.96	
Control Delay	135.6	13.9	0.0	64.3	152.9	3.8	52.5	24.8		113.6	77.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	135.6	13.9	0.0	64.3	152.9	3.8	52.5	24.8		113.6	77.9	
LOS	F	B	A	E	F	A	D	C		F	E	
Approach Delay		20.8			147.7			28.1			91.7	
Approach LOS		C			F			C			F	
Queue Length 50th (m)	36.4	150.3	0.0	2.0	-562.4	3.6	0.5	0.5		56.5	60.1	
Queue Length 95th (m)	#78.1	258.0	0.0	7.3	#587.8	10.1	3.1	7.6		#105.2	#118.2	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	129	2658	1205	129	2333	1065	54	248		203	326	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.98	0.78	0.01	0.05	1.27	0.10	0.04	0.06		0.97	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 137

Actuated Cycle Length: 136.8

Natural Cycle: 150

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.28

Intersection Signal Delay: 94.2

Intersection LOS: F

Intersection Capacity Utilization 110.6%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings
6: Pitt River Rd & Maryhill Bypass

2030 Base + Site
Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	117	1849	10	6	2647	100	2	2	12	192	3	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5		7.5				7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850		0.870			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1621	0	1770	1585	0
Flt Permitted	0.950			0.950			0.143			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	266	1621	0	1393	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			60						
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	131	2078	11	7	2974	112	2	2	13	216	3	333
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	2078	11	7	2974	112	2	15	0	216	336	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.0	104.8	104.8	11.5	101.3	101.3	33.7	33.7		33.7	33.7	
Total Split (%)	10.0%	69.9%	69.9%	7.7%	67.5%	67.5%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	9.7	108.2	108.2	6.0	95.5	95.5	27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.06	0.72	0.72	0.04	0.64	0.64	0.19	0.19		0.19	0.19	

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Lanes, Volumes, Timings
6: Pitt River Rd & Maryhill Bypass

2030 Base + Site
Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.15	0.81	0.01	0.10	1.32	0.11	0.04	0.05		0.83	0.97	
Control Delay	188.6	18.2	0.0	72.7	173.5	5.3	53.0	24.2		84.8	88.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	188.6	18.2	0.0	72.7	173.5	5.3	53.0	24.2		84.8	88.1	
LOS	F	B	A	E	F	A	D	C		F	F	
Approach Delay		28.2			167.2			27.6			86.8	
Approach LOS		C			F			C			F	
Queue Length 50th (m)	-47.9	197.2	0.0	2.2	-631.1	5.8	0.5	0.5		65.9	87.2	
Queue Length 95th (m)	#91.4	297.6	0.0	7.8	#653.0	13.4	3.2	7.4		#108.4	#149.1	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	114	2554	1159	70	2254	1030	49	313		260	349	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.15	0.81	0.01	0.10	1.32	0.11	0.04	0.05		0.83	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 149.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 106.8

Intersection LOS: F

Intersection Capacity Utilization 112.1%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site (Without RT traffic)

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	117	1849	10	6	2647	0	2	2	12	192	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt			0.850					0.870				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1863	1770	1621	0	1770	1863	0
Flt Permitted	0.950			0.950			0.756			0.748		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1863	1404	1621	0	1393	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60					13				
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	131	2078	11	7	2974	0	2	2	13	216	3	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	2078	11	7	2974	0	2	15	0	216	3	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.3	29.8	29.8	11.5	29.8	29.8	33.7	33.7		33.7	33.7	
Total Split (s)	15.0	104.8	104.8	11.5	101.3	101.3	33.7	33.7		33.7	33.7	
Total Split (%)	10.0%	69.9%	69.9%	7.7%	67.5%	67.5%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	9.7	108.2	108.2	6.0	95.5		26.1	26.1		26.1	26.1	
Actuated g/C Ratio	0.07	0.73	0.73	0.04	0.64		0.18	0.18		0.18	0.18	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site (Without RT traffic)

Timing Plan: Weekday AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.14	0.80	0.01	0.10	1.30		0.01	0.05		0.88	0.01	
Control Delay	183.7	17.4	0.0	72.5	165.9		50.0	24.2		93.0	50.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	183.7	17.4	0.0	72.5	165.9		50.0	24.2		93.0	50.0	
LOS	F	B	A	E	F		D	C		F	D	
Approach Delay		27.1			165.7			27.3			92.4	
Approach LOS		C			F			C			F	
Queue Length 50th (m)	-47.9	197.2	0.0	2.2	-631.1		0.5	0.5		65.9	0.8	
Queue Length 95th (m)	#91.4	297.6	0.0	7.8	#653.0		3.1	7.4		#108.4	3.9	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0								
Base Capacity (vph)	115	2586	1173	71	2282		265	317		263	352	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.14	0.80	0.01	0.10	1.30		0.01	0.05		0.82	0.01	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 148.1

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 105.7

Intersection LOS: F

Intersection Capacity Utilization 111.0%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2018 Base
Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Volume (vph)	170	2601	31	12	1363	192	10	20	41	93	9	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.899			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1659	0	1770	1575	0
Flt Permitted	0.950			0.950			0.521			0.664		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	960	1659	0	1234	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			43			71		39			88	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	185	2827	34	13	1482	209	11	22	45	101	10	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	2827	34	13	1482	209	11	67	0	101	98	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	55.3	165.8	165.8	15.5	125.8	125.8	25.7	25.7		25.7	25.7	
Total Split (%)	26.7%	80.1%	80.1%	7.5%	60.8%	60.8%	12.4%	12.4%		12.4%	12.4%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	27.9	160.2	160.2	7.1	134.8	134.8	19.2	19.2		19.2	19.2	
Actuated g/C Ratio	0.14	0.81	0.81	0.04	0.68	0.68	0.10	0.10		0.10	0.10	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2018 Base
Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.75	0.99	0.03	0.21	0.62	0.19	0.12	0.34		0.86	0.42	
Control Delay	100.3	33.9	0.8	102.8	19.9	8.7	87.8	44.9		137.1	24.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	100.3	33.9	0.8	102.8	19.9	8.7	87.8	44.9		137.1	24.3	
LOS	F	C	A	F	B	A	F	D		F	C	
Approach Delay		37.6			19.1			51.0			81.6	
Approach LOS		D			B			D			F	
Queue Length 50th (m)	77.8	-672.7	0.0	5.6	176.8	19.9	4.4	11.3		43.5	4.0	
Queue Length 95th (m)	106.0	#709.4	2.2	14.7	224.7	36.5	12.8	30.3		#83.7	25.7	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	446	2853	1284	89	2400	1096	96	202		124	237	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.41	0.99	0.03	0.15	0.62	0.19	0.11	0.33		0.81	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 207

Actuated Cycle Length: 198.7

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 33.3

Intersection LOS: C

Intersection Capacity Utilization 105.0%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base
Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	173	2705	32	12	1418	196	10	20	42	95	9	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.899			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1659	0	1770	1575	0
Flt Permitted	0.950			0.950			0.514			0.660		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	947	1659	0	1227	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			43			71		40			90	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	188	2940	35	13	1541	213	11	22	46	103	10	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	188	2940	35	13	1541	213	11	68	0	103	100	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	55.3	165.8	165.8	15.5	125.8	125.8	25.7	25.7		25.7	25.7	
Total Split (%)	26.7%	80.1%	80.1%	7.5%	60.8%	60.8%	12.4%	12.4%		12.4%	12.4%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	28.3	160.2	160.2	7.1	134.4	134.4	19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.14	0.81	0.81	0.04	0.68	0.68	0.10	0.10		0.10	0.10	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base
Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.75	1.03	0.03	0.21	0.64	0.20	0.12	0.35		0.87	0.43	
Control Delay	100.0	45.4	0.9	102.8	20.9	8.9	87.9	44.3		139.0	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	100.0	45.4	0.9	102.8	20.9	8.9	87.9	44.3		139.0	24.1	
LOS	F	D	A	F	C	A	F	D		F	C	
Approach Delay		48.2			20.0			50.4			82.4	
Approach LOS		D			C			D			F	
Queue Length 50th (m)	79.1	~725.6	0.0	5.6	190.2	20.7	4.4	11.3		44.5	4.0	
Queue Length 95th (m)	107.2	#760.5	2.3	14.7	241.4	37.8	12.8	30.8		#86.7	26.2	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	445	2850	1283	88	2392	1092	95	203		123	239	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.42	1.03	0.03	0.15	0.64	0.20	0.12	0.33		0.84	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 207

Actuated Cycle Length: 198.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 40.0

Intersection LOS: D

Intersection Capacity Utilization 107.9%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	195	2705	32	12	1418	211	10	21	42	108	9	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.900			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1661	0	1770	1578	0
Flt Permitted	0.950			0.950			0.604			0.712		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1116	1661	0	1324	1578	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			98		46			98	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	212	2940	35	13	1541	229	11	23	46	117	10	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	2940	35	13	1541	229	11	69	0	117	108	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	27.0	102.3	102.3	14.0	89.3	89.3	33.7	33.7		33.7	33.7	
Total Split (%)	18.0%	68.2%	68.2%	9.3%	59.5%	59.5%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	20.7	104.7	104.7	6.8	83.7	83.7	18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.15	0.75	0.75	0.05	0.60	0.60	0.13	0.13		0.13	0.13	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2020 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.81	1.11	0.03	0.15	0.73	0.23	0.07	0.26		0.66	0.37	
Control Delay	81.6	75.6	0.7	70.2	23.6	8.7	53.1	24.7		75.9	15.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	81.6	75.6	0.7	70.2	23.6	8.7	53.1	24.7		75.9	15.5	
LOS	F	E	A	E	C	A	D	C		E	B	
Approach Delay		75.2			22.1			28.6			46.9	
Approach LOS		E			C			C			D	
Queue Length 50th (m)	60.4	-494.5	0.0	3.7	162.8	16.2	2.9	6.0		33.1	2.6	
Queue Length 95th (m)	#108.7	#646.8	1.6	11.7	223.2	34.8	9.1	20.5		55.1	20.3	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	275	2647	1198	107	2116	986	223	370		265	394	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.77	1.11	0.03	0.12	0.73	0.23	0.05	0.19		0.44	0.27	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 140

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 55.3

Intersection LOS: E

Intersection Capacity Utilization 108.5%

ICU Level of Service G

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	182	2965	33	13	1554	205	11	21	44	100	10	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.899			0.866	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1659	0	1770	1577	0
Flt Permitted	0.950			0.950			0.493			0.648		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	909	1659	0	1205	1577	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			43			71		40			95	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	198	3223	36	14	1689	223	12	23	48	109	11	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	3223	36	14	1689	223	12	71	0	109	106	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	55.3	165.8	165.8	15.5	125.8	125.8	25.7	25.7		25.7	25.7	
Total Split (%)	26.7%	80.1%	80.1%	7.5%	60.8%	60.8%	12.4%	12.4%		12.4%	12.4%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	29.5	160.2	160.2	7.3	133.4	133.4	20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.15	0.80	0.80	0.04	0.67	0.67	0.10	0.10		0.10	0.10	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.76	1.14	0.03	0.22	0.71	0.21	0.13	0.35		0.91	0.44	
Control Delay	100.1	87.4	0.9	103.2	24.0	9.5	88.5	46.0		145.8	23.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	100.1	87.4	0.9	103.2	24.0	9.5	88.5	46.0		145.8	23.9	
LOS	F	F	A	F	C	A	F	D		F	C	
Approach Delay		87.2			22.9			52.2			85.7	
Approach LOS		F			C			D			F	
Queue Length 50th (m)	83.3	-858.7	0.0	6.0	229.8	22.8	4.8	12.5		47.4	4.4	
Queue Length 95th (m)	112.4	#890.4	2.4	15.6	290.1	41.0	13.3	32.2		#94.1	27.1	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	443	2838	1278	88	2363	1080	91	202		120	243	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.45	1.14	0.03	0.16	0.71	0.21	0.13	0.35		0.91	0.44	

Intersection Summary

Area Type: Other

Cycle Length: 207

Actuated Cycle Length: 199.7

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 64.8

Intersection Capacity Utilization 115.4%

Intersection LOS: E
ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	204	2965	33	13	1554	220	11	22	44	113	10	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%			0%			0%			0%		
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.900			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1661	0	1770	1580	0
Flt Permitted	0.950			0.950			0.590			0.710		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1090	1661	0	1321	1580	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			98			48			102
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	222	3223	36	14	1689	239	12	24	48	123	11	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	222	3223	36	14	1689	239	12	72	0	123	113	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	28.0	102.3	102.3	14.0	88.3	88.3	33.7	33.7		33.7	33.7	
Total Split (%)	18.7%	68.2%	68.2%	9.3%	58.9%	58.9%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	21.6	104.5	104.5	6.9	82.7	82.7	19.2	19.2		19.2	19.2	
Actuated g/C Ratio	0.15	0.74	0.74	0.05	0.59	0.59	0.14	0.14		0.14	0.14	

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2025 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.82	1.22	0.03	0.16	0.81	0.25	0.08	0.27		0.68	0.37	
Control Delay	81.5	124.9	0.8	70.6	27.8	9.4	53.1	24.4		76.7	15.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	81.5	124.9	0.8	70.6	27.8	9.4	53.1	24.4		76.7	15.5	
LOS	F	F	A	E	C	A	D	C		E	B	
Approach Delay		120.9			25.9			28.5			47.4	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	63.5	-590.1	0.0	4.0	199.2	18.1	3.1	6.3		35.0	2.9	
Queue Length 95th (m)	#113.0	#742.9	1.7	12.3	269.1	38.0	9.6	21.1		57.6	20.9	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	286	2634	1193	107	2085	973	218	370		264	397	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.78	1.22	0.03	0.13	0.81	0.25	0.06	0.19		0.47	0.28	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 140.4

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.22

Intersection Signal Delay: 84.4

Intersection LOS: F

Intersection Capacity Utilization 115.9%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	190	3225	35	13	1690	215	11	22	46	104	10	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%				0%
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.899			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1659	0	1770	1575	0
Flt Permitted	0.950			0.950			0.475			0.634		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	876	1659	0	1179	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			43			71		40			99	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)	0%				0%			0%			0%	
Adj. Flow (vph)	207	3505	38	14	1837	234	12	24	50	113	11	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	207	3505	38	14	1837	234	12	74	0	113	110	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	55.3	165.8	165.8	15.5	125.8	125.8	25.7	25.7		25.7	25.7	
Total Split (%)	26.7%	80.1%	80.1%	7.5%	60.8%	60.8%	12.4%	12.4%		12.4%	12.4%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	30.5	160.2	160.2	7.3	132.4	132.4	20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.15	0.80	0.80	0.04	0.66	0.66	0.10	0.10		0.10	0.10	

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Creative Transportation Solutions Ltd

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.77	1.24	0.03	0.22	0.78	0.22	0.14	0.37		0.96	0.45	
Control Delay	99.9	131.1	1.1	103.2	27.6	10.1	88.8	47.6		157.5	23.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	99.9	131.1	1.1	103.2	27.6	10.1	88.8	47.6		157.5	23.5	
LOS	F	F	A	F	C	B	F	D		F	C	
Approach Delay		128.0			26.1			53.4			91.4	
Approach LOS		F			C			D			F	
Queue Length 50th (m)	87.0	-990.7	0.0	6.0	276.2	25.2	4.8	13.7		49.5	4.4	
Queue Length 95th (m)	116.0	#1017.8	2.7	15.6	347.1	44.5	13.3	34.0		#98.9	27.6	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	443	2838	1278	88	2346	1073	87	202		118	247	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.47	1.24	0.03	0.16	0.78	0.22	0.14	0.37		0.96	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 207

Actuated Cycle Length: 199.7

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.24

Intersection Signal Delay: 91.1

Intersection LOS: F

Intersection Capacity Utilization 122.7%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass

g1	g2	g4
15.5 s	165.8 s	25.7 s
g5	g6	
55.3 s	125.8 s	

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Creative Transportation Solutions Ltd

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Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	212	3225	35	13	1690	230	11	23	46	117	10	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00	0.98	
Frt			0.850			0.850		0.900			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1661	0	1770	1578	0
Flt Permitted	0.950			0.950			0.574			0.708		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1061	1661	0	1317	1578	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			98						107
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	230	3505	38	14	1837	250	12	25	50	127	11	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	230	3505	38	14	1837	250	12	75	0	127	118	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	25.0	102.3	102.3	14.0	91.3	91.3	33.7	33.7		33.7	33.7	
Total Split (%)	16.7%	68.2%	68.2%	9.3%	60.9%	60.9%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	19.7	105.5	105.5	6.9	85.6	85.6	19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.14	0.74	0.74	0.05	0.60	0.60	0.14	0.14		0.14	0.14	

5776 - Greystone Mixed Use TIA
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Synchro 8 Report
Page 1

Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.93	1.33	0.03	0.16	0.86	0.25	0.08	0.27		0.70	0.38	
Control Delay	103.3	173.5	0.9	70.9	29.3	9.0	53.1	24.3		78.0	15.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	103.3	173.5	0.9	70.9	29.3	9.0	53.1	24.3		78.0	15.1	
LOS	F	F	A	E	C	A	D	C		E	B	
Approach Delay		167.4			27.2			28.3			47.7	
Approach LOS		F			C			C			D	
Queue Length 50th (m)	68.2	-684.7	0.0	4.1	224.4	18.8	3.1	6.6		36.3	2.9	
Queue Length 95th (m)	#130.3	#835.5	2.0	12.3	301.9	38.2	9.6	22.0		59.4	21.2	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0		40.0						
Base Capacity (vph)	246	2631	1192	106	2135	994	209	368		260	397	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.93	1.33	0.03	0.13	0.86	0.25	0.06	0.20		0.49	0.30	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 141.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 113.3

Intersection LOS: F

Intersection Capacity Utilization 123.3%

ICU Level of Service H

Analysis Period (min) 15

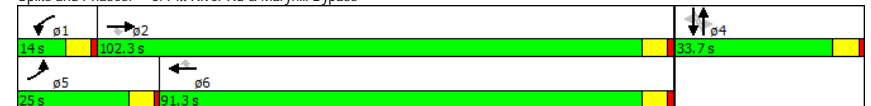
- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



5776 - Greystone Mixed Use TIA
Creative Transportation Solutions Ltd

Synchro 8 Report
Page 2

Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site (Without Right-turn traffic)

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	212	3225	35	13	1690	0	11	23	46	117	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)	0%				0%			0%			0%	
Storage Length (m)	130.0		90.0	60.0		40.0	0.0		0.0	0.0		15.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.99	0.99		1.00		
Frt			0.850					0.900				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1863	1770	1661	0	1770	1863	0
Flt Permitted	0.950			0.950			0.750			0.708		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1863	1384	1661	0	1317	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60					50				
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		359.1			940.9			79.8			69.1	
Travel Time (s)		18.5			48.4			5.7			5.0	
Confl. Peds. (#/hr)							6		1	1		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	230	3505	38	14	1837	0	12	25	50	127	11	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	230	3505	38	14	1837	0	12	75	0	127	11	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4			4		
Detector Phase	5	2	2	1	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	29.8	29.8	14.0	23.8	23.8	33.7	33.7		33.7	33.7	
Total Split (s)	25.0	102.3	102.3	14.0	91.3	91.3	33.7	33.7		33.7	33.7	
Total Split (%)	16.7%	68.2%	68.2%	9.3%	60.9%	60.9%	22.5%	22.5%		22.5%	22.5%	
Yellow Time (s)	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.3	1.3	1.0	1.3	1.3	1.2	1.2		1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.8	5.8	5.5	5.8	5.8	5.7	5.7		5.7	5.7	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	Max	Max	None	None		None	None	
Act Effect Green (s)	19.7	105.5	105.5	6.9	85.6		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.14	0.74	0.74	0.05	0.60		0.14	0.14		0.14	0.14	

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Synchro 8 Report
Page 1

Lanes, Volumes, Timings

6: Pitt River Rd & Maryhill Bypass

2030 Base + Site (Without Right-turn traffic)

Timing Plan: Weekday PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.93	1.33	0.03	0.16	0.86		0.06	0.27		0.70	0.04	
Control Delay	103.3	173.5	0.9	70.9	29.3		52.3	24.3		78.0	51.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	103.3	173.5	0.9	70.9	29.3		52.3	24.3		78.0	51.7	
LOS	F	F	A	E	C		D	C		E	D	
Approach Delay		167.4			29.6			28.2			75.9	
Approach LOS		F			C			C			E	
Queue Length 50th (m)	68.2	-684.7	0.0	4.1	224.4		3.1	6.6		36.3	2.9	
Queue Length 95th (m)	#130.3	#835.5	2.0	12.3	301.9		9.5	22.0		59.4	8.9	
Internal Link Dist (m)		335.1			916.9			55.8			45.1	
Turn Bay Length (m)	130.0		90.0	60.0								
Base Capacity (vph)	246	2631	1192	106	2135		273	368		260	368	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.93	1.33	0.03	0.13	0.86		0.04	0.20		0.49	0.03	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 141.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 119.6

Intersection LOS: F

Intersection Capacity Utilization 123.3%

ICU Level of Service H

Analysis Period (min) 15

- Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Pitt River Rd & Maryhill Bypass



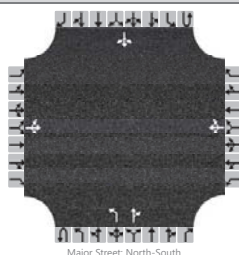
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Synchro 8 Report
Page 2

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2018	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		6	0	12		24	0	19		40	136	8		10	365	19
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			20			48		45					11			
Capacity, c (veh/h)			477			447		1124					1396			
v/c Ratio			0.04			0.11		0.04					0.01			
95% Queue Length, Q ₉₅ (veh)			0.1			0.4		0.1					0.0			
Control Delay (s/veh)			12.9			14.0		8.3					7.6			
Level of Service, LOS			B			B		A					A			
Approach Delay (s/veh)	12.9				14.0				1.8				0.3			
Approach LOS	B				B											

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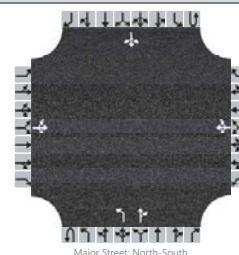
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Harbour St & Pitt River Rd AM 2018B.xtw

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		6	0	12		24	0	19		41	139	8		10	372	19	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)	0				0												
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			20			48		46					11			
Capacity, c (veh/h)			470			439		1116					1392			
v/c Ratio			0.04			0.11		0.04					0.01			
95% Queue Length, Q ₉₅ (veh)			0.1			0.4		0.1					0.0			
Control Delay (s/veh)			13.0			14.2		8.4					7.6			
Level of Service, LOS			B			B		A					A			
Approach Delay (s/veh)	13.0				14.2				1.8				0.3			
Approach LOS	B				B											

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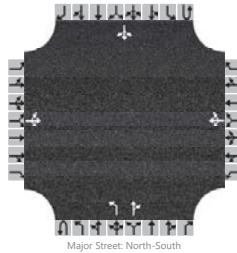
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0		
Configuration			LTR				LTR				L			TR			LTR	
Volume, V (veh/h)		6	0	12		61	0	19		41	140	9		10	373	19		
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2				
Proportion Time Blocked																		
Percent Grade (%)	0				0													
Right Turn Channelized	No				No				No				No					
Median Type/Storage	Undivided																	

Critical and Follow-up Headways															
Base Critical Headway (sec)															
Critical Headway (sec)															
Base Follow-Up Headway (sec)															
Follow-Up Headway (sec)															

Delay, Queue Length, and Level of Service															
Flow Rate, v (veh/h)			20				90			46				11	
Capacity, c (veh/h)			468				371			1115				1390	
v/c Ratio			0.04				0.24			0.04				0.01	
95% Queue Length, Q ₉₅ (veh)			0.1				0.9			0.1				0.0	
Control Delay (s/veh)			13.0				17.8			8.4				7.6	
Level of Service, LOS			B				C			A				A	
Approach Delay (s/veh)	13.0						17.8			1.8			0.3		
Approach LOS	B						C								

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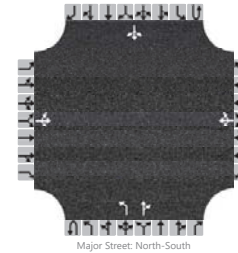
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR				L		TR			LTR
Volume, V (veh/h)		6	0	13		26	0	20		43	146	9		11	391	20
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways															
Base Critical Headway (sec)															
Critical Headway (sec)															
Base Follow-Up Headway (sec)															
Follow-Up Headway (sec)															

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)			21				52			48				12		
Capacity, c (veh/h)			455				414			1095				1382		
v/c Ratio			0.05				0.12			0.04				0.01		
95% Queue Length, Q ₉₅ (veh)			0.1				0.4			0.1				0.0		
Control Delay (s/veh)			13.3				14.9			8.4				7.6		
Level of Service, LOS			B				B			A				A		
Approach Delay (s/veh)	13.3				14.9				1.8				0.3			
Approach LOS	B				B											

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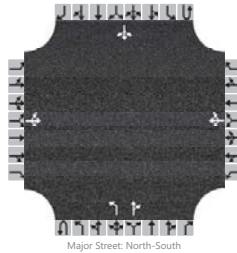
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		6	0	13		63	0	20		43	147	10		11	392	20	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)	0				0												
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			21				93		48				12			
Capacity, c (veh/h)			453				351		1094				1379			
v/c Ratio			0.05				0.27		0.04				0.01			
95% Queue Length, Q ₉₅ (veh)			0.1				1.1		0.1				0.0			
Control Delay (s/veh)			13.3				18.9		8.4				7.6			
Level of Service, LOS			B				C		A				A			
Approach Delay (s/veh)	13.3				18.9				1.8				0.3			
Approach LOS	B				C											

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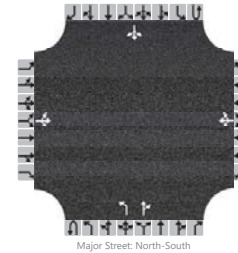
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR				L			TR		
Volume, V (veh/h)		7	0	13		27	0	21		45	152	9		11	409	21
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			22				54		51				12			
Capacity, c (veh/h)			425				398		1075				1373			
v/c Ratio			0.05				0.14		0.05				0.01			
95% Queue Length, Q ₉₅ (veh)			0.2				0.5		0.1				0.0			
Control Delay (s/veh)			13.9				15.5		8.5				7.6			
Level of Service, LOS			B				C		A				A			
Approach Delay (s/veh)	13.9				15.5				1.9				0.3			
Approach LOS	B				C											

