TRANSPORTATION PLANNERS AND ENGINEERS

bunt & associates

5360 12 Avenue

Transportation Impact Assessment

Version 7

Prepared for

1287268 B.C. Ltd.

Date

October 9, 2024

Project No.

04-21-0201

Bunt & Associates acknowledges and respects the Traditional Territories upon which our work spans, and from which we benefit. We are grateful for the unique cultures and histories of Indigenous Peoples that enrich our understanding and connection to the lands we call home. We honour learning, listening, and truth in our journey to reconciliation.

CORPORATE AUTHORIZATION

Prepared By:	Stuart Thornley, P.Eng.	Bunt & Associates Engineering Ltd.	
	Transportation Engineer	1550-1050 West Pender Street	
	Roxana Sorkhi, EIT	Vancouver, BC V6E 3S7	
	Transportation Analyst	Canada	
	Abdifatah Idle, EIT		
	Transportation Analyst		
Reviewed By:	Daniel Fung, P.Eng., M.Sc.	Telephone:	+1 604 685 6427
	Principal	Facsimile:	+1 604 685 6579
Approved By:	Daniel Fung, P.Eng., M.Sc.	Date:	2024-10-09
	Principal	Project No.	04-21-0201
		Status:	Version 7

This document was prepared by Bunt & Associates for the benefit of the Client to whom it is addressed. The copyright and ownership of the report rests with Bunt & Associates. The information and data in the report reflects Bunt & Associates' best professional judgment in light of the knowledge and information available to Bunt & Associates at the time of preparation. Except as required by law, this report and the information and data contained are to be treated as confidential and may be used and relied upon only by the client, its officers and employees. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Bunt & Associates accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

TABLE OF CONTENTS

1. INTRODUCTION 1
   - 1.1 Background 1
   - 1.2 Organization of Report 1
   - 1.3 Proposed Development 2
     - 1.3.1 Site Location 2
     - 1.3.2 Proposed Development 2
2. EXISTING CONDITIONS 5
   - 2.1 Existing Land Use 5
   - 2.2 Existing Transportation Network 5
     - 2.2.1 Road Network 5
     - 2.2.2 Transit Network 5
     - 2.2.3 Pedestrian Network 7
     - 2.2.4 Cycling Network 7
   - 2.3 Data Collection 9
     - 2.3.1 Traffic Data Collection Program 9
     - 2.3.1 Existing Site Vehicle Trip Generation 9
   - 2.4 Existing Traffic Operations 11
     - 2.4.1 Performance Thresholds 11
     - 2.4.2 Existing Conditions Analysis Assumptions 12
     - 2.4.3 Existing Operational Analysis Results 13
3. FUTURE TRAFFIC CONDITIONS 14
   - 3.1 Traffic Forecasts 14
     - 3.1.1 Background Traffic Forecasts 14
     - 3.1.2 Site-Generated Traffic 14
     - 3.1.3 Total Traffic 19
   - 3.2 Future Traffic Operations 19
     - 3.2.1 Future Conditions Analysis Assumptions 19
     - 3.2.2 Future Traffic Operations 19
   - 3.3 Site Access Sensitivity Analysis 23
4. SITE DESIGN REVIEW 26
   - 4.1 Parking Supply 26
     - 4.1.1 Vehicle Parking 26
     - 4.1.2 Bicycle Parking 28
     - 4.1.3 Off-Street Loading 28

4.2 Swept Path Analysis 29
4.2.1 Site Access 29
4.2.2 Parking Layout & On-Site Vehicle Circulation 29
4.2.3 Off-Street Loading 29
4.2.4 Waste Collection 29
5. CONCLUSIONS & RECOMMENDATIONS 30
5.1 Conclusions 30
5.2 Recommendations 31
APPENDIX A Terms of Reference
APPENDIX B Synchro Output Results
APPENDIX C Swept Path Analysis

EXHIBITS

Exhibit 1.1: Site Location 3
Exhibit 1.2: Site Plan 4
Exhibit 2.1: Existing Laning and Traffic Control 6
Exhibit 2.2: Existing Transportation Network 8
Exhibit 2.3: Existing Peak Hour Vehicle Traffic Volumes 10
Exhibit 3.1: Nearby KinVillage & Southlands Development Site Trips 17
Exhibit 3.2: Opening Day (2027) Background Traffic Forecasts 18
Exhibit 3.3: Site Traffic Forecasts 20
Exhibit 3.4: Opening Day (2027) Total Traffic Forecasts 21

TABLES

Table 1.1: Development Statistics 2
Table 2.1: Existing Street Characteristics 5
Table 2.2: Summary of Available and Counted Traffic Data 9
Table 2.3: Traffic Volume Adjustments 9
Table 2.4: Intersection Level of Service Thresholds 11
Table 2.5: Existing Traffic Operations 13
Table 3.1: Peak Hour Vehicle Trip Rates and Estimated Vehicle Trips 15
Table 3.2: Opening Day Traffic Operations – Weekday AM Peak Hour 22
Table 3.3: Opening Day Traffic Operations – Weekday PM Peak Hour 22
Table 3.4: Inbound Left Turn Access Traffic Operations 24
Table 4.1: Minimum Vehicle Parking Supply Requirement & Provision 26
Table 4.2: Joint Use Parking Occupancy Data 27
Table 4.3: Joint Use Parking Requirement 27
Table 4.4: Bicycle Parking Supply Requirement & Provision 28
Table 4.5: Loading Space Supply Requirement & Provision 28

1. INTRODUCTION

1.1 Background

1287268 B.C. Ltd. is proposing to re-develop the site at 5360 12 Avenue and 1170, 1156 and 1146 53A Street in Delta, BC into a mixed-use residential and commercial development. With the proposed development, the existing commercial and residential developments currently occupying the site would be demolished. To support the project approval process, the City of Delta (City) requires that a Transportation Impact Assessment (TIA) be conducted to analyze the traffic and parking impact of the development. 1287268 B.C. Ltd. retained Bunt & Associates Engineering Ltd. (Bunt) to conduct the TIA.

Study Update

This version of the report serves as an update to the previous submission, dated May 30, 2024. Since the previous submission, the proposed development is now planned to comprise a minor increase in proposed density. **Table 1.1** includes the net change in density since the previous version.

The project is currently going through Rezoning and Development Permit review process, and the opening day is planned for 2027. The current development proposal is anticipated to generate approximately 213 and 109 (two-way) site vehicle trips during the weekday AM and PM peak hours, respectively. Note that the operational analysis completed in the previous TIA report was based on 220 and 110 (two-way) site vehicle trips for the weekday AM and PM peak periods, respectively. Given this level of change is not anticipated to materially impact the traffic operations results, the future operations have not been updated. Furthermore, this current version of the report has been updated to reflect the latest development plan.

At the outset of the original study, Bunt developed the study scope in consultation with City of Delta staff and the agreed upon Terms of Reference (ToR) is included in **Appendix A**. Bunt's findings and recommendations are documented in this report.

1.2 Organization of Report

The report sections of the study have been organized as follows:

- **Section 1** presents the study background, site location, and details of the proposed development.
- **Section 2** presents the existing conditions, including land use, road network, transit, and active transportation facilities. In addition, the existing traffic conditions in the study area are analyzed.
- **Section 3** assesses the future traffic conditions, including estimating the site trip generation, and analyzes the traffic operations with and without these trips on study road network.

- **Section 4** provides a review of the site design, parking, bike parking, and loading.
- **Section 5** provides the conclusions and recommendations of the study.

1.3 Proposed Development

1.3.1 Site Location

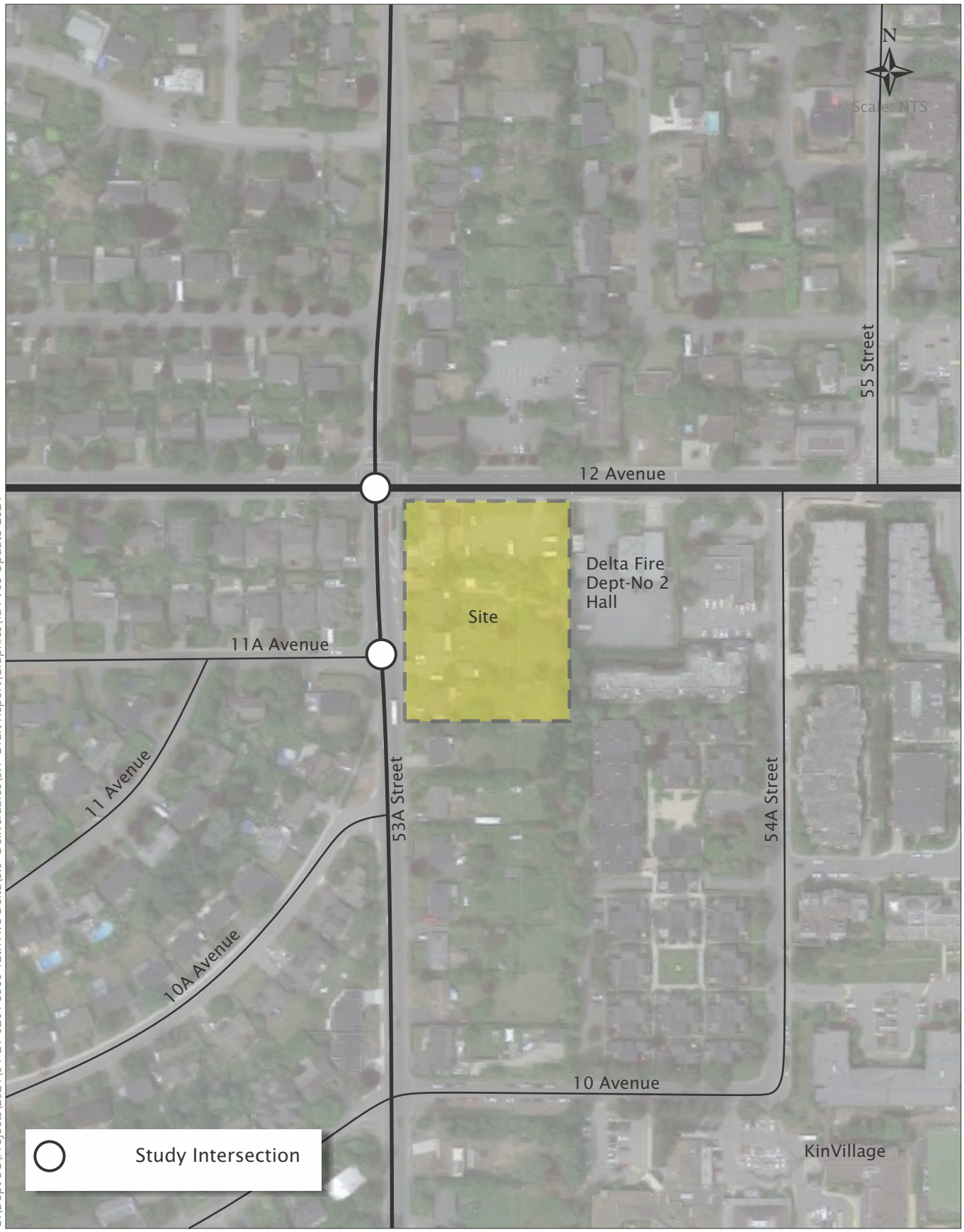
The site is located at 5360 12 Avenue and 1170, 1156 and 1146 53A Street in the Tsawwassen community of Delta, BC. The site is situated south of 12 Avenue, east of 53A Street, north of neighbouring single-family residential houses, and west of Delta Fire Hall No. 2. The site location is shown in **Exhibit 1.1**.

