Olympic Village Elementary (OVE) School Transportation Assessment and Management Plan (TAMS)

This report presents the updated Transportation Assessment and Management Study (TAMS) for the proposed Olympic Village Elementary (OVE) School in Vancouver, BC. The study was commissioned by the Vancouver Project Office (VPO) on behalf of the Vancouver School Board (VSB) to reflect significant changes in the school design and site planning since the completion of the original TAMS report dated November 23, 2023.

Key updates include the reorientation of the school building, removal of underground parking and daycare facilities, adjustments to the anticipated student population, and confirmation of the City of Vancouver's preferred street configuration for Columbia Street. The report also incorporates updated trip generation, multimodal accessibility analysis, PUDO operations modeling, and refined loading and waste management strategies in accordance with the City's bylaws and guidelines.

The report evaluates future traffic conditions and supports the development of a Transportation Demand Management (TDM) Plan that aligns with the City's most recent policies, including the elimination of minimum on-site parking requirements. It also outlines the expectations and structure of the School Active Travel Program (SATP), which the VSB has committed to implementing in collaboration with the City prior to school occupancy.

Through a combination of technical analysis, policy alignment, and coordination with stakeholders, this study aims to ensure that the proposed OVE school is well-integrated into the surrounding transportation network, prioritizes active and sustainable travel, and maintains a safe and accessible environment for students, staff, and the broader community

September 11, 2025

Prepared for:

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Revision Schedule

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
Rev 01	Draft Updated TAMS	Andres Baez	5/15/2025			Stanley Li	
Rev 02	Updated TAMS – Revision	Stanley Li, Chao Qi	7/09/2025				
Rev 03	Updated TAMS – Revision 2	Stanley Li, Chao Qi	8/01/2025				
Final	Final TAMS Report	Stanley Li, Chao Qi	9/11/2025				

Disclaimer

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Stantec has assumed all information received from Kent Grier, Architect AIBC (he/him) Project Manager Vancouver Project Office Vancouver School District 1580 West Broadway, Vancouver BC V6J 5K8 e: kgrier@vsb.bc.ca | p: 604-713-4858 | c: 604-842-3648 (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

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1 Introduction

Stantec Inc. has been retained by the Vancouver Project Office (VPO) of the Vancouver School Board (VSB) to update the previously completed Transportation Assessment and Management Study (TAMS) for the future Olympic Village (OV) School in Vancouver, BC. The original TAMS report was prepared by Morrison Hershfield Ltd. (now Stantec Inc.) and dated November 23, 2023.

This TAMS update is intended to reflect subsequent changes in the school design and site planning that have occurred since the Preliminary Development Review (PDR) stage, and to revise transportation-related impacts and recommendations accordingly. Key changes that may affect previous transportation assumptions include: the reorientation of the school building with its primary access now facing north toward Hinge Park and the waterfront; the removal of the previously proposed daycare facility and underground parking; the confirmation of the City's preferred reconfiguration of Columbia Street along the school frontage; and an increase in the anticipated student population.

The pick-up and drop-off (PUDO) area remains along Columbia Street adjacent to the site and extending farther south—an approach that has been approved in principle by the City.

This TAMS study was completed in accordance with the latest City of Vancouver (COV) guidelines for transportation studies for VSB's school projects issued on May 9, 2019. The study also follows industry-recognized best practices, guidelines and methodologies in the preparation of traffic impact studies including those from the Canadian Institute of Transportation Engineers (CITE) and the Transportation Association of Canada (TAC). Key objectives of this study include, but are not limited to:

- Document and review baseline transportation and site access conditions and particularly during planned PUDO activity periods.
- Identify any potential safety issues and/or capacity constrains with existing and proposed site conditions and make recommendations to achieve a school zone that optimizes safe, efficient pedestrian/vehicular traffic flow.
- Evaluate impacts and proposed mitigation options on vehicular and pedestrian traffic flow for the project and to identify, where possible, means of improving vehicular traffic management and safety while encouraging sustainable modes of travel.
- Recommend preferred treatments to mitigate issues and/or provide recommendations for additional investigation if required.
- Recommend potential Transportation Demand Management (TDM) strategies for future implementation.

2 Existing Conditions

2.1 Study Area

The proposed school is to be located on the east side of Hinge Park, within an open grass parcel at the southwest corner of the intersection of Athletes Way and Columbia Street — on the west side of the Olympic Village, and just south of the False Creek seawall (see **Figure 1** below). This location aligns with the city's 2007-approved Southeast False Creek Official Development Plan, which called for a future elementary school at this specific site.

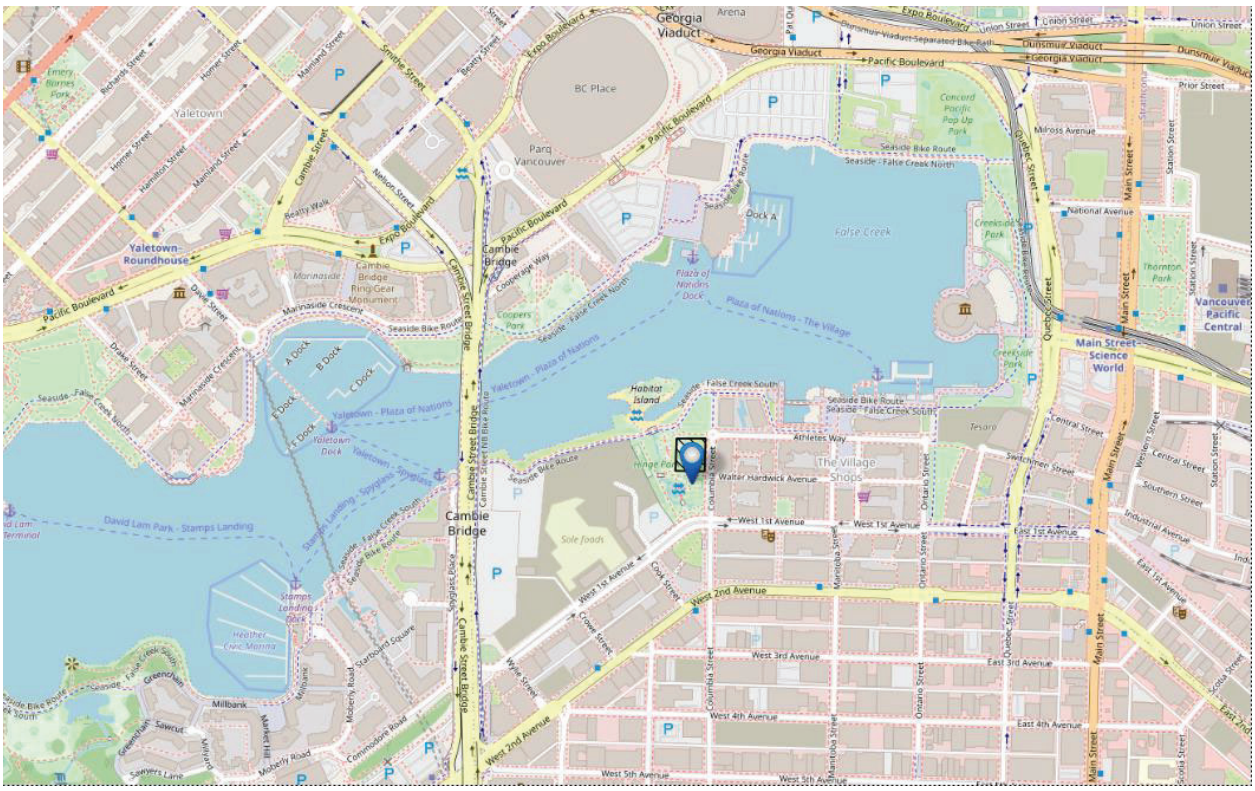


Figure 1. Study Area

2.2 Study Area Transportation Network

The study area transportation network is comprised of a multi-layered street grid-pattern network comprised of:

- Road network for motorized vehicle movement (vehicle traffic, commercial trucks, transit, and emergency services) including local, collector and arterial streets road types.
- Bicycle network On and off-street
- Pedestrian network (e.g., sidewalks, marked crosswalks, and MUT pathways)
- Public transit network (Bus routes and SkyTrain nearby)

The main components of the study area multimodal transportation network are illustrated in **Figure 2** below. Summary tables for street network characteristics, and intersection controls are included in **Section 2.4.1**.

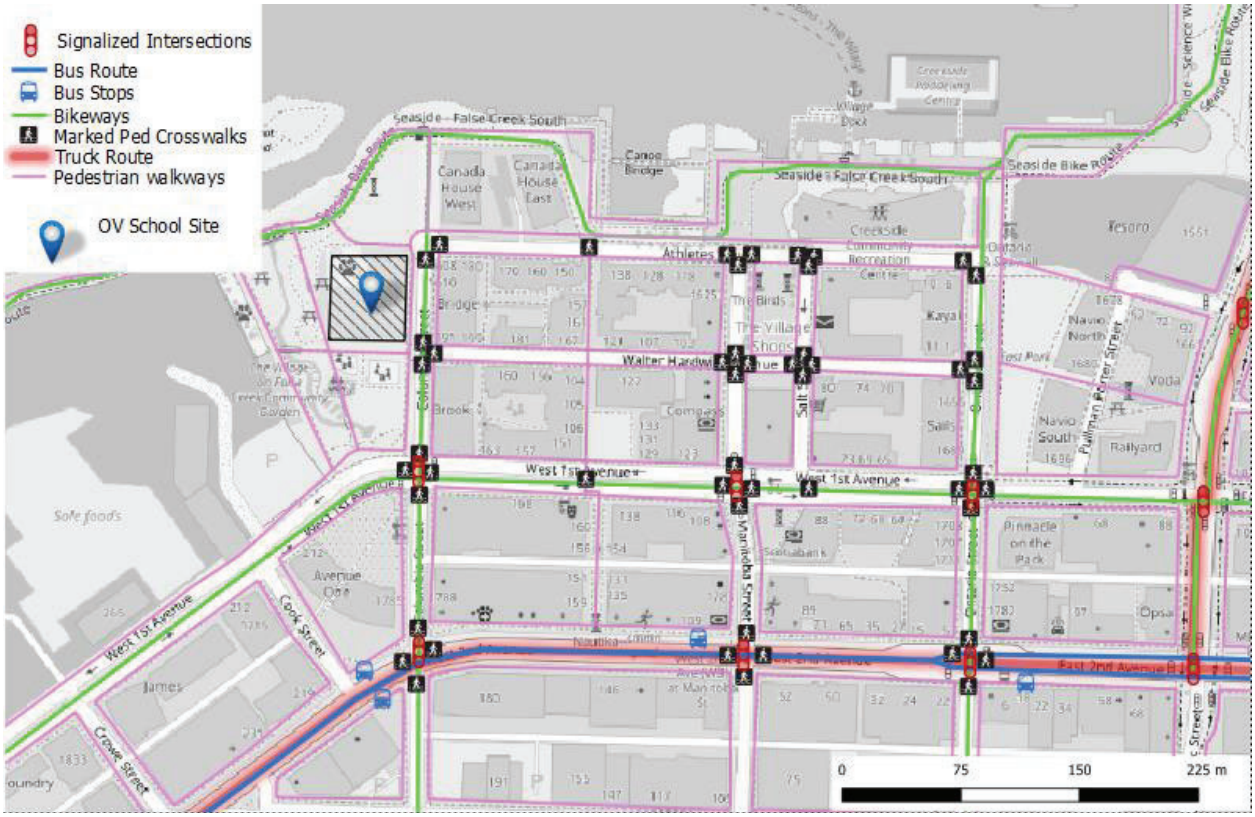


Figure 2. Study Area Multi-Modal Transportation Network

2.3 Study Area Mobility & Accessibility Trends

Southeast False Creek (SEFC) is designed as a mixed-use community plan for a total population of 11,000 – 13,000 people, with a focus on residential housing. As a complete neighborhood, it has been designed to have goods and services within walking distance, and housing and jobs that are accessible by transit and active transportation modes.

In general, the area is a leading model of sustainable development and multimodal transportation featuring close-knitted network of traffic calmed and complete streets that provide people of all ages and abilities with high quality walking, cycling, and transit options. Active transportation modes and transit are already the dominant transport modes in the SEFC neighborhood and nearby communities, which enjoy a high-quality, well-connected, and convenient network of active transportation facilities and transit access, as well as low levels of car ownership. Below are key mobility-related statistics (2021 and 2016 Census) and figures that illustrate the highly sustainable transportation context of the study area:

- Population (2021): 8,739
- Households: 5,490
- Dwelling Units: 5,490
- 1.7 people per household (which suggest a relatively low car ownership)
- 455 school aged (K-7) children aged (3 to 14 years) within less than 1 km.

- 49.1% work from home
- 42.9% walk, cycle or take transit to work every day.
- 55.7% Active transportation to work. (2016 data)
- 30% Transit to Work (2016)

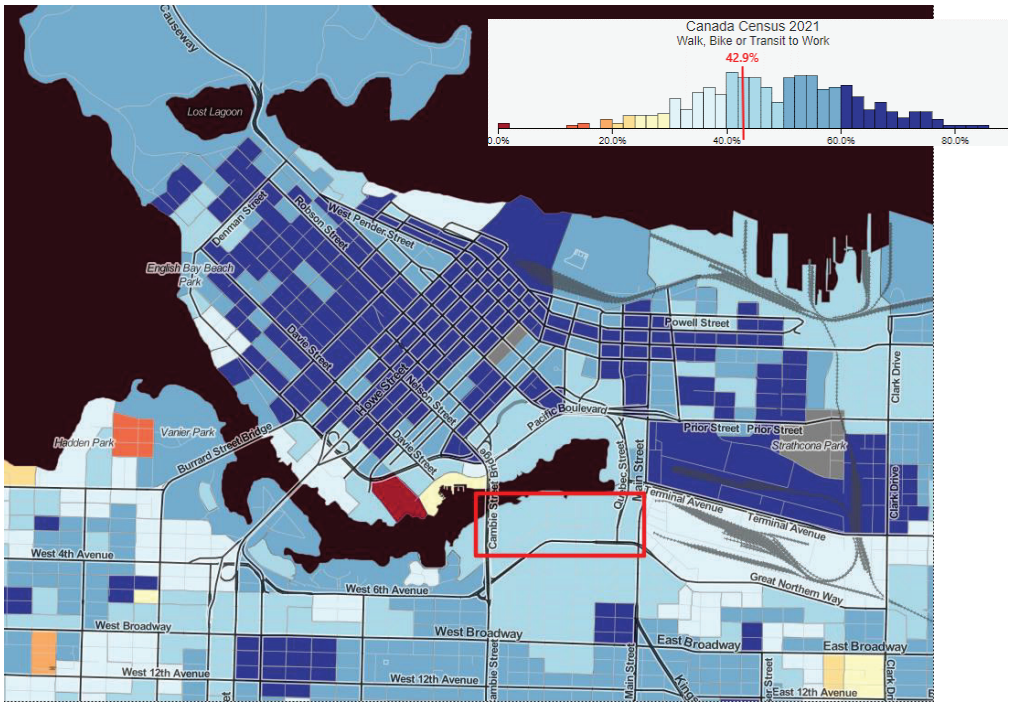


Figure 3. Active Transportation & Transit to Work Census 2021

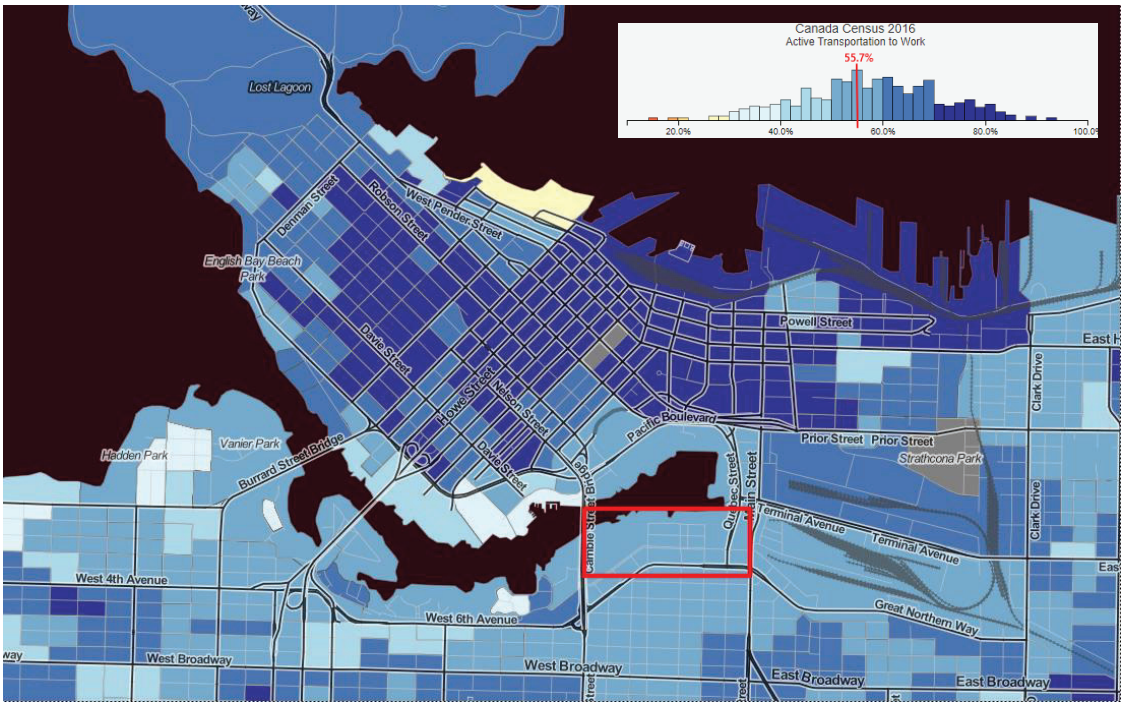


Figure 4. Active Transportation to Work Census 2016

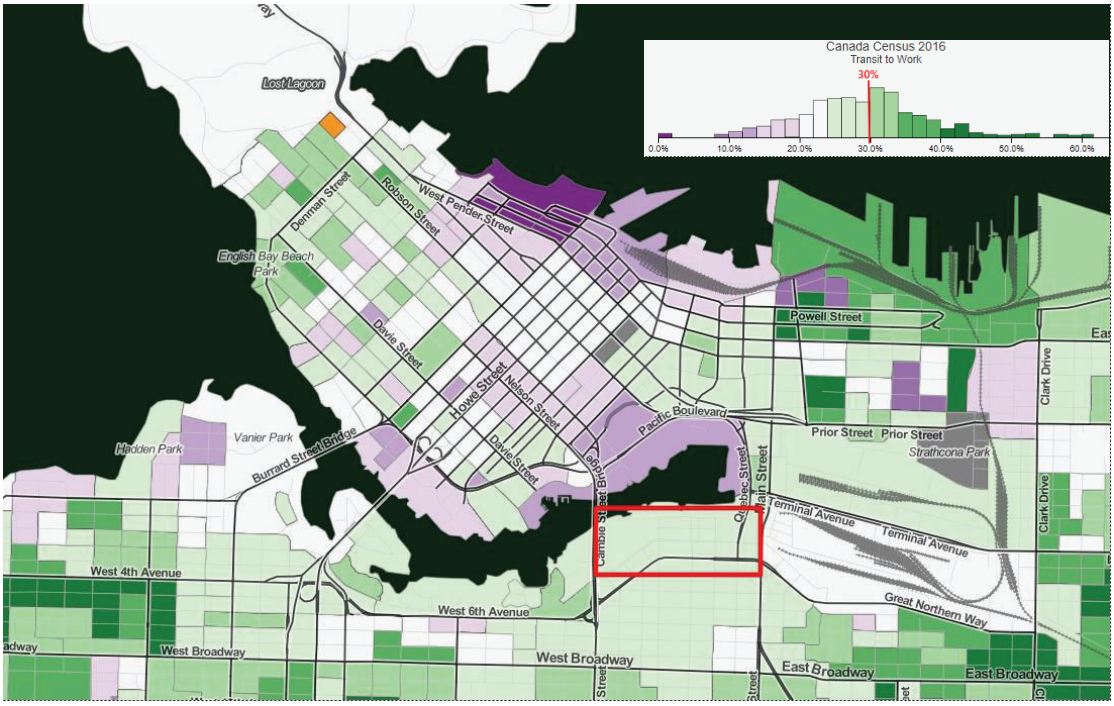


Figure 5 Transit to Work Census 2016.

The above figures and statistics indicate a high degree of connectivity and accessibility for active transportation and transit mobility users in the area, bringing further opportunities for the project to promote and support even more sustainable modes of transport, reducing dependency in the automobile, optimizing existing curbside parking supply and flexible operation, while improving road safety and GHG emission reductions around the school site.

2.4 Site Access

2.4.1 Vehicular Access

The proposed school site is accessible to motorized vehicles via Columbia Street (local residential road) directly adjacent to the site. Columbia Street is further connected to the south to West 1st Avenue at a signalized intersection. West 1st Ave (residential collector) runs east-west connecting to main arterials nearby Quebec and Main Street to the east. Further south, running parallel to West 1st Ave, is West 2nd Ave (major arterial road) also connecting the area to major arterial corridors including Cambie Street, Quebec Street and main Street. The tables below summarize intersection and road network basic configurations and ancillary functions.