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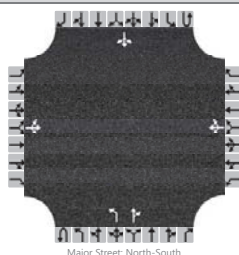
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration		LTR				LTR				L				LTR		
Volume, V (veh/h)		7	0	13		64	0	21		45	153	10		11	410	21
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			22			96		51					12			
Capacity, c (veh/h)			424			336		1074					1371			
v/c Ratio			0.05			0.28		0.05					0.01			
95% Queue Length, Q ₉₅ (veh)			0.2			1.1		0.1					0.0			
Control Delay (s/veh)			14.0			19.9		8.5					7.6			
Level of Service, LOS			B			C		A					A			
Approach Delay (s/veh)		14.0				19.9				1.8				0.3		
Approach LOS		B				C										

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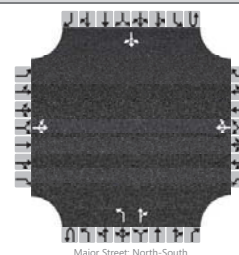
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2018	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration		LTR				LTR				L				LTR		
Volume, V (veh/h)		24	2	47		13	3	7		67	291	24		7	118	23
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			79			25		73					8			
Capacity, c (veh/h)			575			389		1411					1190			
v/c Ratio			0.14			0.06		0.05					0.01			
95% Queue Length, Q ₉₅ (veh)			0.5			0.2		0.2					0.0			
Control Delay (s/veh)			12.3			14.9		7.7					8.0			
Level of Service, LOS			B			B		A					A			
Approach Delay (s/veh)		12.3				14.9				1.3				0.4		
Approach LOS		B				B										

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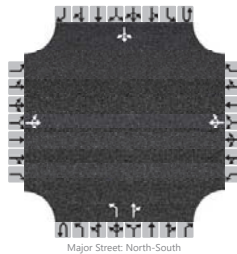
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration		LTR				LTR				L				LTR		
Volume, V (veh/h)		24	2	48		13	3	7		68	297	24		7	120	23
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			80			25		74				8				
Capacity, c (veh/h)			571			382		1409				1183				
v/c Ratio			0.14			0.07		0.05				0.01				
95% Queue Length, Q ₉₅ (veh)			0.5			0.2		0.2				0.0				
Control Delay (s/veh)			12.3			15.1		7.7				8.1				
Level of Service, LOS			B			C		A				A				
Approach Delay (s/veh)		12.3				15.1				1.3				0.4		
Approach LOS		B				C										

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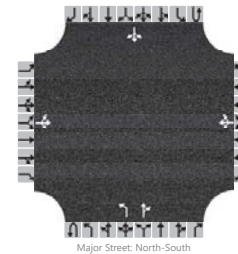
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		24	2	49		32	3	7		68	299	28		7	121	23
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			82			46		74				8				
Capacity, c (veh/h)			570			345		1407				1177				
v/c Ratio			0.14			0.13		0.05				0.01				
95% Queue Length, Q ₉₅ (veh)			0.5			0.5		0.2				0.0				
Control Delay (s/veh)			12.4			17.0		7.7				8.1				
Level of Service, LOS			B			C		A				A				
Approach Delay (s/veh)		12.4				17.0				1.3				0.4		
Approach LOS		B				C										

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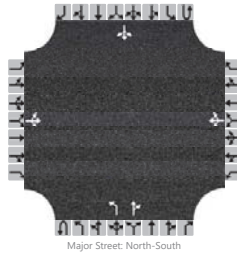
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration		LTR				LTR				L				LTR		
Volume, V (veh/h)		26	2	50		14	3	7		72	311	26		7	126	25
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			85			26		78			8					
Capacity, c (veh/h)			546			360		1398			1166					
v/c Ratio			0.16			0.07		0.06			0.01					
95% Queue Length, Q ₉₅ (veh)			0.5			0.2		0.2			0.0					
Control Delay (s/veh)			12.8			15.8		7.7			8.1					
Level of Service, LOS			B			C		A			A					
Approach Delay (s/veh)		12.8				15.8				1.4				0.4		
Approach LOS		B				C										

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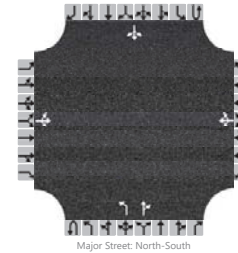
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration		LTR				LTR				L			TR			LTR	
Volume, V (veh/h)		26	2	51		33	3	7		72	313	30		7	127	25	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)	0				0												
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			86			47		78			8					
Capacity, c (veh/h)			546			326		1397			1159					
v/c Ratio			0.16			0.14		0.06			0.01					
95% Queue Length, Q ₉₅ (veh)			0.6			0.5		0.2			0.0					
Control Delay (s/veh)			12.8			17.9		7.7			8.1					
Level of Service, LOS			B			C		A			A					
Approach Delay (s/veh)		12.8				17.9				1.3				0.4		
Approach LOS		B				C										

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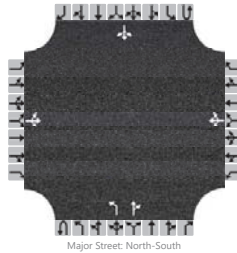
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Harbour St & Pitt River Rd PM 2025B+S.xtw

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0	
Configuration			LTR				LTR			L		TR			LTR		
Volume, V (veh/h)		27	2	53		15	3	8		75	326	27		8	132	26	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)	0				0												
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			89			28		82			9		
Capacity, c (veh/h)			530			345		1389			1149		
v/c Ratio			0.17			0.08		0.06			0.01		
95% Queue Length, Q ₉₅ (veh)			0.6			0.3		0.2			0.0		
Control Delay (s/veh)			13.2			16.4		7.8			8.2		
Level of Service, LOS			B			C		A			A		
Approach Delay (s/veh)	13.2			16.4			1.4			0.5			
Approach LOS	B			C									

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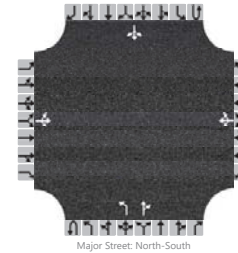
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Harbour St & Pitt River Rd PM 20308.xtw

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Pitt River Rd & Habour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume, V (veh/h)		27	2	54		34	3	8		75	328	31		8	133	26
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			90			49		82			9		
Capacity, c (veh/h)			529			311		1388			1143		
v/c Ratio			0.17			0.16		0.06			0.01		
95% Queue Length, Q ₉₅ (veh)			0.6			0.6		0.2			0.0		
Control Delay (s/veh)			13.2			18.7		7.8			8.2		
Level of Service, LOS			B			C		A			A		
Approach Delay (s/veh)	13.2			18.7			1.3			0.5			
Approach LOS	B			C									

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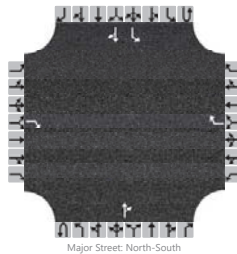
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0
Configuration				R				R				TR		L		TR
Volume, V (veh/h)				5				1			189	12		1	445	0
Percent Heavy Vehicles (%)				3				3						3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

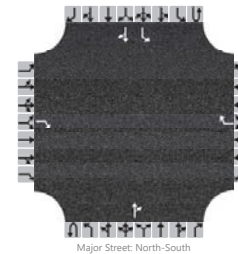
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				6				1							1	
Capacity, c (veh/h)				561				792							1316	
v/c Ratio				0.01				0.00							0.00	
95% Queue Length, Q ₉₅ (veh)				0.0				0.0							0.0	
Control Delay (s/veh)				11.5				9.5							7.7	
Level of Service, LOS				B				A							A	
Approach Delay (s/veh)	11.5				9.5								0.0			
Approach LOS	B				A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0
Configuration				R				R				TR		L		TR
Volume, V (veh/h)				3				1			198	12		1	467	0
Percent Heavy Vehicles (%)				3				3						3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

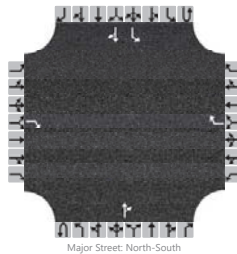
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				3				1							1	
Capacity, c (veh/h)				543				782							1305	
v/c Ratio				0.01				0.00							0.00	
95% Queue Length, Q ₉₅ (veh)				0.0				0.0							0.0	
Control Delay (s/veh)				11.7				9.6							7.8	
Level of Service, LOS				B				A							A	
Approach Delay (s/veh)	11.7				9.6								0.0			
Approach LOS	B				A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0
Configuration				R				R				TR		L		TR
Volume, V (veh/h)				5				1			207	12		1	486	0
Percent Heavy Vehicles (%)				3				3						3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				6				1						1		
Capacity, c (veh/h)				528				772						1294		
v/c Ratio				0.01				0.00						0.00		
95% Queue Length, Q ₉₅ (veh)				0.0				0.0						0.0		
Control Delay (s/veh)				11.9				9.7						7.8		
Level of Service, LOS				B				A						A		
Approach Delay (s/veh)	11.9				9.7								0.0			
Approach LOS	B				A											

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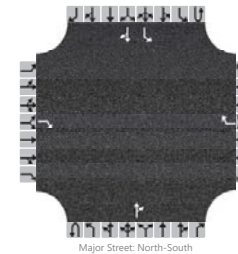
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2020	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0
Configuration				R				R				TR		L		TR
Volume, V (veh/h)				7				2			393	34		2	200	0
Percent Heavy Vehicles (%)				3				3						3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				8				2						2		
Capacity, c (veh/h)				809				591						1075		
v/c Ratio				0.01				0.00						0.00		
95% Queue Length, Q ₉₅ (veh)				0.0				0.0						0.0		
Control Delay (s/veh)				9.5				11.1						8.4		
Level of Service, LOS				A				B						A		
Approach Delay (s/veh)	9.5				11.1								0.1			
Approach LOS	A				B											

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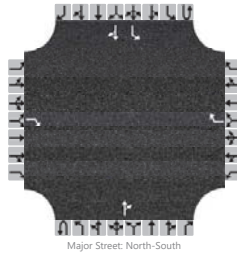
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2025	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0
Configuration				R				R				TR		L		TR
Volume, V (veh/h)				8				2			412	34		2	209	0
Percent Heavy Vehicles (%)				3				3						3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				9				2						2		
Capacity, c (veh/h)				799				576						1056		
v/c Ratio				0.01				0.00						0.00		
95% Queue Length, Q ₉₅ (veh)				0.0				0.0						0.0		
Control Delay (s/veh)				9.6				11.3						8.4		
Level of Service, LOS				A				B						A		
Approach Delay (s/veh)	9.6				11.3								0.1			
Approach LOS	A				B											

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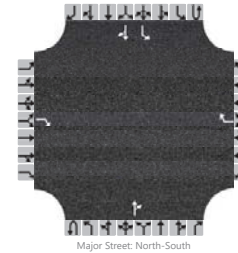
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Pitt River
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Site Access
Analysis Year	2030	North/South Street	Pitt River Road
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1		0	0	1	0	0	1	0	0	1	1	0	
Configuration				R				R				TR		L		TR	
Volume, V (veh/h)				6				2			431	34		2	219	0	
Percent Heavy Vehicles (%)				3				3						3			
Proportion Time Blocked																	
Percent Grade (%)	0				0												
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				7				2						2		
Capacity, c (veh/h)				787				560						1038		
v/c Ratio				0.01				0.00						0.00		
95% Queue Length, Q ₉₅ (veh)				0.0				0.0						0.0		
Control Delay (s/veh)				9.6				11.5						8.5		
Level of Service, LOS				A				B						A		
Approach Delay (s/veh)	9.6				11.5								0.1			
Approach LOS	A				B											

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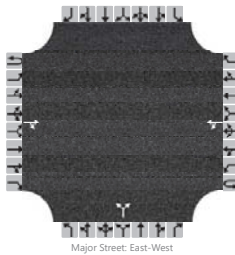
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Site Access
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0
Configuration				TR		LT					LR					
Volume, V (veh/h)			18	1		0	43			37		0				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				42							
Capacity, c (veh/h)					1594				935							
v/c Ratio					0.00				0.04							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				9.0							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				9.0							
Approach LOS									A							

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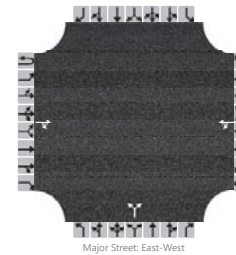
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Site Access
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0
Configuration				TR		LT					LR					
Volume, V (veh/h)			20	1		0	46				37	0				
Percent Heavy Vehicles (%)						2					2		2			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				42							
Capacity, c (veh/h)					1590				928							
v/c Ratio					0.00				0.04							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				9.1							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				9.1							
Approach LOS									A							

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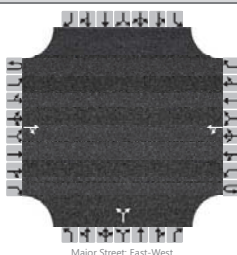
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Site Access
Time Analyzed	Weekday AM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0
Configuration				TR			LT				LR					
Volume, V (veh/h)			20	1		0	48			37		0				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				42							
Capacity, c (veh/h)					1590				926							
v/c Ratio					0.00				0.04							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				9.1							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				9.1							
Approach LOS									A							

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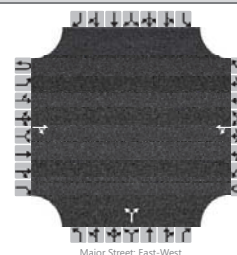
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2020	North/South Street	Site Access
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0
Configuration				TR		LT					LR					
Volume, V (veh/h)			33	4		0	23				19	0				
Percent Heavy Vehicles (%)						2					2		2			
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				21							
Capacity, c (veh/h)					1568				943							
v/c Ratio					0.00				0.02							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				8.9							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				8.9							
Approach LOS									A							

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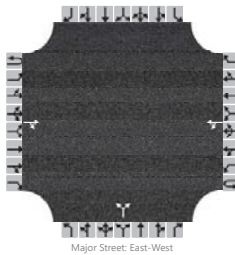
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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2025	North/South Street	Site Access
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0	
Configuration				TR			LT					LR					
Volume, V (veh/h)			35	4		0	24			19		0					
Percent Heavy Vehicles (%)						2				2		2					
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				21							
Capacity, c (veh/h)					1566				939							
v/c Ratio					0.00				0.02							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				8.9							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				8.9							
Approach LOS									A							

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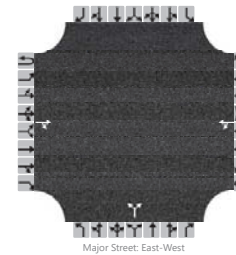
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Site Access & Harbour St PM 2025B+S.xtwt

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RC	Intersection	Site Access & Harbour St
Agency/Co.	CTS	Jurisdiction	Port Coquitlam, BC
Date Performed	Base + Site	East/West Street	Harbour Stree
Analysis Year	2030	North/South Street	Site Access
Time Analyzed	Weekday PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	5776 - Greystone Development 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	1	0		0	0	0	
Configuration				TR			LT				LR						
Volume, V (veh/h)			37	4		0	26			19		0					
Percent Heavy Vehicles (%)						2				2		2					
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					0				21							
Capacity, c (veh/h)					1562				933							
v/c Ratio					0.00				0.02							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.3				8.9							
Level of Service, LOS					A				A							
Approach Delay (s/veh)					0.0				8.9							
Approach LOS									A							

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ARBORIST REPORT

PROJECT:

HARBOUR STREET

SITE ADDRESS:

PITT RIVER ROAD AND HARBOUR STREET, PORT COQUITLIAM, B.C.

CLIENT:

SCHMIDT DEVELOPMENT PLANNING

PROJECT # DP 2017-71

PREPARED BY:

van der Zalm + associates inc.

**Suite 1, 20177 97 Avenue
Langley, BC V1M 4B9**

CONSULTING ARBORIST

AUSTIN PETERSON
ISA Certified Arborist PN 1570A

PROJECT ARBORIST

KELLY KOOME
ISA Certified Arborist PN 5962A
ISA Tree Risk Assessment Qualified

January 16, 2018
March 21, 2018 – 1st Revision



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Background

van der Zalm + associates inc. was contacted by the Laurie Schmidt of Schmidt and Associates Development Planning (Direct 778-773-3448 Email Ischmidt@sadp.ca Ltd) to prepare an ISA Certified forest description for the properties at Pitt River Road and Harbour Street, Port Coquitlam, B.C.

Assignment

van der Zalm and associates inc. have been retained by the client to prepare a report to assess the tree(s) located at Pitt River Road and Harbour Street, Port Coquitlam, B.C. The project arborists, Austin Peterson and Kelly Koome performed a site review entailing identification and visual assessment of the tree(s) on site based on the tree survey provided by the client or representative(s).

The Project Arborists 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

Austin Peterson and Kelly Koome's observations were limited to site visits on January 11 and 12, 2018. No tissue or soil samples were sent to a lab for identification or analysis. van der Zalm + associates located the trees using the tree survey provided.

Testing and Analysis

Austin Peterson and Kelly Koome 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 Port Coquitlam Tree Bylaw, 2005, No. 3474

Site Review



Source: Poco Webmap



Proposed Site Development

The development of apartments and townhouses.

Environmental Description

ISA Certified Arborists Austin Peterson and Kelly Koome of van der Zalm + associates conducted a site review and evaluation of the trees located at the above referenced properties on January 11 and 12, 2018. They assessed the retention suitability of significant trees located on site.

The site is bordered to the southeast by Mary Hill Bypass, to the southwest by Pitt River Road and to the northwest by Harbour Street. Prince Street cuts into the middle of the site.

There are no buildings on the site. The trees present are native and introduced species, both conifers and deciduous. There is extensive Himalayan blackberry cover on the properties bordering Mary Hill Bypass. The side along Harbour Street slopes downward to 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 are subject to 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 Port Coquitlam trees associated with this project.

Straddling Trees – There is a tree straddling with the City of Port Coquitlam.

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.

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.

**Table 1 - Tree Assessment Data:**

Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
The following trees are located onsite						
816	Western redcedar <i>Thuja plicata</i>	G	1.06	4.8	FIGURE 2 LCR = 80 – 90% TRUNK – Co-dominant at 2.0 meters WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
817	Western redcedar <i>Thuja plicata</i>	G	0.27	3.0	FIGURE 2 LCR = 80 – 90% CROWN – Shade suppressed by 816 WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
818	Fruiting cherry <i>Prunus</i> spp	P	0.57	4.5	FIGURE 2 LCR = 40 – 50% TRUNK – Multi-stem at 1.6 meters. Previously topped at 2.0 meters. Fairly significant internal decay on north and south sides. WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
819	Western redcedar <i>Thuja plicata</i>	G	0.32	5.0	LCR = 80 – 90% No visible defects WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
820	Western redcedar <i>Thuja plicata</i> 'excelsa'	G	0.44, 0.21 0.20	3.0	FIGURE 3 LCR = 80 – 90% TRUNK – Multi-stem from base WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
821	Lawson cypress <i>Chamaecyparis</i> <i>lawsoniana</i>	G	0.25, 0.24	3.0	FIGURE 5 LCR = 80 – 90% TRUNK – Co-dominant from base Growing at the top of slope SUITABLE FOR RETENTION WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
822	Beaked hazelnut <i>Corylus cornuta</i>	G	0.10, 0.80-0.12	4.0	FIGURE 5 LCR = 80 – 90% Has existing tree protection fencing SUITABLE FOR RETENTION WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
823	Jeffrey pine <i>Pinus jeffreyi</i>	G	0.66	5.5	FIGURE 5 LCR = 70 – 80% TRUNK – Some ivy growing up to 5.0 meters Has existing tree protection fencing SUITABLE FOR RETENTION WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
824	Juniper <i>Juniperus spp.</i>	G	0.25, 0.17	2.0	FIGURE 5 LCR = 80 – 90% TRUNK – Co-dominant at 0.3 meters. Smaller branch has been bent significantly southwest. Has existing tree protection fencing SUITABLE FOR RETENTION WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
825	Spruce <i>Picea spp.</i>	G	0.37	3.5	FIGURE 5 LCR = 70 – 80% HANDPLOTTED REMOVE / DUE TO POOR CONDITION	REMOVE
826	Pyramidal Arborvitae <i>Thuja occidentalis 'Pyramidalis'</i>	F	0.15 -0.20	1.5	FIGURE 4 LCR = 50% - 60% TRUNKS – Multi-stem from base Row of 3. One is dead, potentially damage from Ivy. REMOVE ALL / INTERCONNECTNESS OF ROOTS TO ADJACENT TREES IN ROW MEANS THAT ALTHOUGH ONE TREE IS NOT IN THE BUILDING ENVELOPE, ALL SHOULD BE REMOVED	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
827	Serbian spruce <i>Picea omorika</i>	G	0.28	2.0	FIGURE 6 LCR = 80 – 90% TRUNK – Leans slightly south WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
828	Big leaf maple <i>Acer macrophyllum</i>	G	0.56	7.0	LCR = 70 – 80% TRUNK – 3 co-dominant stems at 1.8 meters. Thick ivy up to 3.0 meters. WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
829	Big leaf maple <i>Acer macrophyllum</i>	G	0.71	8.0	LCR = 50 – 60% CROWN – Open grown, good form and structure WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
830	Black cottonwood <i>Populus trichocarpa</i>	G	0.40, 0.29	5.0	LCR = 60 – 70% TRUNK – Forks from base WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
831	Red alder <i>Alnus rubra</i>	G	0.23, 0.17 0.16, 0.15	7.5	LCR = 50 – 60% TRUNK – Multi-stem from base HANDPLOTTED WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
832	Black cottonwood <i>Populus trichocarpa</i>	G	0.25, 0.14	1.5	LCR = 20 – 30% TRUNK – Smaller stem dead WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
833	Red alder <i>Alnus rubra</i>	G	0.31	6.0	LCR = 60 – 70% TRUNK – Smaller stem leans north WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
834	Red alder <i>Alnus rubra</i>	G	0.25	6.0	LCR = 60 – 70% TRUNK – Previous small branch failure on lower trunk WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
835	Black cottonwood <i>Populus trichocarpa</i>	G	0.50	9.0	LCR = 20 – 30% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
836	Black cottonwood <i>Populus trichocarpa</i>	G	0.22	3.0	LCR = 60 -70% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
837	Black cottonwood <i>Populus trichocarpa</i>	G	0.22	3.5	LCR = 60 -70% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
838	Black cottonwood <i>Populus trichocarpa</i>	P	0.28	1.5	LCR = 50 – 60% TRUNK – Decay on trunk from 2.0 to 6.0 meters. Top is broken. WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
839	Black cottonwood <i>Populus trichocarpa</i>	G	0.28	3.0	LCR = 60 -70% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
840	Black cottonwood <i>Populus trichocarpa</i>	F	0.28	1.7	LCR = 70 -80% TRUNK – Broken top WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
841	Black walnut <i>Juglans nigra</i>	G	0.45, 0.37 0.24, 0.32	12.0	LCR = 70 -80% CROWN - Open grown, good form and structure TRUNK – Multi-stem from base WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
842	Big leaf maple <i>Acer macrophyllum</i>	P	1.37	9.0	LCR = 60 -70% TRUNK – 1 dominant and 2 subdominant stems at 2.5 meters. Cavity with decay on one subdominant stem, 3.0 meters lone. Large cavity with decay on the southwest side from 2.0 to 4.0 meters on the trunk. Fungal conk on north side. Evidence of use of cavities by wildlife REMOVE DUE TO POOR CONDITION / WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
849	Bitter cherry <i>Prunus emarginata</i>	G	0.25, 0.22	5.0	LCR = 80 to 90% TRUNK – Multi- stem from base SUITABLE FOR RETENTION WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
850	Black cottonwood <i>Populus trichocarpa</i>	G	0.34, 0.25	4.0	LCR = 70 -80% TRUNK – 2 dominant stems from base WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
851	Black cottonwood <i>Populus trichocarpa</i>	P	0.41	1.5	LCR = 70 -80% TRUNK – Dead top, broken at 10.0 meters Growing in pit that is about 0.5 of meter lower than the rest of the property WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
852	Black cottonwood <i>Populus trichocarpa</i>	G	0.30	5.0	LCR = 70 -80% Growing in pit that is about 0.5 of meter lower than the rest of the property WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
853	Red alder <i>Alnus rubra</i>	G	0.30	5.0	LCR = 60 -70% Growing in pit that is about 0.5 of meter lower than the rest of the property WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
854	Black cottonwood <i>Populus trichocarpa</i>	G	0.57	7.0	LCR = 60 -70% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
855	Red alder <i>Alnus rubra</i>	G	0.20	7.0	LCR = 70 -80% TRUNK – Leans 10 degrees to the south WITHIN PROPOSED BUILDING ENVELOPE	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
856	Black cottonwood <i>Populus trichocarpa</i>	G	0.28	3.0	LCR = 40 -50% Growing in pit that is about 0.5 of meter lower than the rest of the property WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
857	Black cottonwood <i>Populus trichocarpa</i>	P	0.46, 0.19	4.0	LCR = 60 -70% TRUNK – Largest stem has a broken top Growing in pit that is about 0.5 of meter lower than the rest of the property WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
858	Black cottonwood <i>Populus trichocarpa</i>	F	0.30, 0.16	5.0	LCR = 60 -70% TRUNK – Smaller stem is dead WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
859	Black cottonwood <i>Populus trichocarpa</i>	G	0.34	5.0	LCR = 70 -80% No visible defects WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
860	Black cottonwood <i>Populus trichocarpa</i>	G	0.42	8.0	LCR = 70 -80% Growing in pit that is about 0.5 of meter lower than the rest of the property. Interconnected with 861, 862, 863. WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
861	Black cottonwood <i>Populus trichocarpa</i>	G	0.28	5.0	LCR = 70 -80% CROWN – Shade suppressed by 860 TRUNK – Slight lean to southeast Growing in pit that is about 0.5 of meter lower than the rest of the property. Interconnected with 860, 862, 863. WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
862	Black cottonwood <i>Populus trichocarpa</i>	G	0.27	5.0	LCR = 70 -80% CROWN – Shade suppressed by 860 Growing in pit that is about 0.5 of meter lower than the rest of the property. Interconnected with 860, 861, 863. WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
863	Black cottonwood <i>Populus trichocarpa</i>	G	0.25	5.0	LCR = 70 -80% CROWN – Shade suppressed by 860 Growing in pit that is about 0.5 of meter lower than the rest of the property. Interconnected with 860, 861, 862 HANDPLOTTED WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
864	Red alder <i>Alnus rubra</i>	G	0.23	5.0	LCR = 70 -80% CROWN – The majority of branching is on the south side to reach the sun TRUNK – Slight lean to the south Growing in thick blackberries WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
865	Red alder <i>Alnus rubra</i>	G	0.27	6.0	LCR = 70 -80% TRUNK – Lower bole leans south before self-correcting. Previous small branch failure on lower trunk. SUITABLE FOR RETENTION WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
866	Fruiting cherry <i>Prunus spp.</i>	G	0.34	5.0	LCR = 70 -80% TRUNK – Upper bole at 8.0 meters height curves to the northeast Interconnected with 867, 868 WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
867	Fruiting cherry <i>Prunus</i> spp.	G	0.25	5.5	LCR = 70 -80% TRUNK – Upper bole at 8.0 meters curves to the north Interconnected with 866, 868 WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
868	Fruiting cherry <i>Prunus</i> spp.	G	0.36	5.5	LCR = 70 -80% TRUNK - Upper bole at 10.0 meters curves to the north Interconnected with 867, 867 WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
869	Red alder <i>Alnus rubra</i>	G	0.21	5.5	LCR = 70 -80% HANDPLOTTED WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
870	Red alder <i>Alnus rubra</i>	G	0.20, 0.14	3.0	LCR = 60 -70% TRUNK – Multi-stem from base. Smaller stem at 6.0 meters up has a co-dominant partner that is broken. WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
871	Black cottonwood <i>Populus trichocarpa</i>	G	0.42, 0.30	7.0	LCR = 70 -80% TRUNK – Co-dominant from base WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
872	Black cottonwood <i>Populus trichocarpa</i>	G	0.34	6.5	LCR = 60 -70% CROWN – Branching weighted to the west side WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
873	Black cottonwood <i>Populus trichocarpa</i>	G	0.43, 0.24	7.5	LCR = 50 -60% TRUNK – Multi-stem from base. Smaller stem leans greater than 20 degrees southwest WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
874	Black cottonwood <i>Populus trichocarpa</i>	G	0.43	7.0	LCR = 80 -90% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
875	Black cottonwood <i>Populus trichocarpa</i>	G	0.32	6.5	LCR = 70 -80% CROWN – Shade suppressed by 874 WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
876	Black cottonwood <i>Populus trichocarpa</i>	G	0.23	6.0	LCR = 70 -80% CROWN – Shade suppressed by 875. Branching weighted to the southwest. TRUNK – Upper bole curves south at 6.0 meters. Slight curve in the trunk at 1.0 meter. WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
877	Black cottonwood <i>Populus trichocarpa</i>	G	0.34	5.5	LCR = 80 -90% No visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
878	Black cottonwood <i>Populus trichocarpa</i>	G	0.27, 0.23	5.0	LCR = 80 -90% TRUNK – Forks at 3.0 meters WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
879	Black cottonwood <i>Populus trichocarpa</i>	G	0.25, 0.21 0.15	5.0	LCR = 70 -80% TRUNK – Leans slightly southwest WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
880	Black cottonwood <i>Populus trichocarpa</i>	G	0.37	7.5	LCR = 80 -90% TRUNK – Forks at 11.0 meters into 2 co-dominant stems WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
881	Black cottonwood <i>Populus trichocarpa</i>	G	0.26	5/0	LCR = 60 -70% TRUNK – Slight lean southwest WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
882	Black cottonwood <i>Populus trichocarpa</i>	P	0.23	4.0	LCR = 60 -70% CROWN – Shade suppressed by 884 TRUNK – Broken top at 9.0 meters WITHIN PROPOSED BUILDING ENVELOPE	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
883	Black cottonwood <i>Populus trichocarpa</i>	P	0.24	4.0	LCR = 60 -70% CROWN – Shade suppressed by 884 TRUNK – Broken top at 9.0 meters HANDPLOTTED WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
884	Black cottonwood <i>Populus trichocarpa</i>	G	0.44	7.5	LCR = 80 -90% Full and open grown tree, no visible defects WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
885	Black cottonwood <i>Populus trichocarpa</i>	G	0.22, 0.18	7.0	LCR = 80 -90% CROWN – Shade suppressed by 877 TRUNK – Co-dominant near base HANDPLOTTED WITHIN PROPOSED BUILDING ENVELOPE	REMOVE
886	Red alder <i>Alnus rubra</i>	G	0.32	4.5	LCR = 80 – 90% Full and open grown tree, no visible defects WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
The following tree is straddling the property line						
S 843	Black walnut <i>Juglans nigra</i>	G	0.37	10.0	FIGURE 7 LCR = 60 -70% TRUNK – Multi-stem from 1.0 meter. Previous lower branch failure on northwest side. WITHIN LIKLEY EXCAVATION / GRADE CHANGES	REMOVE
The following trees belong to the City of Port Coquitlam						
C 844	Red alder <i>Alnus rubra</i>	G	0.29	5.5	LCR = 70 -80% TRUNK - Significant decay on south side where previous sub-dominant stem failed. Growing on side of slope adjacent the ditch along Mary Hill Bypass PROTECT TREE	RETAIN