1.3.2 Proposed Development

Details of the land use statistics are provided in Table 1.1 and the proposed site plan for the development is shown in **Exhibit 1.2**.

Table 1.1: Development Statistics

LANS USE	DENSITY	UNITS	NET CHANGE IN DENSITY COMPARED TO PREVIOUS VERSION (MAY 30, 2024)
Residential	99,583 sq.ft. (9,252 sq.m.) GFA	67 Dwelling Units	+29,965 sq.ft. (2,784 sq.m.) GFA +2 Dwelling Units
Office	6,086 sq.ft. (565 sq.m.) GFA	-	+613 sq.ft. (57 sq.m.) GFA
Retail	2,004 sq.ft. (186 sq.m.) GFA	-	-9 sq.ft. (1 sq.m.) GFA
Café	1,874 sq.ft. (174 sq.m.) GFA	-	-82 sq.ft. (8 sq.m.) GFA
TOTAL	**109,547 SQ.FT. (10,177 SQ.M.) GFA**	**67 DWELLING UNITS**	**+30,487 SQ.FT. (2,832 SQ.M.) GFA**

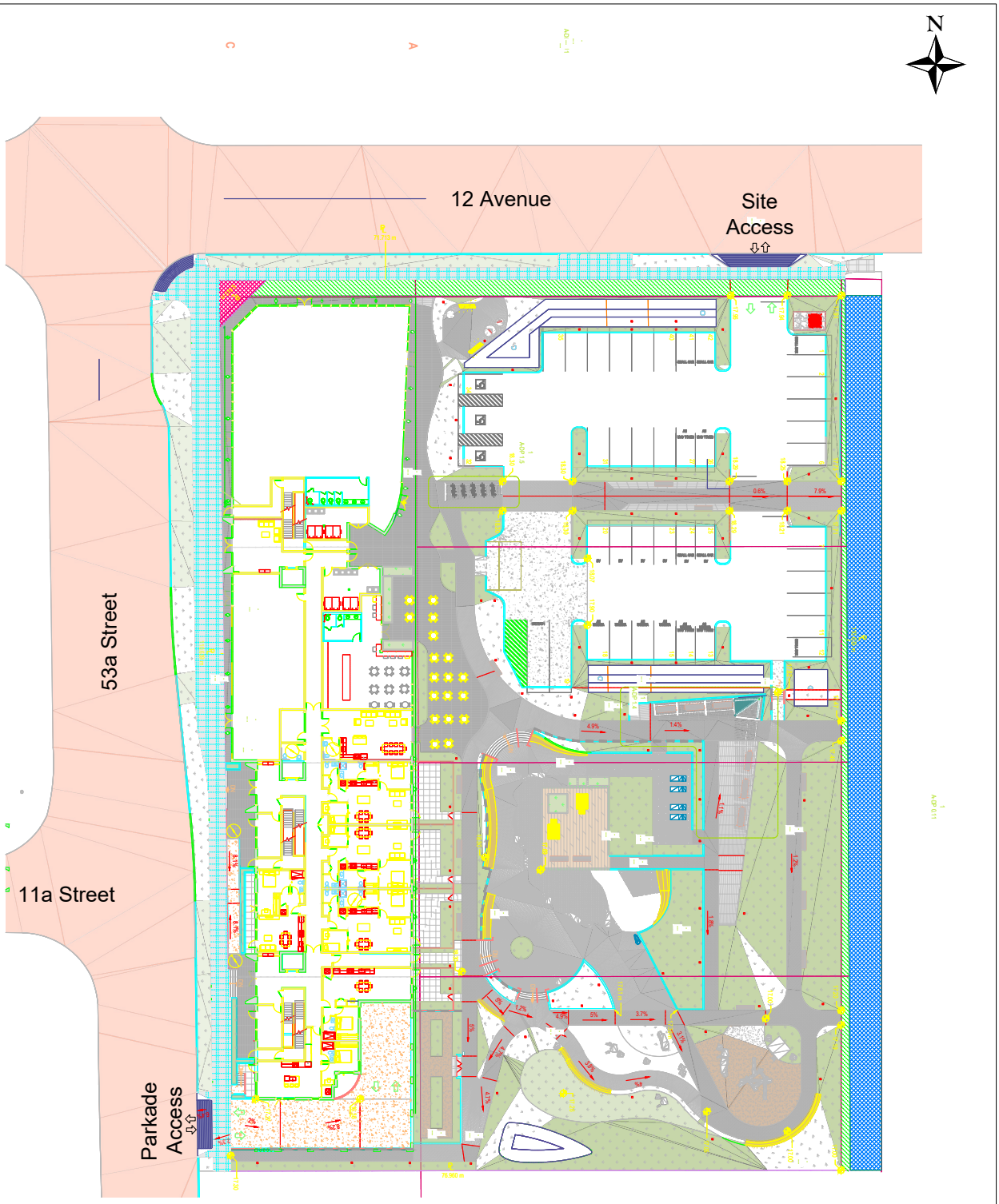


O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

Exhibit 1.1
Site Location

5360 12 Ave Delta
04-21-0201 April 2024

bunt & associates



[Based on Drawing A-DP1-0 from CTA Design dated October 7, 2024]
[Issued for Discussion; not for Construction]

Exhibit 1.2
Site Plan

04-21-0201 October 2024 Scale 1:750 on Letter

5360 12 Ave Delta
Prepared by RS/AI

bunt & associates

O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\4.0 Analysis & Design\CAD\04-21-0201_SwptPth_V19-01.dwg
2024/10/07 12:06, Plotted by Roxana Sorkhi

2. EXISTING CONDITIONS

2.1 Existing Land Use

The existing site is occupied by a two-storey commercial building at 5360 12 Avenue and three single family residential homes at 1170, 1156 and 1146 53A Street, which would be demolished prior to construction of the new development.

2.2 Existing Transportation Network

2.2.1 Road Network

Table 2.1 summarizes the characteristics of the adjacent road network.

Table 2.1: Existing Street Characteristics

STREET	CLASSIFICATION	NUMBER OF TRAVEL LANES[1]	POSTED SPEED	TWO-WAY PEAK HOUR VEHICLE VOLUMES	ON-STREET PARKING
12 Avenue	Collector	4	50 km/h	AM: 640 vph PM: 840 vph	None
53A Street	Collector	2	50 km/h	AM: 570 vph PM: 520 vph	One side (north of 11A Ave) Both sides (south of 11A Ave)
11A Avenue	Local	2	50 km/h	AM: 30 vph PM: 50 vph	Both sides