Table 1. Existing Roadway Network Characteristics

Street	Classification	Cross-Section	Posted Speed	Transit Route	Pedestrian Facilities	Bicycle Facilities	On-street Parking
Columbia Street	Local Residential (traffic clamed)	Two travel lanes (7.0m curb-to-curb)	30 kph	-	Sidewalk (both sides)	Designated bikeway Shared On-street	Recessed on-street bays See section 2.3
Walter Hardick Ave	Local Residential (traffic calmed)	Two-travel lanes (6.0 m curb-to-curb)	30 kph	-	Sidewalk (both sides)	On-street	No Parking See section 2.3
Athletes Way	Local Residential (traffic calmed)	Two-travel lanes (6.0m curb-to-curb)	30 kph	-	Sidewalk (both sides)	On-Street	Recessed on-street bays See section 2.3
W 1st Ave	Residential collector	Two-travel lane (3.5 m each) 5.0 m median	50 kph	-	Sidewalk (both sides)	On-Street Bike Lane	See section 2.3
W 2nd Ave	Arterial	Six-lane undivided (20m curb-to-curb)	50 kph	Bus Route	Sidewalk (both sides)	On-Street	See section 2.3

Table 2. Existing Intersection Characteristics

Intersection	Type	Traffic Control	Pedestrian Crossing
Columbia St & W 1st Ave	Four-legged Local–to-collector	Signalized	Marked pedestrian crossing all approaches
Columbia St & W 2nd Ave	Four-legged Local–to-Arterial	Signalized	Marked pedestrian crossing all approaches (ped and bike push buttons)

Intersection	Type	Traffic Control	Pedestrian Crossing
Columbia St & Walter Hardwick Ave	Three-legged Local–to-local	Unsignalized (stop-controlled on eats leg)	Cobblestone marked pedestrian crossing east, north and south legs
Columbia St & Athletes Way	Two-legged local–to-local	Traffic Circle (button)	Cobblestone marked pedestrian crossing east, and south legs
Manitoba St & West 1st Ave	Four-legged Colelctor-to-Local	Signalized	Marked pedestrian crossing all approaches
Manitoba St & West 2nd Ave	Four legged Arterial-to-Local	Signalized	Marked pedestrian crossing all approaches (ped and bike push buttons)
Manitoba St & Walter Hardwick Ave	Four Legger Collelctor-to-Local	Stop-controlled north and south legs	Cobblestone marked pedestrian crossing all approaches
Manitoba St & Athletes Way	Three Leg Local-to-Local	Stop-controlled south approach	Cobblestone marked pedestrian crossing all approaches

2.4.2 Transit Access

A variety of accessible and frequent transit options (public and private) are available within walking distance to/from the site. See **Figure 6** below for Transit options available.

Available public bus options in the vicinity of the site consists primarily of Bus Route #84 (UBC/VCC Station) which runs on West 2nd Ave connecting UBC with VCC SkyTrain station. The 84 Bus route operates every day from 6:00 AM to 10:33 PM, at approximately 10-15 min headways. Bus stops (eastbound and westbound) are located at the intersection of West 2nd Ave and Columbia Street, approximately 200 m walking distance from the school site.

Additional nearby (less than 700 m) bus services on Main Street includes routes 003,008,019, N8, N19 which are part of the frequent transit Network FTN.

Nearby SkyTrain service is also available. To the east, the SkyTrain Science World Station (Expo Line) on Main St. and Terminal Ave is approximately 900 m walking distance from the site. Also, to the west, The Olympic Village SkyTrain Station (Canada Line) on Cambie St. and West 2nd Ave. approximately 700 m walking distance from the site.

In addition, the Aquabus Service (theaquabus.com) offers an array of flexible commuter pass options for regular travelers (adults and child options available) across various terminals in the False Creek Bay which may be an attractive alternative all year round. The closest aquabus terminal is at the “Olympic Village Terminal” right in front of the Creekside Community Rec Centre, less than 400 m walking distance from the site.

Last but not least, is that a future streetcar (LRT) is planned to be running along West 1st Avenue, steps from the school site with a potential stop at Cook Street, just west of Columbia St. and one stop at Manitoba St. next street to the east.

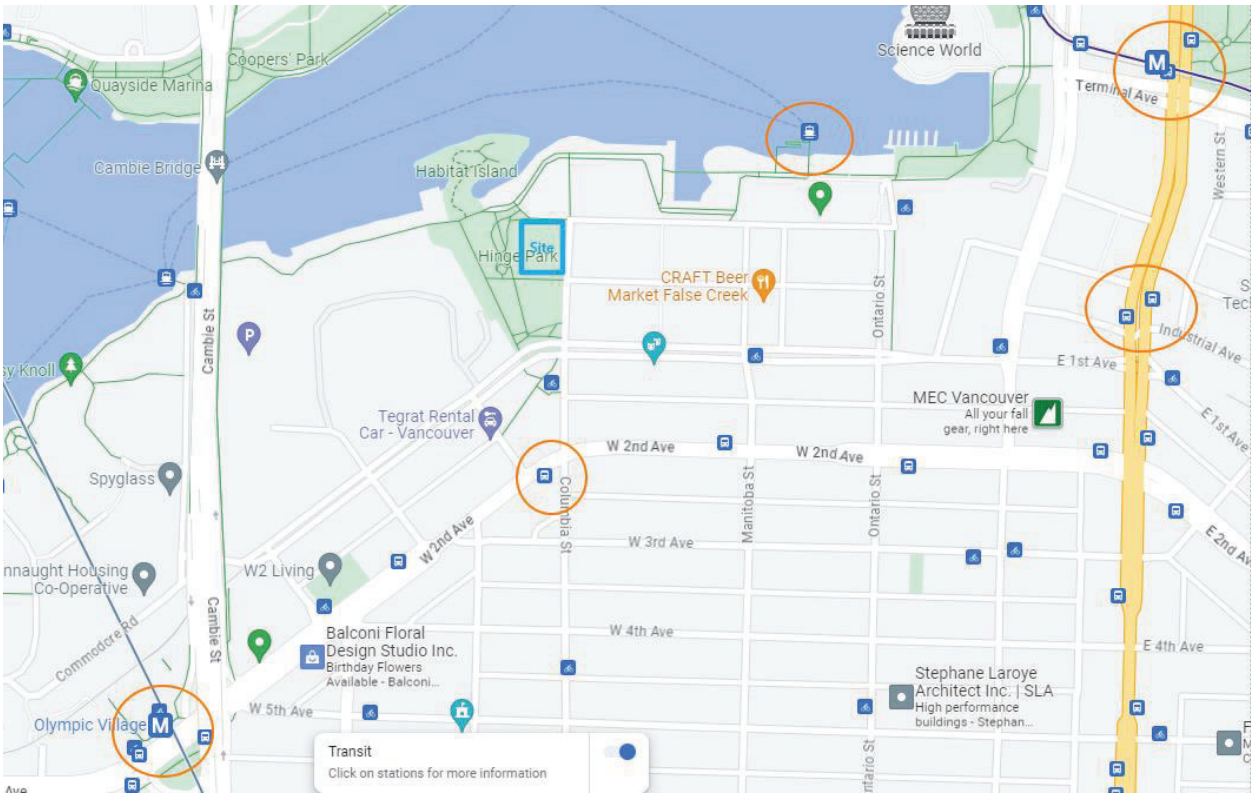


Figure 6. Transit Facilities Near School Site

2.4.3 Pedestrian Access

Walking is facilitated by a surrounding grid street network with sidewalks on both sides of all adjacent streets as well as the Seawall pedestrian pathway regional network and Hinge Park trails. All intersections adjacent to the site feature wheelchair ramps depressions and sidewalk ramps to the sidewalks. The intersection of Columbia Street and Walter Hardwick, directly adjacent to the future school building entrance, featured a cobblestone pavement surface making it more attractive for pedestrian movements and less so for speedy vehicle maneuvering.

The Strava heatmap below shows pedestrian activity and desire lines in the study area, besides the overwhelming pedestrian activity along the Seawall and along Ontario Street, Manitoba and Columbia Street (adjacent to the site) appear also as important pedestrian links in the area. Further, Columbia Street appears to be a key pedestrian link between West 1st Ave and the Sewall walkway, as well as having important crossing activity at the intersections in between (i.e., Walter Hardwick and Athletes Way).

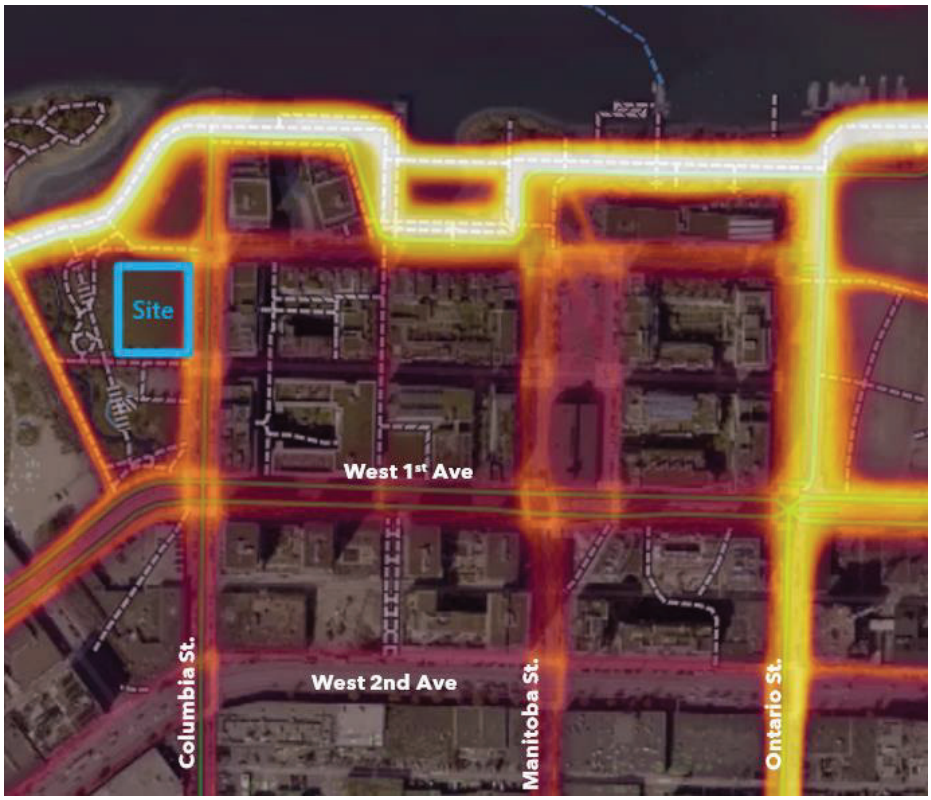


Figure 7. Pedestrian activity Around the School Site (Source: Strava)

2.4.4 Cycling Access

The site is surrounded by an extensive network of highly use city-wide designated commuter bikeways, most notably the Seawall dedicated bikeway along the waterfront and the West 1st Ave bikeway (with on-road bike lanes) that connect the site east and west. Columbia Street and Ontario Street are also designated bikeways (connecting north-south), the latest being the busiest commuter bikeway in the City. **Figure 8** below shows the Strava's heatmap which illustrates the relative importance of cycling activity and accessibility around the site.

Of note, there is significant cycling commuting activity in front of the school site on Columbia Street, connecting north with Athletes Way and further east towards Ontario Street. Athletes Way appears to be a utilitarian east-west efficient bikeway connection between Columbia and Ontario Streets which for many cyclists may prove a more straightforward route instead of the more meandering Seawall bikeway alignment. In fact, the connection between Athletes Way and the Seawall at the north end of Columbia Street does not show to be a well-used link for cyclists.

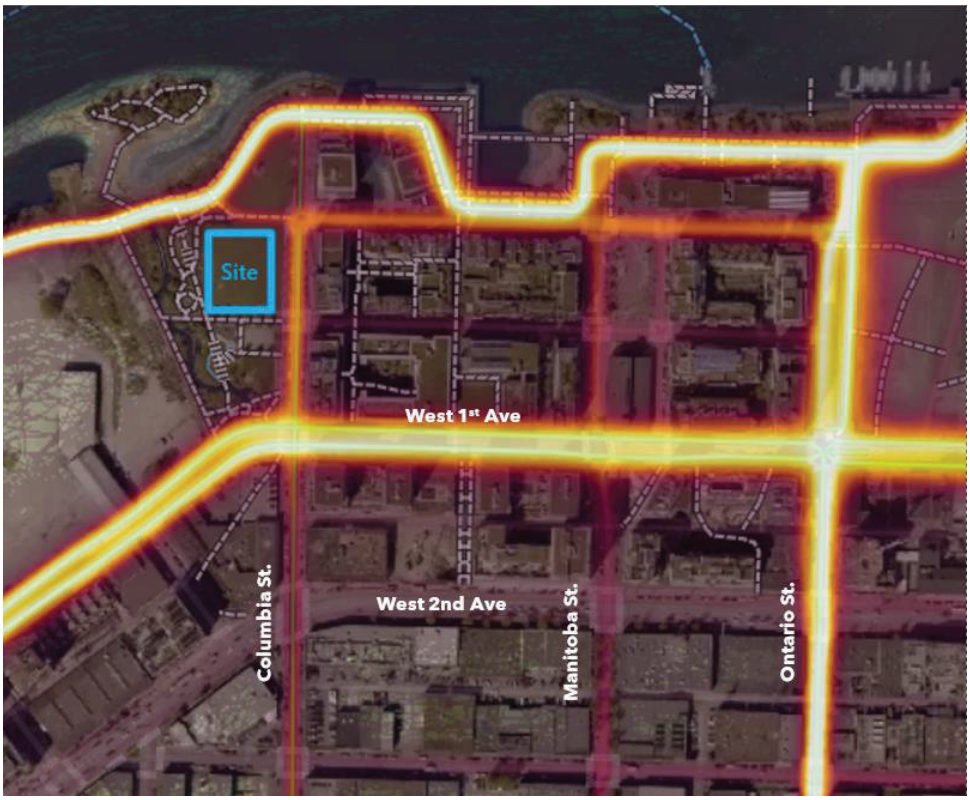


Figure 8. Cycling activity Around the School Site (Source: Strava)

2.5 Parking

2.5.1 On-Street Parking Supply

Parking on both sides of Columbia Street is available and permitted during school hours and on school days. **Figure 9** below illustrates curbside parking provisions and approximate locations.

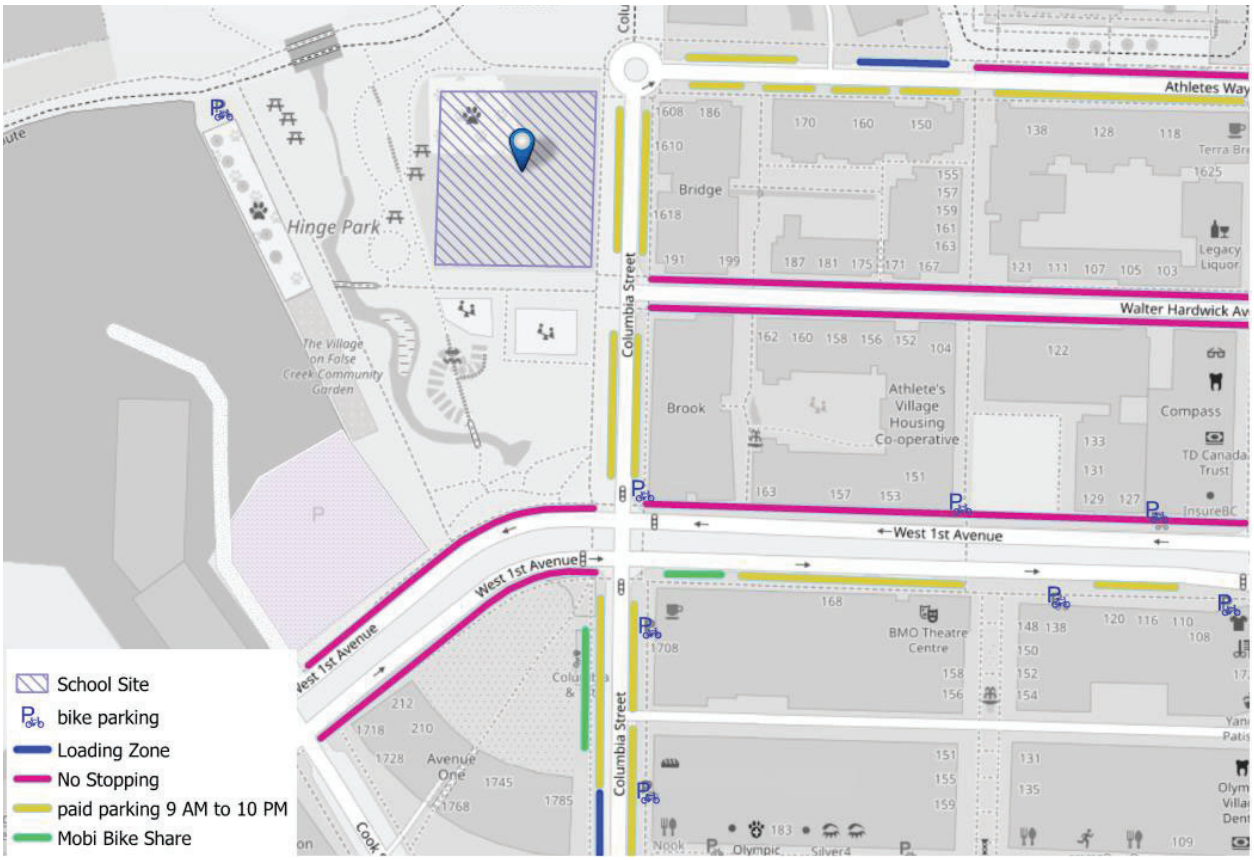
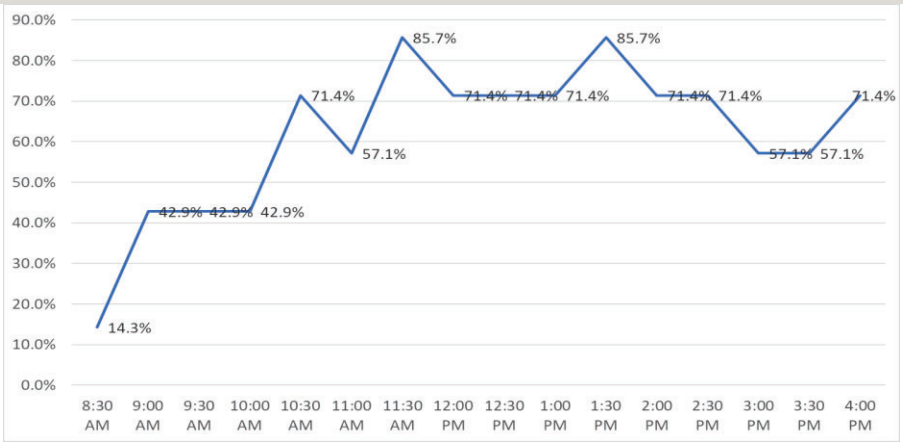
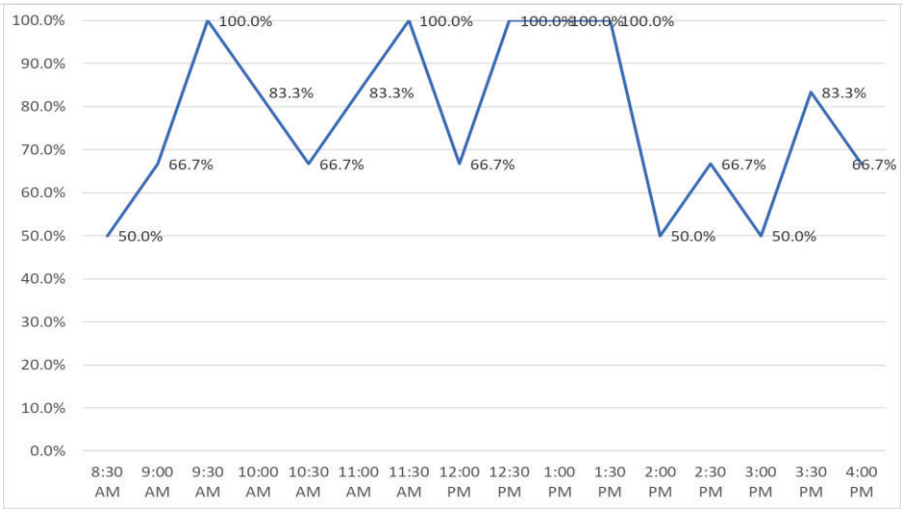
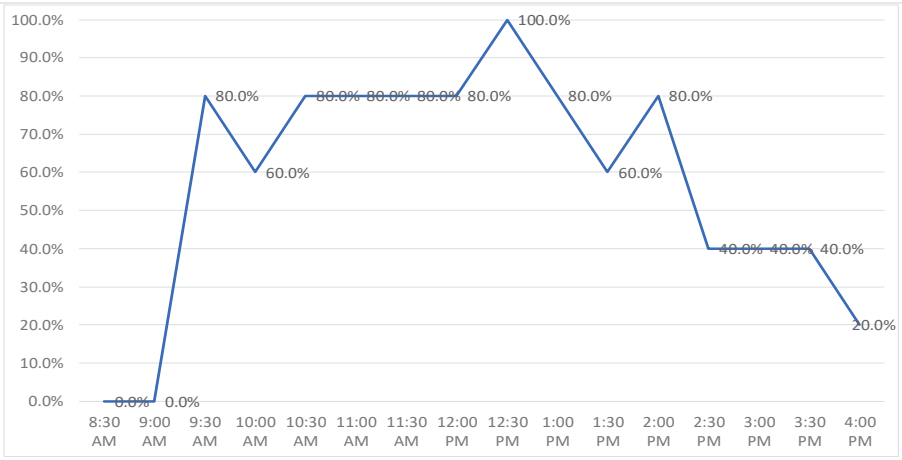


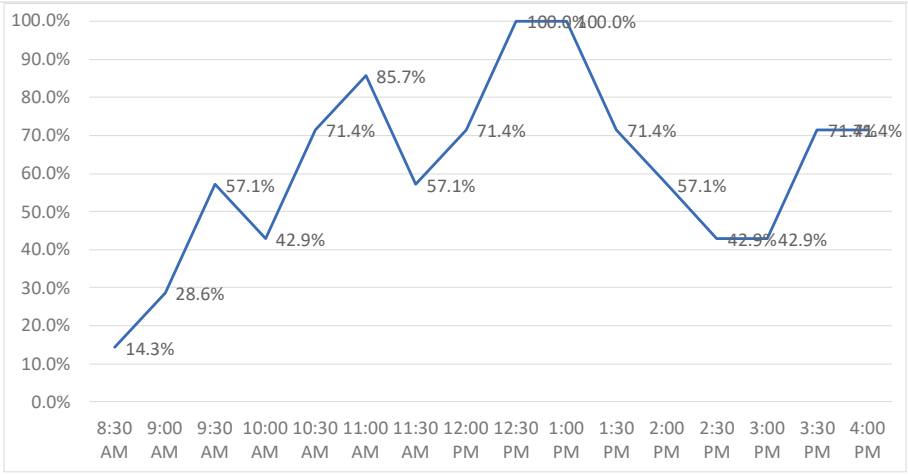
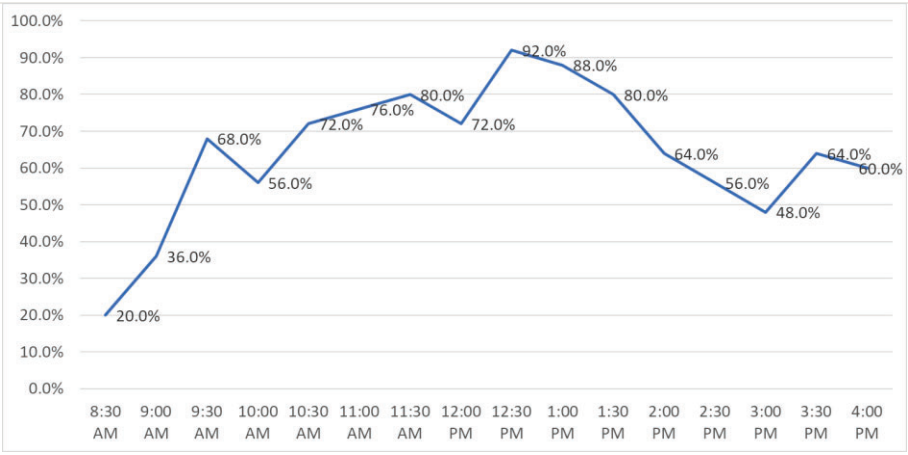
Figure 9. Existing Car and Bike Parking/Loading Locations and Restrictions

2.5.2 Curbside Parking Occupancy

Curbside parking occupancy surveys on adjacent streets were conducted on Thursday, September 14, 2023, from 8.30 AM to 4.00 PM. A summary of curbside parking space utilization around the school block faces is presented in the table below. The raw parking data survey is included in **Appendix A**.