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
C 845	Big leaf maple <i>Acer macrophyllum</i>	G	0.28, 0.26 0.22	5	FIGURE 8 LCR = 70 -80% TRUNK – Multi-stem from 0.3 meters Growing on side of slope adjacent the ditch along Mary Hill Bypass PROTECT TREE	RETAIN
C 846	Big leaf maple <i>Acer macrophyllum</i>	G	0.29	8.0	FIGURE 8 LCR = 70 -80% Growing on side of slope adjacent the ditch along Mary Hill Bypass PROTECT TREE	RETAIN
C 847	Big leaf maple <i>Acer macrophyllum</i>	P	0.33	6.0	FIGURE 8 LCR = 70 -80% TRUNK – Leans east before self-correcting. Broken top at 5.5 meters. Growing on side of slope adjacent the ditch along Mary Hill Bypass PROTECT TREE	RETAIN
C 848	Black walnut <i>Juglans nigra</i>	F	0.19, 0.14	6.0	FIGURE 8 LCR = 70 -80% TRUNK – 1 stem is growing along the ground toward the ditch before self-correcting. This is a poor form for this species. Growing on side of slope adjacent the ditch along Mary Hill Bypass PROTECT TREE	RETAIN
C 887	White spruce <i>Picea glauca</i>	F	0.49	4.0	LCR = 70 -80% TRUNK – Basal resinous on north and sides at base HANDPLOTTED – Location is approximate WITHIN PROPOSED ROADWAY IMPROVEMENTS	REMOVE



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Tree #	Common Name (Botanical Name)	Condition	DBH (meters)	Drip Line (meters)	Comments	Retain/ Remove
C 888	Black cottonwood <i>Populus trichocarpa</i>	F	0.50, 0.37 0.35, 0.45	8.0	LCR = 70 -80% TRUNK – 4 co-dominant stems at base. Northwest stem broken at 15 meters – in poor condition. Other stems lean southwest likely photo-tropically. HANDPLOTTED – Location is approximate SUITABLE FOR RETENTION WITHIN PROPOSED ROADWAY IMPROVEMENTS	REMOVE
C 889	Red alder stand <i>Alnus rubra</i>	G	0.05 to 0.20	5.0	LCR = 70 -80% Stand of young red alder, approximately two dozen. Growing out of slight knoll covered with Himalayan blackberries. HANDPLOTTED – Location is approximate SUITABLE FOR RETENTION WITHIN PROPOSED ROADWAY IMPROVEMENTS	REMOVE
C 890	Beaked hazelnut <i>Corylus cornuta</i>	G	0.05 to 0.15	3.0	LCR = 80 -90% Growing in Himalayan blackberries HANDPLOTTED – Location is approximate SUITABLE FOR RETENTION WITHIN PROPOSED ROADWAY IMPROVEMENTS	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.

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.

C: Refers to trees on City property.

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.

Decurrent Tree Form: Tree form which develops when the lateral branches grow as fast, or faster, than the terminal shot. This results in a tree with a broad, spreading form and multiple trunks.

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.

Dwarf Mistletoe: A species of parasitic plants that infect numerous tree species in North America. Severe dwarf mistletoe infection can result in reduced growth, premature mortality.

Excurrent Tree Form: Tree form, which develops when the leader outgrows the lateral branches. This results in a tree with a narrow, cone-shaped crown and clearly defined central trunk.

CRZ: Critical Root Zone - The area between the trunk and to the end of the Drip Line.

DRIP LINE: Means a circle drawn on the ground around a tree directly under the tips of the outermost branches of the canopy of the tree.

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).

Gale - A very strong wind.

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 include 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: Drip Line + Trunk Radius + (60 cm excavation zone). For example, a 50-cm diameter tree with a 4-meter Drip Line would have a No Disturbance Zone of 4.85 meters measured from the edge of the trunk.

Nurse Log - a downed log from which another tree (s) grows off of.



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Orthotropic Shoot: A shoot that is more or less vertical in orientation, upon which the leaves are usually arranged radially around the stem.

OS: Off-site trees and due to restricted access their DBH measurements are approximate. An assessment of off-site trees does not imply they are safe as the restricted access prevented a thorough review.

Plagiotropic Shoot: A shoot that is more or less horizontal in orientation, and upon which the leaves are often arranged in one plane.

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.

Root Plate - That part of the root system (excluding the small outermost roots) needed to keep a tree windfirm.

Root Plate Failure - The displacement of the root plate in a gale, resulting in the permanent lean or complete failure of the tree with the soil level pushed up on the windward side.

RULE - Remaining Useful Life Expectancy - The expected period of time that a particular tree will remain *relatively* free of defects or deficiencies, that would cause it to decline rapidly in either health or into an unreasonable level of risk.

Shoot: An extension of growth from the stem of a plant, young enough to be furnished with leaves, often associated with pruned trees.

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.

Suckers: Undesirable stem growth from the roots of the lower trunk of a tree, especially those from a rootstock of a grafted tree.

Suppressed: Individual tree whose growth, health and condition is negatively impacted by adjacent tree(s).

Thrifty: Strong and healthy trees, thriving physically and growing vigorously.

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.

Windfirm - Having no elevated risk of windthrow.

Windfirm Boundary - The boundary of a stand of trees that is considered windfirm.

Windthrow - The fall of a tree in a high wind.

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 upward from the roots all the way to the leaves.



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APPENDIX B: PHOTOS



Fig. 1 View looking northeast from the site, from Prince Road



Fig 2. Trees 816 and 817 are western red cedars in good condition. Tree 818 shows signs of significant decay



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Fig. 3 Tree 820 is healthy and robust

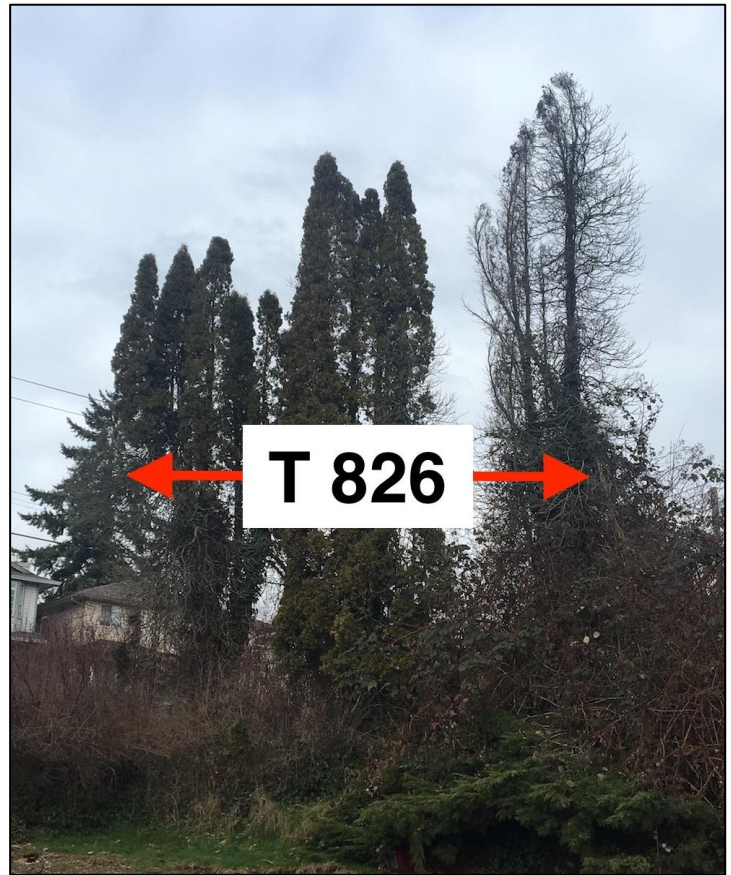


Fig. 4 Two in this row are mature, one is dead

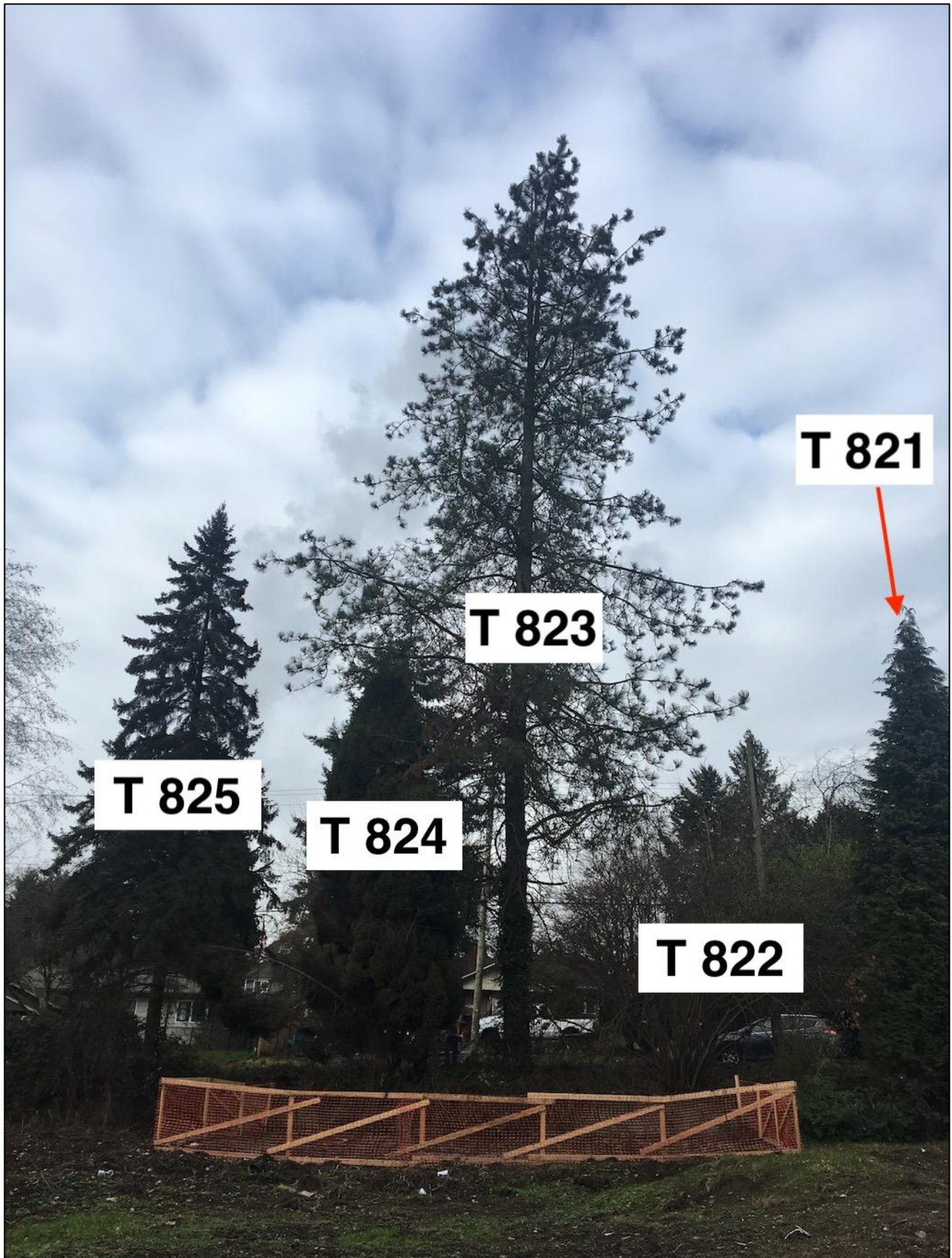


Fig. 5 Trees 822, 823 and 824 have existing tree protection fencing



Fig. 6 Tree 827 leans slightly south



Fig. 7 Tree 843 is straddling the property line

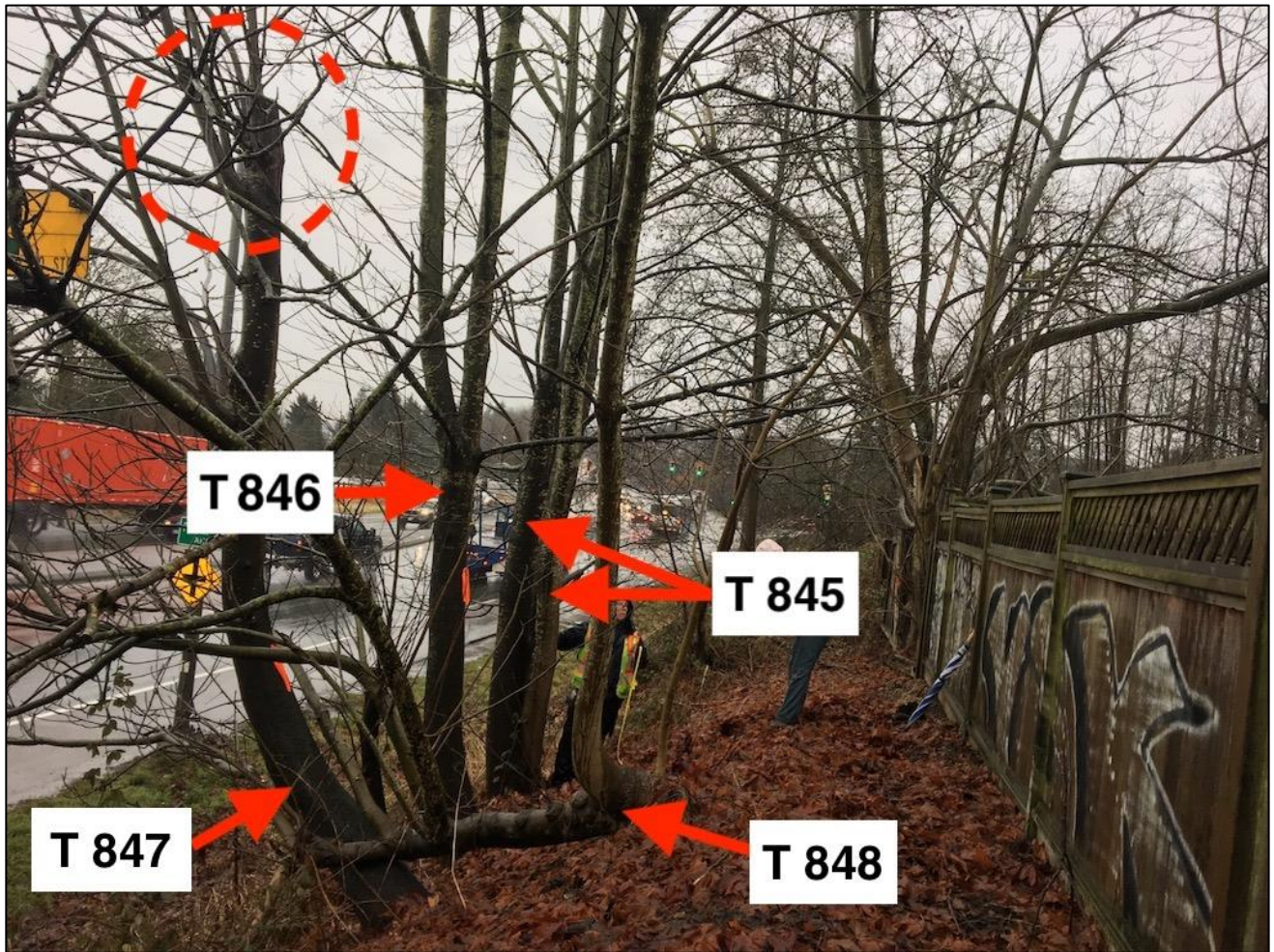


Fig. 8 This group of offsite trees sits along the edge of the ditch. Tree 845 has a broken top.

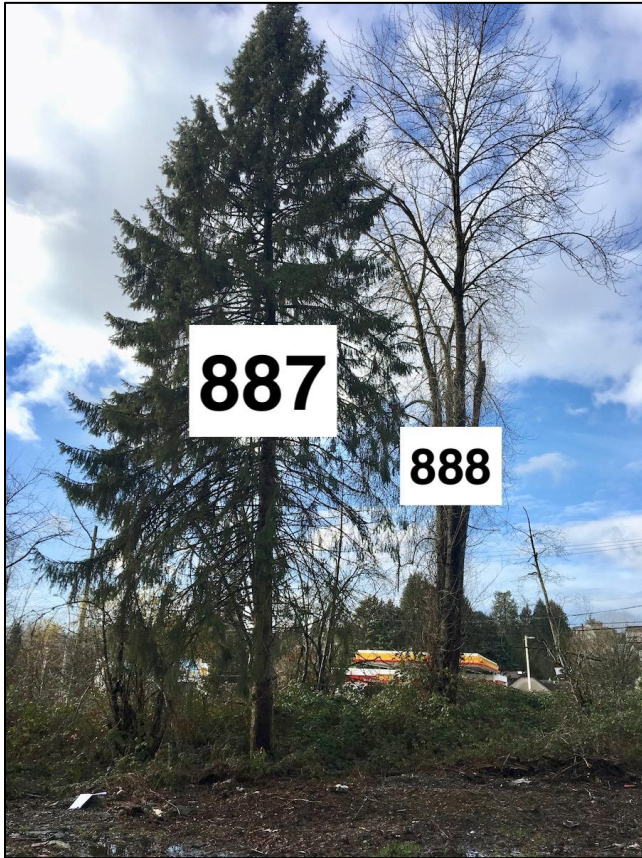


Fig. 9 Tree 887 and 888 are next to Harbour St.

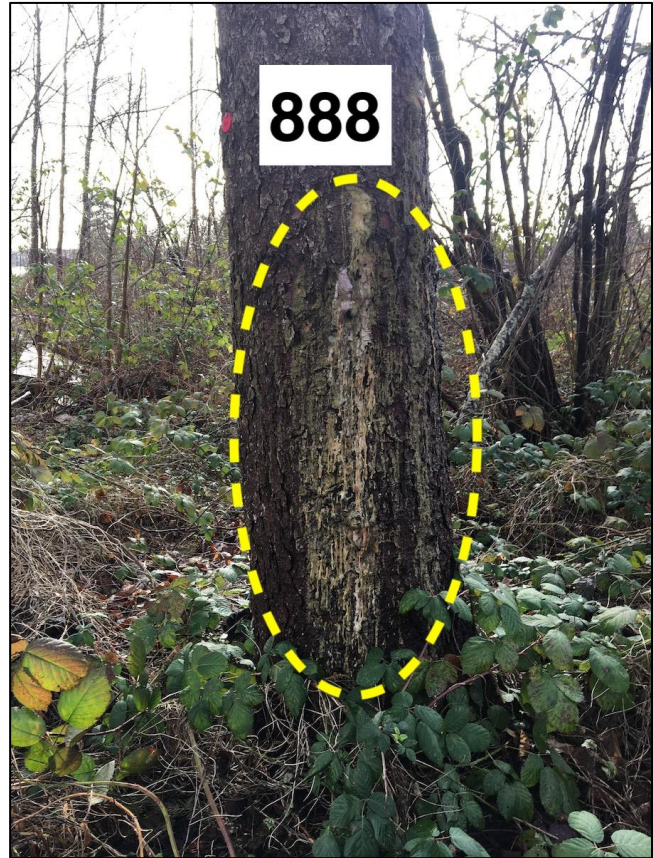


Fig. 10 Basal resinosis on Tree 888

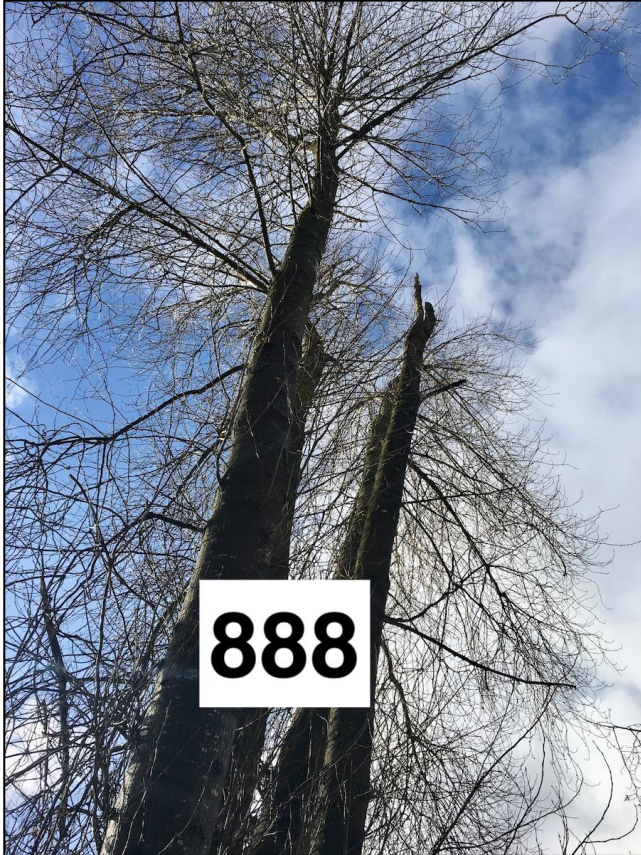


Fig. 11 One stem of Tree 843 has a broken top

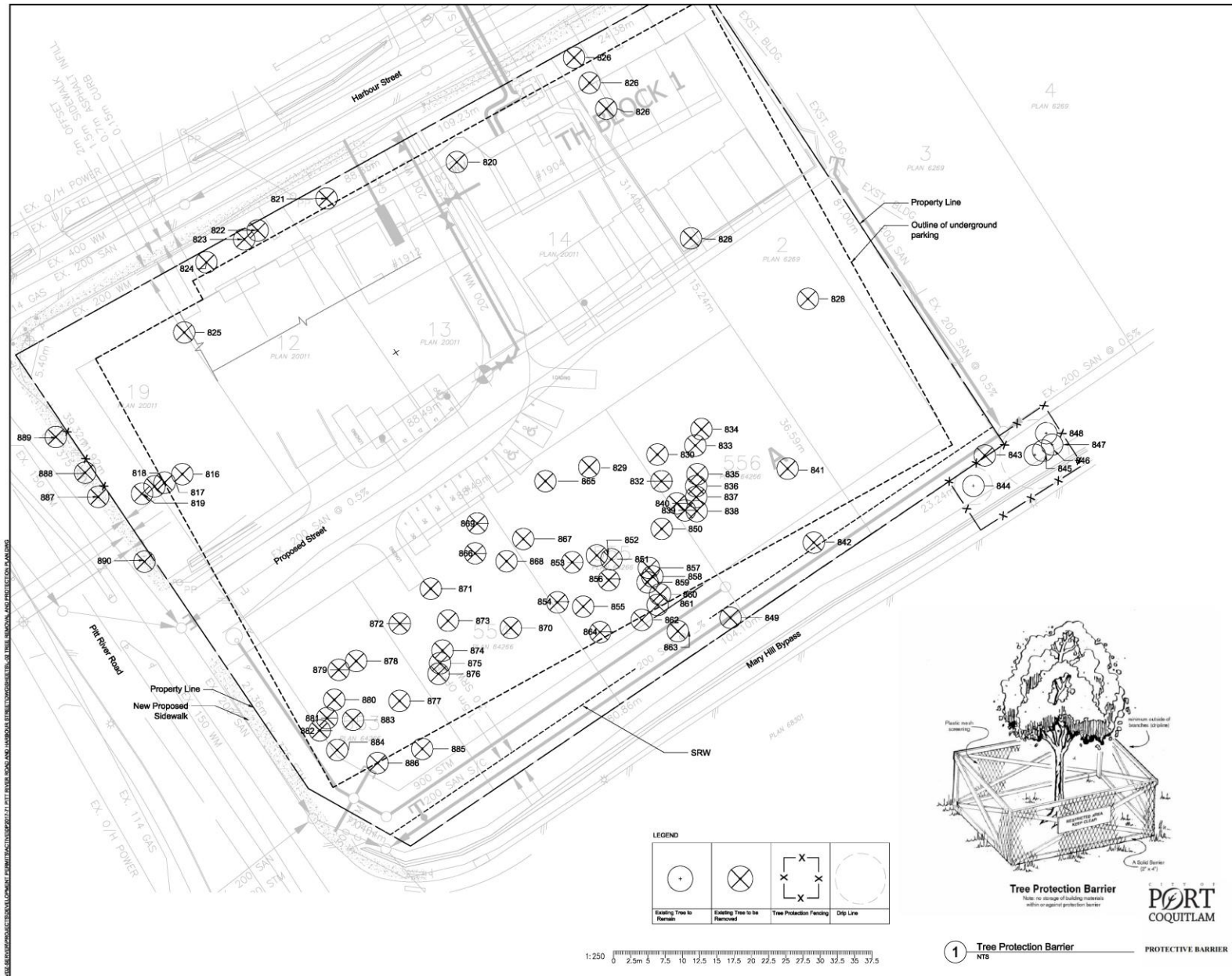


Fig. 12 Stand of red alder in the northwest corner



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APPENDIX C – TREE REMOVAL AND PROTECTION PLAN



Drawing Title:
TREE REMOVAL AND PROTECTION PLAN

DP2017-71

Drawing #:
L-02

1	LJ	Issued for Review	Mar. 15, 2018
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No.	By	Description	Date
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REVISIONS TABLE FOR DRAWINGS			
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No.	By	Description	Date
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REVISIONS TABLE FOR SHEET			
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Project:
Pitt River Road