1. Number of through travel lanes on the roadway in vicinity of the site.

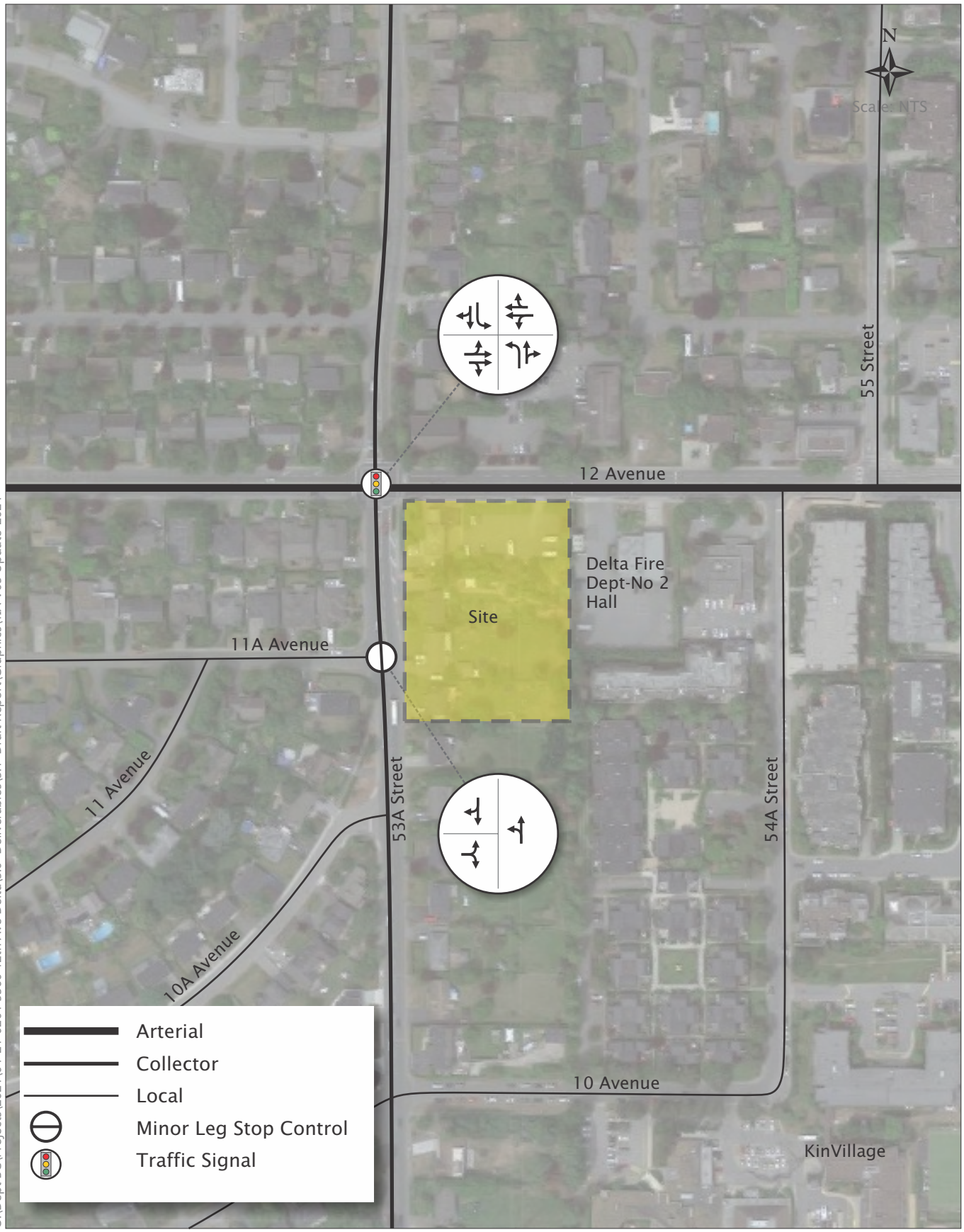
Exhibit 2.1 presents the existing laning and traffic control within the study area.

2.2.2 Transit Network

The existing development is well served by transit along 12 Avenue, with routes to 56 Avenue, through and beyond Tsawwassen via Highway 17A.

The #601, 602, 603, 604, and 609 bus routes connect South Delta, by way of Ladner, to Bridgeport Station in Richmond for connection to the Canada Line. The closest bus stops are located fewer than 100m walking distance from the site frontage, directly adjacent to the site.

The bus routes servicing the site run frequently with headways of less than 30 minutes, seven days a week, with the #601 route arriving every 15 minutes during the AM and PM peak periods. While the site is not located on Metro Vancouver's Frequent Transit Network (FTN), this level of frequency is consistent with that of an FTN route during these peak times (i.e., transit service every 15 minutes or better).



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

Exhibit 2.1

Existing Laning & Traffic Control

5360 12 Ave Delta
April 2024

04-21-0201

bunt & associates

2.2.3 Pedestrian Network

Walking is an everyday activity whether as a single-purpose journey or linked with transit and driving. Typically, people are willing to walk up to 15-minutes for certain activities (i.e. work, school, recreational activities.) and 400 to 800m is the average distance for such trips.

Most streets in the vicinity of the site have sidewalks on at least one side of the roadway although some older local roadways with limited connections or limited residential units have no sidewalks. Along the site frontage, sidewalks exist on both sides of 12 Avenue and 53A Street. In addition, 53A Street & 12 Avenue is controlled by a traffic signal, enabling a safe crossing for pedestrians. In terms of key pedestrian locations, in addition to Winskill Park, which is located about 400m from the site, there are several more popular destinations located within 800m from the site, such as Dennison Park, Brandrith Park, South Delta Secondary School, and Tsawwassen Town Centre.

According to Walk Score (https://www.walkscore.com/), the site has a Walk Score of 78 out of 100, which puts the site in the "very walkable" class. Walk Score is an online rating website that estimates the walking, transit, and cycling score of a location based on its proximity to local services such as schools, shopping, recreation and other nearby amenities.

2.2.4 Cycling Network

Cyclists can generally travel 3 to 4 times the distance of pedestrian over a similar period of time, and therefore cycling 4 to 5 km from the site would be a reasonable distance for a resident or site user to travel. The average cycling speed for commuters is about 15 km/h, and the average distance per journey is approximately 5 km. This equates to about a 20-minute journey on average. Cycling is increasingly becoming a more popular travel mode for work and leisure.

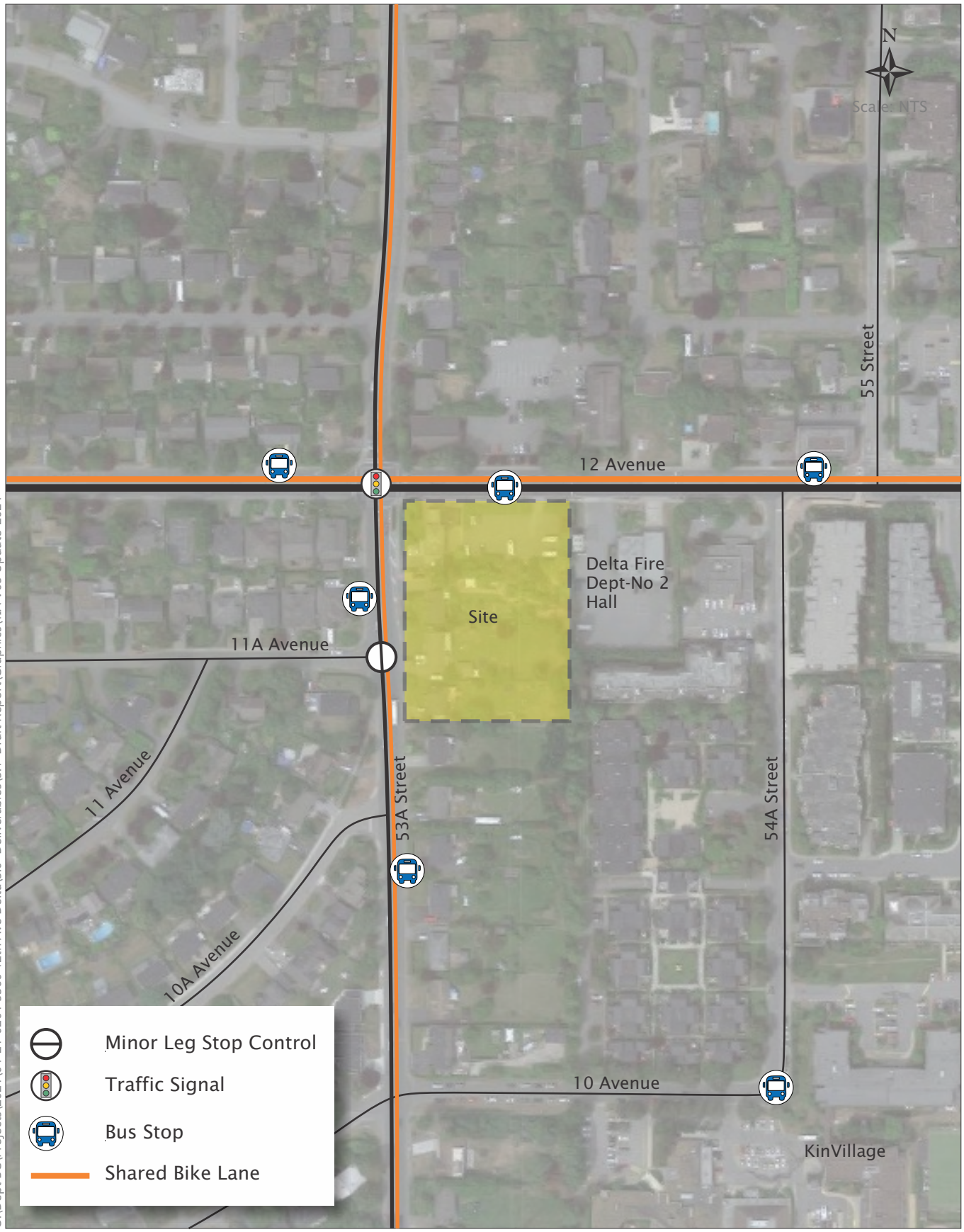
In general, there are currently limited cycling facilities in the vicinity of the site. The notable bike routes (formal or informal) nearby include dedicated bike lanes with signs and pavement markings on 52 Street (Arterial Road), and informal shared lanes on 53A Street (Collector Road), 12 Avenue (Collector Road), and 56 Street (Arterial Road). Similar to the Walk Score, the site also has a Bike Score of 52 out of 100, which puts the site in the "bikeable" class, indicating that biking is convenient for some trips.

Exhibit 2.2 illustrates the existing transportation network in the vicinity of the site.

Future Plans and Policies

The City of Delta's Cycling Master Plan identifies 12 Avenue as a candidate route for protected cycling facilities in the future. The Cycling Master Plan provides a course of action that reflects the community's priorities related to cycling, including: outlining strategies, recommending infrastructure, policies, and education to help enable and encourage cycling as a practical and convenient form of transportation.