Table 3. On-Street Curbside Parking Occupancy Survey Columbia St.

Block name	Est. # Spaces	Parking Occupancy (%)
Columbia Street **East Side** (between West 1st Avenue and Walter Hardwick Avenue)	7	
Columbia Street **East Side** (between Walter Hardwick Avenue and Athletes Way)	6	
Columbia Street **West Side** (between Athletes Way and Walter Harwick Avenue)	5	

Columbia Street **West Side** (between Walter Harwick Avenue and West 1st Avenue)	7	
Overall	**25**	

Analysis reveals that on-street parking on Columbia Street experiences lower activity during the AM peak hour at around 8.30 - 9:00 AM. The peak utilization occurs between 12:30 PM and 1:00 PM, reaching approximately 90%. Subsequently, the utilization decreases to approximately 50%-60% by 3:00 PM. This indicates that Columbia Street's on-street parking has available capacity to serve as PUDO spaces for parents both before and after school hours.

2.5.3 Curbside Parking Turnover

We have computed the average parking duration and turnover ratio for on-street parking on Columbia Street. The average parking duration is calculated as the ratio of total vehicle hours to the number of vehicles parked. Parking turnover describes the number of cars that can use a space in a given period of time.

Across the four mentioned blocks, there is a uniformity in both average parking duration and turnover rate (the number of parked cars per hour). The average parking duration is 1.2 hours, with a turnover rate of 0.8 cars per hour. The following table specifies the turnover rate at block level.

Table 4. On-Street Parking Duration & Turnover Columbia St.

Block face	Average Parking Duration (hour)	Average Hourly Turnover
Columbia Street East Side (between West 1st Avenue and Walter Hardwick Avenue)	1.1	1.0
Columbia Street East Side (between Walter Hardwick Avenue and Athletes Way)	1.3	0.9
Columbia Street West Side (between Athletes Way and Walter Harwick Avenue)	1.3	0.8
Columbia Street West Side (between Walter Harwick Avenue and West 1st Avenue)	1.1	1.0
Overall	**1.2**	**0.8**

2.5.4 Off-Street Parking

We also observed a paid off-street parking lot located within a convenient walking distance (approximately 200 meters) to the south of the school site. This off-street parking facility comprises an estimated 40 parking spaces, with a daily utilization rate currently at around 50%. The parking lot has the capacity to offer additional spaces for school parking with an appropriate adjustment.

2.6 Study Intersections and Turning Movement Counts

Multimodal Intersection turning movement counts (TMCs) were obtained on Thursday Sep 14 during typical school peak travel periods AM (8:30 am to 10:30 am) and PM (2:30 to 4:30 pm). Detailed TMC reports are included in **Appendix A** including additional info included peak hour factors (PHFs), vehicle classification, relative proportion of travel modes and proportion of pedestrian children and adults. Locations surveyed included:

- Columbia Street & Athletes Way
- Columbia St & Walter Hardwick Ave.
- Columbia St. & West 1st Ave
- Manitoba St. & West 1st Ave
- Manitoba St. & Walter Hardwick Ave
- Manitoba St. & Athletes Way
- West 2nd Ave & Columbia St.
- West 2nd Ave & Manitoba St.

Figure 10. Study Intersections

The table below includes the total number of intersection users recorded per location and a summary of the mode shares.

Table 5. Mode Share at Study Intersections

	AM Peak					PM Peak				
Intersection	Total*	Car	Trucks	Pedestrians	Bikes	Total*	Car	Trucks	Pedestrians	Bikes
Columbia Street & Athletes Way	226	19%	2%	45%	34%	324	25%	0%	45%	30%
Columbia St & Walter Hardwick Ave.	378	42%	1%	38%	19%	385	46%	0%	34%	20%
Columbia St. & West 1st Ave.	965	44%	2%	33%	21%	1251	49%	0%	31%	20%
Manitoba St. & West 1st Ave.	745	50%	1%	31%	18%	1335	51%	0%	36%	13%
Manitoba St. & Walter Hardwick Ave.	400	41%	3%	47%	10%	619	38%	0%	54%	8%
Manitoba St. & Athletes Way.	396	20%	1%	67%	13%	629	21%	0%	64%	15%
West 2nd Ave & Columbia St.	2936	95%	1%	4%	0%	3835	92%	0%	7%	1%
West 2nd Ave & Manitoba St.	2804	96%	0%	3%	1%	3455	95%	0%	4%	1%

**Total numbers include all modes entering the intersection*

From the Table above, a few general observations are worth noting:

- The intersections of Columbia St. at Athletes Way and at Walter Hardwick are dominated by Active Transportation users (pedestrian and bikes) accounting for a combined shared of almost 80% on Athletes Way and 57% on Walter Hardwick.
- The busiest intersections in terms of total number of users (entering the intersection) are by far those along West 2nd Ave due largely to the high proportion of auto mode share.
- The PM peak traffic is generally 40% busier than the morning period except for the intersection of Columbia St. and Walter Hardwick (future main intersection at school front) which activity remains almost unchanged between AM and PM peak periods, presumably because is largely local residential users in and out of the neighborhood.
- On average, pedestrians take the highest proportion (44%) of all intersection users at all locations, followed by cars (37%), cyclist (18%) and truck (1%). Pedestrians and bikes combined account for about 62% of intersection users in the study area. These mode share figures are consistent with mobility trends in the area.
- Truck movements were almost exclusively recorded during the AM peak period.

2.7 Existing Intersection Operation Performance

Intersection capacity analysis is conducted in Synchro V11.0 under the existing traffic conditions. The analysis is in accordance with industry-recognized methodologies as set forth in the latest version of the Highway Capacity Manual (HCM). Synchro analyses are based on traffic flow theory and methods & techniques. Key Measures of Evaluation (MOE) include delays, level of services (LOS), volume-to-capacity ratios and estimated queuing at intersections. LOS is a letter code ranging from “A” for optimal conditions to “F’ for failure conditions. Acceptable performance results typically indicate under capacity conditions for highest peak hour periods including level of service (LOS) D or better, low volume to capacity ratios (V/C < 0.90) and no significant queues that may spill back to an upstream intersection.

Because our surveyed unsignalized intersections, such as Columbia St & Athletes Way, Columbia St & Walter Hardwick Ave, Manitoba St & Walter Hardwick Ave, and Manitoba St & Athletes Way, have relatively low vehicular traffic volume and mode share, it can be confidently stated that they are unlikely to experience any issues related to intersection MOEs. This judgement is consistent with our field survey observations.

The primary focus of the Synchro analysis is directed towards the four signalized intersections characterized by higher traffic volumes and more comprehensive traffic operation conditions, namely Columbia St & West 1st Ave, Manitoba St & West 1st Ave, Columbia St & West 2nd Ave, and Manitoba St & West 2nd Ave. The following table is a summary of the Synchro analysis results for these four intersections under the existing traffic conditions.

Table 6. 2023 Existing Intersection Summary Performance

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
#1 Columbia St & West 1st Ave	Intersection Overall		A	9.1	0.30	-	B	10.3	0.44	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#2 Manitoba St & West 1st Ave	Intersection Overall		A	9.2	0.25		B	11.6	0.57	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#3 Columbia St & West 2nd Ave	Intersection Overall		B	10.3	0.74		B	16.1	0.83	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#4 Manitoba St & West 2nd Ave	Intersection Overall		B	14.9	0.78	-	B	16.4	0.81	-
	Critical Movement	No	-	-	-	-	-	-	-	-

As shown in the table above, all the four signalized intersections are currently operating satisfactorily exhibiting acceptable Levels of Service (LOS), minimal delays, and appropriate volume-to-capacity (v/c) ratios under the 2023 existing traffic conditions. Detailed Synchro report can be seen in **Appendix B**.

2.8 Road Safety

2.8.1 Pedestrian & Cycling Crash Mapping Study Area

ICBC and Police Crash Reported Data (TAS) were gathered and reviewed. Specifically, the data reviewed included all pedestrians and cyclists involved collisions in the study area between 2018 and 2022. A collision density heatmap was estimated by using the Equivalent Property Damage Only (EPDO) method which accounts for the frequency and the severity of collisions by weighing more severe collisions (fatal and injury) more heavily than less severe collisions (i.e., property damage only). Assuming CRISP standard weighting factors (Fatal = 174; Injury=10; PDO=1), the pedestrian and cyclist collision density heatmap in the study area is shown in **Figure 11** below.

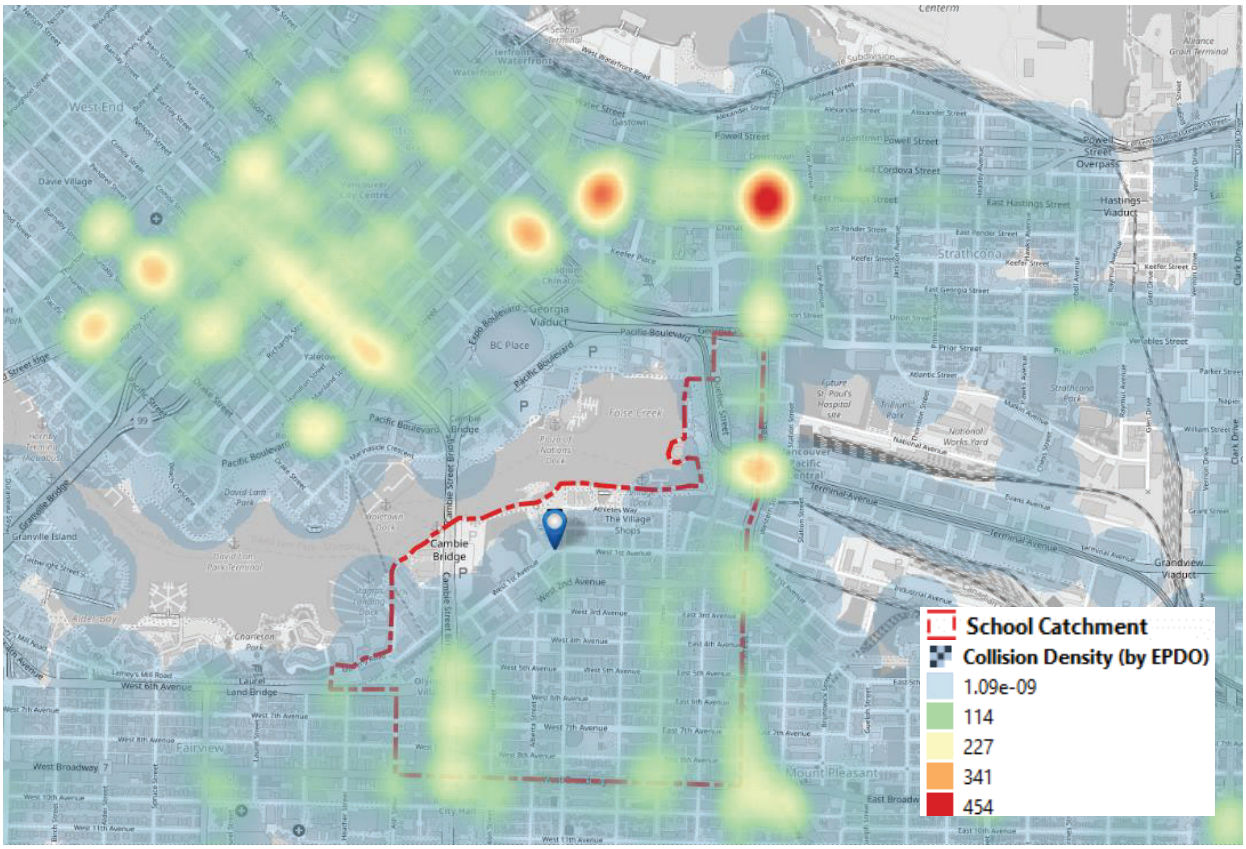


Figure 11. Collision Frequency 5-Year ICBC crash data weighted by EPDO

The above figure shows high (reddish), medium-high (orange), and moderate (yellow) risk density locations, where pedestrians and cyclists have been frequently involved in collisions in the past five years. Some of these hot spots are within the catchment area particularly along the catchment boundaries, namely Main Street to the east, Broadway Ave to the south, and Cambie Street to the west. Also of note are the intersections of Main Street and Terminal Avenue, and several intersections along Ontario Street. Of note, the crash mapping method does not take traffic volumes into account, so it tends to be biased toward higher volume locations.

2.8.2 Pedestrian & Cycling Crash Rate

Crash rates describe the number of crashes in a given period in relation to the traffic volume (or exposure) to crashes, therefore eliminating the biases towards higher volume locations. Crash rates were calculated by dividing the total number of 5-year crashes (pedestrian and cyclist involved) at study area intersections by a measure of exposure (5-year estimated number of pedestrian and cyclist entering the intersection based on observed peak hour data). The crash rate then is a proxy indicator of the potential risk for pedestrians and cyclists getting involved in crashes at an intersection per a million users (cyclists and pedestrians) entering the intersection. The Map below illustrates the Crash Rate (graduated symbology based on crash rate) per location. A Table follows summarizing the collision rate for AM and PM peak periods.

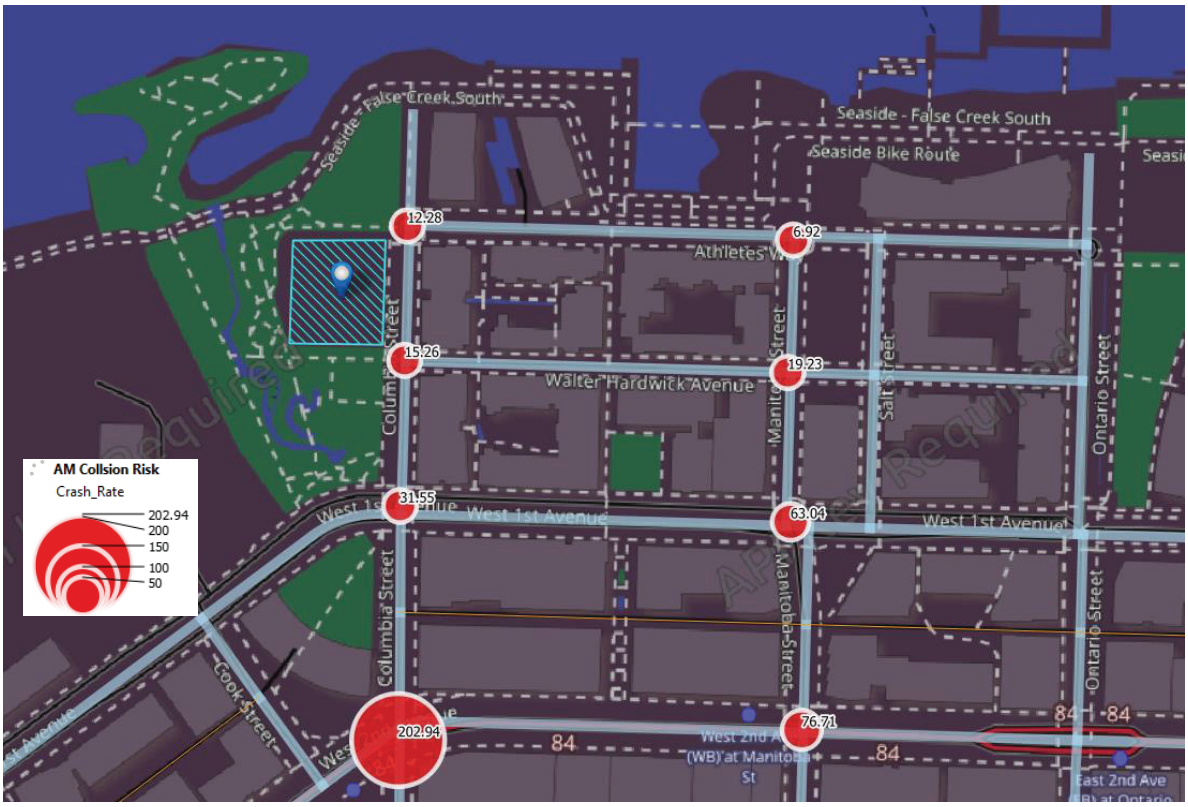


Figure 12. Cyclists and Pedestrian Involved Crash Rate

Table 7. Crash Rate at Study Intersections (Cyclist and Pedestrians Involved)

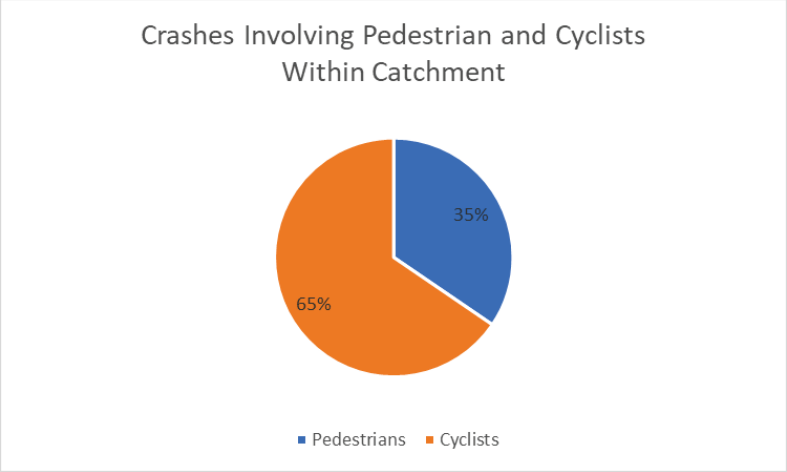
	AM Peak					PM Peak				
Intersection	5-yr EPDO Frequency	Pedestrians	Bikes	Total	Crash Rate	5-yr EPDO Frequency	Pedestrians	Bikes	Total	Crash Rate
Columbia Street & Athletes Way	4	101.70	76.84	178.54	12.28	4	145.80	97.20	243.00	9.02
Columbia St & Walter Hardwick Ave.	6	143.64	71.82	215.46	15.26	6	130.90	77.00	207.90	15.81
Columbia St. & West 1st Ave.	30	318.45	202.65	521.10	31.55	30	387.81	250.20	638.01	25.77
Manitoba St. & West 1st Ave.	42	230.95	134.10	365.05	63.04	42	480.60	173.55	654.15	35.18
Manitoba St. & Walter Hardwick Ave.	8	188.00	40.00	228.00	19.23	8	334.26	49.52	383.78	11.42
Manitoba St. & Athletes Way.	4	265.32	51.48	316.80	6.92	4	402.56	94.35	496.91	4.41
West 2nd Ave & Columbia St.	50	125	10	135	202.94	50	274	16	290	94.47
West 2nd Ave & Manitoba St.	14	98	2	100	76.71	14	155	5	160	47.95

The table above illustrates crash frequency and crash rate to identify high crash locations. The intersection of West 2nd Ave & Columbia St. has the highest number of crashes (crash frequency), but a relative low volume of pedestrian and cyclist involved crashes, giving it the highest crash rate (risk) among all nearby intersections. Conversely, the intersection of Manitoba St. and Athletes Way has a relatively high number of pedestrian and cyclists but also a very low crash frequency, giving it the lowest crash rate among nearby intersections.

2.8.3 In-Catchment Pedestrian & Cyclist Collision Trends

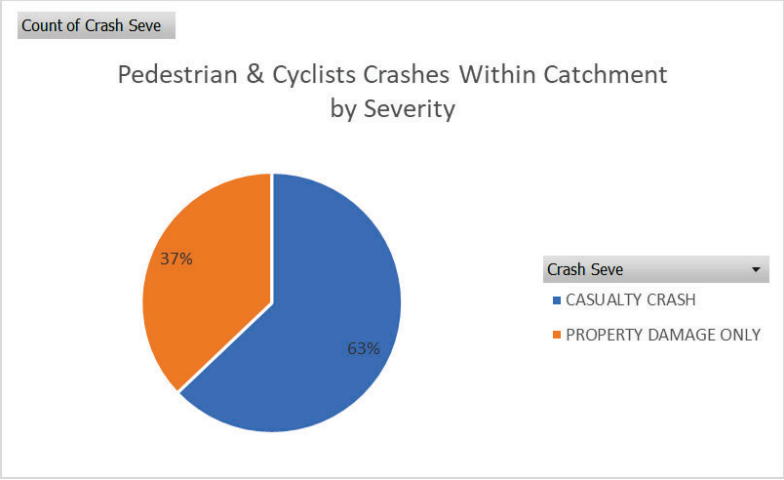
The following figures illustrate some general trends of Pedestrian and Cyclist Involved Collisions within the anticipated catchment area. Between 2018 to 2022, a total of 380 collisions involving pedestrians and/or cyclists were recorded within the catchment.