Location:
Port Coquitlam, BC

Drawn:
LJ

Checked:
MW

Approved:
APPROVED

Original Sheet Size:
24"x36"

Scale:
1:250

CONTRACTOR SHALL COVER ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. ALL DIMENSIONS SHALL BE TO THE EXISTING PROPERTY OF THE OWNER AND NOT TO THE PROPOSED CONSTRUCTION. DIMENSIONS SHALL BE TO THE EXISTING PROPERTY OF THE OWNER AND NOT TO THE PROPOSED CONSTRUCTION.



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APPENDIX - CONSTRUCTION ACTIVITY AROUND TREE PROTECTION ZONE

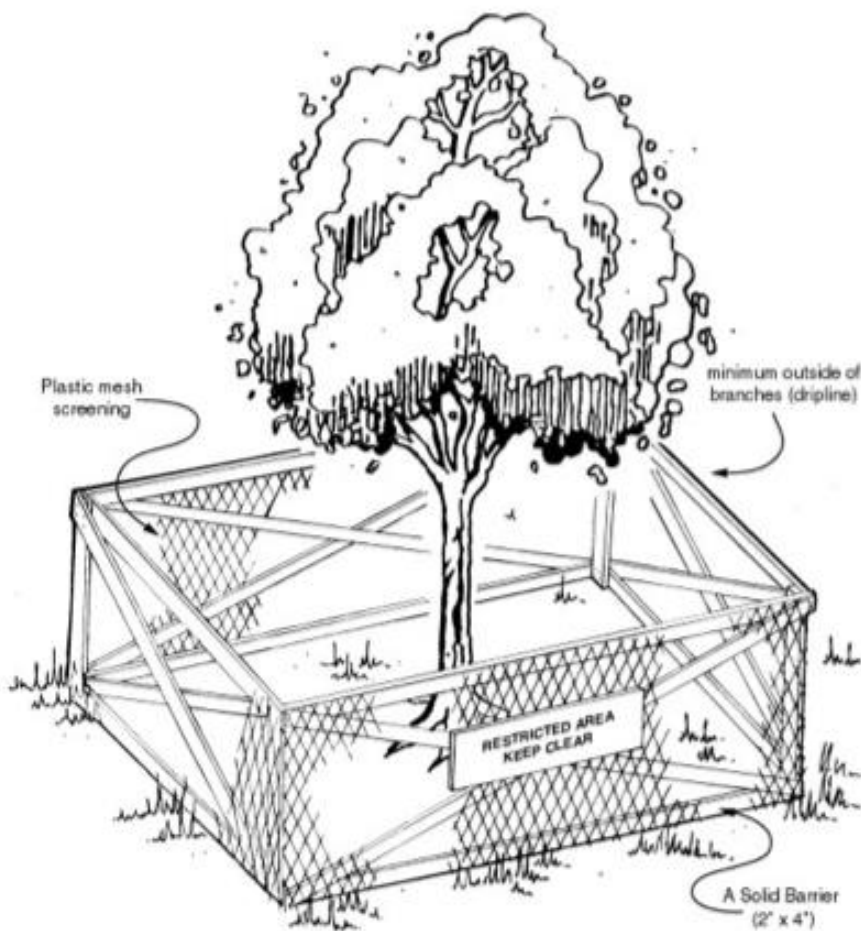
Tree Protection Fencing



APPENDIX I

BYLAW 3474

PROTECTIVE BARRIER



Tree Protection Barrier

Note: no storage of building materials
within or against protection barrier



Protection Barrier Distance from Tree

TRUNK DIAMETER	MINIMUM PROTECTION REQUIRED AROUND TREE
Trunk diameter	Distance from trunk
20 cm	1.2 m
25	1.5
30	1.8
35	2.1
40	2.4
45	2.7
50	3.0
55	3.3
60	3.6
75	4.5
90	5.0
100	6.0

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



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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 removed 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.



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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 van der Zalm + associates.

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.

Avery Group Housing Affordability Program

Housing Affordability Program	A plan to allow income qualified first-time home buyers to enter the housing market and build equity through direct down payment grants of up to \$24,000 for 1 bedroom homes and \$30,000 for 2 bedroom homes.
Rationale	<p>Many BC families (couples and individuals) have the household income to qualify for a home mortgage but with rising home values in the greater Vancouver area, struggle to save the amount required for the ever growing down payment. Avery Group's Housing Affordability Program will provide qualified first-time buyers with financial support for their down payment allowing them to purchase a home and start building equity now.</p> <p>Not only do we see access to home ownership as a benefit for Port Coquitlam families but also for BC municipalities. Increased density coupled with compelling programs like our Housing Affordability Program will contribute to attracting and retaining a strong labour force in our region. Families are able to live closer to work and reduce traffic congestion, commute times and have more time to spend with family.</p>
How it works	<p>First-time buyers will be invited to apply to purchase a home under our Housing Affordability Program.</p> <p>Following an evaluation process, should demand exceed the available number of homes offered in Avery Group Housing Affordability Program, qualified participants will be entered into a random lottery.</p> <p>Avery Group Housing Affordability Program will provide down payment support for 30 (thirty) first-time buyers.</p> <p>Avery Group Housing Affordability Program will make a [\$24,000] down payment contribution toward the purchase of a 1-bedroom home and [\$30,000] down payment contribution toward the purchase of a 2-bedroom (equivalent to 4-6% of purchase price).</p>
Purchaser commitment	<ul style="list-style-type: none"> • Purchaser completes the grant application and meets with financial institution partner. The financial institution partner will confirm to both first-time buyer and to Avery Group whether the applicant(s) are financially qualified to participate in Avery Group Housing Affordability Program. • Purchaser will pay a purchase deposit of 2% of home purchase price at time of pre -construction contract signing. This deposit will be applied to their down payment; • Purchaser will secure mortgage financing or pre-qualify for mortgage financing suitable to complete the purchase of the new home; and • Purchaser meets eligibility criteria for the grant program;
Structure	Avery Group will set up a separate legal entity [Trust] to administer the Avery Group Housing Affordability Program.
Funding	The Developer will contribute the funds to the [Trust] and Developer will have no future interest in or access to the funds.
Eligibility	<ul style="list-style-type: none"> • Purchaser is a first-time homebuyer • Purchaser lives or works in Port Coquitlam or nearby community. Note: Priority is given to those living or working in Port Coquitlam. • Purchaser will live in the home

	<ul style="list-style-type: none"> • Purchaser income qualifies for a lenders mortgage • Purchaser provides lender with acceptable proof of income/net worth • Purchaser household income should be in the range: <ul style="list-style-type: none"> ○ \$85,000 - 105,000 (1-bedroom unit) ○ \$105,000 – 135,000 (2-bedroom unit)
No-flipping	<p>Avery Group Housing Affordability Program is designed to help individuals or families to purchase a home – bettering their family’s lives, staying in the community they love and setting them on a positive financial path.</p> <ul style="list-style-type: none"> • Homes cannot be purchased for investment purposes; and • Restrictions apply if the home is sold in the first five years after contract signing. <p>Upon taking possession of their new home (following approximately 2 years of construction), homeowners will provide annual declaration for first three years confirming they are in compliance with the terms of the Agreement.</p>
Sale of property	<p>Avery Group Housing Affordability Program is designed to assist first-time buyers to become homeowners and create wealth through long-term home ownership. The following restrictions apply if the home is sold in the first five (5) years after pre-construction contract signing:</p> <ul style="list-style-type: none"> • If the home is sold in the first three (3) years after contract signing, the full amount of the original down payment grant must be repaid to the City of Port Coquitlam’s Affordable Housing Reserve; • If the home is sold in the fourth (4th) year after contract signing, fifty percent (50%) of the original down payment grant must be repaid to the City of Port Coquitlam’s Affordable Housing Reserve; • If the home is sold in the fifth (5th) year after contract signing, twenty-five percent (25%) of the original down payment grant must be repaid to the City of Port Coquitlam’s Affordable Housing Reserve; and • After five (5) years following contract signing, the full benefit of the grant accrues to the purchaser.

March 17, 2020

City of Port Coquitlam Development Services Department
City Hall Annex
200-2564 Shaughnessy St
Port Coquitlam BC
V3C 3G4

Re: OCP/Rezoning Application for Pitt River Road and Harbour Street.

To Lisa Grant:

When Avery applied for the OCP and Rezoning application in March 2018, there were different City of Port Coquitlam policies and bylaws. In fact, it was a different market, the average price of a condo has decreased and at the same time the price of construction has increased by 4 – 6 % per year. During this time, we have attempted to tailor our application to meet the new Council direction. This included a new Affordable Housing Policy, family size units and density bonus calculations. We are happy to meet the goals of the City Council; however, we believe it should be recognized that with the new policies our application has been significantly delayed. I think we can all agree a two-year timeframe for development application is not ideal and with the adjusted decline in the economic landscape of housing, it places the project in a challenging position.

The most recent change requested by Planning staff is the newly adopted density bonus figure of \$50 a square foot. This was not in place when we applied, and this new number is challenging to understand. This is the same rate the City would charge for the Westwood Triangle Transit Oriented Development area, which, is within walking distance to a Skytrain station and many other commercial and retail services. We are supportive of a voluntary Community Amenity Contribution, that is reasonable for all stakeholders.

Our project is focused on providing commercial space to an area of town that is in desperate need for additional services and amenities. We have also included a new Affordable Home Ownership Program that would be a first in British Columbia. We have proposed to give back one million dollars to provide up to 30 Port Coquitlam residents who are first time buyers an opportunity to enter the housing market. Indirectly, the program will free up 30 rental units vacated by the first-time buyers.

We strongly believe that Avery's Affordable Home Ownership Program provides greater benefit than required by the OCP. The combination of the Affordable Home Ownership Program and the Density Bonus are a significant cost to the project. If the city is steadfast in requiring \$50 a square foot related to the Density Bonus, Avery may have to reconsider the full value of the Affordable Home Ownership Program and the viability of the project. This is not meant to be a threat, we are attempting to be open and transparent about our project and the current market situation.

When we originally applied for the project, we had calculated \$27 a square foot for the Community Amenity Contribution based on an appraised land lift policy, this would equal a \$1,254,000. Based on the new voluntary CAC suggestions from the City of \$50 a square foot this would increase to \$2,612,000. We propose that the City calculate this voluntary gift based on the increase in density above the allowable permitted use under the Official Community Plan, then reduce the affordable housing program, as affordable housing is a community benefit, it would equal \$21 a square foot.

Further, if we are to proceed with this application in its current state, we would be required to purchase Prince Street, which will be an additional \$750,000 contribution, the value still needs to be confirmed, it might be higher or lower.

Altogether, this development will provide the city with approximately \$1,462,500 of one-time contribution (plus \$1,000,000 Affordable Home Ownership Program), which would be the largest development contribution in Port Coquitlam history. The project would also result in incremental annual property tax contribution of \$191,465.64. Beyond the financial windfall for the city, the development will provide much needed commercial/retail amenities in the Citadel Neighbourhood along with the Affordable Home Ownership Program.

We hope the City Council will appreciate the prolonged process and our willingness to meet the goals of City Council to arrive at a mutually beneficial outcome.

Respectfully,



Laurie Schmidt

c.c.: Chris Laing

PUBLIC CONSULTATION SUMMARY REPORT

PUBLIC OPEN HOUSE – November 8, 2018

PITT RIVER ROAD AND HARBOUR STREET PORT COQUITLAM, B.C.



CHARACTER SKETCH
VIEW ALONG PITT RIVER ROAD

Prepared by Schmidt & Associates Development Planning Ltd.

November 23, 2018

INTRODUCTION

On behalf of Cathedral Ventures Ltd., the project team hosted an Open House on Thursday, November 8, 2018 to update the community on the status of the proposed development as well as ask them for feedback and comments on a proposed mixed-use development containing three, four storey multi-family apartment building, 16- three-storey townhouse units and approximately 12,000 s.f. of commercial space on the site. Note, this is the second open house on this proposed development. The initial open house was held on October 4, 2017.

This report provides the following summary of the November 8, 2018 Open House:

- Event details, including a description and format of the Open House and information presented;
- An overview of the feedback received through comment forms;
- Copies of the sign-up sheets and comment forms; and
- Copies of the notification materials.

OPEN HOUSE DETAILS

Date: November 8, 2018

Time: 5:00 – 7:30 p.m.

Location: Citadel Middle School - Multi-Purpose Room - 1265 Citadel Drive - Port Coquitlam

Notification:

Flyer: (Appendix A)

Approximately 4,413 invitations were distributed to a 1 km radius from the site specified in Appendix B. In addition, City of Port Coquitlam staff, Mayor and Council were notified of the event.

Newspaper Ad: (Appendix C)

An ad was placed in the TriCity News Real Estate Section for the November 2, 2018 circulation.

Site Sign: (Appendix D)

An enlarged version of the open house invitation was attached to the two site signs on November 1, 2018.

Attendees: 60, not including those who did not sign the sign-in sheet, City Councillors and City staff.

Comment forms received: 33



In Attendance:

Cathedral Ventures Ltd.:	Garry Peters Rachelle Peters Allan Achtemichuk
Architect:	Bryce Rostich – Rositch Hemphill Architects Japheth Bondoc - Rositch Hemphill Architects
Landscape Architect:	Micole Wu - van der Zalm + Associates
Land Use Planning:	Laurie Schmidt– Schmidt & Associates Development Planning
Traffic Engineer:	Brent Dozzi - CTS Engineers
Research Consultant:	Monique Janower - Catapult Strategy

Format:

A sign-in table was placed at the entrance of the room and comment forms were distributed to attendees as they signed-in. Attendees were invited to review the display boards, ask questions of the project team and complete a comment form. Attendees were given the option of taking the comment form home and emailing it to Laurie Schmidt. To-date thirty-two (32) comment forms were filled out at the event and one (1) comment form has been received electronically. Display boards outlined the following topics (see Appendix G for a copy of the display boards):

- Welcome
- Application and Public Engagement Process
- Site Overview
- Project Team
- Development Community Rendering
- Landscape Vision
- Development Community Plans
- Aerial View - Northwest
- Aerial View - Southwest
- Site Section
- Connections
- Homes for Modern Families
- Development Community Vision
- Regional Policies
- Rendering
- Traffic Flow and Parking

FEEDBACK SUMMARY

Thirty-two (32) comment forms were submitted at the event and one (1) form was received electronically. Respondents were asked to provide their comments on their feelings about the proposed mixed-use development. They were also invited to provide any other comments that they may have.

Attendees were also asked if they live or work in the area. They were also asked if they rent or own the space where they live or work. The following is a summary of their responses*:

- Live in the area: 30
- Work in the area: 5
- Neither: 1
- Rent: 4 (2 of the renters do not live in Port Coquitlam - North Van and Coquitlam)
- Own: 21

*Some responses did not fill out this section

Summary:

- 14 responses supported the proposal (two of the comment forms in support were completed by couples)
- 5 responses supported the proposal but had concerns with traffic and parking (one form was completed by a couple and one form did not fill out the contact information)
- 7 responses did not support the project
- 4 responses were neutral but had concerns over traffic
- 1 response filled out the contact information and suggestions for commercial users
- 2 responses simply filled out the contact information

Copies of the sign-up sheet and comment forms attached (Appendix F).

APPENDIX A: Flyer Invitation

YOU ARE INVITED
To An Open HouseCHARACTER SKETCH
VIEW ALONG PITT RIVER ROAD

Cathedral Ventures Ltd. invites you to an open house to view and discuss a proposed mixed-use development at Pitt River Road and Harbour Street.

Members of the project team will be in attendance to answer any questions you may have and gather feedback from the community.

When: November 8th, 2018

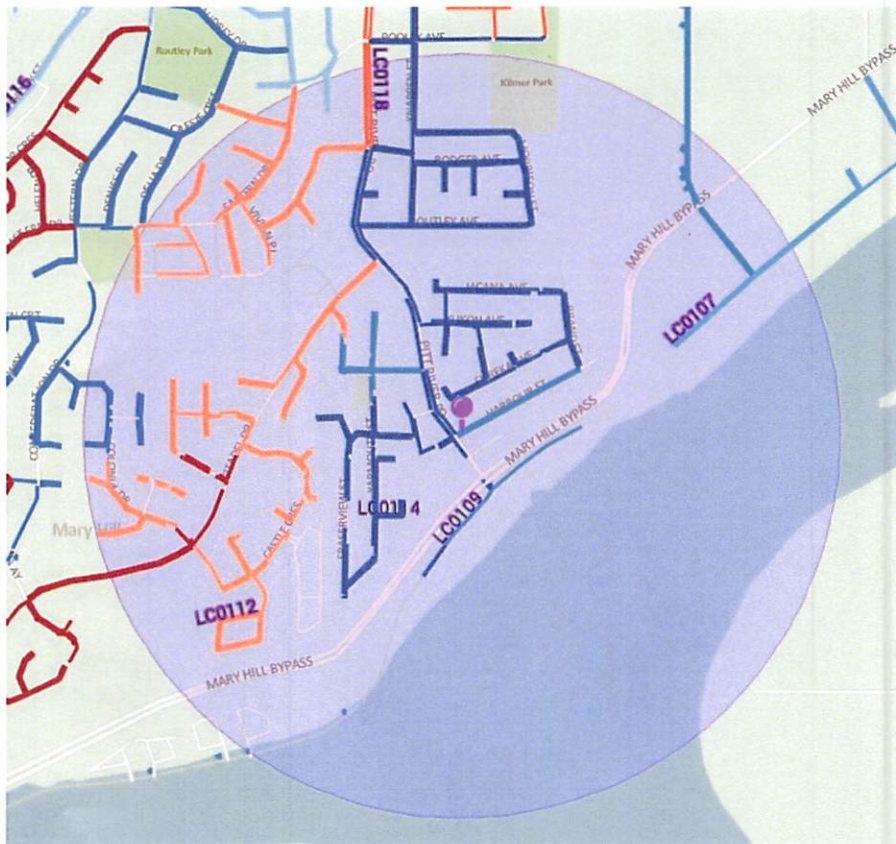
Time: 5:00 to 7:30 p.m.

Where: Citadel Middle School
Multi-Purpose Room
1265 Citadel Drive

For further information contact:
Laurie Schmidt
Email: lschmidt@sadp.ca
Phone: 778-773-3448




APPENDIX B: Flyer Distribution Map



APPENDIX C: Newspaper Ad

YOU ARE INVITED TO AN OPEN HOUSE

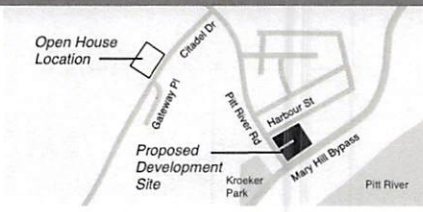


Artist rendering. View along Pitt River Road.

Cathedral Ventures Ltd. invites you to an open house to view and discuss a proposed mixed-use development at Pitt River Road and Harbour Street.

Members of the project team will be in attendance to answer any questions you may have and gather feedback from the community.

WHEN: November 8th, 2018
TIME: 5:00 to 7:30 pm
WHERE: Citadel Middle School
Multi-Purpose Room
1265 Citadel Drive



FOR FURTHER INFORMATION CONTACT:
Laurie Schmidt » EMAIL: lschmidt@sadp.ca » PHONE: 778.773.3448

APPENDIX D: Site Sign



APPENDIX E: Comment Form

GREYSTONE

Pitt River Road and Harbour Street

November 8th, 2018

CHARACTER SKETCH
VIEW ALONG PITT RIVER ROAD

Thank you for attending our Open House for the property located at Pitt River Road and Harbour Street. The purpose of this Open House is to share our proposed plans and hear your thoughts as part of the City's Official Community Plan Amendment and Rezoning Process.

Please select all options that apply to you:

I live in the area ☐ I work in the area ☐ Neither ☐
I rent ☐ I own ☐

Contact Information:

Completion of the information below is optional. However, if you wish to be contacted for future updates, a name and one point of contact is required.

Name: _____

Address: _____

Email: _____ Phone: _____

I would like to be contacted with future updates on this new mixed-used development?

Yes ☐ No ☐*Please turn over for additional questions.*

1. What are your thoughts on the proposed mixed-use development presented today?

2. What are your thoughts on the street level commercial proposed?

3. What type of commercial businesses and/or services would you like to see in your neighbourhood?

- a)

- b)

- c)

- d)

4. Do you have any other comments you would like to share?

*Please drop your completed comment form off at the sign-in desk or submit it via email before
November 29, 2018 to Laurie Schmidt at Schmidt & Associates Development Planning - lschmidt@sadp.ca*

Official Community Plan Amendment Application OCP00025 for 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

RECOMMENDATION:

That the Smart Growth Committee direct staff that the early consultation required for further consideration of an application to amend the Official Community Plan at 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road include the following:

- 1) on-site signage;
- 2) hosting an open house to obtain public comment on the proposed development; and
- 3) informing School District 43 of the proposal.

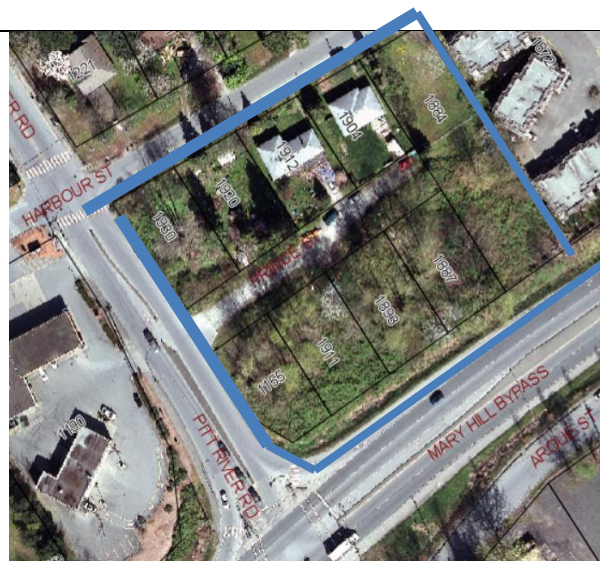
REPORT SUMMARY

The owner of the properties located at the corner of Pitt River Road and the Mary Hill Bypass, 393 Cathedral Ventures Inc., has submitted an application to redevelop the site for a mixed use development that would include commercial spaces, three 4-storey apartment buildings with a total of 130 apartment units, and 16 townhouse units (some with lock-off suites). This site is currently designated in the Plan for townhouse uses and amending both Official Community Plan (OCP) policies and the site's land use designation in the Plan would be required to allow for the proposed development. Acquisition of a portion of road within the site, Prince Street, is also proposed.

This report seeks Committee direction on its requirements to meet the early consultation requirements for an OCP amendment. In addition, it informs Committee of additional information which has been requested to ensure a comprehensive evaluation of the potential impacts and public benefits of this proposal will be provided as part of the initial assessment.



