755, 773 CORDOVA BAY ROAD & 5371 ALDERLEY ROAD

Traffic Impact Assessment

Kristen Bacler – A.Sc.T.
Transportation Technologist
Author

Kristen Machina, P.Eng.
Senior Transportation Engineer
Reviewer

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WATT VICTORIA
#302, 740 Hillside Avenue
Victoria, BC V8T 1Z4
(250) 388-9877

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1.0 INTRODUCTION

Watt Consulting Group was retained by *Aragon (Cordova Bay) Properties Ltd.* to conduct a Traffic Impact Assessment (TIA) for the proposed mixed-use development at 755, 773 Cordova Bay Road & 5371 Alderley Road in the District of Saanich. This study assesses the traffic impacts of the proposed land uses, reviews traffic conditions at key intersections, and assesses the need for any mitigation measures. The study reviews the existing traffic operations along with the post development and long-term conditions for all modes of transportation. The site location is illustrated in **Figure 1**.

1.1 The Site Today

The site is bound by Cordova Bay Road to the south, Fowler Road and a residential subdivision to the east, Alderley Road and single-family homes to the west, and undeveloped land and single-family homes to the north. South of Cordova Bay Road is the Ridge Golf Course and multi-family residential. To the west there are several commercial businesses, the Lakeview Christian School, the Children's Development Centre, and several churches.

The site today is the former Trio Gravel Pit, which is no longer operational.

755 Cordova Bay Road is currently zoned P-4 (Recreation and Open Space), 773 Cordova Bay Road is currently zoned SPL Split (RM-3TR), and 5371 Alderley Road is currently zoned M-2 (Wholesale, Warehouse and Office).

1.2 Proposed Development

The proposed development will have a mix of multi-family residential buildings (ranging between 3 and 11 storeys), totaling 1160 residential units. A mix of commercial uses are also planned to be provided on the east side of the site, with a GFA of up to 2,280 square metres. Two parks are proposed for the site. The proposed zoning is a Comprehensive Development Zone (CD).

1.3 This Report

This report is provided as part of the rezoning application being submitted to the District of Saanich. This report provides the following:

- An overview of the existing and evolving transportation context, including vehicular, pedestrian, cycling, and transit facilities, and area travel characteristics
- An overview of the proposed development and the transportation-related features of the proposed site plan
- A projection of the site's trip generation, distribution, and assignment potential
- An assessment of existing traffic patterns and volumes in the study area during the weekday morning and afternoon peak periods
- A review of the vehicular traffic volume changes that may occur in the area in the future due to growth in the surrounding area
- An operational assessment of vehicular traffic operations in the study area under existing, background, and post-development conditions

Figure 1 – Site Location

2.0 EXISTING CONDITIONS

2.1 Road Network

2.1.1 Existing Road Network

The existing road network, lane configuration, and intersection control within the study area are illustrated in **Figure 2**.

Highway 17 (Pat Bay Highway) is a divided, north-south highway (combination of arterial and expressway) under the jurisdiction of the Ministry of Transportation and Transit (MOTT). It extends between downtown Victoria in the south and the Swartz Bay Ferry Terminal in the north. Highway 17 generally has a four-lane cross section (two lanes in each direction) with turn lanes and acceleration lanes at key signalized intersections. On-street parking is not permitted on Highway 17. The posted speed limit is 80 km/h. Highway 17 is used for commuting, ferry terminal access, tourism, and access to residential, commercial, industrial, and community institutions across the Peninsula.

Cordova Bay Road runs in an east-west direction in the vicinity of the proposed development and turns north-south at Fowler Road. The road is under the jurisdiction of District of Saanich. The east-west portion of the road is classified as a residential road and the north-south portion is classified as a major road. It extends between Highway 17 in the northwest and Ash Road in the south, where it continues as Cedar Hill Road. Cordova Bay Road has a two-lane cross section (one lane in each direction) with a lane width of 3.0 metres. Sidewalk and curb and gutter are generally provided on the south side with the north side having no curb and gutter or paved shoulder. In the immediate vicinity of the site, there is no formal on-street parking; however, vehicles were observed parking on the north side of the street, which does not have a curb or sidewalk, opposite Sayward Hill Crescent and between Hill Rise Terrace and Alderley Road. The speed limit is 40 km/h, except for in the vicinity of the Children's Development Centre where there is a 30 km/h school zone. Cordova Bay Road is mainly used by residents, the educational institutions, the golf course, and commercial visitors in the area.

Sayward Road is an east-west major road under the jurisdiction of the District of Saanich. It extends between Fowler Road in the east, and Highway 17 in the west. Sayward Road has a two-lane cross section (one lane in each direction) with a lane width of 3.4 metres. The north side of the street has a curb, and the south side of the street has a mix of paved/gravel/grass shoulders. The shoulder on Sayward Road is between 0.5-1.0 metres in width and is too narrow for street parking. The speed limit is

50 km/h. Sayward Road is mainly used by area residents, for access to the educational institutions, and commercial along Cordova Bay Road.

Alderley Road is a north-south residential road under the jurisdiction of the District of Saanich. It extends between Cordova Bay Road in the south and ends north of Sayward Road. Alderley Road has 4.5m of asphalt with no centre line that permits two-way traffic. Two passenger vehicles are able to pass each other at slow speeds but may require larger vehicles to yield on the shoulder. On-street parking is not permitted on either gravel/soil shoulder of the road, except in short areas where room permits at the beginning of the road and at driveways. The speed limit is 50 km/h. Alderley Road is mainly used for residential traffic.