Crash Type



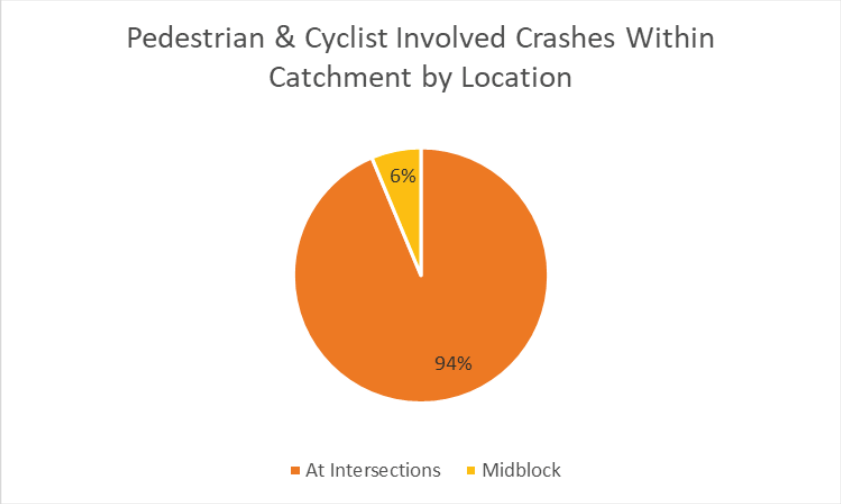
- Majority of collisions involving active transportation users involved cyclist.

Crash Severity



- Majority of collisions involving active transportation users have resulted in injured, although no reported fatalities. The balance of collisions is PDO only.

Crash Location

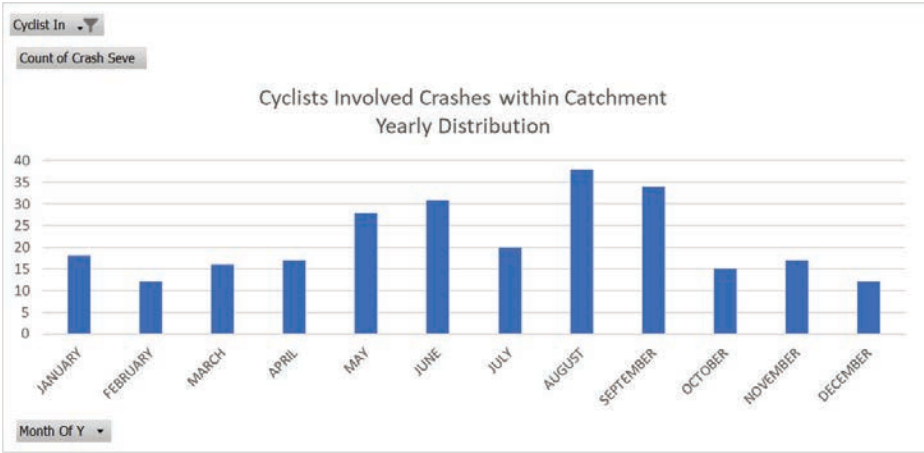


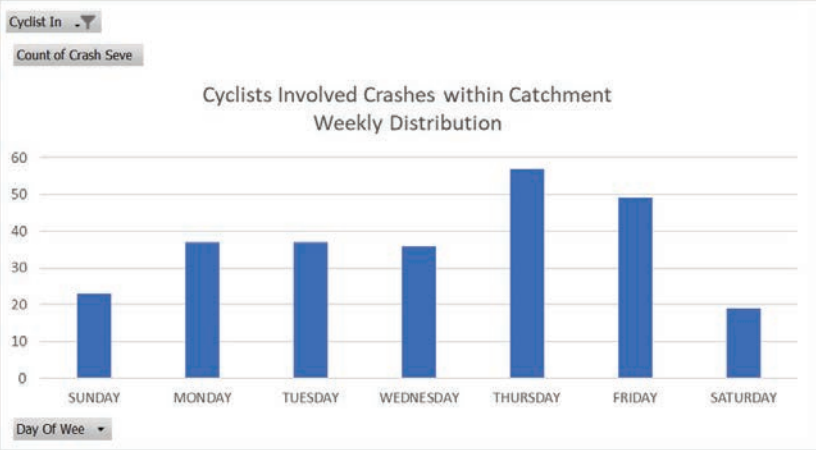
- Vast majority (94%) of pedestrian and cyclist involved collisions within catchment occur at intersections.

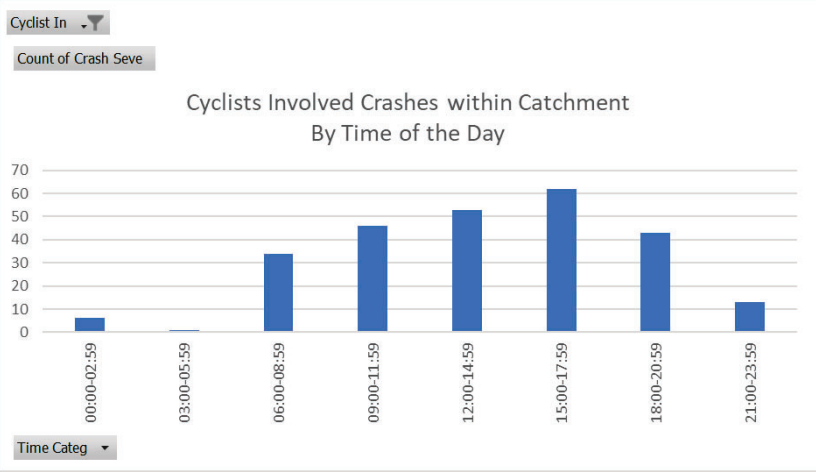
Annual, Weekly and Daily Crash Distribution

Cyclist

- Cyclist crashes tend to peak by August and September on Thursdays and Fridays, between 3 pm to 6 pm

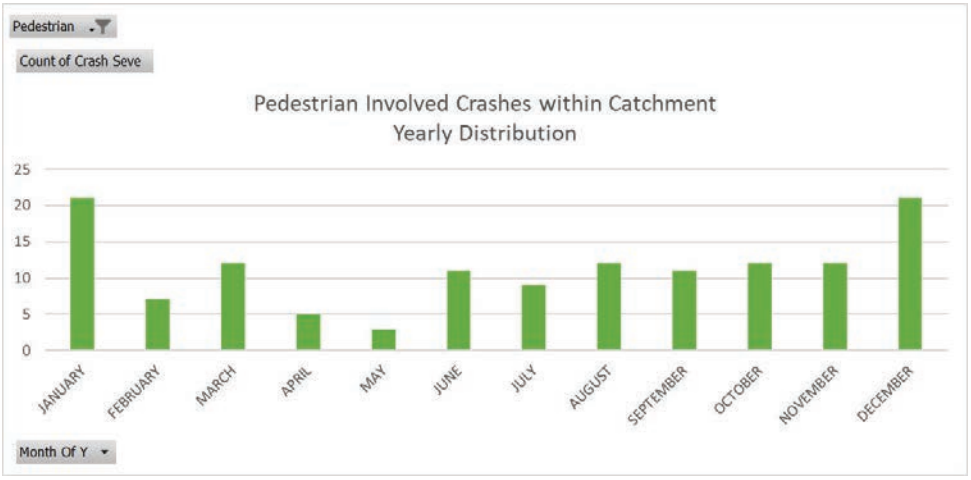


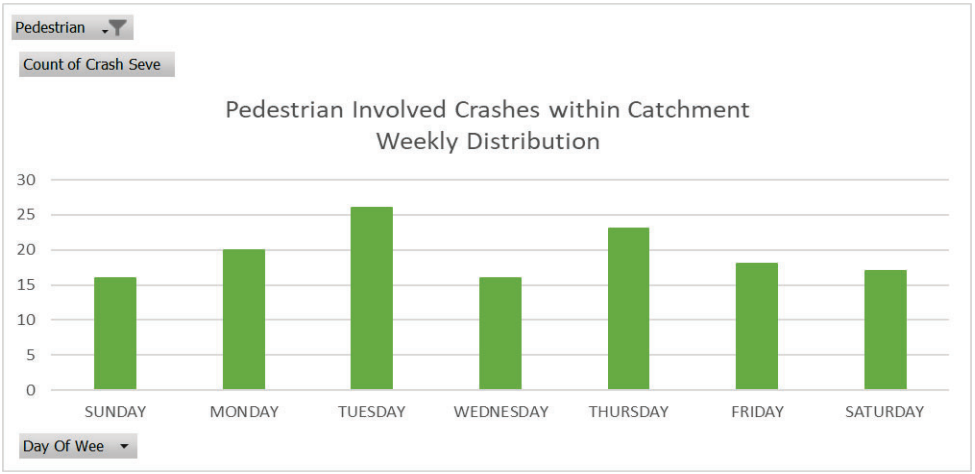


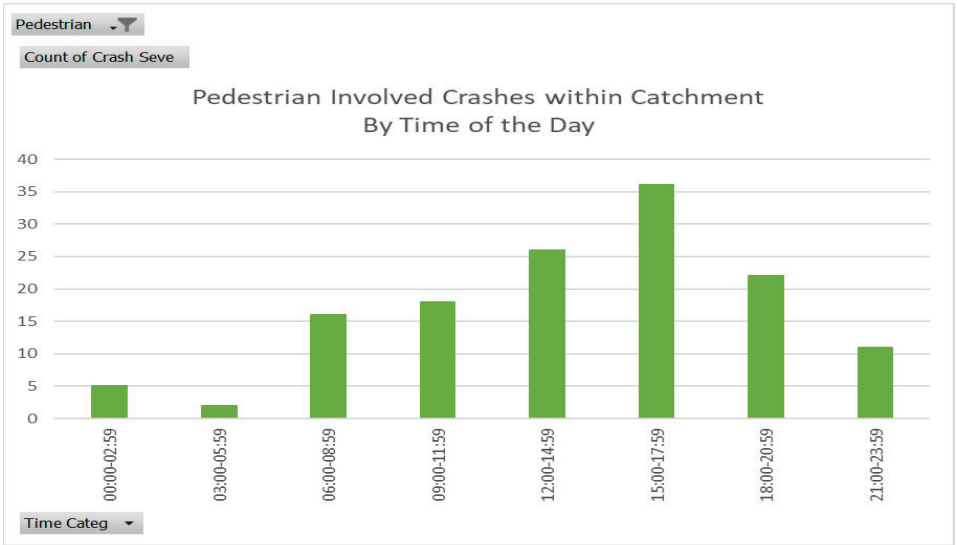


Pedestrians

- Pedestrian crashes tend to peak in January and December (Winter) largely on Tuesday and Thursday between 3 pm to 6 pm


Pedestrian
Count of Crash Seve
Pedestrian Involved Crashes within Catchment
Yearly Distribution
25
20
15
10
5
0
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
Month Of Y


Pedestrian
Count of Crash Seve
Pedestrian Involved Crashes within Catchment
Weekly Distribution
30
25
20
15
10
5
0
SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SATURDAY
Day Of Wee


Pedestrian
Count of Crash Seve
Pedestrian Involved Crashes within Catchment
By Time of the Day
40
35
30
25
20
15
10
5
0
00:00-02:59
03:00-05:59
06:00-08:59
09:00-11:59
12:00-14:59
15:00-17:59
18:00-20:59
21:00-23:59
Time Categ

2.8.4 Pedestrian & Cyclist Collisions Adjacent to School Site

Of the total 380 pedestrian and cyclist involved collisions registered in the past five years, only four are in the vicinity of the school, specifically at the signalized intersection at Columbia Street and West 1st Avenue. The following table summarizes basic information about these collisions.

Table 8. 5-Year Pedestrian & Cyclists Involved Collisions near the School Site

Location	Year	Involved	Month	Day of the Week	Time of the Day	Conflict Type
Columbia Street and West 1st Avenue	2022	Cyclist	Sep	Thursday	12 - 2 pm	Single Vehicle
Columbia Street and West 1st Avenue	2021	Cyclist	Apr	Saturday	6 – 9 pm	Undetermined
Columbia Street and West 1st Avenue	2020	Cyclist	Nov	Tuesday	3 – 6 pm	Single Vehicle
Columbia Street and West 1st Avenue	2019	Cyclist	Jun	Friday	3 – 6 pm	Side Swipe – Same Direction

As per the Table above, the four collisions at Columbia St. and West 1st Ave involved cyclists, presumably on road, directly in conflict with a motor vehicle. Three out of four incidents occur during weekdays and one on a Saturday evening. Only two incidents occur during regular school season and school times (Sep and Nov). There is no specific information on pre and post collision events or direction of traveled for the vehicle and cyclists involved.

3 Proposed School

3.1 School Description

The new elementary school at Olympic Village will be built on a vacant, 2,700-square-meter parcel located on the west side of the village. The site is zoned for school use and fronts onto Columbia Street, between Athletes Way and Walter Hardwick Way. It is bordered on the south, west, and north sides by Hinge Park. This location and plan align with the city's 2007-approved Southeast False Creek Official Development Plan, which had planned for a future elementary school at this specific site.

The proposed four-story school is designed to serve 630 students and 62 full time employees (FTE), with a total floor area of 6,000 square meters, including an accessible rooftop space. There will be no underground parking, and a school-aged childcare facility for 60 children will operate on the ground level. The previously proposed rooftop infant-to-preschool childcare has been removed, which will reduce traffic flow to the site.

In terms of schedule, VSB has indicated that according to standing agreements with the CoV, the approximate development timeframes are as follows:

- Construction: Spring 2027 to 2029.
- Occupancy (Opening): Fall 2029

School bell times are expected to be customary for a typical Elementary school in Vancouver, starting time at 9:00 am and dismissal time at 3:00 pm. Staff is expected to arrive 30 minutes before bell time at 8:30 am and leave 30 minutes later at 4:00 pm.

3.2 School Site Plan

The latest school site plan, as provided by the VSB's lead architect (McFarland Marceau Ltd.) is shown in **Figure 13** below. Also included in **Appendix C**.

The building is oriented with its main entrance facing north, providing direct access to the adjacent triangular park, which will function as an area where students will line up before entering the school.

Classrooms are positioned along the north and south sides of the building to enhance privacy for neighboring residential towers and to improve energy performance by minimizing western solar heat gain.

The site will include six parking stalls at ground level, four accessible and two designated for service, located at the south end, along with a 6-meter-wide entry drive for garbage, service, and emergency vehicle access. Parking lot access is planned at the south edge of the site.

Short-term (Class B) bicycle parking (i.e. bike racks) is planned to be at the north edge of the site, by the main building entrance.

Student PUDO area is to be accommodated on-street alongside the west side of Columbia Street (to be converted by the city from two-way to one-way southbound) fronting the school and adjacent to a city's planned bidirectional protected bikeway.

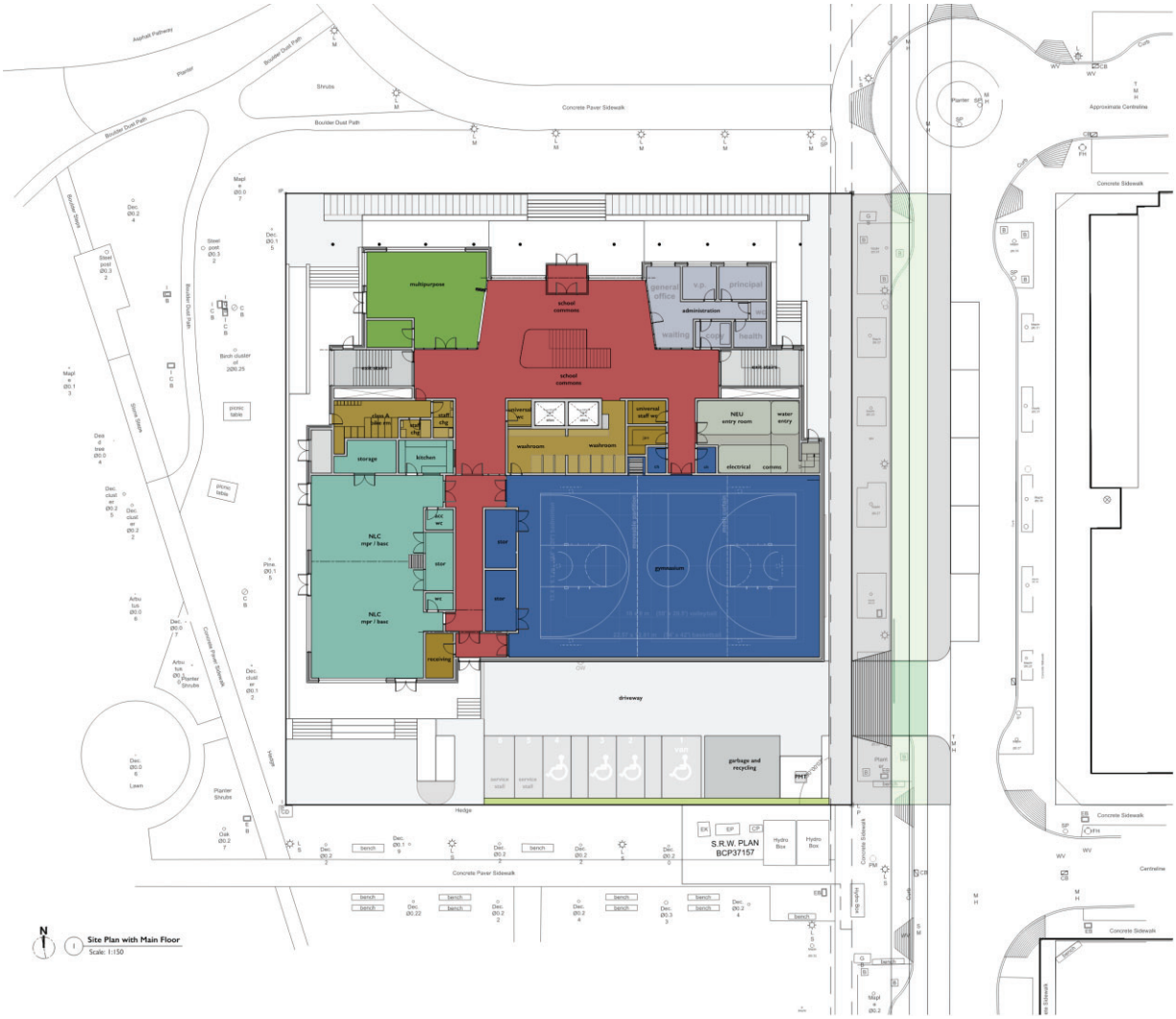


Figure 13. Concept Site Plan (Excerpt from Site Plan Provided by Architect Apr 08, 2025)

3.3 School Catchment

Although no formal catchment review process has been undertaken, the VSB has indicated that the school catchment is likely to resemble approximately a portion of the Fraser (Elementary) catchment north of Broadway plus a small portion at the south end of the Crosstown catchment, plus a portion of the False Creek catchment that approaches the mid-point between Hinge Park and False Creek school, as shown in **Figure 14** below. This catchment delineation is for planning purposes and will be refined through a formal review. This approximation considers that all current catchments are operating over-capacity, and are expected to remain at, or over-capacity even with the addition of new enrolling space at Olympic Village. The figure also shows a sample of the number and geographic distribution of anticipated students by grade level.

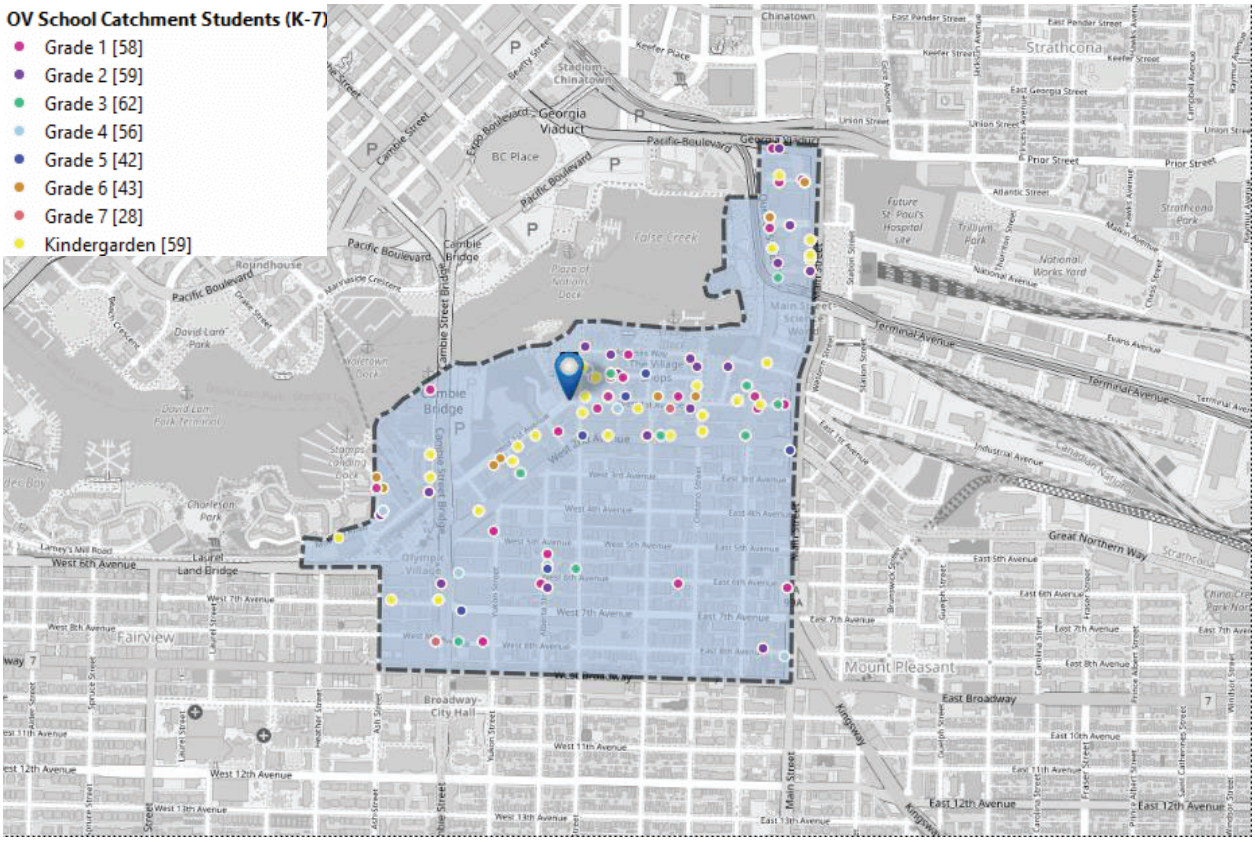


Figure 14. OV School Catchment and Student Location by Grade Level

From a transportation perspective, the definition of a catchment is important to understand the anticipated geographic boundaries from where the bulk of school travel trips will be generated. Also, the size (extent) of the catchment area provides spatial context to estimate the proportion of in-catchment students within walking and cycling reach of the school, therefore being able to right-sized the travel demand by mode. In addition, the most likely walking and cycling routes within the catchment can be identified in geographic context (See **Section 4.3**).