While the project site plan does not currently indicate a protected bike lane on 12 Avenue, the Project Team is aware of this future consideration and are open to working toward envisioning how it could be appropriately accommodated at a later point in time.



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

Exhibit 2.2

Transportation Context

5360 12 Ave Delta
April 2024

04-21-0201

bunt & associates

2.3 Data Collection

2.3.1 Traffic Data Collection Program

Bunt conducted traffic counts (all modes) on Tuesday, June 22, 2021, covering the weekday morning (7:00 am to 9:00 am) and afternoon (3:00 pm to 6:00 pm) peak traffic periods of the study area network. A site visit was also conducted at this time. **Table 2.2** provides a summary of the traffic count data of study intersections.

Table 2.2: Summary of Available and Counted Traffic Data

INTERSECTION	DATE OF COUNT	PEAK HOURS	
		AM	PM
53A Street & 12 Avenue	Tuesday, June 22, 2021	8:00-9:00	15:00-16:00
53A Street & 11A Avenue	Tuesday, June 22, 2021	8:00-9:00	17:00-18:00
OVERALL STUDY AREA PEAK HOUR		8:00-9:00	17:00-18:00

It is noted that the counts were completed during the Covid-19 pandemic and adjustments were made to volumes to anticipate for any potential reductions as a result of the pandemic. Traffic volume adjustment factors were estimated by comparing pre-pandemic link volumes of 12 Avenue, and 53A Street provided by the City of Delta with the volumes collected by Bunt during the pandemic in June 2021. The finding was that the counts completed during the pandemic were already similar to the pre-pandemic conditions but were adjusted upward nonetheless to be conservative. **Table 2.3** summarizes the Covid-19 adjustments for the individual study intersections. Also note, counts completed are reflective of when school was still in session, given the site's proximity to the South Delta Secondary School to the south along 53A Street.

Table 2.3: Traffic Volume Adjustments

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	COVID-19 TRAFFIC (VPH)	ADJUSTED TRAFFIC (VPH)	ADJUSTMENT (% INCREASE)	COVID-19 TRAFFIC (VPH)	ADJUSTED TRAFFIC (VPH)	ADJUSTMENT (% INCREASE)
53A St & 12 Ave	980	1,040	6%	1,230	1,240	1%
53A St & 11A Ave	540	580	7%	510	530	4%

Existing peak hour traffic volumes at the study area intersections are illustrated in **Exhibit 2.3**.

2.3.1 Existing Site Vehicle Trip Generation

The existing site development contains a commercial building and three single family homes. While no observations were made to estimate existing trips, it is anticipated that the traffic generated from the existing uses is relatively low, and thus existing trips were not removed, as a conservative measure, from the network for future traffic analysis.

O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

Exhibit 2.3

Existing (2021) Peak Hour Vehicle Traffic Volumes

5360 12 Ave Delta
April 2024

04-21-0201

bunt & associates

2.4 Existing Traffic Operations

2.4.1 Performance Thresholds

The existing operations of study area intersections and access points were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 9.2 analysis software (Build 915), consistent with other recent studies undertaken in the City of Delta. The traffic operations were assessed using the performance measures of Level of Service (LOS), volume-to-capacity (V/C) ratio, and 95th percentile queue lengths.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. LOS "A" represents optimal, minimal delay conditions while a LOS "F" represents an over-capacity condition with considerable congestion and/or delay. Delay is calculated in seconds and is based on the average intersection delay per vehicle.

Table 2.4 below summarizes the LOS thresholds for the six Levels of Service, for both signalized and unsignalized intersections.

Table 2.4: Intersection Level of Service Thresholds

LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Source: Highway Capacity Manual

The volume to capacity (V/C) ratio of an intersection represents ratio between the demand volume and the available capacity. A V/C ratio less than 0.85 indicates that there is sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. A V/C value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a V/C ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions. A V/C ratio over 1.0 indicates a very congested intersection where drivers may have to wait through several signal cycles. In downtown and Town Centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are common.

Typically, performance measure thresholds are established by municipalities. The City of Delta requires that each movement at study intersections be projected to operate at LOS D or better with a v/c ratio of 0.85 or less under all horizons considered. These thresholds are applied to all intersections regardless of the intersection location (urban or suburban), traffic control (signalized or stop-controlled), or intersecting

road classifications (arterial, collector, or local); all of these elements somewhat influence driver expectations for intersection operations.

The 95th percentile queue is defined as the length that has only a 5-percent probability of being exceeded during the analysis time period. It is a useful parameter for determining the appropriate length of turning storage bays, but it is not typical of what an average driver would experience.

In interpreting of the analysis results, note that the HCM methodology reports performance differently for various types of intersection traffic control. In this report, the performance reporting convention is as follows:

For signalized intersections: HCM 2000 output for overall LOS and v/c as well as individual movement LOS and v/c is reported. 95th percentile queues are reported as estimated by Synchro.

For unsignalized two-way stop-controlled intersections: HCM 2000 LOS, V/C and 95th percentile queue output is reported just for individual lanes as the HCM methodology does not report overall performance.

95th percentile queue lengths reported have been rounded to the nearest metre.

The performance reporting conventions noted above have been consistently applied throughout this document and the detailed outputs are provided in **Appendix B**.

2.4.2 Existing Conditions Analysis Assumptions

The analysis was completed utilizing Synchro defaults for the majority of parameters with a default saturation flow of 1,900 vehicles per hour. Peak hour factors, pedestrian and cyclist volumes, and percentage of heavy vehicles were taken from existing traffic count observations.

2.4.3 Existing Operational Analysis Results

A summary of the existing operations is presented below in **Table 2.5**.

Table 2.5: Existing Traffic Operations

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LOS	V/C	95TH Q (M)	LOS	V/C	95TH Q (M)
53A Street & 12 Avenue (Signalized)	*OVERALL*	*A*	*0.36*	-	*A*	*0.38*	-
	EBLTR	A	0.28	12	A	0.29	14
	WBLTR	A	0.22	10	A	0.40	18
	NBL	A	0.30	10	B	0.26	10
	NBTR	B	0.48	18	B	0.33	15
	SBL	A	0.07	3	B	0.15	6
	SBTR	A	0.33	14	B	0.35	16
53A Street & 11A Avenue (Unsignalized)	EB	B	0.05	1	B	0.04	1
	NB	A	0.00	0	A	0.00	0
	SB	A	0.21	0	A	0.21	0

The existing traffic analysis indicated that all study area intersections are currently operating within acceptable intersection performance parameters at peak times, therefore no intersection improvements are required to accommodate existing traffic demands.

3. FUTURE TRAFFIC CONDITIONS

3.1 Traffic Forecasts

3.1.1 Background Traffic Forecasts

Background traffic is traffic that would be present on the road network if the site did not redevelop. Consistent with previous Bunt studies in the City of Delta, a linear growth rate of 1% per year was applied to the Opening Day horizon to establish Background traffic volume estimates.

The City of Delta specifically requested that the traffic analysis also take into consideration the trips associated with the nearby KinVillage and Southlands developments. The anticipated site traffic associated with these two developments, which is presented in **Exhibit 3.1** for the study area intersections has been factored into our analysis.

The Opening Day Background traffic forecasts therefore include the background growth in traffic based on the existing volumes, plus the nearby development site trips shown in Exhibit 3.1. The Opening Day Background traffic forecasts are presented in **Exhibit 3.2**.

3.1.2 Site-Generated Traffic

To estimate the trip generation associated with the development, Bunt used rates published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Ed). Specifically, the trip rates identified for residential, office, retail, and café have been applied to calculate the trip generation for the proposed development. **Table 3.1** summarizes ITE vehicle trip rates for the project's land uses and the associated estimated peak hour vehicle trips.

Table 3.1: Peak Hour Vehicle Trip Rates and Estimated Vehicle Trips

LAND USE	SIZE*	DESCRIPTION	AM PEAK HOUR			PM PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Residential	67 Dwelling units	Vehicle Trip Rates[1]	23%	77%	0.37	61%	39%	0.39
		Vehicle Trips	6	19	25	16	10	26
Office	6,086 Sq.ft GFA	Vehicle Trip Rates[2]	88%	12%	1.52	17%	83%	1.44
		Vehicle Trips	8	1	9	1	7	9
Retail	2,004 Sq.ft GFA	Vehicle Trip Rates[3]	60%	40%	2.36	50%	50%	6.59
		Vehicle Trips	3	2	5	7	7	13
Cafe	1,874 Sq.ft GFA	Vehicle Trip Rates[4]	51%	49%	93.08	50%	50%	32.29
		Vehicle Trips	89	85	174	30	30	61
TOTAL TRIPS	-	-	**106**	**108**	**213**	**54**	**54**	**109**

Note: All trip rates are for General Urban/Suburban (not close to rail transit) setting.

1. ITE Land use code 221 Multifamily Housing Mid-Rise vehicle trip rates per dwelling unit.
2. ITE Land use code 710 General Office Building vehicle trip rates per 1,000 sq.ft GFA.
3. ITE Land use code 822 Strip Retail Plaza <40k vehicle trip rates per 1,000 sq.ft GFA.
4. ITE Land use code 936 Coffee/Donut Shop without Drive-Through vehicle trip rates per 1,000 sq.ft GFA.

Note: Total values may vary due to rounding.

The net new trip generation for the proposed development is expected to be approximately 213 and 109 vehicle trips during the weekday AM and PM peak hour periods, respectively. This translates to about 2 to 4 vehicles added onto the road network every minute, on average, during the peak hour periods. Please note that this represents a highly conservative estimate as, for the purposes of analysis, additional factors such as pass-by and internal trip capture reductions were not applied. It is anticipated that trips to/from the café would likely be generated by locals within walking/cycling distance of the café, and/or residents and employees within the same building, thus reducing expected automobile use associated with the café.