Fowler Road is a north-south major road under the jurisdiction of the District of Saanich. It extends between Cordova Bay Road in the south and Sayward Road / Hunt Road in the north. Fowler Road has a two-lane cross section (one lane in each direction) with a lane-width of 4.0metres. On-street parking occurs on the shoulders of the road where space permits and where no bicycle lanes exist. The speed limit is 50 km/h. Fowler Road is mainly used by area residents, for access to the educational institutions, and commercial along Cordova Bay Road.

Hunt Road is a north-south residential road under the jurisdiction of the District of Saanich. It extends between Fowler Road in the south and Dooley Road in the north. Hunt Road has a two-lane cross section (one lane in each direction) with a lane-width of 3.0 metres and paved shoulders at the beginning of the road with gravel/grass shoulders on the majority of the road. The shoulders are narrow (0.5 metres) in sections, but if space permits vehicles can park on the shoulder. Hunt Road is mainly used for residential and agricultural traffic.

Six intersections are included within the study area:

Highway 17 / Cordova Bay Road is a three-leg right in / right out yield-controlled intersection that intersects with Highway 17. The northbound and southbound approaches are free flow, and the westbound approach is yield-controlled. The northbound approach has a channelized right turn lane. Curb depressions are provided for pedestrians, but crosswalks at the intersection are not signed or marked.

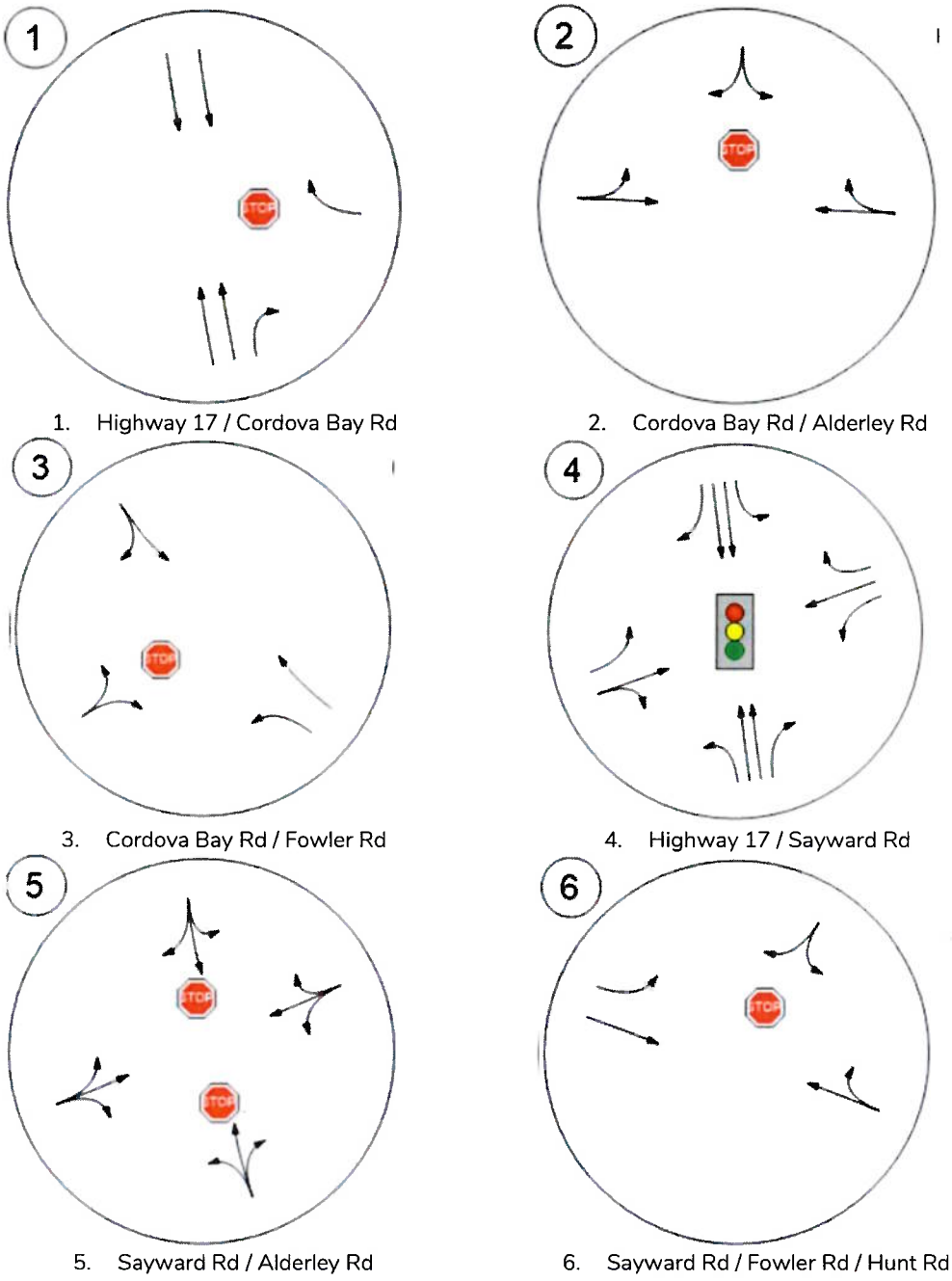
Cordova Bay Road / Alderley Road is a three-leg, stop-controlled intersection with stop control on Alderley Road (southbound). There are no signed and marked crosswalks at the intersection.