3.4 Isochrone Mapping by AT Modes

Isochrone maps are a great way to see all the locations one can reach within a time limit or speed by a specific mode of transport. Isochrone maps consider these variables when generating the region ('service area') a person can reach within a certain travel time. Using average default travel times and speeds by mode as a proxy for distance, isochrones generate maps of temporal proximity, which are much more precise than simple distance-radius maps. The isochrone map below shows all the areas one can reach from the school by different travel modes and overlays the location of potential students to identify their service area.

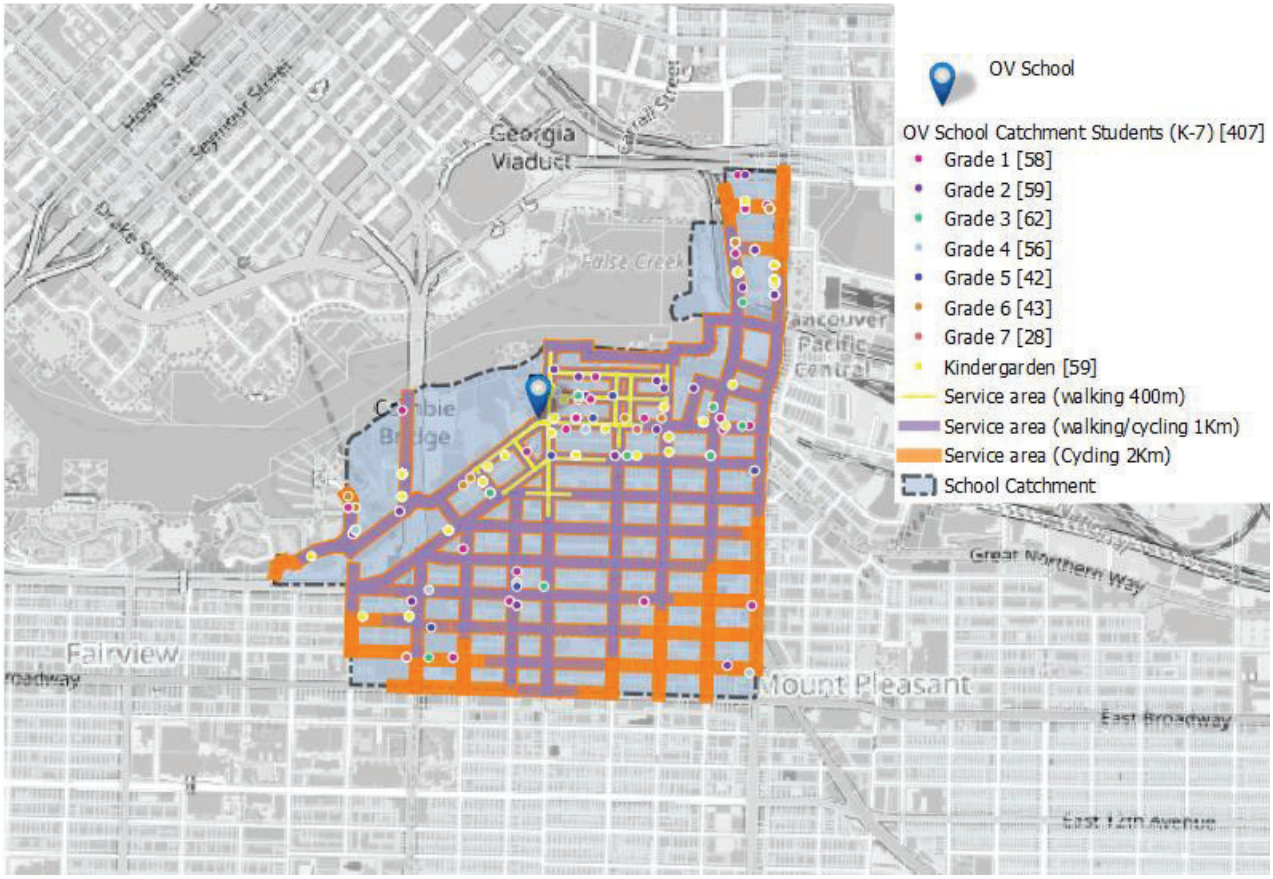


Figure 15. Isochrone map of travel modes and student location

From the figure above, the following observations are noted:

- **32% of students (130 out of 407) live within 400 m walking** distance from school.
- **85% of students (346 out of 407) live within less than 1 km walking/cycling** distance from school.
- **100% of students (407 out 407) live within 2 km** from school.

Note: the above figures are based on a representative sample of potential students attending the school based on pre-registration data provided by the VSB.

3.5 Multimodal Trip Generation

As confirmed with the CoV, we estimated school trip generation rates of vehicles, pedestrians, cyclists, and transit based on a combination of methods including:

- Location data of a sample of potential students in relation to catchment (anonymized data provided by VSB)
- Accessibility indicators for each travel mode (i.e., isochrone mapping above) in relation to available pedestrian and cycling networks and nearby transit facilities.
- Benchmarking with existing mobility trends in the study area (**Section 2.3**)
- VSB's school attendance demand management and placement practices
- Trip generation rate from nearby similar schools.

In addition to the above, the VSB was also consulted on their rationale to forecast school attendance for planning and managing spaces at OVE, for potential catchment spaces available at the time of project completion. It is important to note that "out-of-catchment" reflects those students who currently reside outside of the above noted hypothetical catchment.

Hence, the VSB indicated, for the purposes of the traffic study, the following assumptions can be made about how the school could fill over time:

- The school is likely to be filled primarily from within the approximate future catchment area.
- Significant number of students are expected to come from a future neighborhood to be developed west of Hinge Park in a City-owned vacant waterfront lot (identified as Southeast False Creek Area 1A), between Cambie Bridge and Olympic Village[1].
- In the coming years, some students may attend OV from outside of the currently approximated catchment (directly adjacent catchments i.e., Fraser, False Creek and Crosstown), which are all currently over capacity. These students may fall within the ultimately approved Olympic Village catchment which will consider the demand and capacity of all schools within the area. A lack of capacity has occurred for several years at nearby full schools like Crosstown, Fraser, and False Creek.

The Vancouver School Board (VSB) estimates that, of the approximately 630 school-age children expected to reside within the approximated Olympic Village Elementary (OVE) catchment, roughly 25% may choose to attend district programs elsewhere in the city. As a result, approximately 75%—or 472 students (630 × 0.75)—are expected to enroll in OVE's regular in-catchment program with the remaining students coming from directly adjacent catchments which will continue to be over-capacity.

Assuming a total school capacity of 630 students and 472 of those spaces filled by in-catchment (approximated) students, the remaining 158 students would be drawn from directly adjacent catchments, including the Fraser, False Creek, and Crosstown catchments. These placements will be managed by VSB and are contingent upon available space after the ultimate Olympic Village catchment is defined and in-catchment enrollment takes place.

As revised approved catchments are not resolved, it is assumed that these 158 out-of-catchment students will be evenly distributed across the three surrounding catchments, resulting in approximately 53 students (158 × 0.33) coming from each of the Fraser (south), False Creek (west), and Crosstown (north) areas.

As noted in **Section 3.4**, given that approximately 85% of students are expected to reside within 1 km of the school—and virtually 100% within 2 km—it is reasonable to assume that nearly all in-catchment students (approximately 472) will regularly walk, roll, or cycle to school. It is also reasonable to expect that in an ultimately revised catchment, all students will fall within a 2km radius and would therefore be likely to walk to school. However, for the purposes of this exploration, a conservative approach has been taken that estimated the 158 out-of-catchment students, whose origins are from adjacent catchments, would have a travel mode share that is expected to reflect the 2021 Census transportation patterns in their respective neighborhoods. A summary of this trip distribution is presented in the table below.

[1] https://dailyhive.com/vancouver/southeast-false-creek-cambie-bridge-olympic-village-lot-1a

Table 9. Out-of-Catchment Student Travel Mode Share

Nearby Catchment	Transport Mode Share[2]					
	Car/Other		Walk/Bike		Transit	
Simon Fraser	45%	24	26%	14	29%	15
False Creek	49%	26	42%	22	9%	5
Crosstown	56%	30	27%	14	17%	9
	Total	80	Total	50	Total	29

The estimated multimodal school trip generation and mode share is in the Table below:

Table 10. Expected School Travel Mode Share

		School Mode Share (%)		
	Total Students	Car/Other	Walk/Bike	Transit
In approximated Catchment	472	0	472	0
Within adjacent existing catchment	158	80	50	29
Total	630	80	522	29
Est. School Mode Share		13%	83%	4%

As noted in the table above, the estimated auto mode split is approximately 13%, walking and bicycle mode split about 83%, and transit mode at 4%.

These figures are highly consistent with other similarly sized and situated elementary schools in the area, including Crosstown Elementary and Elsie Roy Elementary, located just across False Creek. According to the VSB[3], Elsie Roy Elementary operates with an approximate mode split of 17% auto, 80% walking, and the remaining 3% split between cycling and transit. Similarly, Crosstown Elementary was projected to have an auto mode share in the range of 17% to 25%, with walking, cycling, and transit mode shares in a similar proportion to Elsie Roy.

In terms of PUDO activity, the referenced study for Elsie Roy Elementary reported a total of 73 daily vehicle trips (corresponding to the 17% auto mode share), including 59 trips during the AM drop-off period and 42 trips during the PM pick-up window. These figures imply vehicle occupancy ratios of approximately 1.2 persons per vehicle in the morning and 1.7 in the afternoon, respectively. These occupancy rates are

[2] Canada Census 2021
[3] Referenced in the Crosstown Elementary TAMS Study (Dec 2013)

consistent with findings from numerous other VSB school transportation studies across Vancouver and have been used to inform the PUDO modeling presented in **Section 3.8** of this report.

For this study, a conservative 20% auto mode share has been assumed, even though the scenario generating the highest auto demand—out-of-catchment student placements—is considered highly unlikely. VSB is expected to fill the majority of seats with in-catchment students, and historically, the Olympic Village area has exhibited strong demand and long waitlists for elementary school enrollment, as widely documented[4]. Therefore, the likelihood of significant out-of-catchment enrollment triggering elevated auto use is minimal.

3.6 Vehicular and Bicycle Parking & TDM Plan

As of June 30, in alignment with changes to provincial housing regulations, the City of Vancouver eliminated minimum vehicle parking requirements city-wide for all land uses. However, accessible parking, visitor parking (for residential uses), bicycle parking, loading, and passenger loading are still required in accordance with the Parking Bylaw.

The city has confirmed that a Transportation Demand Management (TDM) Plan is required for this development. TDM Plans are now only required for developments in the Downtown, Broadway Plan and TOA areas, as well as for Large Sites. This site falls within the provincial TOA designation.

Under the recently updated city's TDM framework, developments may choose from four compliance pathways, as outlined in the table below. Following discussions with City staff, **the VSB intends to pursue TDM Plan B for this development (Appendix D)**, which involves providing enhanced on-site bicycle infrastructure, as specified in the policy.

[4] https://www.cbc.ca/news/canada/british-columbia/olympic-village-school-faces-hurdles-1.6065310

Table 11. Summary of TDM Plan Options

TDM Plan A Transit Passes	TDM Plan B Mobility Infrastructure Package		TDM Plan C Shared Mobility Package	TDM Plan D Unbundled Parking Pilot Program
	Residential Uses	Non-Residential Uses		
Monthly one-zone transit passes for 3 years	30% additional Class A bicycle parking spaces	30% additional Class A bicycle parking spaces; or a minimum of 3 spaces, whichever is greater	Car share vehicles and spaces Commitment from an operator for 3 years, and SRW to the City for the life of the building	Participate in a pilot program to provide parking spaces for lease only, not to purchase. Applicable only to applications with strata components.
	20% of the total number Class A spaces to be lockers	20% of the total number Class A spaces to be lockers; or a minimum of 1 locker, whichever is greater	Mobi All Access Passes for 3 years	
	10% of the total number Class A spaces to be oversized spaces	10% of the total number Class A spaces to be oversized spaces; or a minimum of 1 oversized space, whichever is greater	Monthly one-zone transit passes for 1 year	
	Weather-protected Class B bicycle parking spaces	Weather-protected Class B bicycle parking spaces		

The proposed parking supply as per by-law, including additional TDM requirements, is summarized below as indicated by the VSB's Architect. **TDM Plan B** supporting calculations and submission form are included in **Appendix D.**

Table 12. Summary of TDM Plan Options

Parking		Requirement	Proposed	Note	
	School	0	2		
	School - Accessible	3	4		
Pick-Up & Drop-Off (PUDO)	**School**			TBD	TBD
Bicycles, class A	**Class A Bike Spaces** Basis: 1 per 17 staff per parking By-law 6.2.2.3 plus additional 30% for TDM Plan B, or minimum 3 spaces thus 3 added spaces. **60 staff / 17 = 4 + 3 = 7**			7	7
	Bicycle Lockers Basis: 20% for TDM Plan B, or minimum 1, thus 2 bicycle lockers. **7 × 20% = 1.4 = 2**			2	2
	Oversized Spaces Basis: 10% for TDM Plan B, or minimum 1, thus 1 oversized space. **7 × 10% = 0.7 = 1**			1	1
Bicycles, class B	**Class B Bike Spaces** Basis: 1 per 20 students per parking By-Law 6.2.2.3.			32	32
End of Trip Facilities	**Clothing Lockers** Basis: Per Parking By-law 6.5.1, 1.4 lockers per Class A spaces, thus 10 of which half, thus 5, must be full height. **7 × 1.4 = 10**			10	10
	Grooming Stations			2	2

3.7 Commercial Loading, Servicing, and Waste Management

The City of Vancouver Transportation Department has confirmed its support for waiving the on-site Class B loading stall and on-site PUDO spaces, conditional upon the Vancouver School Board (VSB) committing to participate in the City's School Active Travel Program (SATP) [5], to be in place prior to school occupancy (see **Section 5.5** for SATP details).

3.7.1 Commercial Loading Vehicle Requirements

The VSB has confirmed that no oversized vehicles are expected onsite for commercial loading purposes. The largest commercial vehicle anticipated to make regular deliveries is a Cargo Van (e.g., Ford Transit 350) with approximate dimensions of 236" (L) x 98" (W) x 111" (H). Swept path analysis of this design vehicle is provided in **Appendix E**.

3.7.2 Garbage Collection and Maneuvering

Per Section 2.8(d) of the City's *Parking and Loading Design Supplement*, all garbage and recycling loading areas must:

- Be located on-site; and
- Allow garbage vehicles to enter and exit the site in a forward direction.

Swept path analyses have been conducted for both front-loading and side-loading garbage trucks, in accordance with the City's Garbage and Recycling Storage Amenity Design Supplement[6]. These are also included in **Appendix E**.

As shown in the analysis, turnaround maneuvering for garbage trucks is constrained within the current site layout and roadway characteristics. While technically feasible - assuming pick-up occurs outside of school hours, and the parking lot and PUDO spaces are empty.

To address this, alternative maneuvering scenarios were tested, including:

- **Controlled Reverse Entry with Traffic Support**
  The feasible option involves the garbage truck reversing into the site, positioning itself to perform waste pick-up and exit the site in a forward direction, thereby avoiding the need to expand the parking lot. The VSB has confirmed with their waste management company team that a second person, such as an assistant operator or traffic controller, who would manage pedestrian and cyclist movements during the brief period the truck crosses the sidewalk and bi-directional

[5] https://vancouver.ca/streets-transportation/school-active-travel-planning.aspx
[6] https://guidelines.vancouver.ca/guidelines-garbage-recycling-storage-facility-design.pdf

bikeway. This approach maintains a smaller site footprint while ensuring that conflicts with vulnerable users are actively managed during truck movements.

These scenarios were reviewed with the VSB, and are illustrated in **Appendix E**.

3.7.3 Scheduling Considerations

The VSB has advised that both commercial deliveries and garbage servicing operations can be scheduled outside regular school hours. This approach aims to:

- Minimize conflicts with student activity and vulnerable road users;
- Improve operational efficiency; and
- Enhance overall site safety during peak school times.

3.8 Pick-Up/Drop-Off (PUDO)

As noted above, the City of Vancouver (CoV) Transportation Department has confirmed its support for waiving the on-site Class B loading stall and on-site school PUDO spaces, conditional upon the Vancouver School Board (VSB) committing to implement a School Active Travel Program (SATP) prior to occupancy.

The City has indicated that any on-street PUDO accommodation will be limited to the school frontage only. It is anticipated that the City can designate and regulate approximately 6 to 12 curbside spaces to help accommodate this demand during morning and afternoon PUDO times.

The proposed PUDO zone is illustrated in pink in **Figure 16**. PUDO operations are expected to take place primarily along the west side of Columbia Street, adjacent to the school frontage. This section of Columbia Street is proposed to be converted from the existing two-way operation to one-way southbound operation and will include a bi-directional bikeway along the west curb. The curbside PUDO area has a capacity for approximately five standard-sized vehicles (or six small vehicles).

In the short term, additional off-street public parking is available at a conveniently located surface lot approximately 135 metres west of the school site (future multi-family residential development site). Some parents may choose to use this lot due to its ease of access and convenience. As discussed in **Section 2.5.4**, this parking facility has a capacity of approximately 40 vehicles and is typically underutilized during peak school hours, with observed occupancy levels between 30% and 40% during morning and afternoon bell times.

Understanding that primary school PUDO activity will occur along Columbia Street, a queuing model was developed to evaluate the operational capacity of the zone. Refer to **Section 3.8** for PUDO queueing analysis.

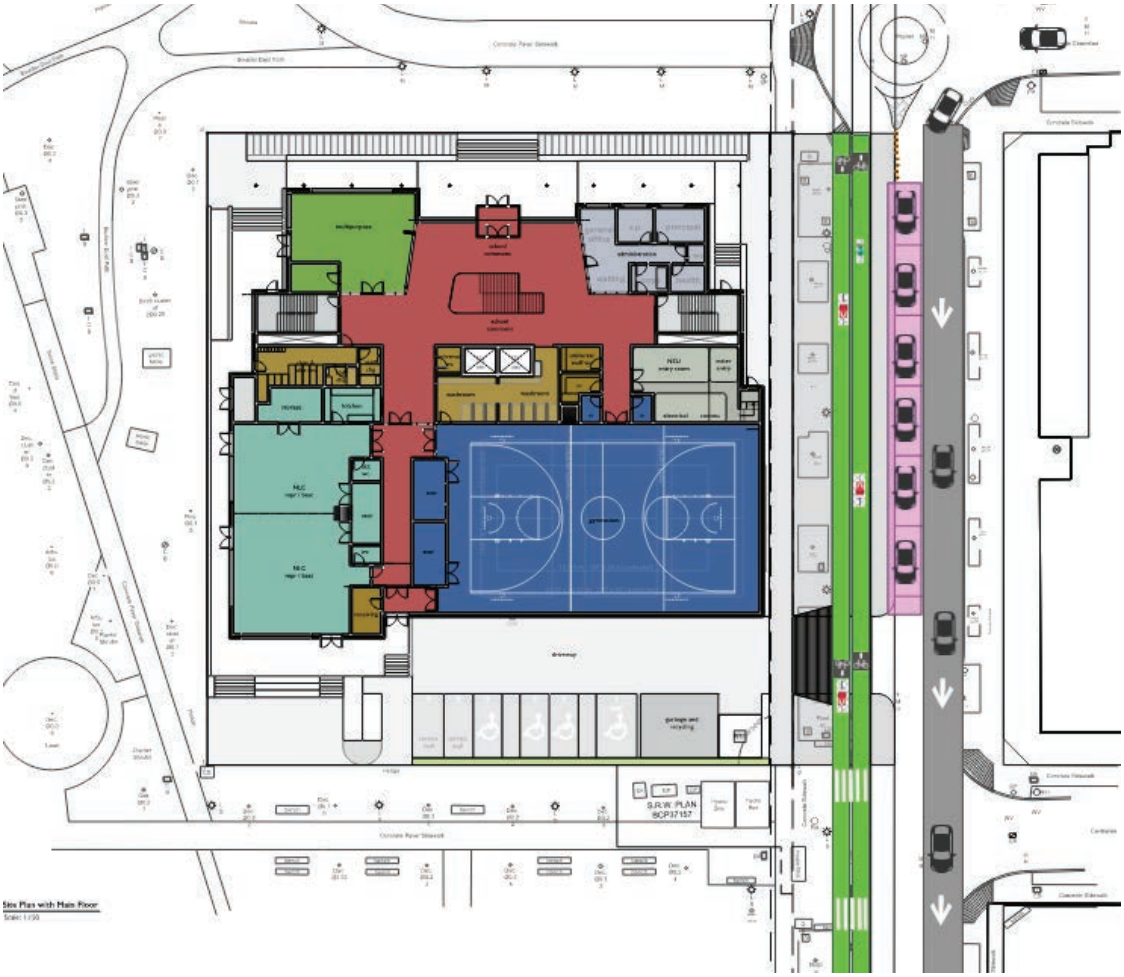


Figure 16. Anticipated On-Street PUDO zone

4 POST-DEVELOPMENT ANALYSIS

4.1 Scenario (S0) – Existing Road Network

Under this scenario, the roadway network remains unchanged from existing conditions. The purpose of the analysis is to assess how the current road network and intersections can accommodate future school-related traffic.