Official Community Plan Land Use Designation



Site (houses have been demolished)

Official Community Plan Amendment Application OCP00025 for 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

BACKGROUND

The vacant site is currently designated Townhouse Residential (RT) in the OCP, a designation that supports townhouse development; it is currently zoned RS1, Single Residential. The development as proposed would require amending the site's land use designation, most likely to a Neighbourhood Commercial designation, and rezoning to a site-specific comprehensive development zone. A proposal for a highway commercial development of this site with a service station and fast food restaurant was considered by Council in 2002 but this proposal was subject to considerable opposition from the neighbourhood and was refused by Council.

The OCP sets policies for how the community is intended to develop as well as designates lands for uses in keeping with these policies. An evaluation of the proposal with applicable policies of the Plan indicates:

- An amendment to the Plan's land use designations would be required for both the proposed commercial uses and apartment uses as the current designation allows only for townhouse uses.
- Additional information is required to determine if the proposed commercial uses would conform to policies that allow for small pedestrian-oriented neighborhood commercial sites to serve a local population. Community commercial (retail, office, and personal services) and highway commercial uses would not be in keeping with commercial policies of the Plan.
- The OCP's designation of this site for townhouses reflects policies that look to meeting the community's significant demand for ground-oriented housing. The Plan also supports locating apartment buildings in urban centres close to community services and transit. Additional information is required to provide a strong rationale for why this site would be suitable for the proposed apartment use.

The applicant has been advised that the following additional information is required to provide for a comprehensive evaluation of the application:

- (1) Commercial uses: The proposal for commercial spaces within two apartment buildings does not specify the proposed types of commercial uses. To understand the project, these uses will need to be defined. A retail impact assessment has been requested to identify the expected trade area for the commercial uses and provide an analysis of their potential impact on existing commercial areas, in order to determine if the proposal would conform to the OCP policies limiting commercial expansion in areas other than our established commercial nodes such as the Downtown. An additional concern to be addressed would be if the commercial uses were to have a highway orientation due to the site's proximity to the Mary Hill Bypass as this orientation would not be in keeping with the residential context of the site and could have significant traffic impacts.
- (2) Residential uses:
 - a. Rationale for apartment use: A strong rationale for why the proposed site would be appropriate for apartments, including comment on residents' access to transit and services, is required.

Official Community Plan Amendment Application OCP00025 for 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

- b. Acoustic assessment: The proposed siting of apartment buildings in close proximity to the Mary Hill Bypass raises concern about the impacts of heavy traffic on the livability of the dwelling units. The applicant has been requested to provide an assessment of measures that would address this concern.
- c. Affordability/Family orientation: the applicant has been requested to evaluate how the City's proposed housing affordability policies and emerging policy to achieve family-oriented units would apply.
- d. Lock-off suites in townhouses: The City does not have any policies or regulations related to this use. The applicant has been requested to provide additional information to identify the potential market for this type of unit and its anticipated requirements (e.g., parking, amenity spaces).

(3) Archaeological Assessment: in 2002, the BC Archeology Branch identified the site as being in proximity to a known archaeological site and required the owner to undertake an archaeological impact assessment. The recommendation of the assessment was that a Site Alteration Permit should be obtained prior to any development work, in accordance with Section 12 of the *Heritage Conservation Act*. The City will require confirmation from the BC Archaeology Branch that assessment and permit requirements have been satisfied.

FINANCIAL IMPLICATIONS

The request to increase residential density and allow commercial uses would impact tax revenues; the sale of a portion of Prince Street would provide land sales revenue. In addition, the application would be subject to the City's density bonus policy. Further information on the financial implications would be provided following determination of the appropriate mix of uses and density for the site.


PUBLIC CONSULTATION

The applicant conducted an initial round of consultation including an open house held on October 4, 2017 at which three development options were presented. The consultant's summary of this consultation indicated the open house was attended by approximately 30 people and three provided comments in writing on the options. Generally, a small commercial component was supported but there was concern regarding potential impacts of parking on Harbour Street and traffic at the Harbour Street and Pitt River Road intersection. It is recommended that the public be given an opportunity to comment on the proposed development as part of the early consultation requirements of the *Local Government Act*.

Official Community Plan Amendment Application OCP00025 for 1884-1930 Harbour Street, 1887-1911 Prince Street and 1155 Pitt River Road

OPTIONS

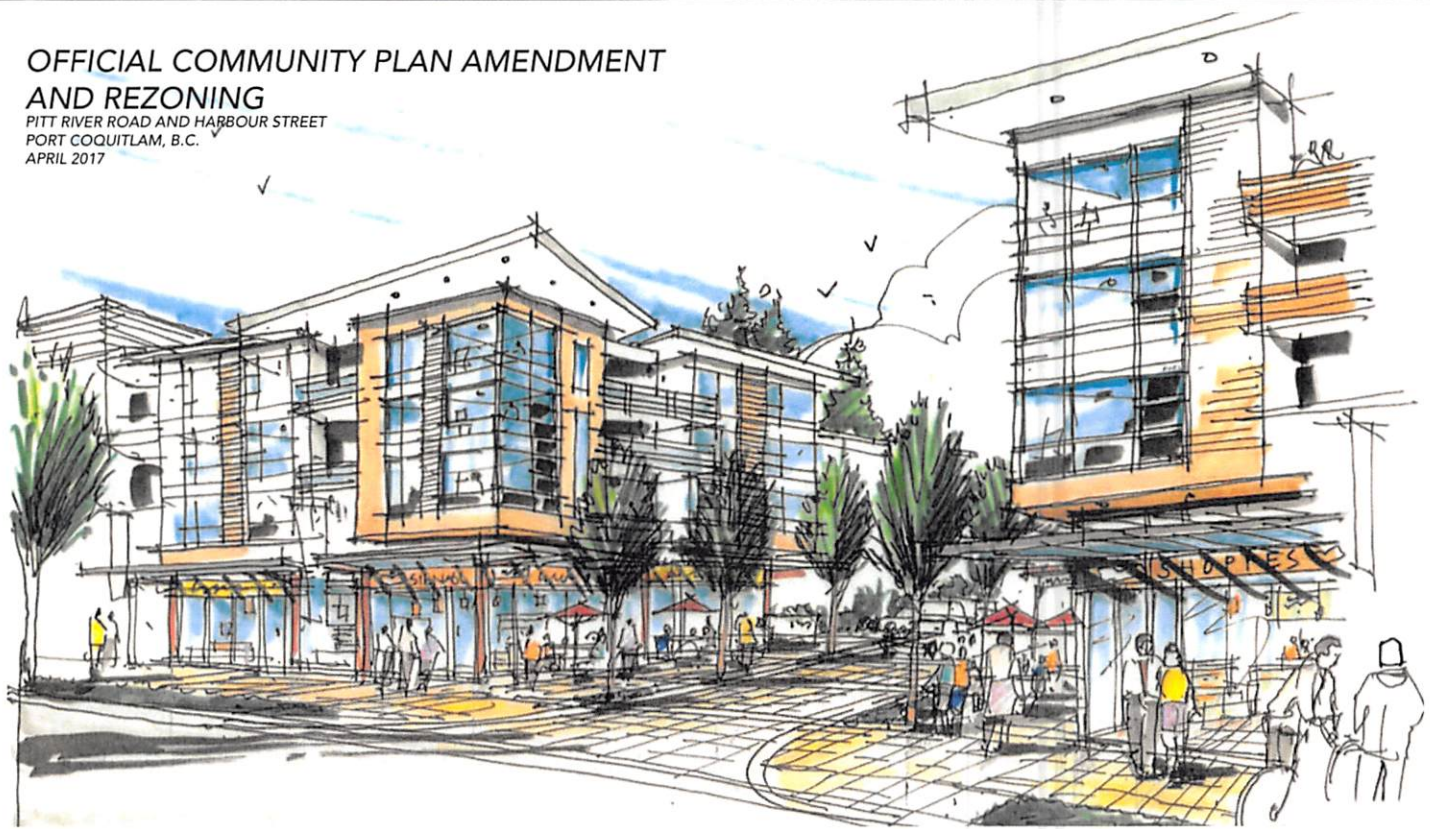
Smart Growth Committee may:

#	Description
1 	Approve the recommended early consultation requirements for amendment of the Official Community Plan
2	Determine that it wishes to receive the additional information identified in this report prior to determining its requirements for early consultation, or
3	Determine that it does not support amending the Official Community Plan to allow for the proposed commercial and apartment uses and recommend to Council that the application be refused.

Attachment #1: Applicant's Submission dated March 2018

OFFICIAL COMMUNITY PLAN AMENDMENT AND REZONING

PITT RIVER ROAD AND HARBOUR STREET
PORT COQUITLAM, B.C.
APRIL 2017



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GREYSTONE PLACE
PORT COQUITLAM-MARCH 2018

CIVIC ADDRESS AND LEGAL DESCRIPTION:

- 1912 Harbour Street – PID 008-481-369
 - Legal Description: Lot 13 DL 232 NWD PL NWP20011
- 1920 Harbour Street – PID 008-481-342
 - Legal Description: Lot 12 DL 232 NWD PL NWP20011
- 1930 Harbour Street – PID 004-344-006
 - Legal Description: Lot 19 Block 1 DL 232 NWD PL NWP20011
- 1155 Pitt River Road – PID 003-439-062
 - Legal Description: Lot 553 DL 232 NWD PL NWP64266
- 1911 Prince Street – PID 003-439-071
 - Legal Description: Lot 554 DL 232 NWD PL NWP64266
- 1893 Prince Street – PID 003-439-097
 - Legal Description: Lot 555 DL 232 NWD PL NWP64266
- 1887 Prince Street – PID 003-439-119
 - Legal Description: Lot 556 DL 232 NWD PL NWP64266

OWNER:

- 393 Cathedral Ventures Ltd.

APPLICANT:

- Laurie Schmidt
Schmidt & Associates Development Planning Ltd.
1440-1166 Alberni Street
Vancouver, B.C.
V6E 3Z3



Schmidt & Associates
Development Planning

March 30, 2018

Development Services - Planning
City of Port Coquitlam
200-2465 Shaughnessy Street
Port Coquitlam, B.C.
V3C 3G4

Attn: Laura Lee Richard - Director

**RE: 1912-1930 Harbour Street / 1887-1911 Prince Street / 1155 Pitt River Road
OCP Amendment and Rezoning Application - Mixed-Use Development Project**

Dear Laura Lee,

The Regional Growth Strategy has tasked Port Coquitlam with substantial growth over the coming years. In order to meet this request, the City will have to work with owners of land assemblies such as this to provide unique housing solutions to meet the ever growing demand while maintaining the lifestyle balance it has worked hard at to maintain.

We are proud of the proposed development and feel it meets the City's policies and needs for the future.

PROPOSAL SUMMARY:

- OCP Amendment and Rezoning of the nine (9) vacant single family properties to CD zone to take advantage of the rare large land assembly;
- Proposal for a mix of grade entry homes, family apartments and smaller affordable apartments;
- Provide much needed neighbourhood commercial to the area;
- Project design exceeds Port Coquitlam's sustainability requirements;
- Project's design will create a "gateway" to Port Coquitlam for those entering the City via the Mary Hill Bypass

RATIONALE SUMMARY:

- With the shortage of designated residential lands, this large lot assembly provides an opportunity for a well-designed, medium density mixed use development.

Sincerely,

LAURIE SCHMIDT
President

SchmidtDevelopmentPlanning.ca



Schmidt & Associates
Development Planning



GREYSTONE PLACE
PORT COQUITLAM - MARCH 2018

PROJECT TEAM:

Architect:

Rositch Hemphill Architects

10-120 Powell Street

Vancouver, B.C.

V6A 1G1

Project Leads – Bryce Rositch, Norm Huey, Reid Bianco

Landscape Architect:

Van der Zalm + Associates Inc.

1-20177 97 Avenue

Langley, B.C.

V1M 4B9

Project Lead – Micole Wu

Arborist:

Van der Zalm + Associates Inc.

1-20177 97 Avenue

Langley, B.C.

V1M 4B9

Project Lead – Kelly Koome

Civil Engineer:

Webster Engineering Ltd.

3745 Delbrook Avenue

North Vancouver, B.C.

V7N 3Z4

Project Lead - John Tynan

Traffic Engineer

CTS Engineering

84A Moody Street

Port Moody, B.C.

V3H 2P5

Project Lead - Brent Dozzi

Sustainability

PGL Environmental Consultants

1500-1185 W. Georgia Street

Vancouver, B.C.

V6E 4E6

Project Lead - David Bell

Communications:

Communication Practitioners

Project Lead - Steve Jones

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3.4 Project Data

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4.2 Geotechnical

4.3 Traffic Impact Study

4.4 Public Consultation Summary Report

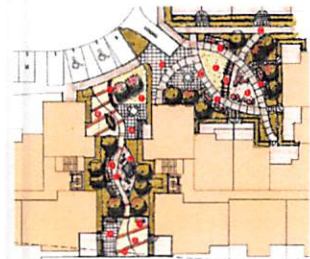
4.5 Sustainability Report

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1. CONTEXT

1.1 SITE CONTEXT

The "site" is comprised of nine residential lots which are currently vacant and an unused City street (Prince Street). The site is approximately 3.0 acres in size (consolidated) including the City street. The site is located at the south-east corner of Pitt River Road and Harbour Street, with the Mary Hill Bypass running along its southern property line. The site slopes approximately 30 feet from north to south.



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1. CONTEXT

1.2 AREA CONTEXT

The site is located along the southern edge of Port Coquitlam. It is bordered by the Mary Hill Bypass to the south, Pitt River Road to the west and Harbour Street to the north. To the north of the site is predominantly single family dwellings, to the east is lower density townhouses, to the west is a mix of commercial and single family and the to the south is a mix of commercial and multi-family. The Fraser and Pitt River are located to the south of the site, giving the site great views of the rivers and Mount Baker. The site is in close proximity to Citadel Heights which is home to larger single family dwellings, schools and parks.



Public Trail System



Poco Trail



Public Playing Field



Citadel Middle School



Gas Station / Convenience Store



Public House and Multi-Family development



Pitt / Fraser River

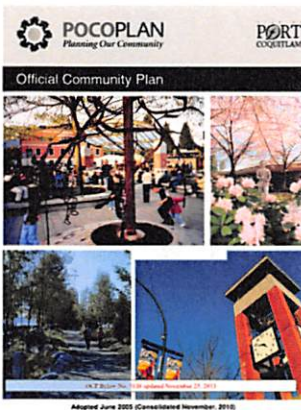
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2. POLICY CONTEXT

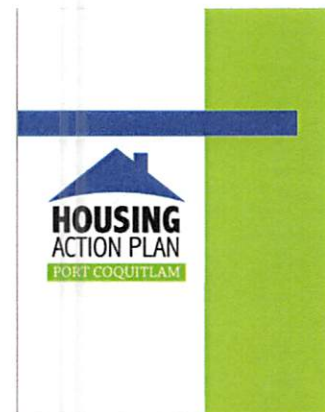
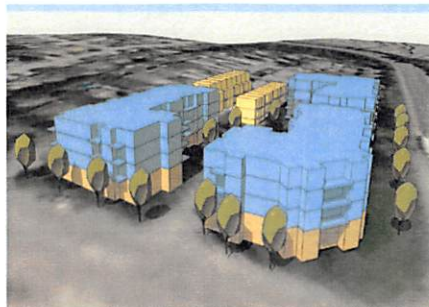


2.1 OFFICIAL COMMUNITY PLAN

The Official Community Plan (OCP) describes Port Coquitlam as "a balanced community with residential, commercial and industrial areas and many community amenities and natural areas for people to enjoy". The OCP guides its land use and manages growth and change in the community. It is no secret that Port Coquitlam has a limited supply of land remaining, of which a majority is designated for light industrial and commercial purposes. The rapid changes in the population and demand for residential housing along with the limited supply of land require the OCP and the City to look at opportunities such as this one to provide a medium density development that provides multiple options for those looking

for housing in Port Coquitlam. The proposed development at Pitt River Road and Harbour Street provides ground oriented family housing, apartments with two or more bedrooms for your families or those wishing to downsize and remain in the neighbourhood (which also frees up larger single family dwellings in the area for larger families) and smaller more affordable apartments. The provision of neighbourhood commercial in the development creates a much needed amenity for the immediate community and the residents of Greystone Place.

The Regional Growth Strategy is projecting a population of 85,000 people in Port Coquitlam for 2041, an increase of approximately 26,000 over what currently exists. With its limited supply of land, assemblies such as this will not present themselves often and must be taken advantage of if Port Coquitlam wants to keep pace with the demand for housing.



2.2 HOUSING ACTION PLAN

Metro Vancouver's Regional Growth Strategy (RGS) requires municipalities to adopt Housing Action Plans to outline how they will meet regional goals for sustainability by providing housing that will contribute to complete communities. The City of Port Coquitlam's Housing Action Plan is intended to fulfill its commitment to comply with this requirement. The RGS forecasts that Port Coquitlam will grow to approximately 68,000 residents by 2021, 76,000 in 2031 and 85,000 in 2041. The largest proportion of this increase will be age 40-55, while the largest increase will be those over 65. To accommodate the project population, the RGS estimates the City will need to have 30,900 dwelling units in 2031 and that this supply will need to increase to 34,300 units by 2041. Based upon the

2. POLICY CONTEXT

2.2 HOUSING ACTION PLAN CON'T

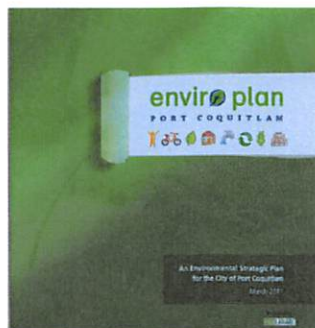
current unit count estimated at 23,000, the City needs to plan for another 11,000 units (an increase of almost 50%). With limited lands remaining designated for residential use, the projected housing capacity for Port Coquitlam is 28,400 dwelling units, which is a shortfall of approximately 2,500 units.

With a number of the areas designated for multi-family development at or near capacity, the challenge is then to find small lot consolidations for higher density projects. The proposed development at Pitt River Road and Harbour Street presents just such an opportunity. The assembly of 9 single family lots along with the consolidation of Prince Street creates an opportunity for a medium density mixed-use development containing ground oriented townhomes with the possibility of lock-off suites, apartments suited for families (two and three bedroom), and smaller more affordable one bedroom units. The provision of a small amount of neighbourhood commercial provides the community and residents of the development an "amenity" in the form of small shops and services that they would otherwise have to drive to.

The City's housing projects indicate the dwelling units that can be accommodated by current land use designations of the OCP is less than what is needed to meet our targeted population in the RGS.

Housing Affordability:

We are acutely aware of the soaring cost of housing in the Lower Mainland and we are looking into various ways to do whatever we can to alleviate the problem for Port Coquitlam families. Most residents we have spoken with, including City Councillors, realize that our options are limited, especially with a small scale development, but we are presently looking into a variety of ideas to ease the pain while still providing a project that will make the community proud.



2.3 ENVIRO PLAN

Creating compact mixed-use walkable neighbourhoods reduces our environmental footprint while helping create a healthier, vibrant community. This was one of the main thoughts when we began designing the proposed Greystone Place development. Located in a predominantly low density residential neighbourhood where it is a necessity to drive to get even the basic goods and services, we felt this was an opportunity to provide the neighbourhood with choices in residential living and give them the opportunity to walk to get their basic needs and even to work in their community.

The developer has also made a conscience decision to create a development that exceeds the current sustainability requirements of Port Coquitlam for OCP Amendments and Rezoning. We plan on building highly efficient buildings, manage storm-water on site through landscaping and retention and provide areas for urban agriculture. Our goal is to meet the LEED Gold requirement for points.



Metro Vancouver 2040 Shaping Our Future
Regional Growth Strategy
By June 1, 2010, 2010

2.4 REGIONAL GROWTH STRATEGY

Metro Vancouver's Regional Growth Strategy (RGS) requires municipalities to adopt Housing Action Plans to outline how they will meet regional goals for sustainability by providing housing that will contribute to complete communities. The City of Port Coquitlam's Housing Action Plan is intended to fulfill its commitment to comply with this requirement. The RGS forecasts that Port Coquitlam will grow to approximately 68,000 residents by 2021, 76,000 in 2031 and 85,000 in 2041. The largest proportion of this increase will be age 40-55, while the largest increase will be those over 65. To accommodate the project population, the RGS estimates the City will need to have 30,900 dwelling units in 2031 and that this supply will need to increase to 34,300 units by 2041. Based upon the current unit count estimated at 23,000, the City needs to plan for another 11,000 units (an increase of almost 50%). With limited lands remaining designated for residential use, the projected housing capacity for Port Coquitlam is 28,400 dwelling units, which is a shortfall of approximately 2,500 units.

3. DESIGN RATIONALE

3.1 Public Benefits

Housing for Families & First Time Home Buyers



Housing for Downsizers allowing them to stay in the Community



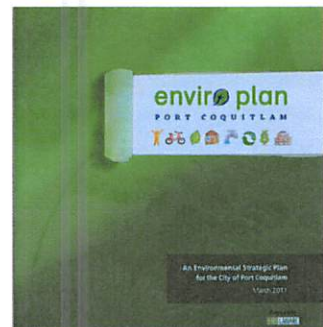
Services and Amenities for Community



Neighbourhood Off-Site Improvements



Sustainable Development



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PORT COQUITLAM - MARCH 2018

3. DESIGN RATIONALE

3.2 Architectural Rationale



Overview:

- The proposed project consists of two four-storey mixed-use commercial/residential buildings, on four-storey residential only building and sixteen three-storey townhome units. This proposal will replace the existing single family and underdeveloped vacant lots currently on the site. The current Prince Street will be purchased from the City and replaced by the new through roadway.
- The primary commercial/retail orientation is located on the ground floor of the two Pitt River Road facing buildings. A smaller portion of the commercial is orientated towards the interior landscaped courtyard and through roadway. Convenient commercial parking, short term residential visitor parking, access to the underground parkade, residential lobby access and the through roadway to Harbour Street are located in this area as well.



- 138 residential units of various types and sizes are proposed within the buildings, all over the required underground parking. This consists of Building 'A' (four-storey-50 unit all residential building), Building 'B' - mixed commercial/residential building with 39 units), Building 'C' (four-storey - mixed commercial/residential building with 41 units) and sixteen residential townhomes (three-storey ground oriented units in two buildings).
- This proposal upgrades the street frontage along Pitt River Road and Harbour Street. A service dedication along Mary Hill Bypass has also been anticipated. Improved pedestrian circulation linkages will result. It is therefore proposed to orient commercial uses toward the new routes and provide grade level access to the CRU's.
- The residential units will provide a wide variety of unit types from one bedroom to three bedrooms and three level townhomes which will provide a wide range of options for families. Commercial space is intended to be community focused to provide neighbourhood scale services. Community feedback to date has identified this as a desired need that will assist with the future success of the proposed development.

Massing and Design Approach

- After preliminary discussions with Planning staff and an introductory pre-submission community meeting, the building massing was divided into four separate building areas with street orientation backing onto a large central landscaped courtyard/roadway area. This area is proposed to be the central feature of the project. Site grades provide a significant south facing slope from Harbour Street towards Mary Hill Bypass. A lesser but significant east to west slope also exists. Three storey building massing is proposed for Harbour Street as an appropriate massing transition to existing single family and townhome residential. Ground oriented commercial fronts Pitt river Road and elevates the residential in this area. Mary Hill Bypass residential is also elevated above the adjacent buy arterial roadway as an appropriate transition to the busy nature of the roadway. Ground oriented townhomes wrap the north east corner of the site and provide each with a small private street oriented yard/street address with access to the public realm. A break in the massing at roughly the middle of the Harbour Street frontage also announces the north site entrance.
- The inner courtyard has defined outdoor areas for both the residential and commercial uses. A general separation line is located along the interior roadway and between Building 'A' and Building 'B'. The roadway access from Pitt River Road provides commercial storefront access with at grade parking, loading and underground parking access. The area beyond and associated to Harbour Street provides for residential apartment lobby access, at grade townhome unit access along with the residential common outdoor areas. These areas provide gathering and meeting spaces for the residents and will house significant landscape features such as play areas and gathering

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GREYSTONE PLACE
PORT COQUITLAM-MARCH 2018

3. DESIGN RATIONALE

3.2 Architectural Rationale con't

spaces. Mary Hill bypass fronting buildings are separated by a common outdoor space that takes advantage of the south facing orientation and views. All residential units above the courtyard have large decks to increase livability of the units and add interest to the massing of the buildings.

- Parking is hidden from the surrounding neighbourhood with the majority of the parking stalls fully contained within the underground parking areas. All loading and garbage handling have been internalized within the site and within the building. Residential parking is on one and one-half levels and is secured separately from the commercial and visitor parking area. The residential and commercial parking proposed meets the level required by the Parking Bylaw. A parking analysis to support the proposed design has been completed by Creative Transportation Solutions (report attached).
- The design respects the general residential nature of the area, with acknowledgment of the introduction of community oriented commercial for the neighbourhood. Careful attention will be paid to the relationship of the neighbourhood retail frontages and the pedestrian realm which includes opportunity for weather protection along the Pitt River Road frontage and the internal courtyard area. A contemporary approach with generous fenestration and quality cladding materials is intended for all buildings. A West Coast modern approach with the use of natural materials mixed with contemporary materials is proposed.



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PORT COQUITLAM - MARCH 2018

3. DESIGN RATIONALE

3.3 Landscape Rationale

The proposed project is a mixed-use development composed of commercial at-grade with apartment units above as well as a series of townhomes. The design intent is to provide high-quality outdoor space in both the public and private spaces. Below is an outline for the approach to key design elements:



- **Outdoor Amenity:** The central open space will incorporate elements of natural play as well as areas for seating and picnicking. The amenity space between buildings A & B has a look-out terrace where residents will have excellent views towards the Pitt and Fraser Rivers. On the way to this look-out terrace a landscape display area has been carefully designed with a feature stone to represent the historic rock that was found on the project site. This responds to the First Nation history of the site and provides an additional cultural layer to the landscape.



- **Circulation:** Pedestrian safety is a critical factor that drove the landscape design. Accessible pathway(s) incorporated into the internal network provide connections between all main entries. A few nodes are paved with coloured unit pavers to accentuate crosswalks at key intersections to provide further delineation for pedestrian safety.
- **Commercial area:** The outdoor patio space is well-proportioned to accommodate table and seating areas for pedestrians passing by or to be used as outdoor seating for the commercial units. An alley of trees from the access on Pitt River Road provides for a strong connection to the building entrance for residents and visitors. The existing street will be enhanced by constructing a new public sidewalk and adding additional boulevard trees and plantings. The two corner nodes on Pitt River Road have been improved to include benches and shade protection.