Cordova Bay Road / Fowler Road is a three-leg, stop-controlled intersection. The northbound and southbound approaches are free flow, and the eastbound approach (Cordova Bay Road) is stop-controlled. There is a left turn lane on the south leg of the intersection for vehicles to turn left onto Cordova Bay Road. There is a marked crosswalk provided on the west leg of the intersection (crossing Cordova Bay Road).

Highway 17 / Sayward Road is a four-leg, signalized intersection. Left turn lanes are provided in all directions. Right turn lanes are provided in all directions but eastbound. Westbound right turning traffic has an acceleration lane to continue northbound on Highway 17. Two through lanes are provided in both directions on Highway 17, with a third through lane in the northbound direction dedicated for bus traffic only. There are crosswalks provided on all legs of the intersection and across the channelized right turns on the east leg of the intersection.

Sayward Road / Alderley Road is a four-leg, stop-controlled intersection. The eastbound and westbound approaches are free flow, and the northbound and southbound approaches are stop-controlled. There are no signed and marked crosswalks at the intersection.

Sayward Road / Fowler Road / Hunt Road is a three-leg, stop-controlled intersection. The eastbound and northbound approaches are free flow as Fowler Road curves into Sayward Road. The eastbound approach (Hunt Road) is stop-controlled. The west leg (Sayward Road) has a left turn lane to turn onto Hunt Road. There is a signed crosswalk across Hunt Road.



1. Highway 17 / Cordova Bay Rd
2. Cordova Bay Rd / Alderley Rd
3. Cordova Bay Rd / Fowler Rd
4. Highway 17 / Sayward Rd
5. Sayward Rd / Alderley Rd
6. Sayward Rd / Fowler Rd / Hunt Rd

Figure 2 – Existing Road Network

2.1.2 Evolving Road Network

The District of Saanich would like the project to encourage residents to walk and bike via the active transportation routes to the Highway 17 / Sayward Road intersection. To support this traffic calming measures are recommended on Alderley Road. The recommended traffic calming measures are as follows:

- Speed Humps/Table
- Speed Display Device
- Speed Reduction to 30km/h

Cordova Bay Road frontage improvements will be completed as follows.

- 2.0 m concrete sidewalk
- 0.3 m hardscape buffer
- 2.0 m westbound bike lane
- 2.0 m boulevard (no parking)
- 3.3 m westbound travel lane
- 3.3 m eastbound travel lane
- 0.6 m buffer
- 1.8 m eastbound bike lane

Frontage improvements on Cordova Bay Road will be extended to Alderley Road in collaboration with the District of Saanich. Between Hillrise Terrace and Alderley Road a small section of Cordova Bay Road will have a 2.3m parking layby with a 0.9m buffer and the bike lane will be constrained to 1.5m.

The Highway 17 / Sayward Road intersection has been identified as a potential candidate for conversion to a grade-separated interchange in Urban Systems' 2014 Highway 17 Planning Study report. The report identified the Cordova Bay / Sayward section of the Highway to be the second highest segment along the entire highway for collision rate (collisions per million vehicle kilometres).

2.2 Transit Network

2.2.1 Existing Transit Network

The existing transit network in the vicinity of the site is illustrated in **Figure 3**.

Route 32 – Cordova Bay / Royal Oak Exchange operates between Downtown Victoria and Sayward Road / Highway 17, with key stops at the Royal Oak Exchange, Mayfair Mall, and the Uptown Shopping Centre. The closest stop is on the west end of site's frontage at Cordova Bay / Hill Rise. Buses operate at 30-to-60-minute headways on weekdays, and 60-minute headways on weekends.

The bus stops on Cordova Bay Road are signed only with no other amenities provided at the stop. This stop is not accessible as there is no bus stop pad provided; however, the road and sidewalk are at the same elevation. Improvements to the bus stop as part of the frontage improvements to provide a shelter, bench, and trash can are recommended.