4.1.1 S0 Background Traffic Opening Day (2029)

As noted earlier, the school is expected to be operational by 2029. The CoV indicated to assume an annual linear background growth rate of 0%, meaning no vehicle background traffic growth in the area. As such, background traffic levels are expected to remain consistent between 2023 and 2029. Additionally, with no changes to the road network under this scenario, traffic patterns and turning movements are expected to remain the same as current conditions (see **Figure 17**). Consequently, intersection performance is projected to match the existing scenario, with no significant operational issues identified (see **Table 6** in **Section 2.7**).

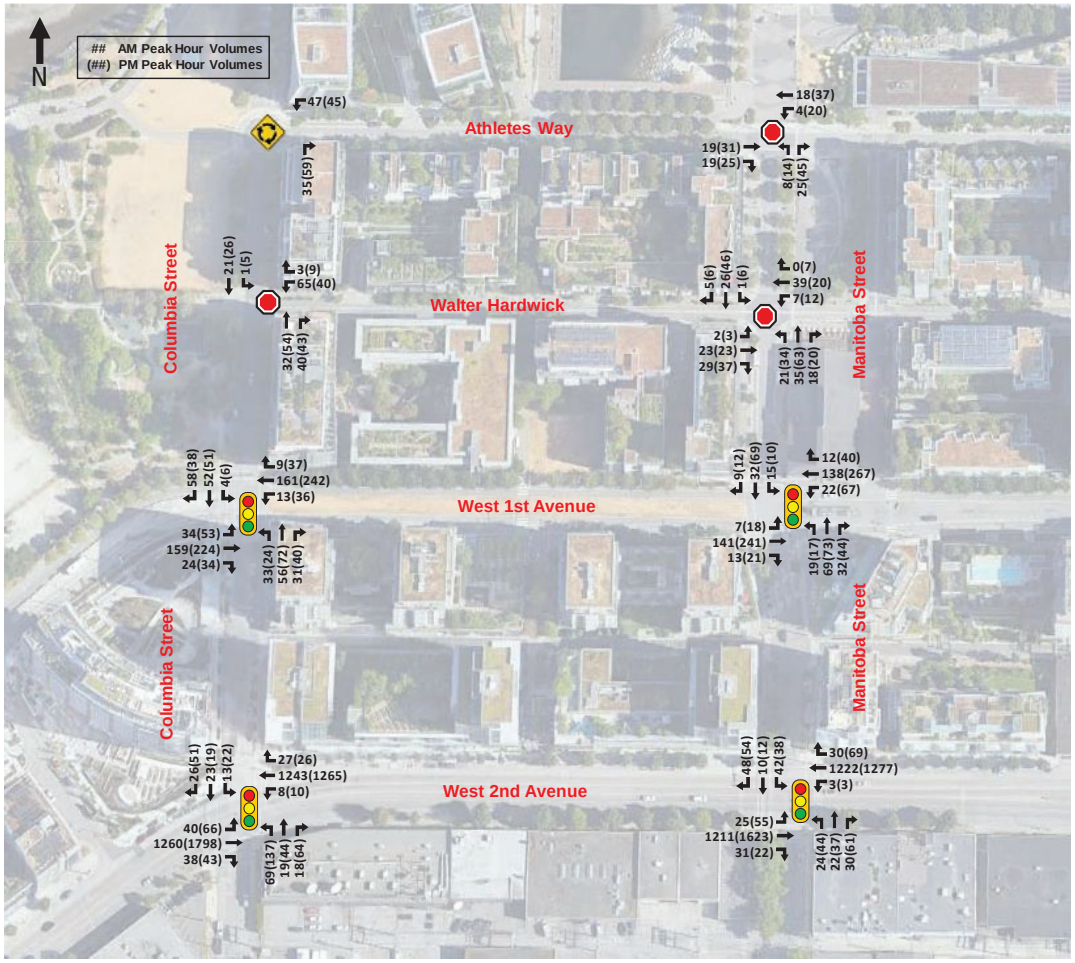


Figure 17. 2029 Background Auto Traffic Scenario (S0)

4.1.2 S0 School Vehicle Traffic Distribution

As noted in **Section 3.5**, the share of school trips made by automobile (80 vehicles) will likely come from nearby catchments (i.e., Fraser, False Creek, and Crosstown) per VSB placement management practices. It is assumed that school traffic will generally follow the existing traffic distribution patterns around the site, as no changes are proposed to the road network under this scenario. **Figure 18** below shows the distribution of school traffic under the existing road network.

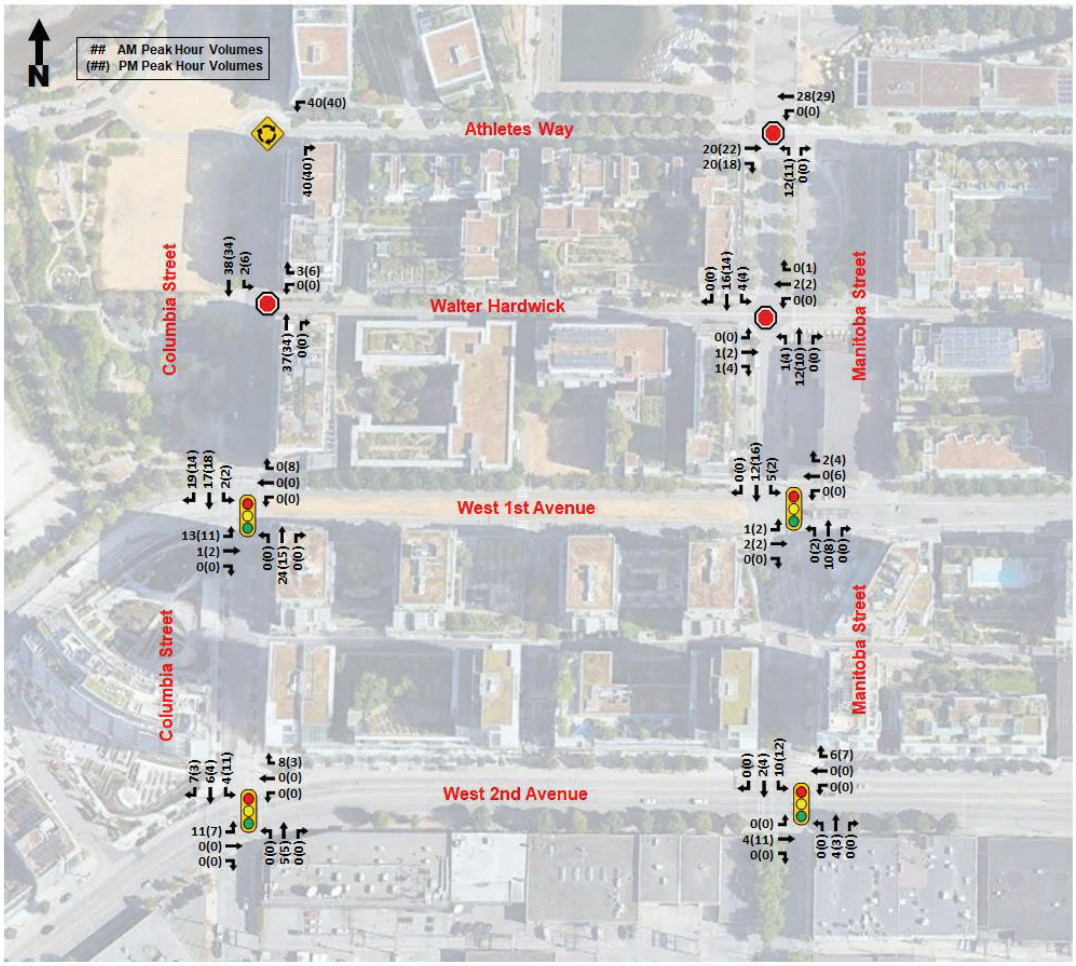


Figure 18. 2029 School Auto Traffic Scenario (S0)

4.1.3 S0 Post-Development Traffic Operations Opening Day (2029)

The 2029 total traffic combines background traffic with the traffic generated by the new school. **Figure 19** below illustrates the total traffic distribution following the school's opening in 2029, under the existing road network scenario (S0).

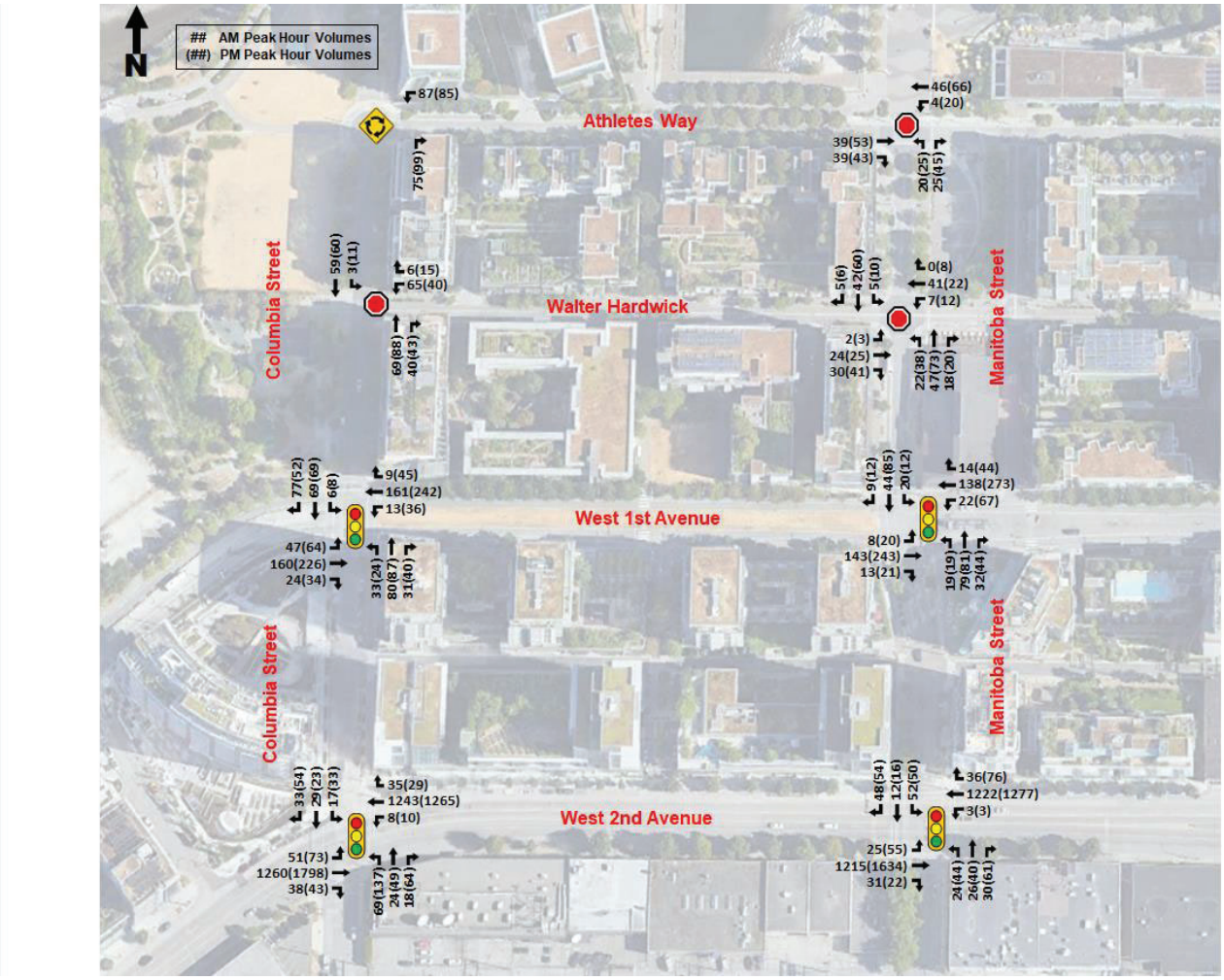


Figure 19. Total Auto Traffic Assignment Under School Opening 2029 (S0)

Table 13 below is the summary of the Synchro analysis results for the signalized intersections under the S0 2029 total traffic conditions. The detailed Synchro analysis results can be seen in **Appendix B**.

Table 13. 2029 Total Condition Intersection Summary Performance (S0)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
#1 Columbia St & West 1st Ave	Intersection Overall		A	9.7	0.34	-	B	10.8	0.58	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#2 Manitoba St & West 1st Ave	Intersection Overall		A	9.6	0.27	-	B	12.0	0.59	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#3 Columbia St & West 2nd Ave	Intersection Overall		B	16.6	0.81	-	C	20.7	0.91	-
	Critical Movement	No	-	-	-	-	-	-	-	-

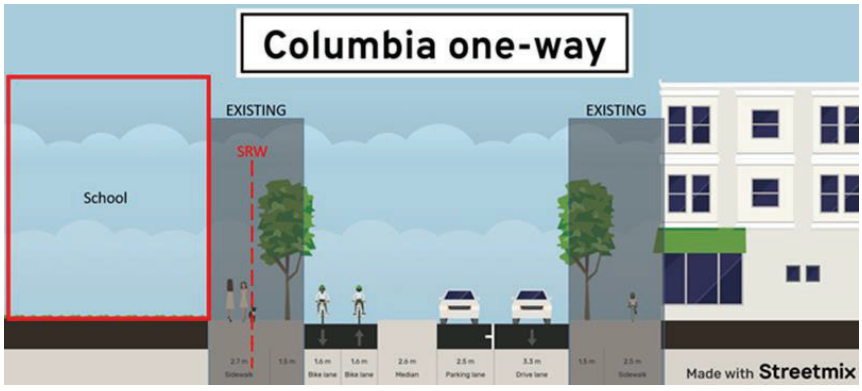
#4 Manitoba St & West 2nd Ave	Intersection Overall		B	15.2	0.79	-	B	16.7	0.81	-
	Critical Movement	No	-	-	-	-	-	-	-	-

The analysis indicates that the addition of school traffic is not expected to place a significant burden on the existing intersections, assuming no changes are made to the current road network. All intersections are projected to operate at LOS A to C during both the AM and PM peak periods, with delays remaining within acceptable limits.

4.2 Scenario (S1) – Road Network Changes

It should be noted that the CoV is exploring the one-way conversion of Columbia Street; however, this remains subject to further analysis, detailed design, approvals, and public engagement. The following scenario analysis is based on the assumption that ongoing and future committed network upgrades along Columbia Street and surrounding streets within the study area will proceed, including:

- **Columbia Street: Southbound one-way from Athlete's Way to 2nd Ave** (full closure south of 2nd). Assume 2-legged intersection at Athlete's Way & Columbia Street (traffic circle to be eliminated). Also, assume one-way WB at Athlete's Way between the driveway access and Columbia St. per diagram and cross-section below as provided by the CoV:



This scenario is also inclusive of the following nearby network changes which are considered as part of trip distribution assumptions:

- Ontario St: Southbound one-lane only from Walter Hardwick Ave. to 2nd Avenue, as per City's Ontario Street Upgrades[7] requires redistributing traffic to Manitoba. expected to be completed by end of 2025
- Eastbound left turn restricted at Columbia St at 2nd Ave: no left turn from EB 2nd onto NB Columbia.
- Manitoba and 1st should include a protected WBR turn phase as the volumes exceed the threshold for an unprotected turn across a bike lane.

4.2.1 S1 Background Traffic Opening Day (2029)

Planned network changes may impact traffic distribution, and the background traffic patterns will be influenced by the new network scenario. To address this, the background traffic is redistributed to the 2029 future road network according to the scenario described above. A graphical representation of the redistribution of traffic onto the anticipated road network is shown below.

[7] https://vancouver.ca/files/cov/ontario-upgrades-notification-letter.pdf

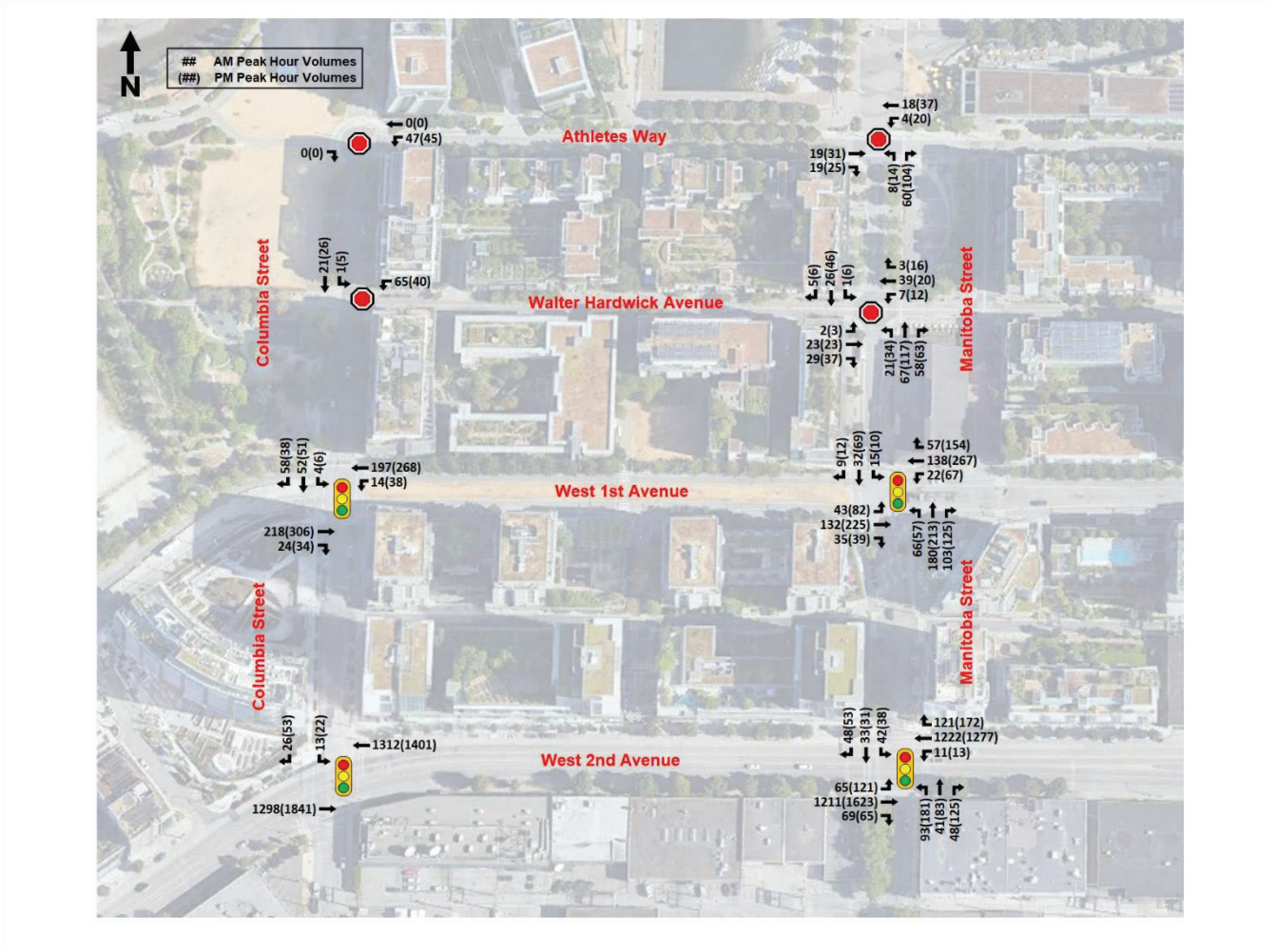


Figure 20. Background Auto Traffic Scenario (S1)

4.2.2 S1 Background Traffic Operational Performance Opening Day (2029)

The following table is the summary of the Synchro results for the signalized intersections under the S1 2029 background traffic conditions. The detailed Synchro analysis results can be seen in **Appendix B**.

Table 14. 2029 Background Intersection Summary Performance

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
#1 Columbia St & West 1st Ave	Intersection Overall		A	7.2	0.32	-	B	10.5	0.44	-
	Critical Movement	No	-	-	-	-	-	-	-	-
	Intersection Overall		B	17.1	0.63		C	32.5	0.87	-

#2 Manitoba St & West 1st Ave	Critical Movement	No	-	-	-	-	-	-	-	-
#3 Columbia St & West 2nd Ave	Intersection Overall		A	9.4	0.73		A	10.0	0.73	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#4 Manitoba St & West 2nd Ave	Intersection Overall		B	18.5	0.84	-	D	36.4	1.02	-
	Critical Movement	NBT	-	-	-		F	80.1	1.02	125.3

Note that the signal at Manitoba Street & West 1st Avenue has integrated a protected westbound right-turn phase, as traffic volumes exceed the threshold for an unprotected turn across a bike lane. Signal timing at this intersection has been updated and optimized accordingly, with details provided in **Appendix B**.

The operation of Manitoba Street & West 2nd Avenue is expected to encounter increased challenges due to the anticipated rise in traffic volume resulting from the adjustments made to the adjacent roads. Anticipated traffic changes are expected to lead affected vehicles to modify their routes and travel patterns towards the specific intersection in question. This, in turn, will result in certain directions experiencing a higher volume of traffic. In particular, it is anticipated that the northbound movement at this intersection will experience a LOS of F during the PM peak hour.

4.2.3 S1 School Vehicle Traffic Distribution

Figure 21 below illustrates the assumed distribution and assignment of school-related vehicle trips on the S1 2029 background road network.