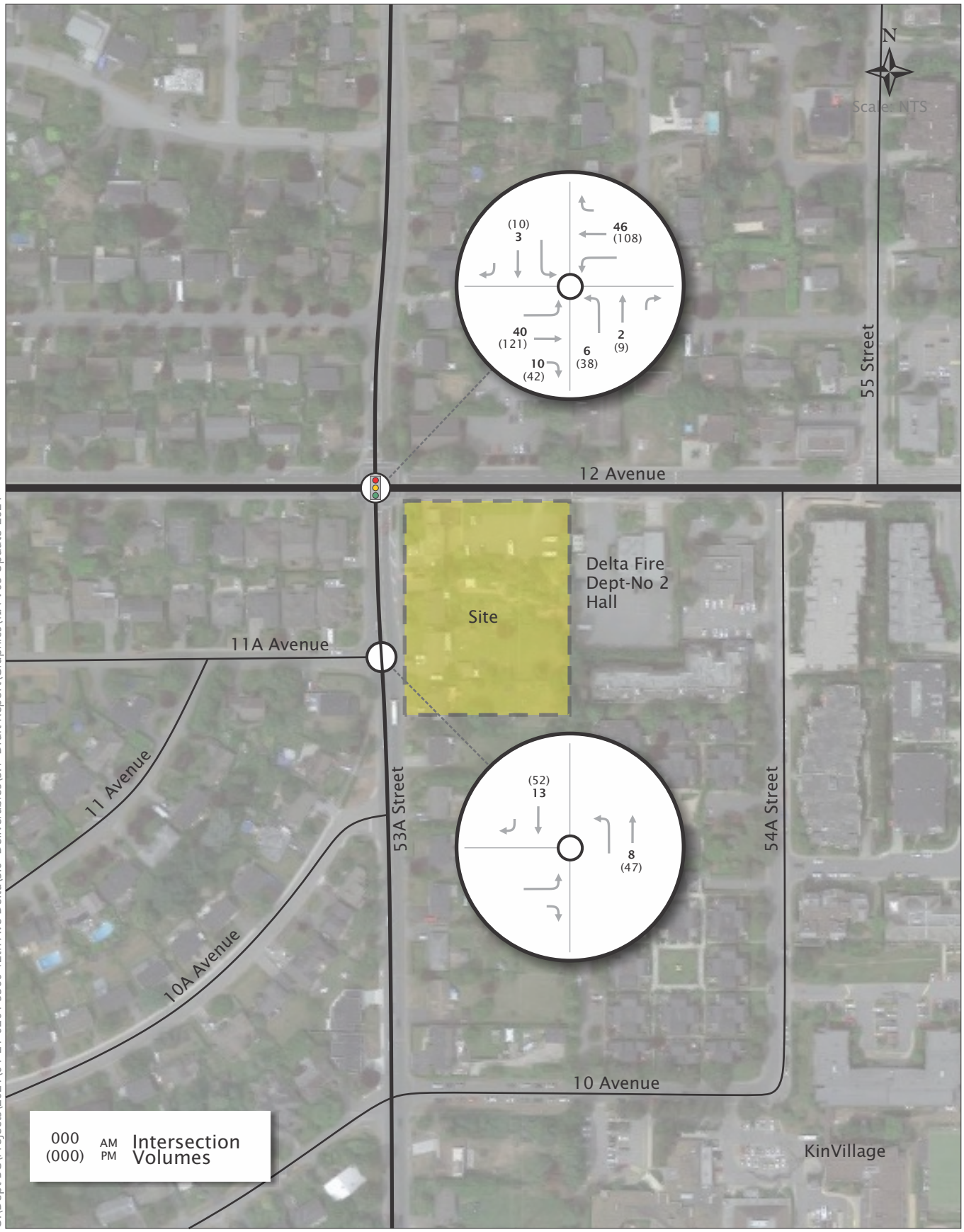
The resulting site generated traffic forecasts are illustrated in **Exhibit 3.3**. Vehicular trips were distributed to the road network based on existing traffic patterns and assigned to the development accesses based on logical routing patterns given the site layout.

At the time of the original study, the City of Delta previously advised that both site driveways should operate as right-in/out only for vehicle movements. However, since the 53A Street driveway has been relocated approximately 100 m away from 12 Avenue in the current site plan, it is Bunt's opinion that full movements can be considered at this access to improve site accessibility and avoid circuitous routing through the neighbourhood. While 53A Street can be considered wide enough for vehicles proceeding straight to pass left turning vehicles, monitoring should be implemented to ensure that a left turn lock

scenario is prevented for southbound vehicles turning left into the site access at the same time northbound vehicles are turning left to 11A Avenue. However, based on the relatively low future vehicle volumes forecasted, this is not anticipated to pose a significant concern. To that end, the traffic operations analysis contained herein has assumed full turning movements at the site's 53A Street access, to demonstrate adequate operations.

Note, site accessibility at the 12 Avenue access is further discussed in **Section 3.3**, considering further evaluation of the future traffic condition with the sensitivity of a permitted left-turn inbound movement into the site.

With the above in mind, Bunt does not anticipate changes in road line paint markings to support left-turn movements at the access points; however, this could likely be confirmed by an appropriate member of the Project Design Team.



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

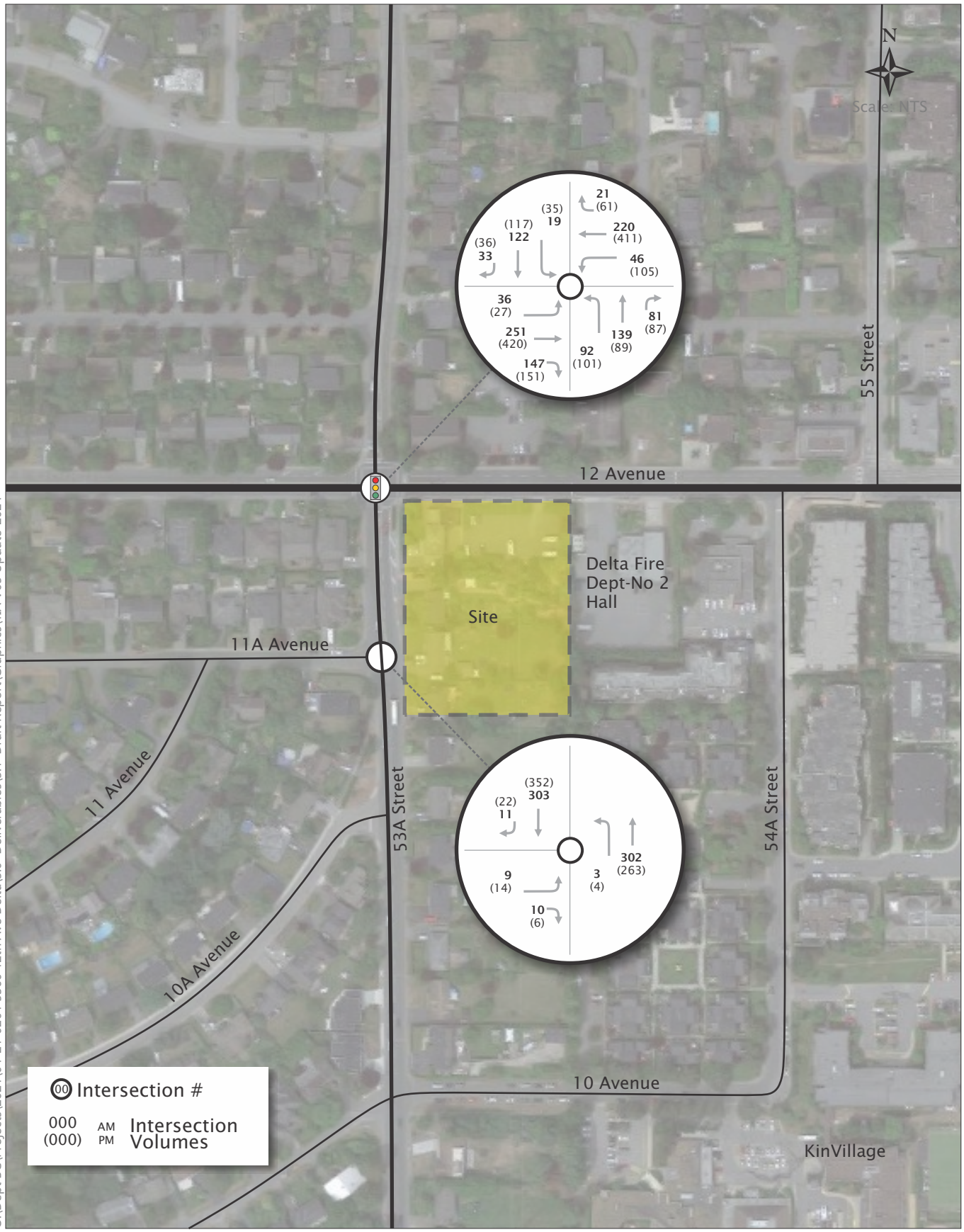
Exhibit 3.1

Nearby KinVillage & Southlands Development Site Trips

04-21-0201

5360 12 Ave Delta
April 2024

bunt & associates



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V05 Update-2024

Exhibit 3.2

Opening Day (2027) Background Traffic Forecasts

5360 12 Ave Delta
April 2024

04-21-0201

bunt & associates

3.1.3 Total Traffic

The future Total traffic was calculated by adding the site traffic to the Background traffic and this is illustrated in **Exhibit 3.4**.

3.2 Future Traffic Operations

3.2.1 Future Conditions Analysis Assumptions

The future analysis was carried out using Synchro 11 and the HCM 2000 methodology. The same performance thresholds were also used to trigger consideration of roadway or traffic control improvements, as detailed in Section 2.4.