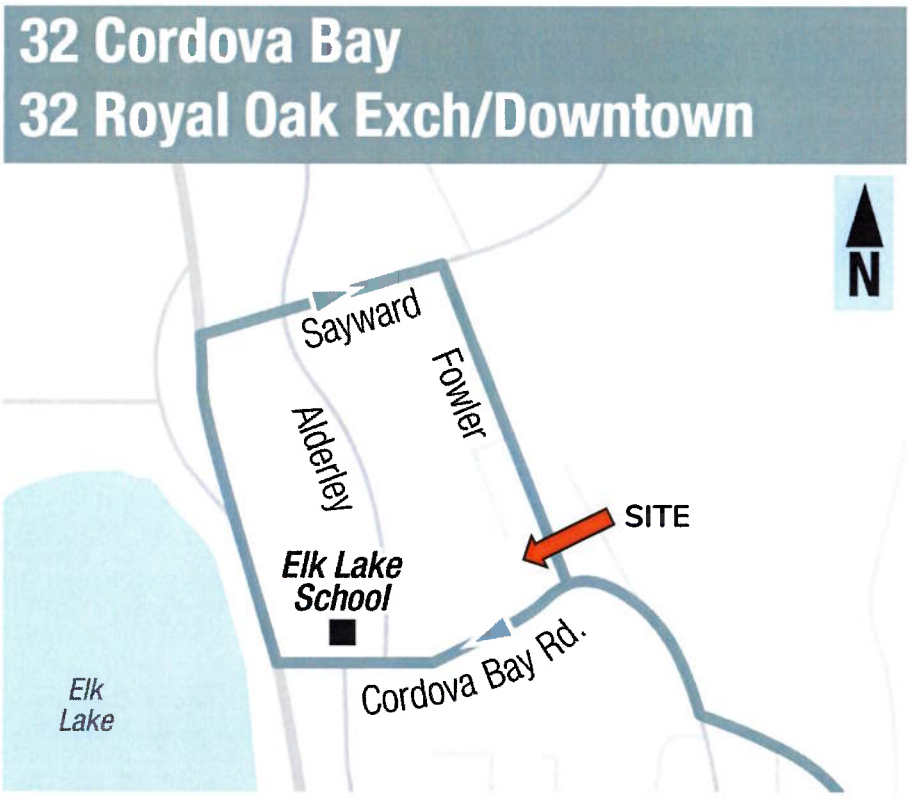


Figure 3 – Existing Transit Network

2.2.2 Evolving Transit Network

BC Transit is collaborating with municipal, regional, and provincial partners to develop the Regional RapidBus Implementation Strategy. RapidBus routes are planned to operate two-ways, 18-20 hours per day, 7 days a week. Phase 2 includes the Peninsula Line which will run from Swarz Bay to Victoria's Downtown Core with frequencies of 15 minutes or less. The closest stop to the site will be at Highway 17 at Sayward Road, which can be reached by riding the route 32 bus to Highway 17 at Sayward.

The evolving transit network in the area of the site is illustrated in **Figure 4**.

Figure 4 – Evolving Transit Network

2.3 Cycling Network

2.3.1 Existing Cycling network

The existing cycling network in the vicinity of the site is illustrated in **Figure 5**.

The Lochside Regional Trail is close by (within 200 metres of the site) and can be accessed from Lochside Drive just off Cordova Bay Road, or via Hunt Road.

The east-west portion of Cordova Bay Road does not have bike lanes; however, portions of the roadway are wide enough such that vehicles may pass cyclists who are close to the edge of the roadway. Sporadic portions of the roadway have an asphalt pathway delineated from vehicle traffic, but it is unclear if these are intended for cyclists, pedestrians, or mixed-use, as they are quite narrow. The north-south portion of Cordova Bay Road has on-street painted bike lanes.

Alderley Road has no bike lanes.

The majority of Sayward Road has no bike lanes, except for a short 120 metre portion on the Fowler Road end that has on-street painted bike lanes. There is an asphalt pathway on the north side of Sayward Road on the western shared use portion that is likely used by cyclists, though it is unclear if this pathway is intended for cyclist use.

Fowler Road has painted bike lanes in the vicinity of Hunt Road on both sides of the road. The bike lanes on the east side of the road terminate adjacent to the south end of Fowler Park. Bike lanes on the west side of the road terminate approximately 120 metres south of Hunt Road. On the southern portion of the road, cyclists must bike in the roadway or on the shoulders.

There are no bike lanes on Highway 17; cyclists may use the paved shoulders.

A paved shoulder is provided on the south side of Hunt Road up to the Lochside Trail. Beyond the Lochside Trail, the road and shoulders narrow substantially, and cyclists must travel in the roadway.

2.3.2 Evolving Cycling Network

The January 2024 Active Transportation Plan includes cycling facilities suitable for all ages and abilities (AAA) along the full length of Sayward Road and adding Fowler Road to the bike network (but not as a AAA facility) as a medium-term project (i.e., by 2040). Cordova Bay Road (from Alderley Road to Fowler Road) and Alderley Road will also be part of the bicycle network by 2050, but not to the AAA standard. To improve

connectivity to Lochside Trail, Cordova Bay Road, from Fowler Road to Lochside Drive, will be improved to provide AAA cycling facilities in collaboration with the District of Saanich under an Excess Services arrangement. The evolving cycling network in the vicinity of the site is illustrated in **Figure 6**.