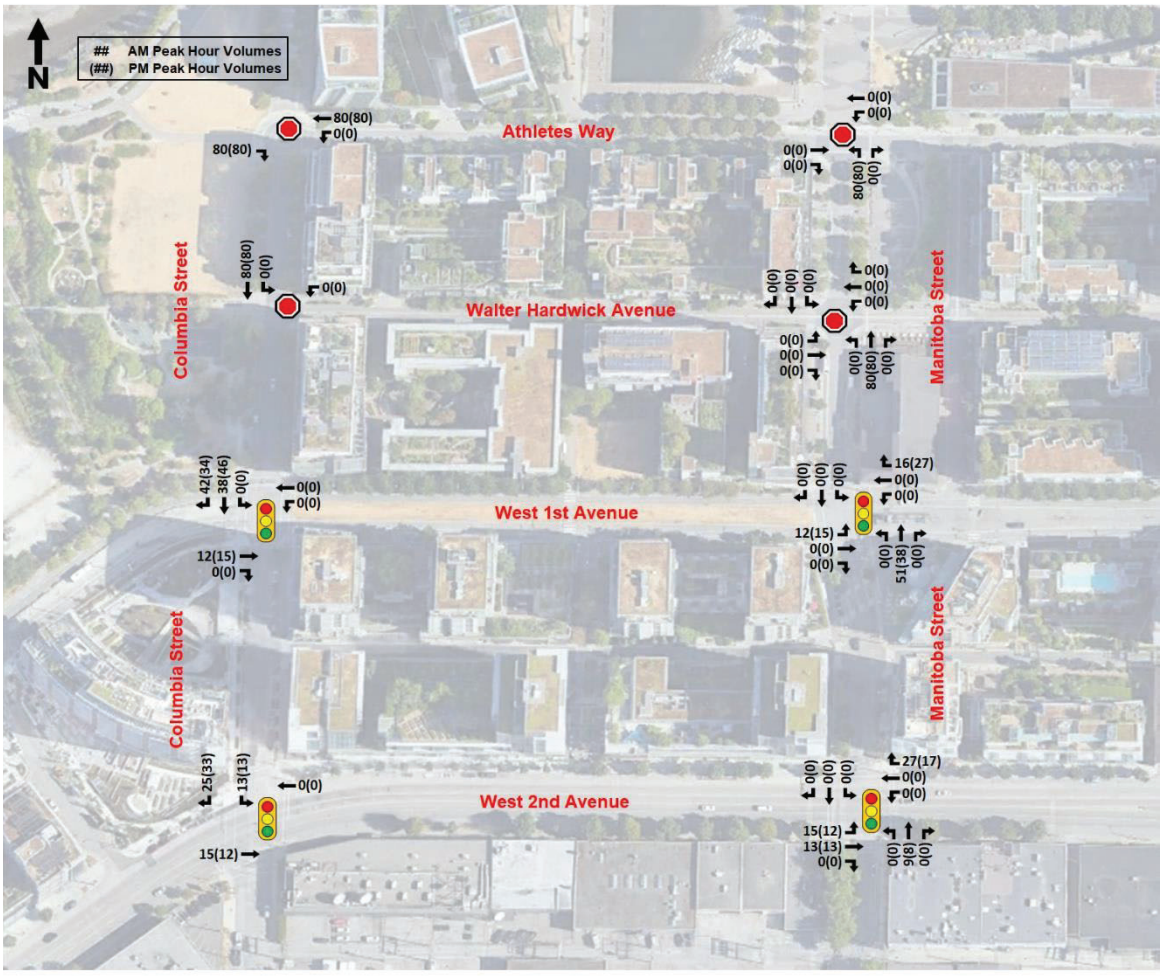


Figure 21. School Auto Traffic Distribution in 2029

4.2.4 S1 Post-Development Traffic Operations Opening Day (2029)

The 2029 total traffic combines background traffic with the traffic generated by the new school. **Figure 22** below illustrates the total traffic distribution following the school's opening in 2029, under the S1 condition.

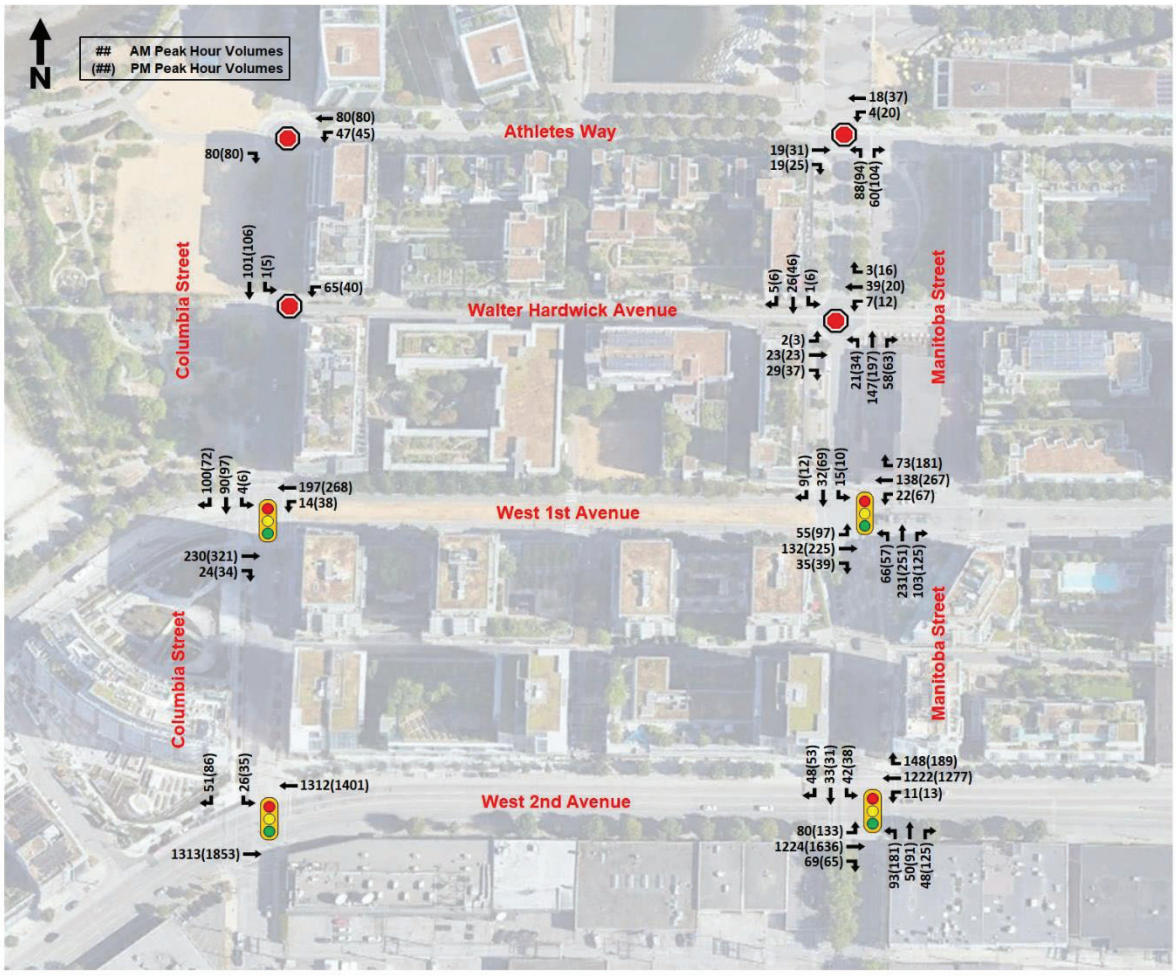


Figure 22. Total Auto Traffic Assignment Under School Opening 2029

Table 15 below is the summary of the Synchro analysis results for the signalized intersections under the S1 2029 total traffic conditions. The detailed Synchro analysis results can be seen in **Appendix B**.

Table 15. 2029 Total Condition Intersection Summary Performance (S1)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
#1 Columbia St & West 1st Ave	Intersection Overall		A	7.9	0.41	-	B	11.0	0.46	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#2 Manitoba St & West 1st Ave	Intersection Overall		C	23.3	0.83		D	37.0	0.91	-
	Critical Movement	No	-	-	-	-	-	-	-	-
#3 Columbia St & West 2nd Ave	Intersection Overall		A	9.5	0.73		B	10.3	0.74	-
	Critical Movement	No	-	-	-	-	-	-	-	-

#4 Manitoba St & West 2nd Ave	Intersection Overall		B	19.2	0.85	-	D	38.5	1.04	-
	Critical Movement	NBT	-	-	-		F	85.1	1.04	128.3

Overall, the addition of school-generated traffic to the 2029 background traffic has an insignificant impact on the operational performance of the studied intersections, including LOS, delays, and v/c ratios. The intersection showing notable operational challenges is Manitoba Street & West 2nd Avenue, where northbound movements are mostly affected during the PM peak hour. However, these issues are primarily due to changes in the background road network rather than the school-related traffic.

Manitoba Street & West 1st Avenue is also expected to experience relatively busier traffic conditions, operating at LOS D during the PM peak hour. Although the LOS remains acceptable, it is recommended that traffic operations at this intersection be monitored in 2029, taking into account the impacts of school traffic and the implementation of the protected westbound right-turn phase.

4.2.5 S1 Post Development Traffic Operational Recommended Improvements

Given the anticipated operational challenges at the intersection of Manitoba Street & West 2nd Avenue in 2029 under the S1 road network scenario, it is recommended that improvements be implemented at this location. Specifically, we propose adjusting the PM peak hour signal timing plan to address traffic performance issues effectively. The modification involves optimizing the splits of different phases. Detailed Synchro reports for the improved scenario, including the revised signal plan, are provided in **Appendix B**. A summary of the intersection's improved performance following these adjustments is presented in the **Table 16** below.

Table 16. 2029 Total Condition Int. Summary Performance – Manitoba St & West 2nd Ave

Intersection			PM Peak Hour – After (Before)			
			LOS	Delay (s)	Max v/c	95th Queue (m)
Manitoba St & West 2nd Ave - After (Before)	Intersection Overall		C (D)	35.0 (38.5)	0.99 (1.04)	-
	Critical Movement	NBT	E(F)	62.5 (85.1)	0.96 (1.04)	120.3 (128.3)

The table above highlights specific improvements in intersection performance following the signal timing adjustments. Delays and v/c ratios have decreased for the subject intersection. Notably, the previously critical northbound movement shows improvement, with a better LOS (from F to E) and a reduction in delay, v/c ratio and queue length.

However, it is important to recognize that this intersection, especially the northbound direction in question, is still expected to experience high traffic volumes and busy operation conditions. It is advisable to closely monitor the traffic flow at this intersection, especially after school opening. In the event of any deterioration in performance, it may be prudent to consider further enhancements or adjustments.

4.3 Anticipated Walking Routes to School

The most likely anticipated walking school routes (desire lines) for pedestrians and cyclists within the catchment are shown in **Figure 23** (heatmap) below. The heatmap of the most probable walking routes have been developed in GIS based on the shortest distance to school from a sample of 407 potential students living in the area as reported by VSB. Further, the density of overlapping paths is calculated and further visualized as a heat density map with the reddest most paths representing the most anticipated popular walking routes. The figure also shows the location of students.

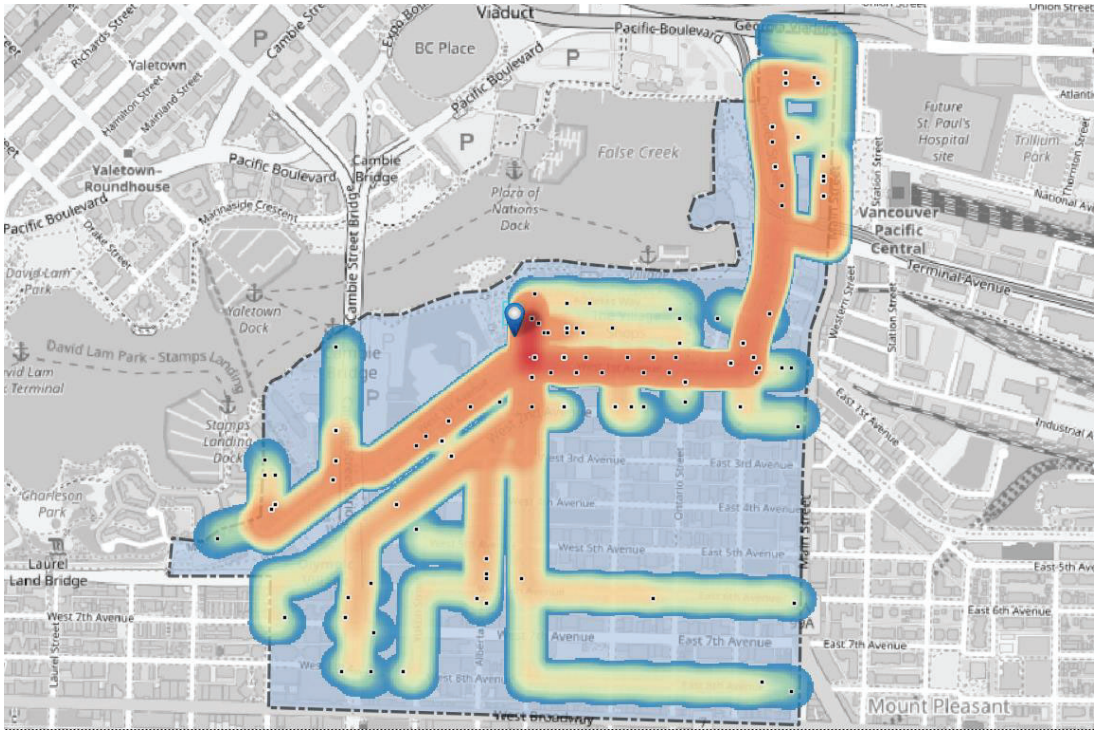


Figure 23.Probable Walking Routes to School

Furthermore, the figure below shows the overlay of the walking routes heatmap and the pedestrian and cyclists collision risk map (crash rate) from **Section 2.8.2**, highlighting the relative risk for pedestrian and cyclist along these routes.

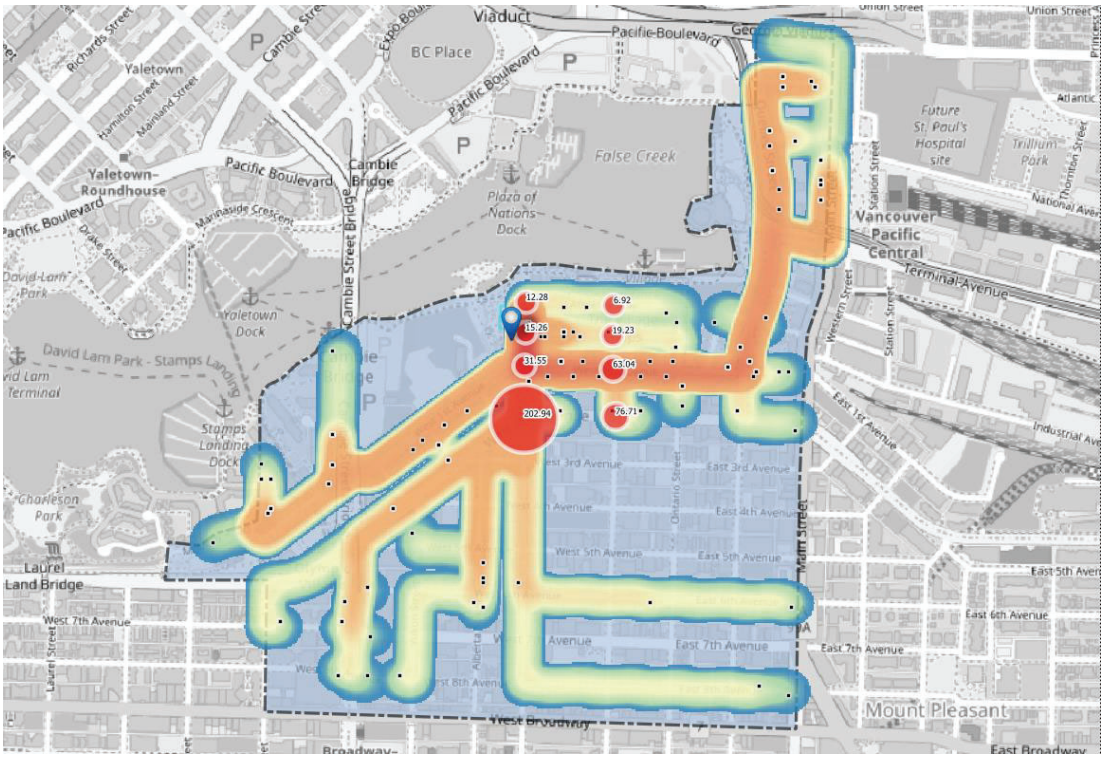


Figure 24. Walking Routes to School and Crash Rate Overlay

The figures above indicate the following:

- The busiest most anticipated walking school route could be along West 1st Ave coming from the east from Quebec St.
- The next busiest anticipated walking school route would be to/from the west approximately from Cambie Street, along West 1st Ave to Columbia Street.
- The two busiest intersections for school pedestrian activity in the area are Columbia Street at Walter Hardwick Ave and Columbia St and West 1st Ave. respectively.
- Columbia St at West 2nd Ave is a high-risk location for pedestrians and bikes that may be a desired line for school walking and cycling trips.
- Columbia St at West 1st Ave, a desired line for school walking and cycling trips, poses a relatively low-to-moderate risk for pedestrians and bikes.
- Manitoba St at west 1st Ave and 2nd Ave intersections also pose moderate risk to pedestrians and cyclists along potential desired lines to/from school.
- Some students may be walking/cycling to/from the northeast from the high-density condo towers on the east side of Quebec St. between Terminal Ave and Milross Ave. Hence, the intersections of National Ave and Quebec St and Terminal Ave. and Quebec St. may become part of a desirable walking route to school. The COV is advised to monitor closely these two locations in the future for potential pedestrian crossing improvements such as implementation of Leading Pedestrian Intervals (LPIs) or implementation of prohibited right-turn-on-red (RTOR) operation.

As noted earlier, a significant number of students are expected to walk, cycle, or roll to school from a future residential neighbourhood to be developed west of Hinge Park, on a City-owned vacant waterfront lot identified as Southeast False Creek Area 1A, located between Cambie Bridge and Olympic Village.

These students are anticipated to access the school via internal off-road active transportation (AT) connections, including the existing multi-use seawall pathway and other pedestrian/cyclist links through Hinge Park. Given the segregated nature of these routes, no significant safety risks are anticipated for students traveling from this future development to the school site.

4.4 On-Street Pick-Up/Drop-Off (PUDO) Queueing Modeling

Parent PUDO activity can be modeled using a queuing simulation framework, as illustrated in **Figure 25**. In this model, parents arrive randomly following a Poisson distribution. Upon arrival, drivers enter the PUDO area, wait for an available space, stop to load or unload their child, and then depart. The number of curbside stalls is treated as the number of servers in a multi-server queuing system.

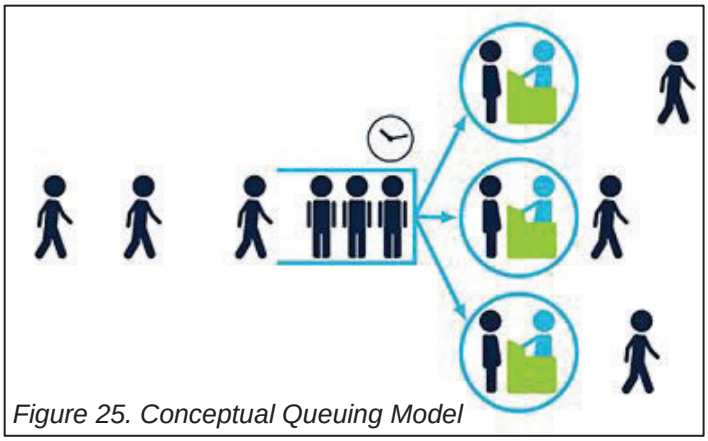


Figure 25. Conceptual Queuing Model

The arrival rate (λ), expressed in vehicles per minute, is estimated based on the anticipated peak hour vehicle volume, adjusted by a 0.70 peak hour factor to reflect the concentration of arrivals within the peak 15-minute window. The service rate (μ)—or the average number of vehicles served per minute per stall—is estimated at 0.4 vehicles per minute, based on an average dwell time of 2.5 minutes per vehicle. This estimate accounts for time required to assist students with luggage and seatbelts. Vehicle processing follows a First-In, First-Out (FIFO) sequence.

The PUDO queuing model evaluates how many curbside stalls are needed to accommodate peak 15-minute vehicular demand. A sensitivity analysis was conducted, testing curbside availability ranging from 5 to 9 spaces. The resulting performance metrics are summarized in Table 17, and include:

- Number of vehicles in the system
- Number of vehicles in queue
- Average time spent in the system
- Average queue time
- Probable capacity utilization

It is assumed that **AM and PM peak arrival traffic rates are comparable** for modeling purposes.

Table 17. Sensitivity Analysis, Queuing Modelling for School PUDO Operation

		AM Pick-Up / Drop-Off (PUDO) Queuing Model					
Model Inputs	**Number of Parking Spaces ('Servers')**	**Stalls**	**5**	**6**	**7**	**8**	**9**
	Est. school auto mode split	Veh/Hr	80.0	80.0	80.0	80.0	80.0
	vehicle occupancy ratio	person/veh	1.2	1.2	1.2	1.2	1.2
	Est. PUDO vehicule demand	vehi/hour	67.0	67.0	67.0	67.0	67.0
	Gross Arrival Rate	Veh/min	1.1	1.1	1.1	1.1	1.1
	Peak Hour Factor (PHF)	-	0.7	0.7	0.7	0.7	0.7
	Net peak vehicle Arrival Rate (ƛ)	Veh/min	1.6	1.6	1.6	1.6	1.6
	Average Service Rate (μ)	Veh/min	0.4	0.4	0.4	0.4	0.4
Model Outputs	Average Customers in System (cars)	Vehicles	6.22	4.57	4.18	4.06	4.02
	Average Customers in Queue (cars)	Vehicles	2.22	0.57	0.18	0.06	0.02
	Average Time Spent in System (min)	Min/vehicle	3.89	2.86	2.61	2.54	2.51
	Average Time in Queue (min)	Min/vehicle	1.39	0.36	0.11	0.04	0.01
	Stall utilization (p)	percentage	0.80	0.67	0.57	0.50	0.44

Based on the results presented in the above table, the queuing model indicates that five to six curbside spaces along the school frontage should be sufficient to accommodate the anticipated on-street PUDO demand during the peak 15-minute arrival period. The analysis further shows that, with five or more spaces, occupancy remains below 85%, which aligns with the industry-accepted threshold for efficient operation. As such, the system is expected to function without significant queuing or delays.

In the unlikely event that additional on-street PUDO capacity is required, there is flexibility within the surrounding curbside network (as discussed in **Section 2.5.1**), along with off-street parking capacity nearby (as previously noted), including a conveniently located lot to the west of the school site.

Based on this analysis, it can be concluded that the proposed curbside PUDO area along Columbia Street, with 5 to 6 stalls, is expected to operate satisfactorily, without causing adverse impacts to existing curbside operations.