- **Townhome Patios:** Each resident of the townhomes at Harbour Street will enjoy a private front patio with gated access to the public sidewalk. Shade trees and shrub planting with seasonal interest have been selected to further establish a comfortable space with privacy for the residents. The rear patio connects to the internal pedestrian route allowing residents to have access to exterior spaces through both sides of their units.
- **Planting:** Native and regionally appropriate plants are used to suit the micro climate of the site, provide seasonal interest and have medium-to-low watering requirements. The plant material will not only enhance the experience but also help with the storm-water management on-site.

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GREYSTONE PLACE
PORT COQUITLAM-MARCH 2018

3. DESIGN RATIONALE

3.4 Project Data

Project Statistics				
Greystone Commercial /Residential – Harbour Street, Port Coquitlam, B.C.				
1	<u>Project Description:</u>	Mixed Use Development with Neighbourhood Scale Commercial/Retail, Three/Four Storey Wood Frame Residential Apartments, Three Storey Residential Townhomes on Underground Parking		
2	<u>Municipal Address:</u>	Mary Hill Bypass and Pitt River Road, Port Coquitlam B.C.		
3	<u>Legal Description:</u>			
4	<u>Zone:</u>			
5	<u>Fire Protection:</u>	Combustible Construction, Sprinklered Building		
6	<u>Permitted Uses:</u>	<table><tr><td>Commercial/ Residential Apartment and Townhomes</td><td>Development Proposal: Commercial / Residential Apartments and Townhomes</td></tr></table>	Commercial/ Residential Apartment and Townhomes	Development Proposal: Commercial / Residential Apartments and Townhomes
Commercial/ Residential Apartment and Townhomes	Development Proposal: Commercial / Residential Apartments and Townhomes			
<u>Parcel Dimensions:</u>				
1	<u>Parcel Area:</u>	9,609 Sq.M. 103,434 Sq.Ft.		
2	<u>Parcel Frontage:</u>	Two Streets		
<u>Maximum Parcel Density:</u>				
	Floor Space Ratio: (FSR)	FSR Proposed 1.54		
	9,609 Sq. M. (103,434 Sq. Ft.) Lot Area	14,811 Sq. M. (159,427 Sq. Ft.)		
<u>Minimum Principal Building Setbacks:</u>				
1	<u>Principal Building Front Setback:</u>	Minimum 6.0 M 6.0 M 19.69 Ft.		
2	<u>Principal Building Rear Setback:</u>	Minimum 6.0 M 6.0 M 19.69 Ft.		
3	<u>Principal Building Interior Side Setback:</u>	Minimum 6.0 M 6.0 M 19.69 Ft.		
<u>Maximum Building Height:</u>				
1	<u>Maximum Building Height:</u>	15.85 M / 52.0 Ft. 4 Storeys		

UNIT MIX

BUILDING A						
Floor	1 Bed	1+Den	2 Bed	2+Den	3 Bed	Floor Total
1	3	2	4	2	1	12
2	3	2	4	2	1	12
3	3	2	4	4	1	14
4	3	2	4	4	1	14
5th Fl.	18%	16%	29%	28%	8%	100%
Totals	8	8	16	10	4	46

BUILDING B						
Floor	1 Bed	1+Den	2 Bed	2+Den	3 Bed	Floor Total
1	1	1	1	0	1	4
2	1	2	4	0	1	8
3	1	2	4	4	1	12
4	1	2	4	4	1	12
5th Fl.	16.7%	16.7%	33.3%	33.3%	8.3%	100%
Totals	4	7	13	8	4	36

BUILDING C						
Floor	1 Bed	1+Den	2 Bed	2+Den	3 Bed	Floor Total
1	0	0	0	0	0	0
2	0	0	4	0	1	5
3	0	0	4	4	1	9
4	0	0	4	4	1	9
5th Fl.	0%	0%	22.2%	22.2%	11.1%	100%
Totals	0	0	8	8	2	18

PARKING CALCULATIONS

Project Stats									
Building	Totals	1 Bed	1+Den	2 Bed	2+Den	3 Bed	TH	Parking Totals	
Townhomes	16	0	0	0	0	0	16		
Zone Required Parking	2.0 per unit							32	32 stalls
Parking Ratio Required	1 per 5 units							4	4 stalls
Zone Required Vehicle									
Apartments									
Building A	50	8	8	16	14	4	0		
Building B	36	4	7	13	11	4	0		
Building C	18	0	0	8	8	2	0		
5th Fl.	1.38%	16.67%	22.22%	22.22%	22.22%	8.33%	100%		
Unit Totals	104	12	15	34	33	10	16		
Zone Required Parking	1 per 5 units							21	21 stalls
Parking Ratio Required	1 per 5 units							4	4 stalls
Zone Required Vehicle									
Parking Provisional Totals									215 stalls
Commercial Parking									
Zone Required	1 for each 20 sq. m (220 sq. ft.) of gross floor area							13	13 stalls
Parking Provisional Totals	13,000 sq. ft. (1,210 sq. m) of gross floor area							13	13 stalls
Developmental Parking Totals									232 stalls

S&A

Schmidt & Associates
Development Planning



GREYSTONE PLACE
PORT COQUITLAM - MARCH 2018

RECOMMENDATION:

That Committee of Council

- *Endorse the preliminary design concepts for Kingsway Avenue as outlined in the staff report titled Kingsway Avenue Design dated February 18, 2020;*
- *Add to the scope a northbound left hand turn lane at the McLean Avenue intersection (as per Scenario 2 within this report);*
- *Direct staff to proceed with detailed design; and*
- *Direct staff to Consider a new north/south connection from Kingsway Avenue to McLean Avenue as part of the Master Transportation Plan update.*

PREVIOUS COUNCIL/COMMITTEE ACTION

At the February 18, 2020 Committee of Council meeting, staff presented the proposed Kingsway Avenue concept design, and Committee provided feedback.

At the March 17, 2020 Committee of Council meeting, the following motion was passed:

That Committee of Council direct staff to remove the intersection improvements at Tyner Street/Kingsway Avenue from the scope of work for the PCCC off-site works, and include the work as part of the Kingsway Avenue corridor improvements.

REPORT SUMMARY

Further to the February 18, 2020 report which recommended improvements to Kingsway Avenue, this report provides additional information regarding the intersections at McLean Avenue and Kingsway Avenue and Tyner Street and Kingsway Avenue.

BACKGROUND

Kingsway Avenue is classified as a major road network (MRN) which supports efficient movement of large volumes of people and goods and connecting provincial highways to municipal road networks. Currently, Kingsway has one travel lane in each direction for the majority of the corridor with parking permitted on both sides of the road. It is surrounded primarily by industrial and commercial developments and is a designated truck route.

Funding was approved in September 2018 to develop a conceptual design in 2019 with the objective of assessing existing and future traffic performance and determining preferred design criteria for the interim and future horizons. Additionally, funding was approved to prepare a detailed design in 2020 once the concept was endorsed by Committee of Council (CoC).

At the February 18, 2020 CoC meeting, staff presented the concept design which was developed for the Kingsway Avenue corridor between Tyner Street and the Mary Hill Bypass. The concept design was informed by a comprehensive traffic study which included provisions for ongoing and future development in the area, identifying measures of the effectiveness at each of the intersections along the corridor, as well as traffic demands compared to capacity of the travel lanes.

Committee was generally supportive of the concept design, but requested additional information relating to the Tyner Street intersection and the McLean Avenue intersection. The Tyner Street intersection was originally proposed as a roundabout to be constructed as offsite works in conjunction with the Port Coquitlam Community Centre (PCCC) development, in addition to a roundabout which is proposed at Kelly Avenue. This was based on a traffic impact assessment performed in 2016. At the March 17, 2020 CoC meeting, this scope was removed from the PCCC offsite scope given the revised recommendation flowing from the updated corridor traffic assessment, and added to the capital project scope to be considered as part of the overall project planned for 2022.

At McLean Avenue, CoC requested staff explore the potential for a northbound left hand turn lane from McLean Avenue onto Kingsway Avenue, a phase that does not currently exist in the signal cycle.

Finally, the previous report recommended a future north / south connector road between Kingsway Avenue and McLean Avenue, and is again recommended in this follow up report.

DISCUSSION

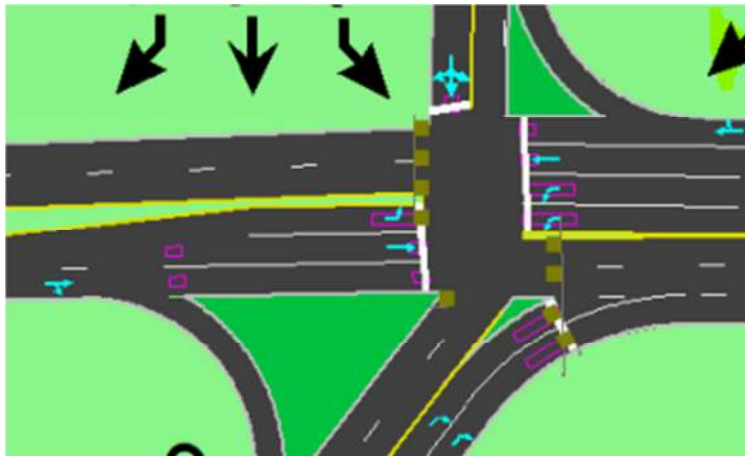
Tyner/Kingsway:

Due to the proximity of the intersections at Kelly Avenue and Tyner Street, a roundabout is not recommended at Tyner Street due to spillback that will occur, limiting the available movements at the Tyner Street intersection. A right in right out (RIRO) configuration results in the best level of service and eliminates the most critical movements at this intersection: left hand turns from Tyner Street onto Kingsway Avenue and left hand turns from Kingsway Avenue onto Tyner Street, resulting in an intersection which operates with a high level of service.

Alternate routing for those motorists no longer able to make left turns at Tyner Street was outlined in the March 17, 2020 report, however, CoC expressed their concern for movements in and out of this area, indicating their support for this configuration would be influenced by the ability to accommodate a northbound left turn at McLean, which will be discussed further below. The staff recommendation at this intersection has not changed.

McLean/Kingsway:

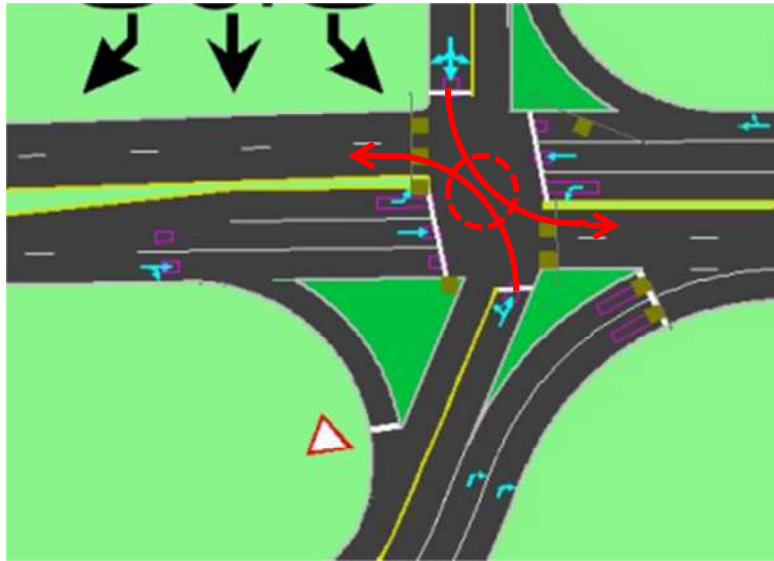
The concept design prepared by staff did not include a northbound left hand turn lane at the McLean Avenue intersection as shown in the schematic below. The concept did however include dual left hand turns from Kingsway Avenue on to McLean Avenue, and dual right turns from McLean Avenue to Kingsway Avenue.



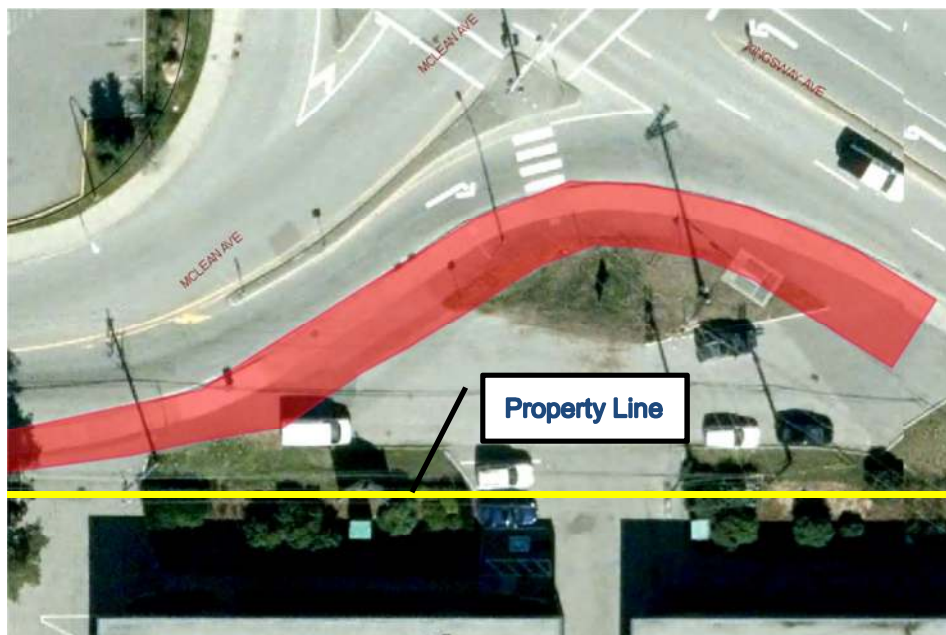
Staff modelled two additional scenarios further to CoC's request, both of which introduce a northbound left hand turn lane at McLean Avenue.

Scenario 1 (Not Recommended)

Due to the geometric constraints, scenario 1 involves removing the proposed dual westbound left hand turn lanes from Kingsway Avenue onto McLean Avenue, thereby removing the necessary receiving lane on McLean Avenue, allowing additional width for the northbound left hand turn lane. The dual westbound left hand turn bays were proposed to avoid traffic backup from McLean Avenue to the Broadway Street / Coast Meridian Overpass intersection and therefore, removing one of these lanes would not mitigate this operational issue. Additionally, there would be less green light time on Kingsway Avenue which causes the through traffic to be poor by 2029 and failed by 2044; this is exacerbated by the fact that there is a commercial driveway access to the north and the southbound left hand turn movement would conflict with a northbound left hand turn movement (shown in the red dashed circle area). To mitigate this safety issue, the left hand turns would have to be set up as split phase (occurring separately rather than simultaneously), increasing the signal cycle time and lessening the green light time on Kingsway.



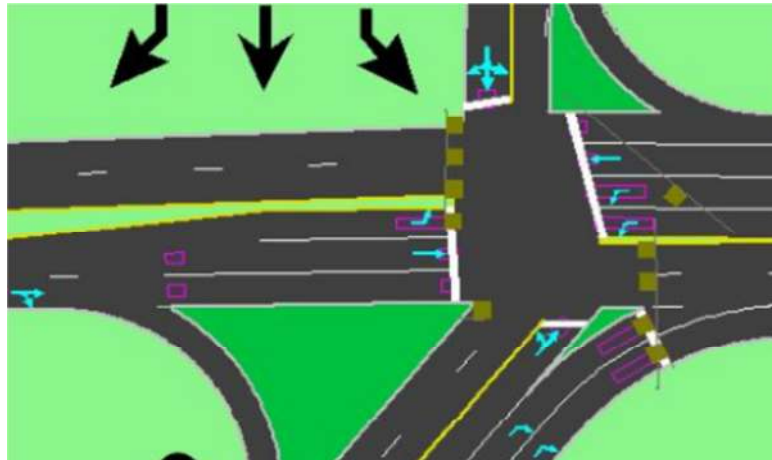
The results of this scenario are as follows: insignificant impact to the overall performance of the intersection in the interim (2029) horizon, however, eastbound through movements along Kingsway would be compromised. By the future (2044) horizon, with the inclusion of a northbound left hand turn bay, the intersection would operate in a failed condition. The following figure depicts the approximate road widening which would be required for this option, which is relatively insignificant and avoids relocation of a significant overhead utility pole.



Kingsway Avenue Design Update

Scenario 2 (Recommended)

Staff also modelled a scenario introducing the northbound left hand turn lane without removing the proposed dual left hand turn lanes from Kingsway to McLean, shown below.



This scenario results in overall acceptable levels of service for both the 2029 and 2044 horizon years, however, would require significant widening and impacts to the currently utilized boulevard space, as well as relocation of the complex overhead utility pole. The approximate required widening is depicted below:



Although this option would result in additional cost to the project and impact to the boulevard space which is currently being used for private parking from the adjacent businesses, it provides the greatest overall benefit to the road network, introducing opportunity to turn left onto Kingsway Avenue, whilst not compromising overall performance of the intersection. It should be noted however, that at this conceptual stage, survey and detailed design has not been performed and the viability of constructing Scenario 2 needs to be confirmed, including: geometry considerations, design standards and feasibility of pole relocation(s) (relocation of the conflicting pole could require relocation of adjacent poles which would bring further cost implications). If at the preliminary design stage, anticipated mid to late summer, it is determined that this scenario is not achievable, staff will report back to Council with an alternative recommendation.

Future North / South Connector:

As discussed in the February 18, 2020 report, the intent for consideration of a north south connector between the intersections at Tyner Street and McLean Avenue is to improve access for businesses along Kingsway Avenue, splitting the approximately 980m currently between the intersections. This alignment should be reviewed and considered as part of the Master Transportation Plan update which is commencing Q2 2020.


FINANCIAL IMPLICATIONS

Eliminating the roundabout at Tyner Street in favour of a right in right out intersection would reduce project costs by \$300,000.

Additional costs to include a northbound left hand turn lane at McLean Avenue as identified in scenario 2 (recommended) is estimated to be \$190,000. This includes assumed road widening and pole relocation.

Additional costs to include a northbound left hand turn lane at McLean Avenue as identified in scenario 1 would be negligible.

OPTIONS (✓ = Staff Recommendation)

	#	Description
	1	Support the staff recommendation identified in this report
	2	Provide direction for an amended scope

ATTACHMENTS

Att#1: February 18, 2020 Kingsway Avenue Design Report

Att#2: Kingsway Interim Concept Design

Lead author(s): Jason Daviduk

RECOMMENDATION:

That Committee of Council

- *Endorse the preliminary design concepts for Kingsway Avenue as outlined in the staff report titled Kingsway Avenue Design dated February 18, 2020;*
- *Direct staff to proceed with detailed design; and*
- *Consider a new north/south connection from Kingsway Avenue to McLean Avenue as part of future OCP revisions.*

PREVIOUS COUNCIL/COMMITTEE ACTION

At the September 17, 2018 Finance & Budget Committee meeting, the following motions were passed:

*That \$50,000 be approved in 2019 for the Kingsway Avenue Conceptual Design; and
That \$100,000 be approved in 2020 for Kingsway Avenue – Detailed Design.*

REPORT SUMMARY

The objective of the Kingsway Avenue Conceptual Design assignment was to assess existing, and future traffic performance and determine preferred design criteria for the interim and future horizons. This report summarizes the traffic study which was carried out along Kingsway Avenue between Tyner Street and the Mary Hill Bypass (MHB), and the corresponding transportation planning which informed the proposed concept design. These extents were selected recognizing the extensive truck traffic and redevelopment of industrial sites which will result in increased turning movements and interruption to traffic flow along the corridor. The report further discusses the proposed multiuse path (MUP) which is recommended to extend to Kebet Way in order to complete the connection to the Traboulay PoCo trail along the dyke.

BACKGROUND

Kingsway Avenue is classified as a major road network (MRN) which supports efficient movement of large volumes of people and goods and connecting provincial highways to municipal road networks. Currently, Kingsway has one travel lane in each direction for the majority of the corridor with parking permitted on both sides of the road. It is surrounded primarily by industrial and commercial developments and is a designated truck route. There are six key intersections located along the corridor, namely:

Street Name	Current Traffic Control Type
Tyner Street	Stop controlled
McLean Avenue	Signalized
Broadway Street / Coast Meridian Overpass (CMO)	Signalized
Langan Avenue	Stop controlled
Coast Meridian Road	Stop controlled
MHB	Signalized (operated by Ministry of Transportation and Infrastructure (MoTI))

Several key challenges exist and are anticipated to exacerbate with development and growth along Kingsway Avenue. The solutions proposed attempt to address these challenges in addition to planning for growth and development alone:

- Increasing truck traffic and left hand turning movements (access to sites) which causes queuing behind the turning vehicles waiting for gaps in oncoming traffic;
- Egress from lots waiting for gaps in both directions of traffic;
- Parking availability for businesses' staff;
- Lack of active transportation facilities (sidewalk or path);
- Challenges related to weaving and queuing of vehicles making right hand turns off of McLean Avenue or the Coast Meridian Overpass; and
- Development opportunities (finalizing this design will allow the City to give developers clear direction of their required offsite requirements so that they can construct portions of the work, or contribute the appropriate amount of cash-in-lieu).

Recent traffic counts conducted by the City at each of these intersections were used to inform the traffic study to determine how each of the intersections is currently performing in their existing conditions. Using modelling software which is based on current analysis standards, measures of effectiveness were determined at each of the intersections, which results in a level of service (LOS) ranging from A to F, with A being the best case scenario and F being the worst case. For capacity analysis in a typical urban area, an LOS of D or better is generally considered as acceptable. LOS is defined by how many seconds a vehicle is delayed as follows:

Traffic Control Type	LOS	A	B	C	D	E	F
Signalized	Delay (Sec / Veh)	0-10	10-20	20-35	35-55	55-80	>80
Unsignalized		0-10	10-15	15-25	25-35	35-80	>80

In addition to intersection performance, overall traffic demands are compared to corridor capacity and a volume over capacity (v/c) ratio determined. A low ratio indicates a road which is operating under capacity but as v/c approaches or exceeds a value of 1.0, the road is considered to be at or over capacity (a value of 1.0 means volume equals capacity). Typically, road improvements should be considered as a v/c ratio approaches 0.9.

In its existing condition, all of the intersections are operating with acceptable LOS with the exception of the MHB (operated by MoTI) which is the main constraining factor at the east end of the corridor. Only the intersection at Broadway Street / CMO operates at a LOS of D whilst the remaining intersections are operating at an A or B. Furthermore, there are no current concerns with volume as compared to capacity throughout the corridor; the existing two travel lanes are adequate to convey existing traffic volumes.

It is also important to note that the scope of this Kingsway Avenue conceptual design ties in directly to the Port Coquitlam Community Center (PCCC) offsite design. The PCCC offsite requirements include full width asphalt rehabilitation for all adjacent roads, construction of sidewalks on all frontages, and the continuation of the Kelly Ave Greenway extending through the Kelly Ave Plaza. The PCCC scope also includes the conversion of Kingsway/Kelly and Kingsway/Tyner intersections from stop controlled to roundabouts; the latter is reviewed further within the discussion of this report.

DISCUSSION

The objective of the Kingsway Avenue Conceptual Design assignment was to assess existing, and future traffic performances and determine preferred design criteria for the interim and future horizons. Recommended design criteria have been justified for a 10 year horizon (2029) and a 25 year future (2044) condition and is based on results from modelling these scenarios and comparing volume to capacity. In order to determine future traffic volumes, the numerous major developments throughout the corridor were analyzed as they will contribute significantly to future traffic generation. Furthermore, a linear growth factor was applied to the 2019 traffic volumes to estimate the future horizon years.

Interim Condition

Lanes

By the year 2029, traffic volumes are not anticipated to increase by an amount which warrants additional travel lanes. The v/c ratios throughout the corridor remain under 0.9 and capacity increase is therefore not justified. However, with only two lanes of traffic and considering the significant percentage of trucks throughout the corridor, a conflict which currently exists and which will worsen with increased volume is through traffic queuing behind heavy trucks and other vehicles turning left into businesses. Therefore a shared left hand turn lane, similar to on

Broadway Street, throughout the majority of the corridor is proposed to accommodate these turning movements and eliminate the conflict with through traffic. This will furthermore improve left turn egress from the businesses as vehicles can turn and stage within the shared lane and not have to wait for a full gap in traffic coming from both directions.

Parking

West of Broadway Street / CMO, it is evident that the various businesses' staff are utilizing Kingsway Avenue for parking as the existing sites are unable to accommodate the amount of onsite parking required. Businesses are required to provide parking onsite for staff as development occurs, however, some of the older developments along Kingsway are not providing or are using parking space for storage and street parking on both sides of the street is heavily utilized west of Broadway / CMO. It is proposed to retain the existing parking lane on the south side of Kingsway and to install parking pockets on the north side rather than a full parking lane which would otherwise require significant relocations of existing overhead utilities. It is estimated that 15 stalls would be removed as a result, however, given that a number of lots on the north side are currently being redeveloped and will accommodate onsite parking this impact will be largely mitigated. East of Broadway / CMO, parking demand is not nearly as significant as new developments provide sufficient parking onsite for their staff and it is proposed to retain just one lane of parking on the south side of Kingsway, which limits the amount of road widening and overhead utility relocations. At the front end of detailed design, staff will consult with business owners to better understand their current and future parking requirements and determine an appropriate strategy which accommodates the owners and minimizes project costs.

Intersections

The existing stop controlled intersection at Tyner Street currently functions with a high LOS, however by 2029, it is anticipated that the intersection in its current configuration would function at a failed LOS. Three potential configuration options (signalization, roundabout and right in right out (RIRO)) were assessed, taking into account the future one lane roundabout planned for Kelly Avenue.

The analysis determined that spillbacks from both intersections (Tyner and Kelly) would occur during peak periods of both horizon years, limiting available movements at roundabouts, whereby a signal will improve the overall intersection performance significantly in comparison (LOS of C or better as compared to F with a roundabout). Restricting left turns with the RIRO configuration resulted in the best overall LOS, performing at an A in both horizon years. Furthermore, restricting permissive left turns eliminates the conflict zone with oncoming traffic, improving the overall safety of the intersection. Westbound traffic would be redistributed at McLean and northbound traffic at Mary Hill Road; the performance of the McLean Avenue intersection is not impacted by the additional traffic being rerouted. Because the RIRO configuration will result in the highest performing LOS and with added safety benefits, a RIRO configuration is proposed at this time,

however, can be monitored and assessed in the future. As this is a departure from the previous plans, if the concept design is endorsed, staff will consult with impacted business owners along Tyner regarding the proposed change.