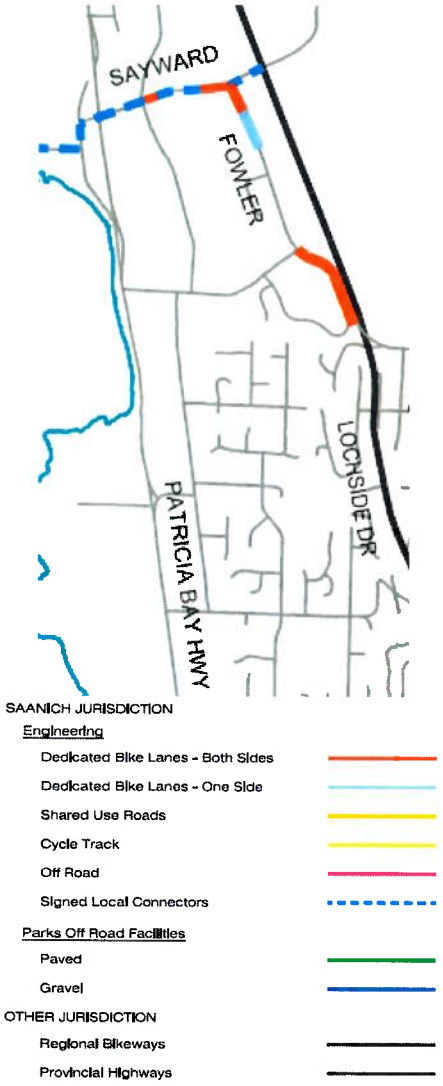


Figure 5 – Existing Cycling Network

Figure 6 - Evolving Cycling Network

2.4 Pedestrian Network

2.4.1 Existing Pedestrian Network

Portions of Cordova Bay Road have an asphalt pathway separated by an extruded asphalt curb along the north side of the road between Highway 17 and Alderley Road. East of Alderley Road the asphalt pathway switches to the south side of the road and 40 metres further east, a concrete sidewalk is provided that continues to the intersection with Fowler Road where Cordova Bay Road turns south. The bus stop on the site's frontage on Cordova Bay Road does not have an adjacent sidewalk. Along the frontage of the Ridge Golf Course, the sidewalk is physically separated from the road by a landscaped buffer. The sidewalk continues along the west side of Cordova Bay Road south of the Fowler Road intersection.

There are no sidewalks provided on Alderley Road.

Sidewalks along Sayward Road are fragmented; a concrete sidewalk is provided along the north side of the road for approximately 80 metres east of the Highway 17 intersection. The sidewalk turns into an asphalt pathway separated by an extruded asphalt curb up to a point approximately 120 metres west of Hunt Road, where a concrete sidewalk is provided on both sides of the road up to Hunt Road.

Fowler Road has concrete sidewalks in the vicinity of Hunt Road on both sides of the road. The sidewalks on the east side of the road terminate adjacent to the south end of Fowler Park. Sidewalks on the west side of the road terminate approximately 120 metres south of Hunt Road. A sidewalk on the west side of the road is provided south of Menawood Place. Gravel shoulders along the remainder of Fowler Road are generally wide enough for pedestrian travel.

Hunt Road has sidewalk on both sides of the road for a very short 10 metre section east of the intersection with Fowler Road.

2.4.2 Evolving Pedestrian Network

The January 2024 Active Transportation Plan includes a sidewalk on at least one side of the road along the full length of Sayward Road and Fowler Road as medium-term projects (i.e., by 2040).

The District of Saanich has requested that the existing mid-block crosswalk be removed, and new crosswalks be installed on Cordova Bay Road at the intersections with Sayward Hill Crescent, Hill Rise Terrace, and Alderley Road. *The Pedestrian*

Crossing Control Manual for British Columbia (MOTT) specifies that zebra markings be used at unsignalized intersections, sidewalks be in place to reach the crosswalk, and that the appropriate stopping sight distance (SSD) be maintained where a crosswalk is being considered. All three intersections possess the minimum SSD of 50 metres and have an Average Daily Traffic of 1740-1790 vehicles/weekday. The recommended crosswalk is a pedestrian crossing (signed and marked). All crosswalks are recommended to have a 30-metre stopping prohibition on approach and 15 metres following the crosswalk, with a 30-metre passing restriction (single yellow centreline) required.

The crosswalks at Cordova Bay Road / Sayward Hill Crescent and Cordova Bay Road / Hill Rise Terrace shall have back-to-back PS-003-LR signs and zebra markings. It is also recommended to have advance warning signs (PS-002-LR) and overhead lighting due to grades and curves in the road limiting visibility.

At the intersection of Cordova Bay Road / Alderley Road there is a daycare on the northwest corner and a school close by. The recommended back-to-back sign is the school crosswalk sign (PS-005-LR) and the school crosswalk ahead (PS-004-LR) for the advance warning sign. A 6.0 m x 2.5 m white X should be painted on the roadway in advance of the crosswalk. Vegetation on the northeast corner of Cordova Bay Road / Alderley Road will need to be removed to create better visibility for crossing parents and children from the daycare.

The Pedestrian Crossing Control Guide (TAC) was also consulted to ensure crossing treatment is correct. The Treatment Selection Matrix seen in **Figure 7** shows the recommended treatment is for ground mounted (GM) treatment. Recommendations from the MOTT guidelines are appropriate.

Average Daily Traffic	Speed Limit [2] (km/h)	Total Number of Lanes [1]				
		1 or 2 lanes	3 lanes (two-way)	3 lanes (one-way)	2 or 3 lanes/direction w/ raised refuge	2 lanes/ direction w/o raised refuge
1,500 < ADT ≤ 4,500	≤ 50	GM	GM	GM	GM	GM+
	60	GM+	GM+	OF	RRFB or OF [3]	RRFB
	70	RRFB	RRFB	OF	OF	OF
4,500 < ADT ≤ 9,000	≤ 50	GM	GM	GM	GM	RRFB
	60	GM+	GM+	OF	RRFB or OF [3]	OF
	70	RRFB	OF	OF	OF	TS
9,000 < ADT ≤ 12,000	≤ 50	GM	RRFB	OF	RRFB or OF [3]	OF
	60	RRFB	RRFB	OF	RRFB or OF [3]	TS
	70	OF	OF	OF	TS	TS
12,000 < ADT ≤ 15,000	≤ 50	RRFB	RRFB	OF	RRFB or OF [3]	OF
	60	RRFB	OF	OF	RRFB or OF [3]	TS
	70	OF	TS	TS	TS	TS
> 15,000	≤ 50	RRFB	OF	OF	RRFB or OF [3]	TS
	60	RRFB	TS	TS	TS	TS
	70	OF	TS	TS	TS	TS

Figure 7 – TAC Treatment Selection Matrix

2.5 Area Travel Characteristics

2.5.1 Existing Area Travel Characteristics

The 2022 CRD Household Travel Survey provides information on area travel characteristics for Greater Victoria. **Table 1** outlines the mode share for Saanich North.