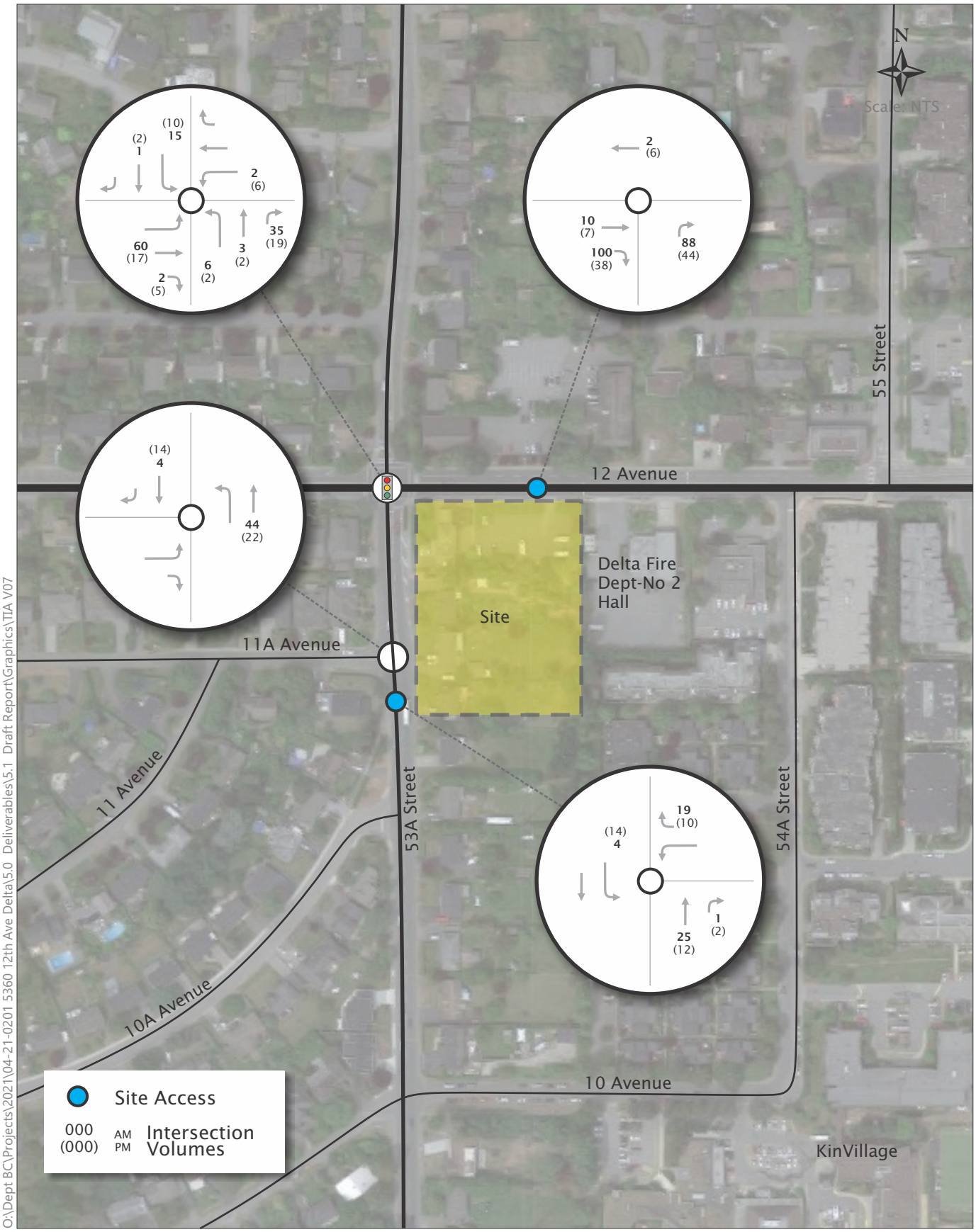
The future traffic operations analysis assumed use of the existing signal timing at 12 Avenue & 53A Street; i.e., that the signal timing plan would not require optimization or changes to cycle length or splits.

3.2.2 Future Traffic Operations

Table 3.2 and **3.3** summarize the capacity analysis results for the weekday AM and PM peak hour periods for the future Opening Day Background and Total traffic scenarios. The detailed Synchro outputs are included in Appendix B.

The future traffic operations analysis indicate that all study area intersections are anticipated to operate within acceptable capacity parameters; therefore, no intersection improvements are required to accommodate the traffic demands for either the Background (without development) or Total (with development) traffic conditions. The results also indicate that the development is not anticipated to materially impact the traffic operations of the study road network.

Further to the results, it is Bunt's opinion that the site's vehicle trip generation is not likely to cause significant impact to the traffic operations at the 56 St & 12 Ave, or 52 St & 12 Ave intersections.



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V07

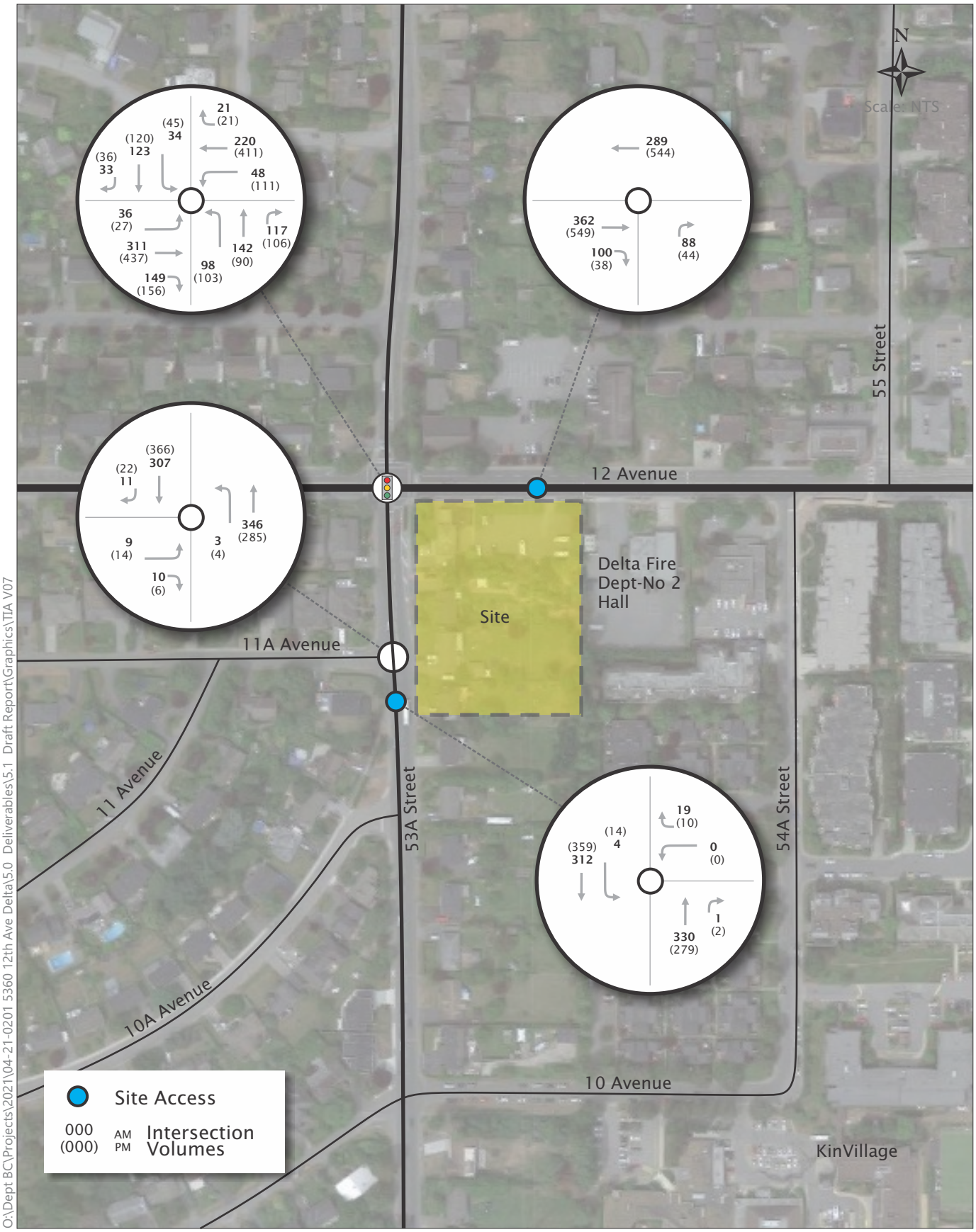
Exhibit 3.3

Site Traffic Forecasts

04-21-0201

5360 12 Ave Delta
October 2024

bunt & associates



O:\Dept BC\Projects\2021\04-21-0201 5360 12th Ave Delta\5.0 Deliverables\5.1 Draft Report\Graphics\TIA V07

Exhibit 3.4

Opening Day Total Traffic Forecasts

04-21-0201

5360 12 Ave Delta
October 2024

bunt & associates

Table 3.2: Opening Day Traffic Operations – Weekday AM Peak Hour

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	BACKGROUND			TOTAL		
		LOS	V/C	95TH Q (M)	LOS	V/C	95TH Q (M)
53A Street & 12 Avenue (Signalized)	*OVERALL*	*A*	*0.40*	-	*A*	*0.46*	-
	EBLTR	A	0.33	15	A	0.45	21
	WBLTR	A	0.27	13	A	0.33	16
	NBL	B	0.34	13	A	0.28	14
	NBTR	B	0.51	23	A	0.46	28
	SBL	A	0.07	4	A	0.11	6
	SBTR	B	0.36	17	A	0.28	18
53A Street & 11A Avenue (Unsignalized)	EB	B	0.05	1	B	0.05	1
	NB	A	0.00	0	A	0.00	0
	SB	A	0.23	0	A	0.24	0

Table 3.3: Opening Day Traffic Operations – Weekday PM Peak Hour

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	BACKGROUND			TOTAL		
		LOS	V/C	95TH Q (M)	LOS	V/C	95TH Q (M)
53A Street & 12 Avenue (Signalized)	*OVERALL*	*A*	*0.47*	-	*A*	*0.49*	-
	EBLTR	A	0.41	25	A	0.48	26
	WBLTR	A	0.48	27	A	0.56	29
	NBL	B	0.45	18	B	0.36	19
	NBTR	B	0.40	21	B	0.35	23
	SBL	B	0.16	8	B	0.16	10
	SBTR	B	0.40	22	B	0.33	23
53A Street & 11A Avenue (Unsignalized)	EB	B	0.05	1	B	0.06	1
	NB	A	0.00	0	A	0.00	0
	SB	A	0.26	0	A	0.27	0

.