Due to the short spacing between McLean Avenue and Broadway Street / CMO and high traffic demands in all directions, these intersections were analyzed as one entity to minimize vehicle spillback and weaving. These intersections will operate with LOS of F by the 2029 horizon year and improvements to increase capacity are proposed as follows:

- At McLean Avenue
 - Add an additional dedicated westbound left turn lane; and
 - Add an additional northbound right turn lane and convert from yield controlled to signalized.
- At Broadway Street / CMO
 - Add an additional eastbound through lane from McLean to approximately 100m past Broadway / CMO;
 - Add an additional westbound through lane west of Langan; and
 - Add an additional southbound right turn lane and convert from yield controlled to signalized.

The additional through lanes resolve capacity issues at these intersections which have been identified in the horizon year, and the signalized dual right turns minimize issues with heavy traffic merging and weaving, one of the major challenges identified along the corridor. The signalized dual rights are dedicated movements and allow traffic to flow through without conflicting with other movements such as through traffic heading east at McLean or west at Broadway and would require no right turn on red light restrictions. The preceding improvements result in these intersections operating at acceptable LOS for both horizon years.

The intersection at Langan Avenue currently operates with a LOS of A and will continue to do so for both horizon years without any improvements. The intersection at Coast Meridian Road will function at an acceptable level in the 2029 horizon year, however, at a failed level by 2044. No improvements are proposed at this time but this intersection should be monitored and a signal considered in the future, closer to the 25 year horizon.

Signal timing for the intersection at MHB is governed by the dominant traffic flows travelling east / west along MHB which is needed to convey significant volumes of traffic. The traffic entering and departing Port Coquitlam is comparatively much less which results in shorter green light phases for Kingsway Avenue. MoTI has previously made operational improvements and optimized signal timing to reduce delays and queuing while still meeting traffic demands along the MHB. Given the signal timing limitations, the City is currently working on a design for improvements at Shaughnessy Street and Broadway Street to facilitate Port Coquitlam traffic movement. Both

projects are considering acceleration lanes for vehicles turning right onto the MHB as well as adding more left turn queuing capacity for vehicles turning off of the MHB onto Shaughnessy and Broadway. The intent is to use the design to seek funding from MoTI and ICBC to support construction of the project. At Kingsway, there is a lower demand for right turn movements and adequate gaps for them to be made during the signal cycle; therefore, an acceleration lane was not considered at this location at this time.

Multiuse Path

In addition to the proposed road improvements, a separated MUP is proposed on the north side of Kingsway within the BC Hydro owned land, providing a safe facility for active transportation along this busy corridor and providing connection from downtown to the Traboulay PoCo Trail along the dyke east of MHB. Although there is no formal agreement between the City and BC Hydro at this time to locate the MUP within their property, BC Hydro has previously acknowledged and generally supported the project in the past, indicating that once the MUP design was finalized and any necessary pole or guy wire relocations identified that they would prepare designs to do so. Staff will be engaging BC Hydro early in the detailed design process to determine the requirements and work toward a formal agreement.

A MUP linking downtown Port Coquitlam and the PoCo Traboulay Trail was originally initiated as a capital project in 2012 which in addition to the path, included landscaping and planting beds and seating nodes. Council did not support the project at that time due to the significant cost associated with the pathway and other proposed improvements. Subsequently, a revised more basic design was brought forward in 2017. The cost estimate for the revised design was significantly less than the original, however, with the various redevelopment projects occurring along the corridor, Council directed staff to prepare a strategy for the path that would maximize the development contributions as part of a more comprehensive plan for the Kingsway corridor.

The MUP is now being proposed to be constructed in conjunction with the road works, at an incremental cost to the larger road works project, taking advantage of economies of scale. The simplified design has also been retained to minimize costs. In addition, and as summarized under Financial Implications, the City is anticipating significant contributions from TransLink and fronting developers.

Future Condition

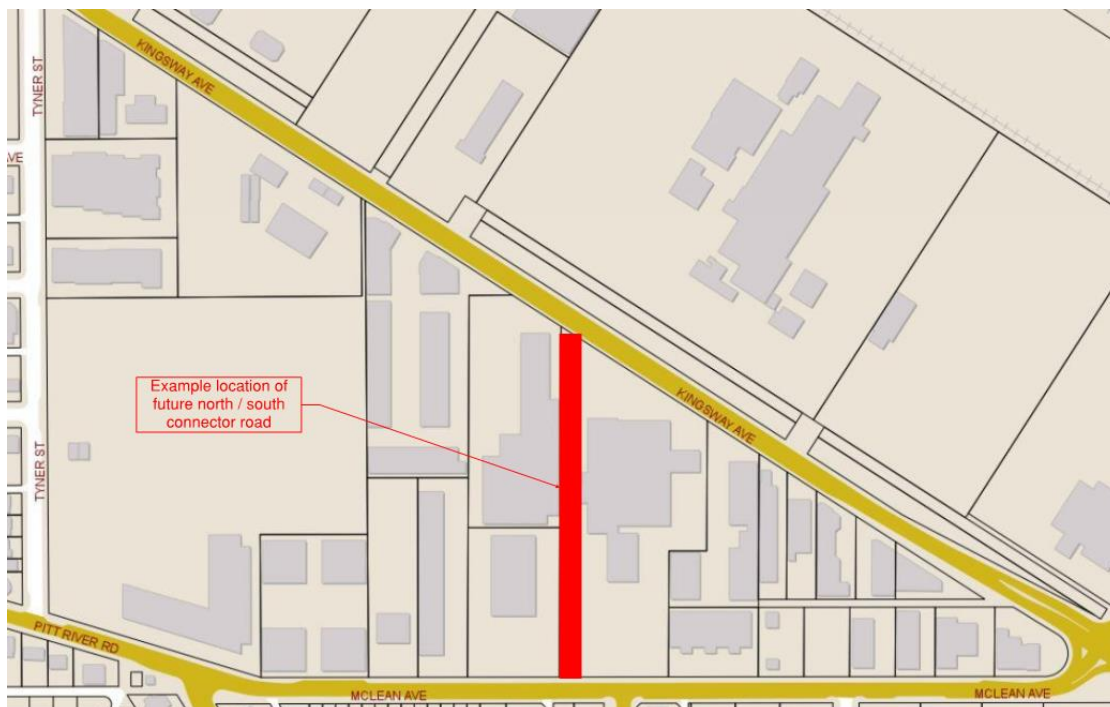
With the exception of installing a signal at the Coast Meridian Road intersection, all of the intersection improvements necessary for the future condition are being proposed in the interim solution. By 2044 and particularly during the PM peak hour, v/c ratios reach their threshold at locations throughout the corridor. In order to increase capacity along the corridor to keep up with the increased volumes, the main difference between the 2029 and 2044 (future) horizon is the conversion from a three lane cross section with parking to a four lane cross section with some

Kingsway Avenue Design

parking retained on the north side of Kingsway, west of Broadway / CMO. Road widening required for the 2029 horizon year will provide adequate width to implement the future four lane road with minimal additional construction (predominantly eradicating and repainting the road markings). A four lane cross section would preclude on street parking east of Broadway / CMO and reduce from two parking lanes to one west of Broadway / CMO, however, it is anticipated that with development west of Broadway / CMO over the next 25 years that developers would be required to provide onsite parking for their staff and that removal of street parking would not be a major impact.

Future North / South Connector

The distance between Tyner Avenue and McLean Avenue is approximately 980m, the equivalent of about five City blocks. Between these two intersections, there are no north / south routes linking Kingsway to McLean. Motorists trying to access businesses along Kingsway Avenue from the south, west of Broadway / CMO are forced to use Tyner or McLean and then back track to their destination point. Consideration should be given to a future new road between Kingsway and McLean, effectively creating a new north / south connector, improving access for businesses along Kingsway. This could be a potential requirement as part of land development in the future to dedicate land for road allowance. Providing this alternative north / south route would allow for the implementation of turning restrictions at Tyner and McLean intersections, both of which present challenges given their proximity to adjacent intersections. This alignment should be considered in future OCP revisions and is illustrated in the figure below.



FINANCIAL IMPLICATIONS

The cost of the interim project is estimated at \$5.5 Million which includes a 25% contingency and is currently scheduled for the 2022 (west of Broadway / CMO) and 2023 (east of Broadway / CMO) construction years. It should be noted that these are class C estimates which are prepared with limited site information and are based on some assumed site conditions (typically +/- 25 - 40% of actual project costs). Class C estimates are used for project planning and following approval to proceed with detailed design further investigations and more accurate estimates are prepared.

The City is applying to Translink for funding contributions toward this project and anticipates 50% grant funding. TransLink allocates limited funding to municipalities for improvements made to the road, and cycling and pedestrian facilities along MRN roads, provided the projects meet the criteria for funding. The Kingsway concept meets the current criteria for funding and it is anticipated that the City will be successful in securing this funding for construction of the works.

The City also expects significant developer contributions from the redevelopment along the corridor, at an estimated value of \$1.2M. The most cost effective way to deliver this project is by constructing each phase of the project all at once, rather than smaller piecemeal sections by both the City and developers. Staff will work with developers to maximize the amount of cash in lieu for the work, recognizing these cost savings for the developer and the City, however, the decision to self-perform the work or provide cash in lieu for future works is ultimately the developer's decision.

The following table outlines the approximate funding sources for each phase of the project:

Year	Total Cost	Developer Contribution	Remaining	City Funding Required	TransLink Funding
2022	\$2,750,000	\$695,000	\$2,055,000	\$1,027,500	\$1,027,500
2023	\$2,750,000	\$550,000	\$2,200,000	\$990,000*	\$1,100,000*

*Reduced by \$110,000 due to the cash in lieu previously secured

OPTIONS (✓ = Staff Recommendation)

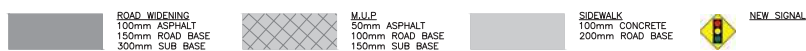
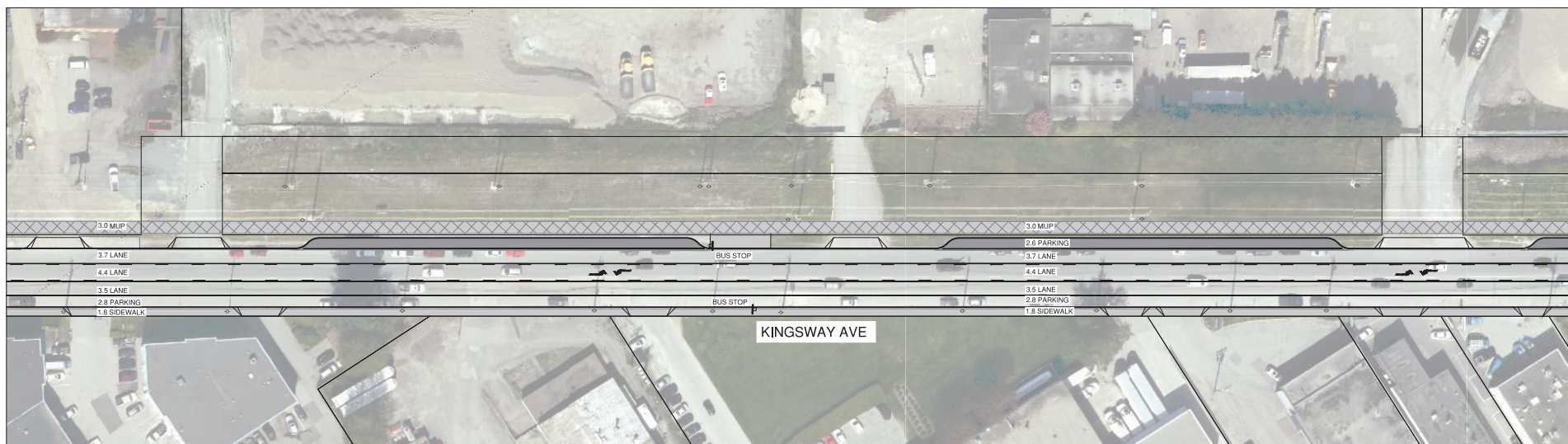
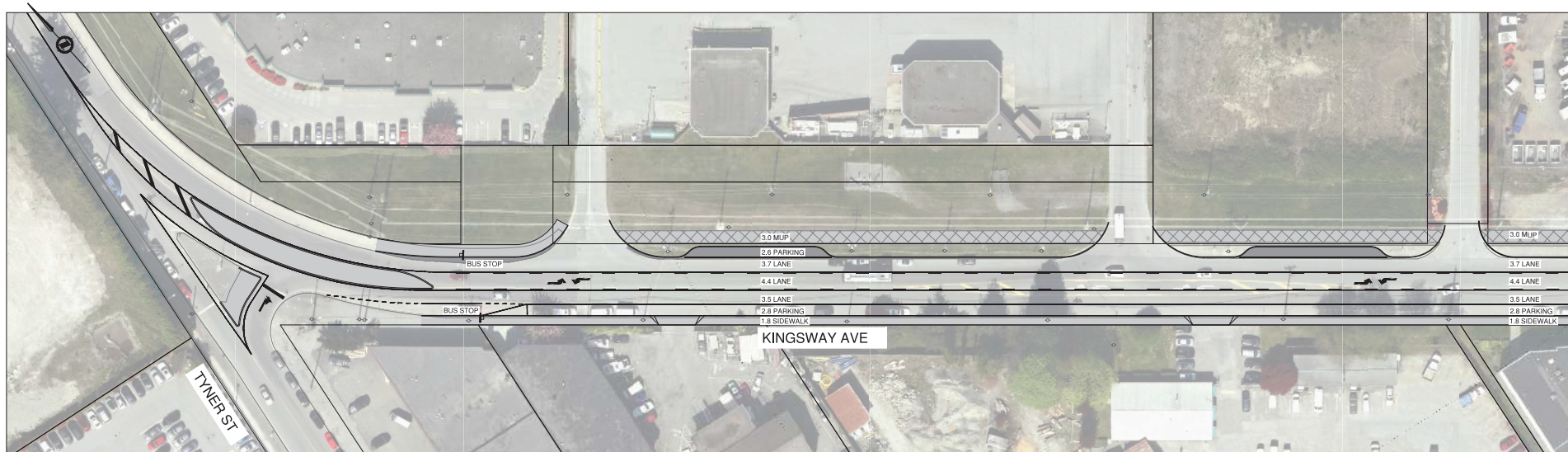
	#	Description
✓	1	Support the staff recommendation identified in the report
	2	Direct staff to consider alternate design considerations prior to proceeding to detailed design

ATTACHMENTS

Att#1: Kingsway Interim Design Concept

Att#2: Kingsway Ultimate Design Concept

Lead author(s): Jason Daviduk



CONCEPTUAL – INTERIM DESIGN – ALTERNATE

PLOT DATE: February 13, 2020				
REV NO	REVISIONS	DATE	DRAWN	APPROVED
0	CONCEPTUAL DESIGN	10/09/09	RC	CMB
1	REVISED CONCEPT	10/11/12	CJB	CMB
2	REVISED CONCEPT	10/12/10	CJB	CMB
3	ALTERNATE CONCEPT - RIGHT-IN RIGHT-OUT	20/02/13	CJB	CMB



KINGSWAY AVENUE
TYNER ST

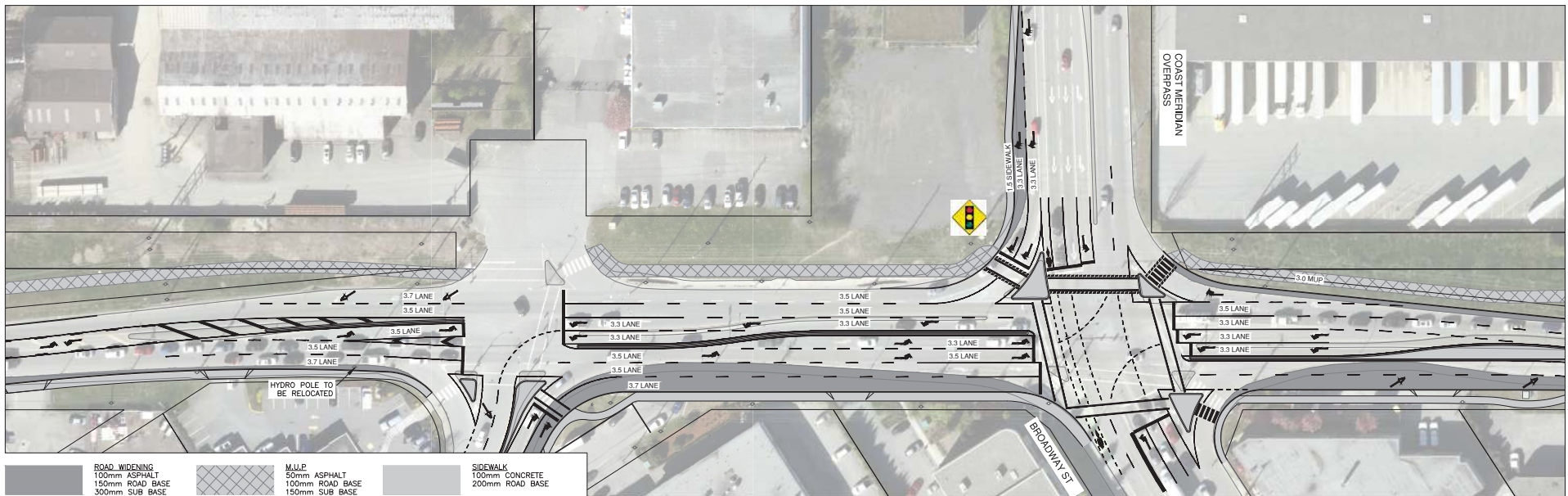
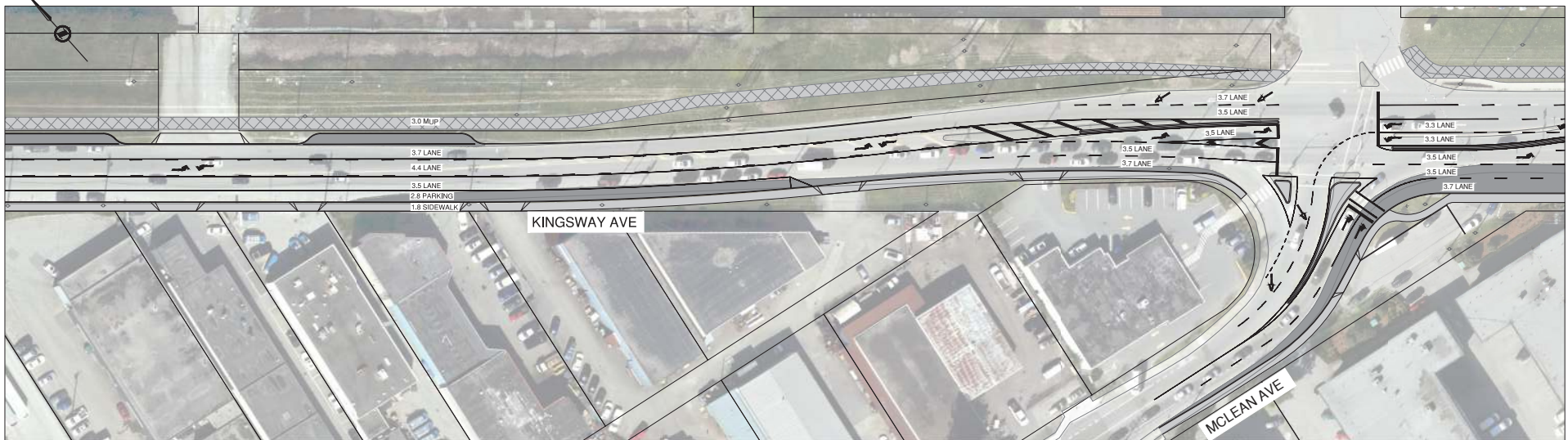


#603 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A

SCALE	1:500	DESIGN NO.	32340	DWG. NO. 9.1
		DATE	2019-09-09	
DRAWN BY	RC	DESIGN BY	CJB	REV. 2
CHECKED BY	CNR	APPROVED BY	CNR	

DESTROY ALL PRINTS BEARING PREVIOUS NO.

File: G:\Projects\2019\20190324\Kingsway Ave Concept Design\02 - Kingsway Ave Concept Design\02360 - Geometrics and Layout - Streets Network.dwg



CONCEPTUAL — INTERIM DESIGN

PLOT DATE: December 10, 2019

REV NO	REVISIONS	DATE	DRAWN	APPROD
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2	REVISED CONCEPT	191210	CJB	CMB

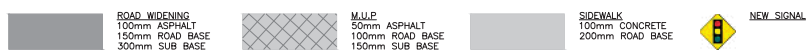
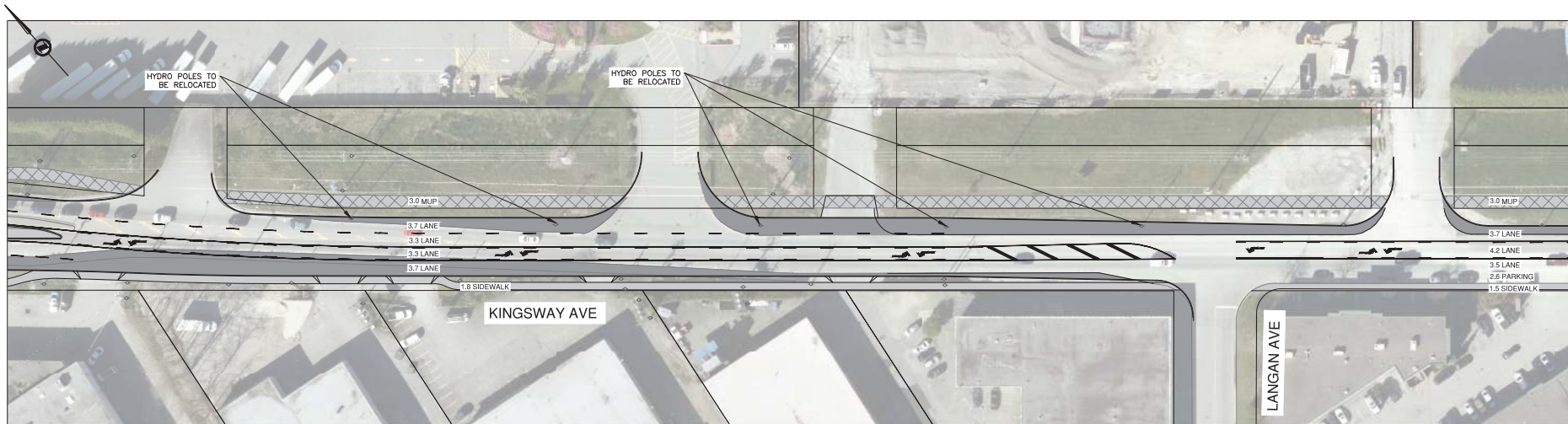


KINGSWAY AVENUE
MCLEAN AND CMO



SCALE	1:500	DESIGN NO.	52440	DWG. NO.	9.2
DRAWN BY	RC	DATE	2019-09-09		
CHECKED BY	CMB	DESIGN BY	CJB		
		APPROVED BY	CMB	REV.	2

DESTROY ALL PRINTS BEARING PREVIOUS NO.



PLOT DATE: December 10, 2019

REV NO	REVISIONS	DATE	DRAWN	APPROD
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1	REVISED CONCEPT	191112	CJB	CMB
2	REVISED CONCEPT	191210	CJB	CMB



KINGSWAY AVENUE LANGAN AND COAST MERIDIAN

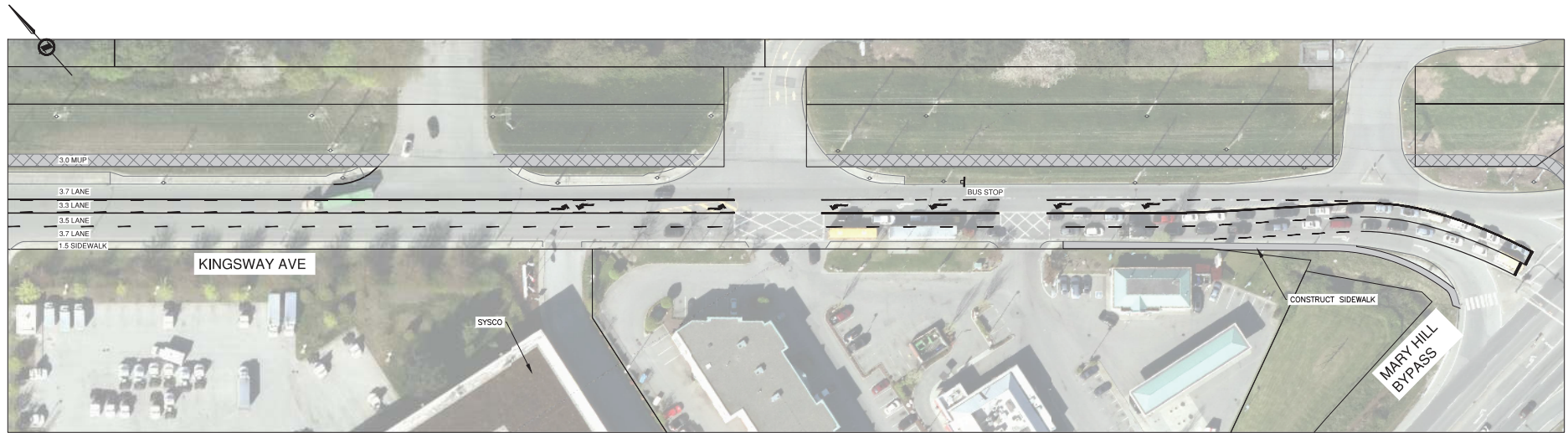
CONCEPTUAL — INTERIM DESIGN



#603 4199 Lougheed Hwy. Burnaby, B.C. V5C 6A8
T: (604) 662-0000 F: (604) 662-0001

SCALE	1:500	DESIGN NO.	92440	DWG. NO.	9.3
DRAWN BY	RC	DATE	2019-09-09		
CHECKED BY	CMB	DESIGN BY	CJB		
		APPROVED BY	CMB	REV.	2

DESTROY ALL PRINTS BEARING PREVIOUS NO.