Table 1 – Existing Mode Share for Saanich North

Mode	AM Peak	PM Peak
Auto Driver	71%	69%
Auto Passenger	14%	19%
Transit	9%	3%
Bicycle	4%	4%
Walk	0%	1%
Other	3%	4%

Notes: Travel mode split calculation based on overall number of trips to, from, and within district.

2.5.2 Evolving Area Travel Characteristics

The District of Saanich's Active Transportation Plan (2018) identifies mode share targets to reduce GHG emissions and energy use. **Table 2** outlines Saanich's mode share for 2011 and the targets for 2036 and 2050.

Table 2 – Saanich Mode Share Targets

Mode	2036	2050
Auto	64%	50%
Transit	14%	20%
Bicycle	10%	13%
Walk	12%	17%

Shifting trips away from vehicular travel and toward transit and active transportation options will help to reduce congestion on the roads and will improve the expected long-term conditions for the road network.

3.0 PROPOSED DEVELOPMENT

The proposed site will have a mix of commercial uses, multi-family mid- and high-rise residential buildings including strata and affordable housing, and single-family homes including semi-detached duplexes and townhouses. The key land uses, and transportation-related elements of the proposed site plan are summarized in **Table 3**. The current site plan is provided in **Appendix A**.

Table 3 – Development Proposal

Site Element	**Details**		
Residential	Townhouse	Strata	70 units
	Mid-rise	Non- / Below-Market Rental	116 units
	Mid-rise	Market Rental	174 units
	Mid-rise	Strata	800 units
	Total		**1160 units**
Commercial	2,280 square metres (24,542 square feet)		
Vehicular Access	3 full movement access points on Cordova Bay Road		

Notes:
1. Based on architectural plans prepared by D'Ambrosio Architecture + Urbanism, dated June 12, 2025.

3.1 Site Access

Three full movement vehicular accesses to the site are proposed:

Cordova Bay Road / East Hill Crescent Access

This driveway is located approximately 60 metres west of the Cordova Bay Road / Fowler Road intersection.

Cordova Bay Road / Sayward Hill Crescent / Cordova Hill Road Access

This driveway is located approximately 170 metres west of the Cordova Bay Road / Fowler Road intersection across from the Sayward Hill Crescent intersection.

Cordova Bay Road / Hill Rise Terrace / West Hill Crescent Access

This driveway is located approximately 340 metres east of the west of the Cordova Bay Road / Fowler Road intersection and opposite Hill Rise Terrace.

3.2 Sight Distance

To safely make a left or right turn from a stop on a two-lane road with a speed limit of 50 km/h and a grade of 3% or less on the minor road the Transportation Association of Canada's (TAC) *Geometric Design Guide (2017)* requires 105 metres of sight distance looking left and right for a left turn and 95 metres of sight distance looking left for a right turn. Sight distance analysis for the site accesses is summarized in **Table 4.**

Table 4 – Sight Distance Analysis for Site Accesses

Site Access	Turn Movement (from a stop)	Looking Direction	Required Sight Distance (m)	Measured Sight Distance (m)	Sight Distance Requirement Met?
East Hill Crescent Access	Left	Left	105 (for 50km/h)	105	Yes
		Right	105 (for 50km/h)	>105	Yes
	Right	Left	95 (for 50km/h)	105	Yes
Cordova Hill Road Access	Left	Left	105 (for 50km/h)	>105	Yes
		Right	105 (for 50km/h)	105	Yes
	Right	Left	95 (for 50km/h)	>105	Yes
West Hill Crescent Access	Left	Left	105 (for 50km/h)	>105	Yes
		Right	105 (for 50km/h)	105	Yes
	Right	Left	95 (for 50km/h)	>95	Yes

All three accesses into the development meet the intersection sight distance requirements vertically. The developer will need to ensure to leave clear sight lines at the corners of the accesses to meet horizontal sight line clearance as well.

3.1 Vehicular Parking

3.1.1 Vehicular Parking Requirements

Refer to the accompanying Parking Study for required vehicle parking requirements.

3.1.2 Proposed Vehicular Parking Supply

The site is proposed to have 1,728 parking spaces across all development areas of the site. For further details, see the accompanying Parking Study.

3.2 Bicycle Facilities for Internal Road Network

To encourage residents to use active transportation to reach transit stops along the highway, bicycle lanes shall be included on the internal site roads. Based on the conceptual rural classifications in the *British Columbia Active Transportation Design Guide (2019)* the development is best described as a developed rural core which is treated as urban in the case of bike lanes. The District of Saanich policy is supportive of AAA (appropriate for all ages and abilities) cycling facilities. As such, a protected bike lane is preferred. The *British Columbia Active Transportation Design Guide (2019)* recommends a width of 2.5 metres (1.8 metres if constrained) with a 0.9 metre buffer (0.6 metres if constrained) for protected unidirectional bike lanes.