3.3 Site Access Sensitivity Analysis

In the City of Delta's preliminary site design comments, staff had noted that the 12 Avenue site access should be limited to right-in, right-out vehicle movements only. In Bunt's traffic analysis, this condition was assumed to be in place.

However, given that restricted left turns in and out of the site inherently create site accessibility issues, Bunt conducted a sensitivity analysis of the traffic operations at the 12 Avenue site access, assuming westbound left turns into the site would be permitted. Northbound left turns out of the site could remain restricted and controlled by raised channelization at the driveway/12 Avenue interface and posted "no left-turn" signage.

Figure 3.1 presents the proposed traffic laning of this access scenario review, and **Figure 3.2** presents the traffic volumes that would be anticipated in the Opening Day Total Conditions with left turn movements into the site permitted. Note that the laning assumed westbound left turn movements to be shared with through movements in the shared left/through lane, so that a dedicated left turn lane would not be required.

Figure 3.1: Proposed 12 Avenue Site Access Laning Configuration

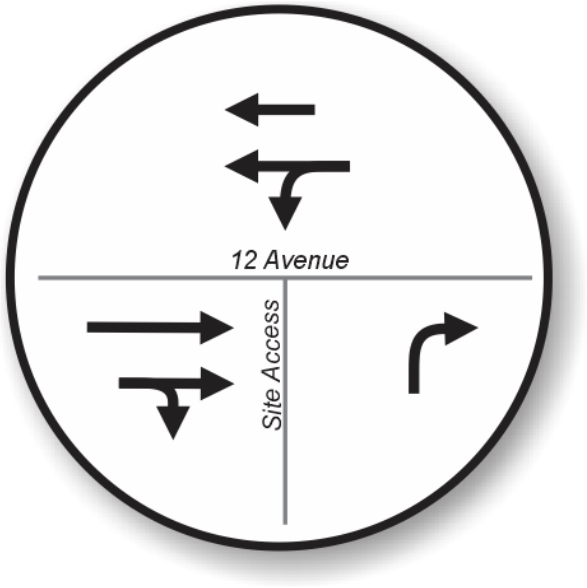


Figure 3.2: Opening Day Left-In Access Total Traffic Forecasts

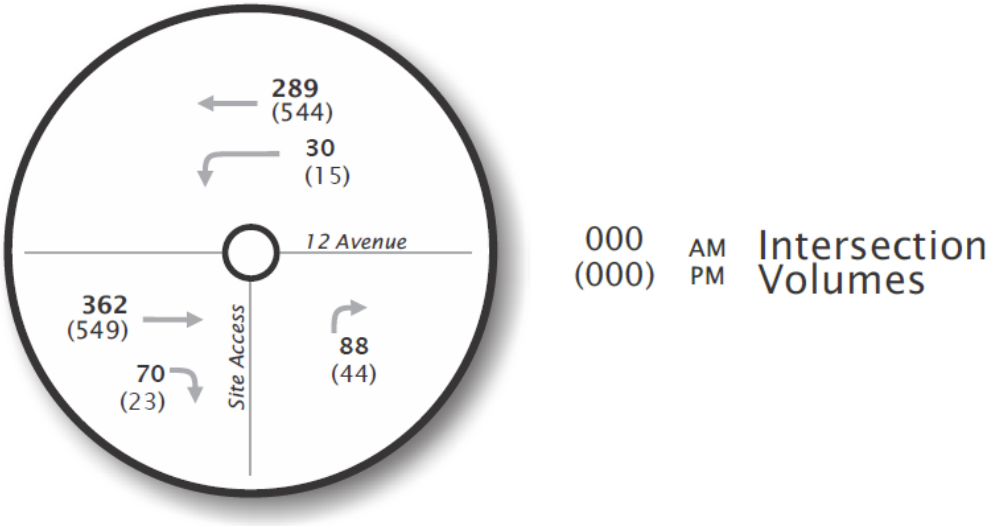


Table 3.4 summarizes the capacity analysis results for the proposed left-in access configuration.

Table 3.4: Inbound Left Turn Access Traffic Operations

INTERSECTION/ TRAFFIC CONTROL	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LOS	V/C	95TH Q (M)	LOS	V/C	95TH Q (M)
12 Avenue Site Access (unsignalized)	EBT	A	0.15	0	A	0.23	0
	EBR	A	0.12	0	A	0.13	0
	WBL	A	0.03	1	A	0.02	0
	WBT	A	0.12	0	A	0.23	0
	NBR	B	0.13	4	B	0.07	2

The table indicates that no delay, capacity, or queuing issues are anticipated at the 12 Avenue access when westbound left turn movements into the site are permitted.

Without inbound left turn access, drivers destined for the site originating from the east would be forced into circuitous routing patterns, including potentially circling around the block clockwise from 54A Street to 10 Avenue back to the site, or alternatively performing a southbound to northbound U-turn maneuver

at 53A Street & 11A Avenue. Another consideration is that the 95th percentile queue for the westbound movement at 12 Avenue & 53A Street is not expected to extend east to or near this site access driveway.

As such, Bunt recommends that the City of Delta consider allowing left turn movements into the site at this driveway access (12 Avenue).

Impact to Fire Hall Access

City staff requested that road geometry be reviewed to ensure safe access for broader use given the close proximity to the neighbouring Fire Hall. In response to City staff comments, it is Bunt's opinion that the westbound left turn vehicle queueing does not pose a significant concern.

As part of the sensitivity analysis, trip generation, traffic capacity, delay, and 95th percentile queues were reviewed. The traffic analysis indicated that vehicle queueing is not anticipated to pose significant concerns during weekday AM and PM study peak hour periods. Given this, and that fire truck movements near this intersection are anticipated to occur relatively infrequently, it is Bunt's opinion that there would not be a material impact experienced as a result of inbound left turns being permitted at the 12 Avenue site driveway.

4. SITE DESIGN REVIEW

4.1 Parking Supply

4.1.1 Vehicle Parking

Table 4.1 summarizes the proposed off-street parking supply for the development in comparison to the City of Delta's Zoning Bylaw minimum requirement.

Table 4.1: Minimum Vehicle Parking Supply Requirement & Provision

LAND USE	SIZE	BYLAW RATE	REQUIRED SPACES	PARKING PROVIDED
Residential	3 studio and 1-bedroom units	1.3 spaces per studio or 1-bedroom dwelling unit	100	114*
	64 2+ bedroom units	1.5 spaces per dwelling unit with 2 or more bedrooms		
	67 dwelling units	0.1 visitor parking space per dwelling units	7	7**
Residential Total			*104*	*114*
Office	565 sq.m. GLA	3 spaces per 100 sq.m. GLA	17	42**
Retail	186 sq.m. GLA	3.5 spaces per 100 sq.m. GLA	7	
Café	174 sq.m. GLA	10 spaces per 100 sq.m. GLA if more than 150 sq.m.	17	
Non-Residential Total			*41*	*42*
TOTAL			**148**	**156**

GLA – Gross Leasable Area

*Note: The developer is proposing 13 motorcycle spaces for the residential land use in the underground parkade. Per City of Delta Bylaw, each motorcycle or scooter space counts as 0.5 of a required parking space, translating to 7 parking spaces.

**Note: 7 visitor parking spaces are proposed to be shared with the commercial use parking in the surface parking area.

The Bylaw requirement for the proposed development is 148 spaces in total. The developer is proposing to provide 156 parking spaces, which meets the overall requirement.

In terms of the parking space allocation, the developer is planning to provide 42 parking spaces to meet the commercial requirement, and this includes 7 Joint Use parking spaces to be shared with the residential visitor use. To ensure the residential visitor parking allocation is met, Bunt recommends the site plan reallocate 7 of the 42 spaces for residential visitor use, allocating the remaining 35 spaces among the commercial uses on site. With this in mind, to confirm that the proposed parking provision would be

adequate, Bunt conducted a Joint Use parking analysis using the occupancy data outlined in Section 8.4.3 of City's Zoning Bylaw, as summarized in **Table 4.2**.

Table 4.2: Joint Use Parking Occupancy Data

LAND USE	OCCUPANCY PERIOD					
	WEEKDAY			WEEKEND		
	8:00AM –5:00PM	5:00PM–12:00AM	12:00AM – 8:00AM	8:00AM –5:00PM	5:00PM–12:00AM	12:00AM – 8:00AM
Commercial	90%	80%	5%	100%	70%	5%
Office	100%	20%	5%	5%	5%	5%
Coffee Shop	70%	100%	10%	70%	100%	100%

Applying the above rates, the parking requirement for each use was calculated and is shown in **Table 4.3**.