	ROAD WIDENING 100mm ASPHALT 150mm ROAD BASE 300mm SUB BASE
	M.U.P. 50mm ASPHALT 100mm ROAD BASE 150mm SUB BASE
	SIDEWALK 100mm CONCRETE 200mm ROAD BASE

PLOT DATE: December 10, 2019

REV NO	REVISIONS	DATE	DRAWN	APPROD
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1	REVISED CONCEPT	19/11/12	CJB	CMB
2	REVISED CONCEPT	19/12/19	CJB	CMB



KINGSWAY AVENUE
McLEAN AND CMO

CONCEPTUAL — INTERIM DESIGN



#003 4100 Loughheed Way, Burnaby, B.C. V5C 6A8
Tel: (604) 291-0000 or (604) 291-0001

SCALE	1:500	DESIGN NO.	32440	DWG. NO.	9.4
DRAWN BY	RC	DATE	2019-09-09		
CHECKED BY	CMB	DESIGN BY	CJB		
		APPROVED BY	CMB	REV.	2

DESTROY ALL PRINTS BEARING PREVIOUS NO.

Letter of Support for Sport Nation proposal at Pitt River Middle School

RECOMMENDATION:

That a letter be provided to SD43 confirming the City's support of this project

PREVIOUS COUNCIL/COMMITTEE ACTION

None.

REPORT SUMMARY

The City has been approached by Sport Nation, seeking our support for an indoor multi-sport facility at Pitt River Middle School. This report recommends the letter be provided.

BACKGROUND

Sport Nation is a private organization that has approached School District 43 with a request to lease land at Pitt River Middle School to build an indoor multi-sport facility. School District 43 confirmed their interest in the proposal, and as part of their consideration, requested that Sport Nation provide a letter from the City of Port Coquitlam in support of the project at this location.

Staff met with representatives from Sport Nation on May 6, 2020 to discuss the proposal.

DISCUSSION

The idea behind Sport Nation's proposal is to meet growing demand for an indoor multi-sport facility. The proposed Dome would be 375'x240'x75' (90,000 square feet) with artificial turf field under an air supported structure complete with heating and air conditioning systems that can support a variety of supports and events all year long. The proposed site is at Pitt River Middle School, as shown on the following site plan.



Letter of Support for Sport Nation proposal at Pitt River Middle School

The City has no formal role in approving this specific proposal, but will have a regulatory role in approval of the permitting and construction of the facility. This proposal would comply with the zoning of the site, and staff do not anticipate any regulatory issues, aside from the typical obligations to meet parking, lot coverage, minimum setbacks, and servicing requirements.

From staff's perspective, a private facility like this would complement the City facilities in the area and staff have no concern supporting the proposal. For example, while the Port Coquitlam Community Centre is just down the street, the indoor gymnasium, arenas, and other multi-use spaces, are not anticipated to host the same sport options that could be played on an indoor turf field. In addition, access to an indoor running track would expand the options currently available in Port Coquitlam, particularly in the evenings and when weather conditions are unfavourable.


Additional information for Council's interest has been provided by Sport Nation (although it is in draft form at this point), including samples of the structures, sample schedules, potential users and rate structure, and a rough business case showing the viability of the venture.

Staff recommend providing the letter of support that has been requested.

FINANCIAL IMPLICATIONS

None.

OPTIONS (✓ = Staff Recommendation)

	#	Description
	1	Provide the letter of support as requested
	2	Request additional information
	3	Do not provide the letter of support as requested

ATTACHMENTS

Att#1: Sport Nation Presentation



Sport Nation Multi-Sport Dome

We have field sports covered all year long.



Overview

*There is strong demand for an Indoor Multi-Sports Facility in the North Fraser Valley area. In particular, there are no available indoor playing surfaces in the region larger than 120' x 250' (30,000 sqft.), which limits the ability to have indoor baseball infield practices or full-sized soccer games. There are also insufficient turf facilities with several sports organizations indicating that they cannot rent all the time they seek to obtain.

*To construct a Multi-Sports Dome for the user groups of the Tri-Cities and surrounding area through a private venture or partnership (SD 43).

*The proposed Dome would be 375'x240'x75' (90,000 square feet) with artificial turf field under an air supported structure complete with heating and air conditioning systems that can support a variety of sports and other events all year long.

*Additional modular building, facilities for washrooms and change rooms will be connected to the dome to provide a welcoming reception area for our guests.

Challenges

- *Locating a suitable piece of property large enough to house the structure and its requirements within the Tri-Cities has its challenges.
- *Dome manufacturers recommends 3+ Acres for a dome of the proposed size. A detailed review of the dome requirements, supporting facilities, clearances, maintenance and required parking may result in a closer to 3 – 5 acres.
- *Prime time gym space annually is growing as user groups grow, more groups will be fighting for indoor space this season than ever before. Having a Dome would allow the field sport user groups to practice and play on turf fields to free up space for the hard surface sport groups like basketball and volleyball.

Needs Assessment

Sport Nation assessed the probable demand through a set of interviews with sports groups in the Tri-Cities area. We found that there is a demand for indoor field space that is not met by current facilities in the area with respect to the kind of facilities, the availability of time in the facilities and the cost of facilities.

Sport Associations Consulted			
Association	Sport	# Members	Demand
Port Moody Soccer Club	Soccer	900	None
Tri City Field Hockey Club	Field Hockey		Low
Coquitlam Ducks	Volleyball	200	None
Coquitlam Moody Minor Baseball	Baseball	300	Moderate
Coquitlam Little League	Baseball	550	Moderate
Coquitlam Minor Softball	Softball	300	Moderate
TriCity Minor Softball	Softball	150	Moderate
Metro Ford FC	Soccer	4500	High
Port Coquitlam Saints	Lacrosse (Field & Box)		Low
Poco Euro-Rite	Soccer	1000	High
Poco Minor Baseball	Baseball	100	Low
Poco Minor Softball	Softball		Low
True North Basketball	Basketball		None
West Coast FC	Soccer	3500	Low
Windies Cricket Club	Cricket		Low
Douglas College	Sports Programs		Low



Sport Nation Multi-Sport Dome

*The highest level of demand comes from the Soccer Clubs which identified that it cannot obtain the amount of indoor time necessary to meet its demands and forecasts a demand for a turf field for most of the potentially available peak time (6 - 9pm on weeknights and weekends).

*Demand from baseball and softball clubs is for the type of space rather than the quantity. For baseball a field that is at least 120 ft. wide and softball a field that is at least 90 ft. wide is required to run indoor infield practices. There are no local facilities that provide this kind of space.



*The business case for a new facility depends on whether other operators in the private or non-profit sectors are able to provide similar facilities. The sports groups interviewed indicated that they were unable to access as much time as they would like at any of the facilities during the winter season.

Existing Local Facilities				
Venue	Size	Type	Amenities	Rates
North Shore Girls Soccer Dome	100' x 225'	Turf	Soccer Field (3 pads 75'x100')	\$75/hr/pad
Canlan Ice Sports	16,500 Sqft	Turf	Converted Hockey Rink to turf	\$125/hr (+ Leagues)
Futbol 5	12,000 Sqft.	Gym/Turf	Turf Field (2 pads)/Workout Area	\$100/hr/pad
Batters Box		Turf	2 Batting Cages	\$50/hr/cage
Inside Performance	4,500 Sqft.	Turf/Gym	3 Batting Cages/Workout Area	Full Facility \$150/hr
Urban Soccer Centre		Turf/Gym		

*Based on this analysis, and the demands of local sports groups, there appears to be insufficient local supply of indoor field space to meet either the peak or shoulder demands. Perhaps equally important, the facilities available are not ideally suited to the needs of some local sports groups.

Target Market & Product

Considered the core function of the proposed facility, the turf field can be used for a wide variety of outdoor field sports including: soccer, baseball, football, golf, ultimate, rugby, field-hockey, etc. Most of these sports are prepared to play indoors with modified rules to accommodate the space available. Modifications to the game may include dead-ball rules when a ball hits the structure and reduced numbers of players on the field to avoid over-crowding. Other adaptations include running a partial game – such as a baseball infield drill.

Turf Field Activity Requirements		
Sport	Dimensions	Comments
Soccer – FIFA minimum Standard	150' x 300'	1 – 11v11, 3 – 7v7,
Soccer – FIFA International standard	210' x 330'	4 – 4v4 (U6), 7 – 4v4 (U4-5)
Baseball – infield practice – 90' base path	150' x 150'	Two concurrent
Softball – infield practice – 60' base path		Two concurrent
Football (CFL – not including end zones)	195' x 330'	
Rugby	230' x 328'	
Lacrosse	180' x 330'	
Ultimate – Disk League	160' x 360'	

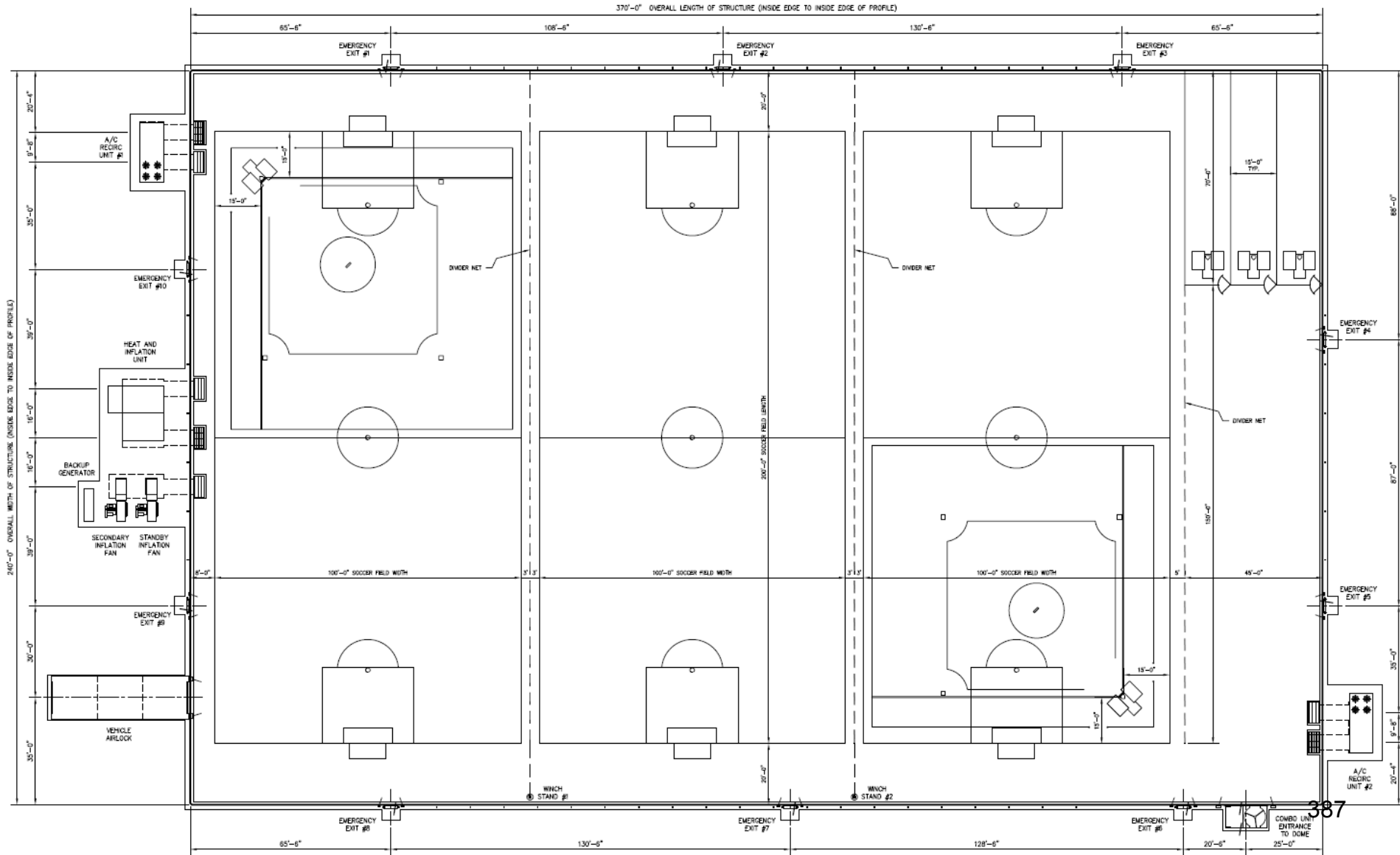
Specialized Sport Training Spaces

*Several sports organizations identified a requirement for sport-specific and general conditioning training. The baseball organizations seek pitching lanes and batting cages. These facilities can be incorporated into the open turf area. Batting cages are available as drop-down nets that can be deployed for specific practices. Pitching lanes are available as drop-down nets or as nets that can extend from a wall. In both cases, the sport-specific facilities can be deployed as needed and would not interfere with other uses of the facility.

*For baseball and other sports, there is interest in a walking/running track to be used for cardiovascular training. It will be important to ensure that the corner radius is large enough to achieve sufficiently fast lap times. All sports organizations also indicated an interest in having basic weight training with a focus on free-weights and no interest in exercise machines.

Sport Nation Multi-Sport Dome

Preliminary Layout Plan:



Estimated Construction Costs

DOME (375' x240' x75')

- 28oz. vinyl polyester outer fabric with 20-year pro-rated warranty
- 560 watt LED light fixtures
- Mechanical unit (inflation unit) & air conditioner
- Detail drawings stamped by qualified structural engineer
- On-site supervision of installation

Price: \$1,600,000

FOUNDATION/CIVIL

- Site works (excavation and backfilling)
- Grade Beam 1,220 Linear feet

Price: \$700,000

FIELD & TURF

- Field excavation to sub grade
- Field drainage
- Artificial turf (FIFA rated)

Price: \$800,000

EQUIPMENT

- Office & Computer equipment
- Spectator seating
- Sporting equipment & divider netting

Price: \$100,000

PROFESSIONAL SERVICES

- Engineering and Architect fees
- Administrative costs

Price: \$250,000

CONTINGENCY

Price: \$300,000

TOTAL: \$3,750,000



Sport Nation Multi-Sport Dome

Rentals and Schedule

*The Dome would be open from 7 a.m. to 12:00 p.m. Monday to Sunday during Peak Season and/or can be booked for private use on an hourly basis.

*Rental rates will be based on peak times and non-peak times, based on the initial projections even at a third the capacity of the dome the revenue would cover the operating costs.

*With the user groups already contacted within the area the initial projections would have the dome rented out and all monthly expenses covered. Bookings will be made through an online website or onsite staff member.

See attached schedule and projections.



Sport Nation Multi-Sport Dome

DOME BOOKING SCHEDULE (Sept. to June)								
Time/Day	Monday	Tuesday	Wednesday	Thursday	Friday	Time	Saturday	Sunday
7:00 - 8:00	Fitness/Training					7:00 - 8:00	Sport Club Rentals / Tournaments	
8:00 - 9:00	School District #43					8:00 - 9:00		
9:00 - 10:00						9:00 - 10:00		
10:00 - 11:00						10:00 - 11:00		
11:00 - 12:00						11:00 - 12:00		
12:00 - 1:00						12:00 - 1:00		
1:00 - 2:00						1:00 - 2:00		
2:00 - 3:00						2:00 - 3:00		
3:00 - 4:00						3:00 - 4:00		
4:00 - 5:00						4:00 - 5:00		
5:00 - 6:00	Sport Club Rentals					5:00 - 6:00	Leagues	
6:00 - 7:00						6:00 - 7:00		
7:00 - 8:00						7:00 - 8:00		
8:00 - 9:00						8:00 - 9:00		
9:00 - 10:00						9:00 - 10:00		
10:00 - 11:00	Leagues					10:00 - 11:00		
11:00 - 12:00						11:00 - 12:00		

Operating Hours			
		<u>October to April</u>	<u>May to September</u>
Non-Prime	Mon-Sun	144	2043
SD 43	Mon-Fri	1296	558
Prime Time	Mon-Sun	2113	
			<u>Total Hours</u>
			2187
			1854
			2113



Sport Nation Multi-Sport Dome

Pricing

*Proposed pricing is based on a preliminary assessment of the prices charged in comparable local facilities. Adjustments have been made considering the functionality of the full-size playing field and the potential to use the space for more players than can be accommodated in smaller facilities. As the plans for the facility evolve and in discussion with key users, the proposed pricing may be adjusted to optimize use of the facility.



Sport Nation Multi-Sport Dome

Preliminary Pricing

Peak Season (October to April)				
PST not included	Hourly Rate	Hourly Rate (Min. 25 sessions)	Hourly Rate (Min. 50 sessions)	Hourly Rate (Min. 100 sessions)
100'x200' FIELD RENTALS				
Prime Time	\$185.00	\$179.45	\$173.90	\$166.50
Non-Prime	\$129.50	\$125.62	\$121.73	\$116.55
FULL FIELD RENTALS	Hourly Rate	<div>Prime Time - From 5pm to 11pm - Monday to Friday 8am to 11pm - Saturday to Sunday</div> <div>Non-Prime - From Opening to 5pm - Monday to Friday</div> <div>*Includes 1 Batting/Throwing Cage</div>		
Prime Time	\$527.25			
Non-Prime	\$369.08			
BASEBALL/SOFTBALL DIAMOND RENTAL	90 minute Rate *			
Prime Time	\$336.12			
Non-Prime	\$235.29			
Non-Peak Season (May to September)				
PST not included	Hourly Rate	<div>From Opening to 11pm - Monday to Sunday</div> <div>*Full field bookings of 16+ sessions will enjoy a 10% discount, reducing the fee to \$270/hour. Applicable ONLY for full field bookings.</div>		
100'x200' FIELD RENTALS	\$125.00			
FULL FIELD RENTALS *	\$300.00			
90 min. DIAMOND RENTAL	\$150.00			

Community Benefits

*During the rainy months of October to April, with a dome in place, the facility will operate from 7 a.m. to 12 p.m., providing an extra 2100 hours of field time for soccer players and other field sport user groups.

*Indoor walking track would be beneficial for seniors who want to get some exercise without having to endure harsh weather conditions. It would also be great for families who want to take an easy stroll without worrying about their little ones getting burnt, cold, or sick from the outside weather.

*Open play days allowing young families the ability to play indoors where we create a Fun Zone with multi sport/activities on the field, fun games, inflatable's, obstacle course, and so much more!

*No extra cost to taxpayers.

Personnel

*Co-Founders are Dale Carlin and Derek Doucette.

*Silent investors have been approached and will be brought on board as needed should the project require additional financing to get off the ground.

*On site staff will consist of a receptionist/booking agent as well as a maintenance staff to ensure the dome and the facility systems are performing properly.

*The benefit of a partnership with School District 43 would allow for shared services and staff to provide daytime activities within the facility.

Vision and Future Goals

*Become renowned as one of the leading indoor sports training centers in British Columbia. Sport Nation allows training opportunities for turf sport teams (baseball/softball, football, soccer, and lacrosse) as well as to individual athletes, of any sport, who desire to improve athleticism and personal leadership skills.

*Rental rates will be based on prime-time, and non-prime time rates similar to those found in existing air dome or indoor sport facilities in British Columbia, Alberta and Ontario and can be adjusted annually as required.

*The goal of Sport Nation is to offer a clean and friendly place to grow and play.

For the Love of Sports,

Thank you & See you on the fields.

Dale Carlin & Derek Doucette



Sport Nation Multi-Sport Dome

Example Dome Images



Sport Nation Multi-Sport Dome

Example Domes : North Shore Girls Soccer Dome (with SD44) – North Vancouver, BC





Sport Nation Multi-Sport Dome

Example Structure: Guelph Community Sports Dome



Air Lock Entry



Interior



Grommet Strip



Promotional Banners



Example Structure: Country Day School – Soccer Dome



Interior



Interior



Air Lock Entry



Vehicle Air Lock



Mechanicals and Sensor System





Sport Nation Multi-Sport Dome

Example Structure: Whitby Soccer Dome



Whitby Soccer Dome



Vehicle Air Lock Entry



Interior Entry Area



Interior Lights



Fields



Interior Air Lock

Alcohol Consumption in City Parks

RECOMMENDATION:

THAT Council directs staff to prepare a bylaw to permit the consumption of alcoholic beverages in public parks, as a pilot project, with the following criteria:

- 1. Pilot project ends October 31st, 2020; and*
- 2. Located in neighbourhood parks with washroom and picnic facilities.*

PREVIOUS COUNCIL/COMMITTEE ACTION

None.

REPORT SUMMARY

As an opportunity to continue to support social distancing and encouraging people to spend time outdoors, staff is evaluating expanded uses of City spaces. One option is to permit the responsible consumption of alcohol in City parks, and this report recommends a pilot project to allow for this in City parks with picnic and washroom facilities, that would end October 31, 2020. If directed, staff will prepare bylaw amendments for a future Council Meeting.

BACKGROUND

During this pandemic, health officials are advising people to get outdoors and to continue to practise social distancing measures. As a result, people are accessing local parks more often and looking to connect with their immediate circle in outdoor settings. Municipalities across the Province are looking at ways to support and encourage outdoor activities, and looking at relaxations on public liquor consumption in public places and relaxing regulations on restaurants and patios as a means to assist with health orders.

The city recently launched a program which allows businesses to expand onto city right of ways as one method to support business. Staff is also looking to providing greater flexibility for uses in city parks as a way to support families to get outside and maintain social distancing.

Provincial Regulations:

The Province's *Liquor Control and Licensing Regulation* (Attachment 2) permits municipalities to pass a bylaw specifying areas and times where liquor consumption in public is permitted.

Port Coquitlam Regulations:

The Parks and Facility Bylaw 2003 No. 3421 Section 8.2 (Attachment 1) restricts the consumption of alcohol in City parks with the exception of special events, with approval from the Provincial Government. In order to permit liquor consumption in City parks, an amendment to the bylaw is required.

DISCUSSION

In total, the City has approximately 40 parks (Attachment 3) that are divided into three service level categories (weekly, bi-weekly and monthly visual inspections) and provide a range of recreational equipment and open space. Staff is recommending that a pilot project be undertaken to allow responsible liquor consumption in City parks, and that the following criteria be used to identify which parks should be included in the pilot project:

- Parks that have picnic tables and picnic shelters
- Parks that provide washroom facilities
- Parks that have a service level of weekly and bi-weekly visual inspections

Staff have not specifically recommended criteria relating to play structures, as the bylaw requires responsible consumption of liquor and therefore irresponsible behaviours would be managed by the RCMP and Bylaw regardless of location, as it currently is. Staff is also recommending that the pilot project be in place until the end of October 2020. At that time, staff will report back to Council on the project and make a recommendation on the continuance and/or modifications to the bylaw.

Using the above criteria, the following parks would be included in the pilot project (Attachment 4):

- Castle Park
- Settlers Park
- Gates Park
- Lions Park
- Aggie Park
- Evergreen Park
- Cedar Drive Park

Alternatively, Council can direct staff to prepare bylaw amendments for all City parks to permit liquor consumption as a broader pilot project. Another option is to undertake a smaller scale pilot project at a handful of locations.

Next Steps


If directed to prepare bylaw amendments for liquor consumption, staff will refer the bylaw to the RCMP for comment. Early feedback from RCMP indicates they do not anticipate any additional resources to support this initiative. Staff will engage with internal departments for feedback on the proposed bylaw including Bylaw Enforcement and the Parks departments. Staff will also engage with our insurer to understand any measures required and ensuring risk and liability are understood and mitigated. We anticipate this may include clear signage and messaging concerning responsible consumption.

Alcohol Consumption in City Parks

FINANCIAL IMPLICATIONS

Staff will report back on any additional funds that may be required to implement this project. It is anticipated that one-time costs for signage may be required.

OPTIONS (✓ = Staff Recommendation)

	#	Description
	1	Direct staff to prepare bylaw amendments to implement a pilot project to permit the responsible consumption of alcohol in city parks ending October 31, 2020 for the following parks Castle Park, Settlers Park, Gates Park, Lions Park, Aggie Park, Evergreen Park and Cedar Park.
	2	Direct staff to prepare bylaw amendments to implement a pilot project to permit the responsible consumption of alcohol for all City parks.
	3	Direct staff to prepare bylaw amendments to implement a pilot project to permit the responsible consumption of alcohol at Lions Parks.
	4	Do not implement the pilot project to allow alcohol consumption in city parks.

ATTACHMENTS

Att#1: Extract from Parks and Facilities Bylaw, 2003, No. 3421

Att#2: Extract from Liquor Control and Licensing Regulation

Att#3: Map of City Parks

Att#4: Map of City Parks with highlighted recommended for alcohol consumption

Lead author(s): Lisa Grant, Director of Development Services

Contributing author(s): Forrest Smith, Director of Engineering, Parks and Operations

Attachment #1 - Extract from Parks and Facilities Bylaw, 2003, No. 3421

Definition:

Liquor means spirits, wine, beer, or any combination thereof, and includes any alcohol in a form appropriate for human consumption as a beverage, alone or in combination with any other matter;

8.2 Liquor: No person may bring, keep or consume upon any park/facility any liquor, unless that person complies the Liquor Control and Licensing Act, R.S.B.C., c. 267 and has been issued a rental agreement.

Unlawful possession or consumption of liquor

- 73** (1) A person must not consume liquor, or possess liquor in an open container, in a place other than
- (a) a residence,
 - (b) a private place,
 - (c) a service area in respect of which a licence, authorization or permit allows consumption,
 - (d) as provided under section 11,
 - (e) as provided under subsections (2) to (4) of this section,
 - (f) an assisted living residence, community care facility, hospital or other prescribed facility as provided in section 9, or
 - (g) in a liquor store as allowed under the *Liquor Distribution Act*.
- (2) Subject to subsection (3) and the regulations, a public place, or part of it, may be designated, by a bylaw of the municipality or regional district that has jurisdiction over the public place, as a place where liquor may be consumed.
- (3) A bylaw under subsection (2) must contain the hours during which liquor may be consumed.
- (4) Without limiting subsection (2), regulations under that subsection may provide that a bylaw referred to in that subsection may not designate
- (a) a specified public place, or
 - (b) a specified public place for a specified period of time.

Division 6 — Bylaws Dealing with the Consumption of Liquor in a Public Place

Content of bylaws

- 197** A bylaw of a municipality or regional district under section 73 (2) of the Act designating a public place as a place where liquor may be consumed must
- (a) require the person responsible for the public place to post signs setting out
 - (i) the boundaries of the public place, and
 - (ii) the hours that liquor may be consumed, and
 - (b) describe the number and size of the signs and how they are to be posted.