4.0 TRAFFIC VOLUMES

4.1 Traffic Analysis Scenarios and Time Periods

Traffic operations analysis has been undertaken during the weekday AM and PM peak periods under the following scenarios:

- Existing Conditions
- Opening Day (2030) Background Conditions
- Opening Day (2030) Post-Development Conditions
- 10 Year Post-Buildout (2040) Background Conditions
- 10 Year Post-Buildout (2040) Post-Development Conditions

While buildout of the proposed development is planned to be completed in 4 phases over an extended period, for the purposes of analysis, this study reviews full buildout of the development within 5 years of this study, and 10 years beyond that. The 2030 horizon year is hereafter referred to as Opening Day, and the 2040 horizon year is hereafter referred to as 10-year post-buildout.

4.2 Existing Traffic Volumes

Turning movement volumes for the study intersections were established for the weekday AM and PM peak periods based on the counts summarized in **Table 5**. Corridor growth was applied to bring volumes to current traffic volumes for 2025. The existing 2025 traffic volumes for the weekday AM and PM peak periods are illustrated in **Figure 8** and **Figure 9**, respectively.

Table 5 – Existing Turning Movement Counts

Intersection	Count Date	Time Period	Source
Highway 17 / Cordova Bay Road	Thursday Sept. 7, 2023	8:00 – 9:00 AM	WATT
	Wednesday Sept. 6, 2023	4:00 – 5:00 PM	
Cordova Bay Road / Alderley Road	Tuesday Sept. 12, 2023	8:00 – 9:00 AM	
	Tuesday Sept. 12, 2023	4:00 – 5:00 PM	
Cordova Bay Road / Fowler Road	Tuesday Sept. 12, 2023	8:00 – 9:00 AM	
	Tuesday Sept. 12, 2023	4:00 – 5:00 PM	
Highway 17 / Sayward Road	Thursday Sept. 7, 2023	8:00 – 9:00 AM	
	Wednesday Sept. 6, 2023	4:00 – 5:00 PM	
Sayward Road / Alderley Road	Tuesday Sept. 12, 2023	8:00 – 9:00 AM	
	Tuesday Sept. 12, 2023	4:00 – 5:00 PM	
Sayward Road / Fowler Road / Hunt Road	Thursday Sept. 7, 2023	8:00 – 9:00 AM	
	Wednesday Sept. 6, 2023	4:00 – 5:00 PM	