4.5 Crosswalk Warrants

The CoV requested evaluation of pedestrian crossing warrants for the intersection of Columbia St. and Walter Hardwick Ave and for Columbia/Athlete's Way.

The warrant criteria in the TAC Pedestrian Crossing Control Manual were used to determine the need and type of crossing at the selected intersections. The manual's warrant utilizes pedestrian type (children, adults and seniors/disabilities) and volumes, crossing opportunities (number of safe gaps in traffic for pedestrians to cross), and an adjustment for community population to determine the level of crossing.

For a crosswalk at an intersection to be marked, warrant evaluation requires that a minimum of 15 equivalent adult units (pedestrians) and at least than 120 crossing opportunities per hour exists. Equivalent adult units are calculated based on the type of pedestrian with children (12 years old or younger) and physically challenged pedestrians equal to 2.0 adult pedestrians and seniors (older than 65) equal to 1.5 adults. Crossing opportunities are determined by the width of the crossing, the volume of traffic at the proposed crossing location and proximity to a traffic signal. On two-lane roads (7.5m crossing distance) the two-way traffic volume needs to exceed 800 vph, while on four-lane roads with 14m crossing distances the volumes need to exceed 300 vph.

The Table below summarizes the applied conditions for the selected intersections for the TAC warrant evaluation:

Table 18. Crosswalk Warrants Columbia St.

Intersection		Current Pedestrian Crossings	Expected School Pedestrian Crossings (Eq. Adults Units)	Total Pedestrian Crossings	Daily Traffic Volume (VPD)	Crosswalk Warrant
Columbia St. and Walter Hardwick	North Leg	22	56 EAU (28 children x 2)	75 EAU	755 vpd	NO
	South Leg	46	20 EUA (10 children x 2)	66 EAU	1,600 vpd	YES
Columbia St. and Athletes Way	South Leg	53	12 EAU (6 children x 2)	65 EAU	1,315 vpd	NO

Based on the analysis presented in Table 18, the south leg of the intersection at Columbia Street and Walter Hardwick Avenue is identified as a candidate for pedestrian crossing control. According to the TAC Pedestrian Crossing Control Guide and its treatment selection matrix, the recommended treatment corresponds to the Passive Crossing Treatment System category (Group "GM"), which consists of a marked crosswalk with side-mounted signage.

Additionally, with the relocation of the school building entrance to the north side of the site, facing Hinge Park and Athletes Way**, there is potential for increased pedestrian activity at the south leg of the intersection at Athletes Way and Columbia Street.**

While future pedestrian crossing patterns at this intersection may be difficult to anticipate, the proximity of the school entrance and adjacent park space suggests a reasonable likelihood of increased crossing activity. As such, proactive consideration of a **Passive Crossing Treatment System, especially at the south leg of the intersection at Athletes Way and Columbia Street** is recommended to support anticipated pedestrian movement and enhance safety.

It is important to note that while pedestrian warrant analysis remains a key determinant in identifying suitable crossing treatments, it is not the sole factor guiding implementation. Engineering judgment, community input, field observations, vehicle and pedestrian volume trends, and speed data must all be considered in the final decision-making process. Ultimately, the municipality is responsible for determining whether pedestrian crossing treatments are warranted and implementing any related infrastructure.

5 SUMMARY OF FINDINGS & RECOMMENDATIONS

In general, the area offers a highly accessible and well-connected network of roads, cycling, pedestrian and transit networks with some of the highest sustainable mode shares in the City. The school community, being part of the existing SEFC neighborhood and nearby communities, it is highly expected to follow similar commuting and mobility patterns in the area including high proportion of work-form home adults, relatively small family size (likely low car ownership), high proportion of daily trips done by walk, bike and transit (43%).

5.1 Pedestrian & Cycling Mobility, Accessibility and Safety

- Among intersections studied, the intersection of West 2nd and Columbia Street has the highest risk for pedestrians and cyclist getting involved in a crash, followed by the intersection West 2nd Ave and Manitoba Street.
- Based on pedestrians and cyclist crashes in the past 5 years, cyclists are most likely to be involved in crashes in the study area.
- The majority of pedestrian and cyclist crashes (94%) happened at intersections while only 6% at mid-block road sections.
- Only 4 collisions (out of 380 in-catchment pedestrian and cyclist crashes) in the past 5 years occurred at the intersection of Columbia Street and West 1st Ave. All 4 crashes involved cyclists.
- Based on current counts, highest to lowest proportion of pedestrians handled at study intersections:
    1. Manitoba St. and Athletes Way (66%)
    2. Manitoba St. and Walter Hardwick Ave (51%)
    3. Columbia St. and Athletes Way (45%)
    4. Columbia St. and Walter Hardwick Ave. (36%)
    5. Manitoba St. and West 1st Ave. (34%)
    6. Columbia St. and West 1st Ave. (32%)

- Based on current counts, highest to lowest proportion of cyclists handled at study intersections:

    1. Columbia St. and Athletes Way (32%)
    2. Columbia St. and West 1st Ave. (21%)
    3. Columbia St. and Walter Hardwick Ave. (20%)
    4. Manitoba St. and West 1st Ave. (16%)
    5. Manitoba St. and Athletes Way (14%)
    6. Manitoba St. and Walter Hardwick Ave (9%)

- Columbia Street (in front of the school site), connecting north to Athletes Way and further east towards Ontario Street, appear to be a well-used commuter cycling route, seemingly a more straightforward and efficient route for those cycling between the Seawall and West 1st Ave and Columbia Street.

- Columbia Street in front of the school is also an important pedestrian north-south connection between West 1st Ave and the Seawall

- A large majority of potential school age children (85%) living within the catchment are within less than 1 km walking/cycling distance to school. 100% of them live within 2 km distance from school which suggest a high potential for walking and cycling school trips.

- To the above, the total anticipated number of school person-trips is approximately 510, expected to be approximately 20% (102) auto mode, 74% (377) walk/bike, and 6% (30) Transit.

- The most anticipated well-used walking/cycling school routes may be along West 1st Ave coming from the east and west of Columbia Street. The most desirable may be connecting to Quebec St to the east. The next most desirable may be to/from the west towards Cambie Street and the OV SkyTrain station along West 1st Ave to Columbia Street. It is noted that while sidewalks are fully provided all along west 1st Ave, the dedicated and separated cycle track along West 1st Ave from Quebec St., stops short at the intersection with Ontario St. and becomes a narrower on-street painted bike lane towards the west across Manitoba St., Columbia Street, all the way towards Cambie St. and beyond. We presumed the COV plans to eventually continue the dedicated cycle track towards the west, which will be a substantial upgrade towards school active transportation, considering the expected importance of West 1st Ave east and west of Columbia St as a major walking/cycling route to school. Hence, **we recommend the CoV**

to prioritize the extension of this dedicated cycle track along West 1st Ave. before the school is in operation by 2029.

- Some students may be walking/cycling to/from the northeast from the high-density condo towers on the east side of Quebec St. between Terminal Ave and Milross Ave. Hence, the intersections of National Ave and Quebec St and Terminal Ave. and Quebec St. may become part of a desirable walking route to school. The COV is advised to monitor closely these two locations in the future for potential pedestrian crossing improvements such as implementation of Leading Pedestrian Intervals (LPIs) or implementation of prohibited right-turn-on-red (RTOR) operation.

- Based on TAC Crosswalk warrant evaluation, the intersection of Walter Hardwick and Columbia St. requires a Passive Crossing Treatment System category (GM), which consist of crosswalk with side-mounted signs. Given the likelihood of this intersection becoming a central point of school-age (and parents) pedestrians' activity, particularly around school bell times, we suggest that **a raised intersection treatment** be considered at this location. A raised intersection is essentially a speed table (see photo below) for an entire intersection. Construction involves providing ramps on each intersection approach and elevating the entire intersection to the level of the sidewalk. The crosswalks on each approach are also elevated as a part of the treatment, to enable pedestrians to cross the road at the same level as the sidewalk. This is good for mobility of impaired pedestrians provided appropriate tactile detection surfaces at the curb edge (see photo below).

- The proximity of the school entrance and adjacent park space to intersection at Athletes Way and Columbia Street suggests a reasonable likelihood of increased crossing activity, particularly at the south leg of the intersection. As such, proactive consideration of a Passive Crossing Treatment System is recommended to support anticipated pedestrian movement and enhance safety. Also, given the likelihood of this intersection becoming a central point of school-age (and parents) pedestrian activity, particularly around school bell times, we suggest that a raised intersection treatment be considered at this location. A raised intersection is essentially a speed table (see photo below) for an entire intersection.

Figure 26. Example of Raised Intersection Treatment

- The intersection of Quebec Street and West 1st Ave is one of the busiest intersections in the area for all modes, and as such has been designed and constructed as one of the few Dutch-inspired fully protected intersections in the City. This intersection is expected to be along one of the most popular walk-to-school routes. The fact that Quebec Street is a designated north-south truck route raises some concerns about

potential conflicts with young pedestrians and cyclist at this location. There have been 7 non-fatal crashes (6 involving cyclist 1 pedestrian) in the past 5-years. Although no further details were found about collision type or root causes, this intersection may be a good candidate for future implementation of no-turn on red restrictions.

5.2 Vehicular Traffic Operation Findings & Recommendations

Regarding traffic operation, our Synchro models prove that the four signalized intersections, including Columbia St & West 1st Ave, Manitoba St & West 1st Ave, Columbia St & West 2nd Ave, and Manitoba St & West 2nd Ave are currently operating satisfactorily exhibiting acceptable levels of service, delays, and volume-to-capacity ratios under the existing traffic conditions.

If no further changes are made to the road network with the opening of the new school, the Synchro model confirms that the addition of school traffic is not expected to result in any significant adverse impacts on the existing intersections.

However, the modifications to the background road network under the CoV's assumed scenario — including the closure of the northbound lanes on certain segments of Columbia Street and Ontario Street, as well as the full closure of Columbia Street south of West 2nd Avenue — are expected to increase traffic volumes on Manitoba Street. This surge is largely driven by background traffic (unrelated to school travel demand) diverting to Manitoba Street as an alternative route in response to the network changes.

Specifically, the intersections at Manitoba Street & West 1st Avenue and Manitoba Street & West 2nd Avenue are expected to face increased delays, elevated volume to capacity ratios, and lower level of services. The former intersection - Manitoba Street & West 1st Avenue, is anticipated to still operate with acceptable conditions under the 2029 total traffic scenarios although it could be busier due to the traffic increase. However, the northbound movement of the latter intersection – Manitoba Street & West 2nd Avenue, is anticipated to experience a level of service of F in the PM peak hour under the 2029 background scenario, which means intersection improvements are needed. In contrast, the introduction of school-related traffic is not projected to have a substantial impact on the operational dynamics of the aforementioned intersections under any scenario.

We have recommended traffic signal timing adjustments to improve the PM peak hour operational conditions of the problematic intersection of Manitoba Street & West 2nd Avenue when the school opens in 2029. However, it is worth noting that ongoing operation monitoring of this intersection is advisable, because of the substantial traffic load and the busy nature of its operations. Should the operational efficiency of this intersection further decline, additional interventions beyond signal improvements may be necessary.

Furthermore, it is expected that the intersection of Columbia Street & West 1st Avenue may experience significant active transportation volume and heightened collision risks following the opening of the new school. Implementing a Leading Pedestrian Interval (LPI) at this junction could be a viable solution to address these concerns. LPI is a traffic signal timing strategy that gives pedestrians a head-start before vehicles receive a green light at an intersection. During an LPI, pedestrians get a few seconds of exclusive right-of-way to begin crossing the street before vehicular traffic starts moving. This is intended to enhance pedestrian safety by increasing their visibility to drivers and reducing conflicts between pedestrians and turning vehicles. LPI may also be suitable for the intersection of Manitoba Street & West 1st Avenue. However, caution is advised, given that this intersection is already relatively busy. It is important to ensure that the implementation and operation of LPI at this location will not cause substantial underperformance of any vehicular movement.

5.3 School Pick-up/Drop-off

No significant issues are anticipated with the potential use of the school frontage curbside parking as on-street school PUDO zone. As discussed in **Section 3.8**, dedicating the northern section of curbside parking (5-6 stalls) on the west side of Columbia Street to school PUDO will sufficiently handle the anticipated PUDO demand around bell times plus allowing flexible use of spaces for other purposes including occasional passenger loading, commercial loading, on-street garbage pick-up, and emergency services.

On-street pick-up and drop-off areas adjacent to schools and are typically signed as "No Parking School Days" or "Three Minute Parking School Days". As per the Street and Traffic Bylaw, passenger zones and three-minute parking zones can be stopped in to load or unload passengers for up to three minutes and any "No Parking" zone can be stopped in for up to five minutes. In practice, Parking Enforcement Officers will allow up to six minutes if a vehicle is actively loading or unloading. Furthermore, more time to load or unload passengers is allotted to persons with disabilities; vehicles displaying a valid SPARC1 placard (disability placard) may stop for up to 30 minutes.

5.4 Summary of Recommended Off-Site Mobility/Transportation Improvements

The table below summarizes recommended off-site improvements. Suggested responsibility is implied by the nature of the impact (i.e., school related or COV's background network or both). Relative cost (1 to 5 qualitative scale) is only high-level and needs to be confirmed at a later stage in the design process.

Table 19. Summary of Recommended Off-Site Mobility & Transportation Improvements

Improvement	Type	Cost	Suggested Responsibility
Raised intersection treatment at Columbia St. and Walter Hardwick (w/ tactile treatment at corners for visually impaired users)	Pedestrian Crossing / Safety Improvement	$$$$	VSB
Raised intersection treatment at Columbia St and Athletes Way (w/ tactile treatment at corners for visually impaired users) – Traffic circle to be eliminated.	Pedestrian Crossing / Safety Improvement	$$$$	COV
Two-way Bikeway along Columbia St. from Athletes Way to West 1st Ave	Bike Network Improvement	$$$	COV
Extend Cycle track along West 1st Ave from Quebec to Columbia Street	Bike Network Improvement	$$$$$	COV
Implement Ped-activated buttons and Leading Pedestrian Intervals (LPIs) at Columbia Street and West 1st Ave Intersection.	Intersection Operational Improvement	$$$	VSB-COV
Consider implementation of prohibited right-turn-on-red (RTOR) at Columbia St. and West 1st Ave	Intersection Operational Improvement	$$	VSB-COV

Improvement	Type	Cost	Suggested Responsibility
Consider implementation of Leading Pedestrian Intervals (LPIs) at Manitoba Street and West 1st Ave Intersection.	Intersection Operational Improvement	$$	COV
Additional signage for on-street PUDO operation	Parking	$	VSB
Additional signage and pavements markings for vehicular operation along Columbia Street	Roadside operations	$$	COV
Signal timing optimization at Manitoba St. and West 2nd Ave. and coordination with upstream and downstream signals.	Intersection Operational Improvement	$$$	COV
Pedestrian crossing signal improvements (i.e., LPIs and no RTOR) on Quebec Street at National Ave.	Intersection Operational Improvement/ Pedestrian Safety	$$$	COV
Pedestrian crossing signal improvements (i.e., LPIs and no RTOR) on Quebec Street at Terminal Ave.	Intersection Operational Improvement/ Pedestrian Safety	$$$	COV
Improve visibility and crossing safety of Cyclists at Columbia St. and West 2nd Ave intersection. (Depending on future COV's configuration of Columbia St between W 1st and 2nd Ave.)	Cyclist Safety Intersection Improvement	To be determined by COV	COV

5.5 School Active Travel Program (SATP)

The **City of Vancouver's School Active Travel Program (SATP)** is a collaborative initiative aimed at promoting **safe, active, and sustainable transportation choices** for students commuting to and from school. Developed in partnership with school communities, the SATP focuses on creating safer walking and cycling environments, raising awareness of active travel options, and reducing vehicle congestion near school sites.

As part of development conditions, the **City may require school proponents to engage with the SATP prior to occupancy**, particularly where traditional on-site parking or loading provisions are reduced or waived. This ensures that the school community is supported by effective and context-sensitive mobility planning.

5.5.1 Key Components of the SATP

The SATP typically includes the following core components:

- **School Travel Planning**
  A collaborative process involving schools, parents, the City, and stakeholders.
    - Identifies travel patterns, barriers, and opportunities for improvement.
    - Often includes surveys, walkabouts, and the creation of school-specific action plans.
- **Education and Encouragement**

    - Initiatives that raise awareness about the benefits of walking, cycling, and rolling.
    - Tools such as travel maps, promotional guides, and participation in events like Walk/Bike to School Week.
    - In-school safety education programs for students.
- **Infrastructure Improvements**
    - Targeted upgrades to improve safety and accessibility for students.
    - Examples include curb extensions, crosswalks, signage, traffic calming, and improved bike parking.
- **Monitoring and Evaluation**
    - Collection of baseline and follow-up data on student travel modes and safety outcomes.
    - Supports program accountability and ongoing refinement.
- **Policy Integration**
    - Ensures that school travel considerations are embedded in land use, rezoning, and development decisions.
    - Developers may be required to support SATP participation through school travel plans or TDM measures.

5.5.2 Target Travel Mode Splits

As outlined in **Section 3.5**, the projected modal split for student travel at Olympic Village Elementary is as follows:

- Walking and cycling: 83%
- Auto (private vehicle): 13%
- Transit: 4%

Given the excellent local transit service, strong active transportation network, and potential future LRT service along West 1st Avenue, it is anticipated that **out-of-catchment students may increasingly adopt multimodal trips**, combining transit with walking or cycling for the “last mile.” Over time, this may further reduce the proportion of auto-based trips.

Figure 27 below presents the suggested TDM mode share targets for the site.

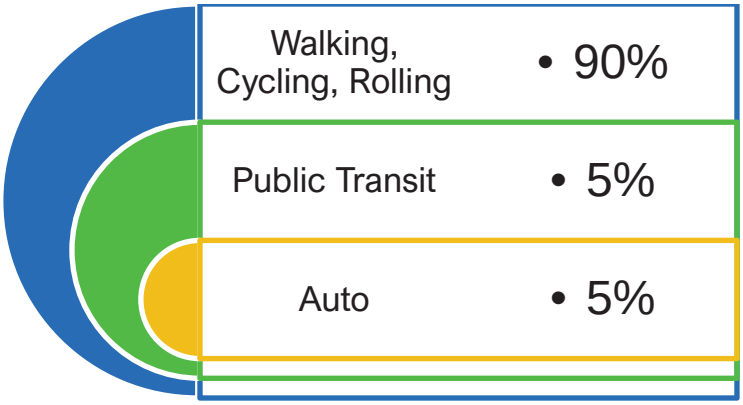


Figure 27. Suggested TDM Target Mode Shares

5.5.3 SATP Recommendations

Once the school is operational, it is recommended that a **supplementary SATP plan** be developed in addition to the formal TDM Plan. School travel planning is a community-driven process that encourages safe walking and cycling while building a travel culture tailored to the needs of each school.

5.5.3.1 City of Vancouver SATP Programs

- **School Street Program:** Temporarily closes a block adjacent to the school during PUDO times. *Columbia Street* may be a suitable candidate.
- **Walk Bike Roll Mini Grant:** Offers up to $500 annually to support local school-based travel initiatives.
- **Walking School Bus:** Supervised walking group supported by volunteers, in partnership with TransLink and SCY.
- **School Slow Zones:** Pilot program reducing speed limits near schools. *West 1st Avenue* could be a candidate.

More details: City of Vancouver SATP
Additional tools: Canadian School Travel Planning Facilitator Guide
Archived resources: HASTe BC (archived site)

5.5.4 Supplementary TDM Measures

In addition to participating in the SATP, the following **school-specific TDM measures** are recommended:

5.5.4.1 Information Packages

At the beginning of each school year, distribute information packages to students, parents, and staff, including:

- Sustainable travel options
- School loading/pick-up protocols

- Carpool strategies
- VSB safety and adult crossing brochures
  These materials should also be posted on the school website.

5.5.4.2 Bicycle Parking and End-of-Trip Facilities

- Provide Class A (secured) and Class B bike parking per CoV Bylaw.
- Include change rooms and showers for staff.
- Consider adding bike repair stations in the secured storage area.

5.5.4.3 Carpooling Support

- Encourage and facilitate staff carpooling at the school level.

5.5.4.4 Neighbourhood Liaison

- Assign the **school principal** as the point of contact for school-related traffic and parking concerns.
- Encourage establishment of a **PAC traffic subcommittee** to address ongoing local issues.

5.5.5 School Crossing Programs

The **Pedestrian Crossing Control Manual for BC** outlines three school-based crossing programs:

- Safe Route to School Program
- School Patrol Program
- Adult Crossing Guard Program

This study has identified likely walking routes and major crossing locations, supporting future consolidation of crossing points and evaluation of appropriate traffic control devices. Coordination with **CoV Engineering** and the **BCAA School Safety Patrol Program** is encouraged.

5.5.6 Additional Cycling Support Programs

- Weekly active travel events (e.g., “Walk or Cycle Wednesdays”)
- Bike buddy systems (pairing students for safe group rides)
- Bike safety and repair workshops
- On-site access to basic bike tools (pumps, patch kits, wrenches)
- Cycling incentive programs:
  - Cyclist of the Month awards

- Prizes for trip frequency/distance
- Healthy snack giveaways
- Bicycle raffle tickets for regular riders

Schools may also create a **Strava School Cycling Club Account** to foster positive, gamified engagement. Strava clubs can track weekly leaders by distance, ride count, longest ride, and more—encouraging healthy competition and continued cycling participation.

5.5.7 Education and Enforcement

The school should work with the **Vancouver Police Department (VPD)**, **ICBC**, and **CoV Engineering** to enforce parking and traffic regulations, including:

- Speed limits
- No-stopping zones
- Parking time limits

VPD's **Community Road & Education Safety Team** offers:

- Educational presentations on pedestrian and cyclist safety
- Responses to traffic concerns around school zones
- Support for school safety patrol programs

These efforts align with city-wide traffic safety goals and reinforce the school's commitment to a safe travel environment.

Should you have any questions or comments concerning the contents of this report, please do not hesitate to contact the undersigned.

Sincerely,

Stantec Consulting Ltd.

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