Table 4.3: Joint Use Parking Requirement

LAND USE	BYLAW PARKING REQUIRMENT	JOINT USE PARKING REQUIRMENT					
		WEEKDAY			WEEKEND		
		8:00AM –5:00PM	5:00PM–12:00AM	12:00AM – 8:00AM	8:00AM –5:00PM	5:00PM–12:00AM	12:00AM – 8:00AM
Commercial	7	6	6	0	7	5	0
Office	17	17	3	1	1	1	1
Coffee Shop	17	12	17	2	12	17	17
TOTAL	41	35	26	3	20	23	18

Based on the Joint Use parking assessment, the maximum parking requirement for the non-residential uses on site would be 35 spaces, occurring between 8:00am to 5:00pm on a weekday. As such, the proposed parking supply meets the parking requirement, assuming 7 spaces in the surface parking lot are allocated for visitor use and the remaining 35 spaces are shared among the commercial uses on site.

In addition to the parking supply discussed above, the developer is proposing to provide one (1) passenger Pick-Up/Drop-Off (PUDO) space at the surface parking lot.

The City's Zoning Bylaw (8.5.4) permits up to 25% of the required parking supply to be provided as small car spaces. For the required 148 spaces, this translates to 37 small car spaces. The developer is proposing to provide 31 small car spaces, which complies with the provisions of the Bylaw.

According to the City Bylaw, based on the required supply of 41 non-residential spaces, at least 2 accessible parking spaces must be included. The developer is proposing to provide 3 accessible spaces for commercial use, which exceeds this requirement by one (1).

For residential use, one (1) accessible parking space is required for 50% of the required adaptable dwelling units. Based on discussions with the Project Architect, the project requires a minimum of 14 adaptable

residential units. As such, 7 accessible spaces are required. The developer is proposing to provide 8 accessible spaces for residential use, which meets this requirement.

In terms of electric vehicle (EV) parking and charging infrastructure, the Bylaw requires 100% of the residential parking and 20% of the non-residential parking spaces be provided with EV chargers. For the required 41 non-residential spaces, this translates to 8 EV charging spaces. The developer proposes to provide 14 EV spaces at the surface parking lot, which exceeds this requirement for the non-residential component of the project. Additionally, the developer proposes to provide all residential parking spaces with an EV charger or a dedicated energized electric vehicle outlet, which meets the requirement for this use.

4.1.2 Bicycle Parking

Table 4.4 summarizes the bicycle parking space supply requirement for the proposed development.

Table 4.4: Bicycle Parking Supply Requirement & Provision

LAND USE	SIZE	BYLAW RATE	REQUIRED SPACES	PROVIDED SPACES
Residential	67 dwelling units	1 space per dwelling unit for residents	67	70
Residential Visitor	1 apartment building	5 spaces per apartment building for visitors	5	5
Office, Retail, Cafe	3 CRU units total	1 Space per commercial retail unit, or 5 spaces per building, which is greater	5	5
TOTAL	-	-	77	80

The Bylaw bicycle parking requirement is 77 spaces, and the developer is proposing to provide 80 spaces to meet the requirement.

4.1.3 Off-Street Loading

Table 4.5 summarizes the loading space supply requirement for the proposed development.

Table 4.5: Loading Space Supply Requirement & Provision

LAND USE	SIZE	BYLAW RATE	REQUIRED SPACES	PROVIDED SPACES
Residential	67 dwelling units	1 space per building with more than 80 dwelling units	0	0
Office, Retail, Cafe	1 principal building	1 space per overhead loading door or shipping and receiving door, or 1 space per principal building, whichever is the greater number	1	1
TOTAL	-	-	1	1

The Bylaw requires 1 off-street loading space for the development, and the developer proposes to provide the required loading space at the southwest corner of the surface parking lot to meet this requirement.

4.2 Swept Path Analysis

Bunt has conducted a swept path analysis using AutoTURN software to determine the feasibility of passenger vehicle, loading, and waste collection vehicle maneuvers. The results and key finding of the analysis are discussed in this section, while the detailed drawings showing these movements are included in **Appendix C**.

4.2.1 Site Access

The vehicular access to the development for the commercial land uses is proposed off 12 Avenue, while the underground parkade access for residents is proposed off 53A Street.

Exhibit C.1 shows the maneuvers of two passenger vehicles as they simultaneously enter and exit both site accesses. As the exhibit indicates, no maneuvering issues are expected.

4.2.2 Parking Layout & On-Site Vehicle Circulation

In terms of the underground parkade, Bunt reviewed the parking layout and confirms that it generally meets the Bylaw requirements pertaining to aisle widths, parking space dimensions, etc.

Exhibit C.2 shows two passenger vehicles concurrently travelling through the P1 parkade ramp in opposing directions. As shown on the exhibits, no maneuvering issues are expected.

With respect to parking space accessibility, **Exhibit C.3** shows a small car vehicle successfully entering and exiting the end space in the P3 level, which is expected to be the most challenging parking space to access. Similarly, **Exhibit C.4** shows a small car vehicle successfully entering and exiting the end-of-aisle space in the surface parking lot.

4.2.3 Off-Street Loading

The project's required loading space is located at the southwest corner of the surface parking lot. **Exhibit C.5** shows the loading maneuvers. As indicated, a standard SU9 truck design vehicle is expected to be able to successfully enter and exit the loading space without any maneuvering issues or conflicts.

4.2.4 Waste Collection

A garbage staging area is proposed at the southwest corner of the surface parking lot to the west of the proposed loading stall. **Exhibits C.6** demonstrates a medium single unit (MSU) truck, representative of full-sized waste collection vehicle, entering and exiting the loading bay without any maneuvering issues.

5. CONCLUSIONS & RECOMMENDATIONS

Based on Bunt's review of the proposed development, a summary of the conclusions and recommendations of the study is provided below.

5.1 Conclusions

1287268 B.C. Ltd. is proposing to re-develop the site at 5360 12 Avenue and 1170, 1156 and 1146 53A Street in Delta, BC into a mixed-use residential and commercial development. The development proposal includes 67 residential dwelling units, approximately 6,086 sq.ft. (565 sq.m.) of office space, approximately 2,004 sq.ft. (186 sq.m.) of retail space, and approximately 1,874 sq.ft. (174 sq.m.) of café space. Vehicle access to the development's 156 parking spaces would be taken from two driveways on 12 Avenue and 53A Street.

The site is well-connected to the existing transportation network. Transit stops within a short walk of the site service several bus routes leading directly through Tsawwassen with connections to the rest of Delta, and Richmond, ultimately leading to the Canada Line SkyTrain. Sidewalks are present on both sides of the streets fronting the site, with direct walking connections east to Tsawwassen Town Centre. Several nearby attractions include Winskill Park, Brandrith Park, Dennison Park and South Delta Secondary School, which are also within 800m of the site. At present, there are limited cycling facilities in the vicinity of the site. Bike routes in the area include informal shared lanes on 53A Street and 12 Avenue. The Delta Cycling Master Plan also indicates 12 Avenue as a candidate location for future protected cycling facilities. While the project site plan does not currently indicate a protected bike lane on 12 Avenue, the Project Team is aware of this future consideration and are open to working toward envisioning how it could be appropriately accommodated at a later point in time.

The existing traffic operations analysis indicated that all study area intersections are currently operating within acceptable capacity parameters during the weekday AM and PM peak hour periods.

The net new trip generation for the proposed development is expected to be approximately 213 and 109 vehicle trips during the weekday AM and PM peak hour periods, respectively. This translates to about 2 to 4 vehicles added onto the road network every minute, on average, during the peak hour periods. Please note that this represents a highly conservative estimate as, for the purposes of analysis, additional factors such as pass-by and internal trip capture reductions were not applied.

The future traffic operations analysis indicated that all study area intersections are anticipated to continue operating within acceptable capacity parameters, with or without the proposed development. As such, infrastructure improvements are not required to accommodate the future traffic demands.

Bunt explored a sensitivity analysis examining the traffic operations the 12 Avenue site access with left turn vehicle movements into the site permitted. The results indicated that no delay, capacity, or queuing issues would be anticipated at the 12 Avenue access when westbound left turn movements into the site are permitted.

The Bylaw requirement for the proposed development is 148 spaces in total. The developer is proposing to provide 156 parking spaces, which meets the overall requirement.

In terms of the parking space allocation, the developer is planning to provide 42 parking spaces to meet the commercial requirement, and this includes 7 parking spaces to be shared with the residential visitor use. To ensure the parking allocation is adequate for each land use, Bunt conducted a Joint Use parking assessment using guidance from the Zoning Bylaw, which indicated that the maximum parking requirement for the commercial uses would be 35 spaces. As such, the proposed parking supply meets the requirement assuming 7 spaces in the surface parking lot are allocated for visitor use and the remaining 35 spaces are shared among the commercial uses on site.

Although not required by the Bylaw, the developer is proposing to provide one (1) passenger Pick-Up/Drop-Off (PUDO) space at the surface parking lot.

The Bylaw bicycle parking requirement is 77 spaces, and the developer is proposing to provide 80 spaces to meet the requirement.

The Bylaw requires 1 off-street loading space for the development, and the developer proposes to provide the required loading space at the southwest corner of the surface parking lot to meet this requirement.

The site design layout was reviewed in terms of vehicle circulation, and parking/loading/waste collection maneuvers using AutoTURN turning path analysis software. The results indicated that no maneuvering issues or conflicts are anticipated based on the site design.

5.2 Recommendations

That the City consider allowing left-turn vehicle movements into the site at the 12 Avenue site access based on the findings presented herein.

That the City consider allowing left-turn vehicle movements at the 53A Street site access based on the findings presented herein.

That the City of Delta consider acceptance of the Transportation Impact Assessment based on the analysis and findings presented herein.