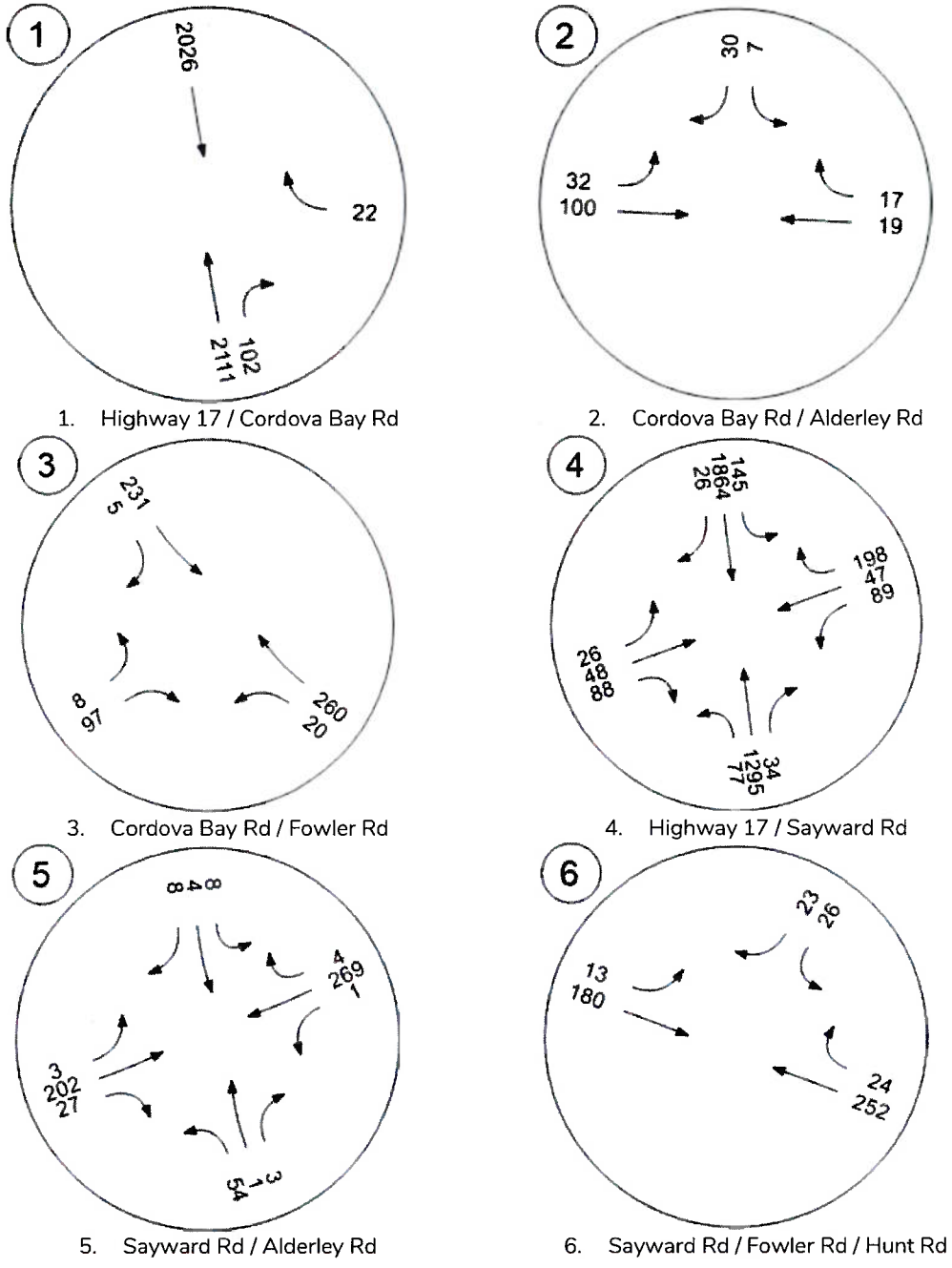


Figure 8 – Existing Traffic Volumes – AM Peak Hour

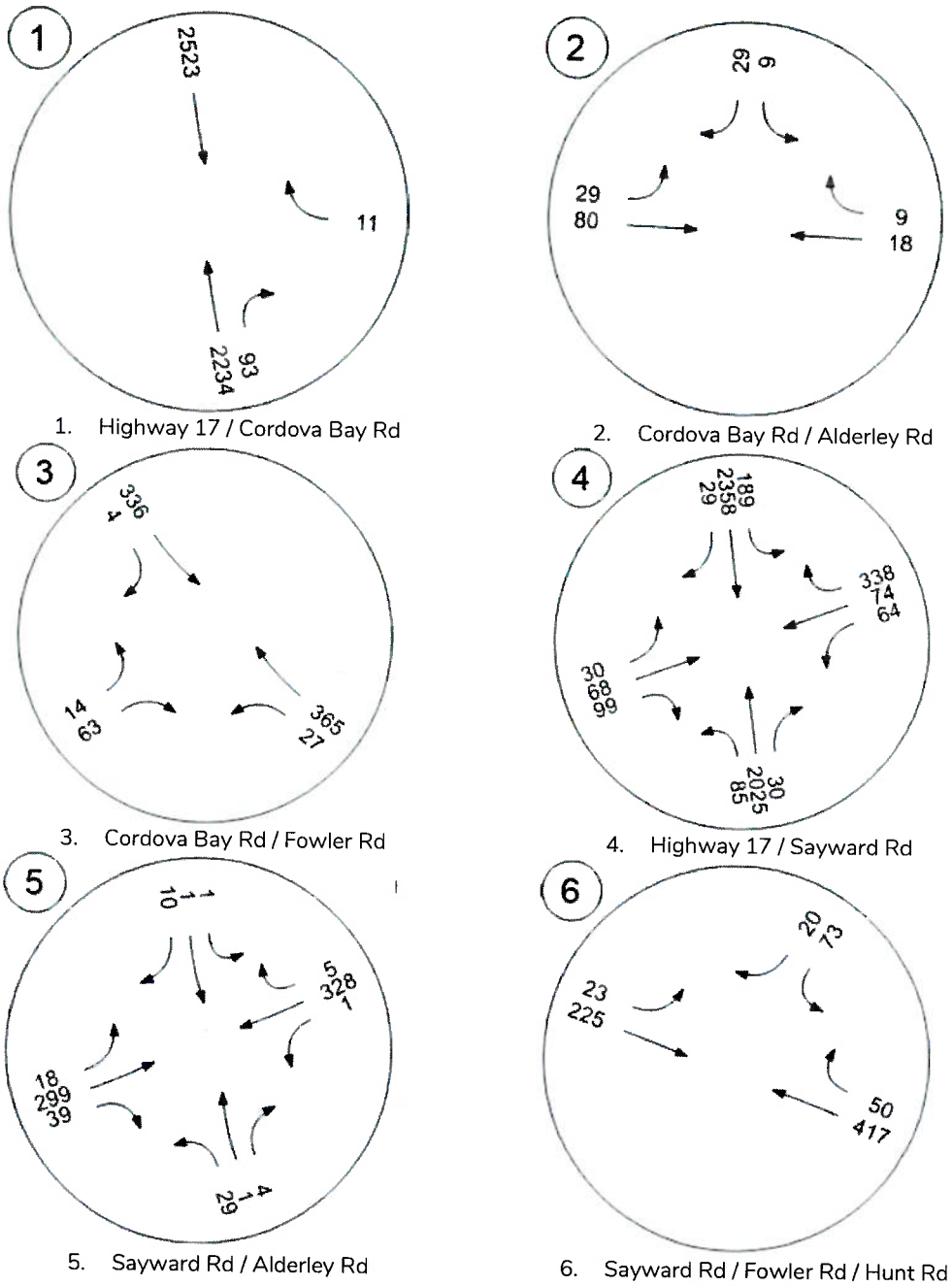


Figure 9 – Existing Traffic Volumes – PM Peak Hour

4.3 Background Traffic Volumes

4.3.1 Corridor Growth

Corridor growth on all streets in the study area was forecast using a 1.0% annual linear growth rate applied to the observed volumes from 2023 to the 2030 and 2040 horizon years.

4.3.2 Concurrent Developments

No concurrent background developments in the surrounding area were identified at the time of writing.

4.3.3 Background Traffic Volumes

Background traffic volumes are the sum of existing traffic volumes and corridor growth. Background traffic volumes for opening day and the 2040 horizon year are illustrated in **Figure 10**, **Figure 11**, **Figure 12**, and **Figure 13**, respectively.

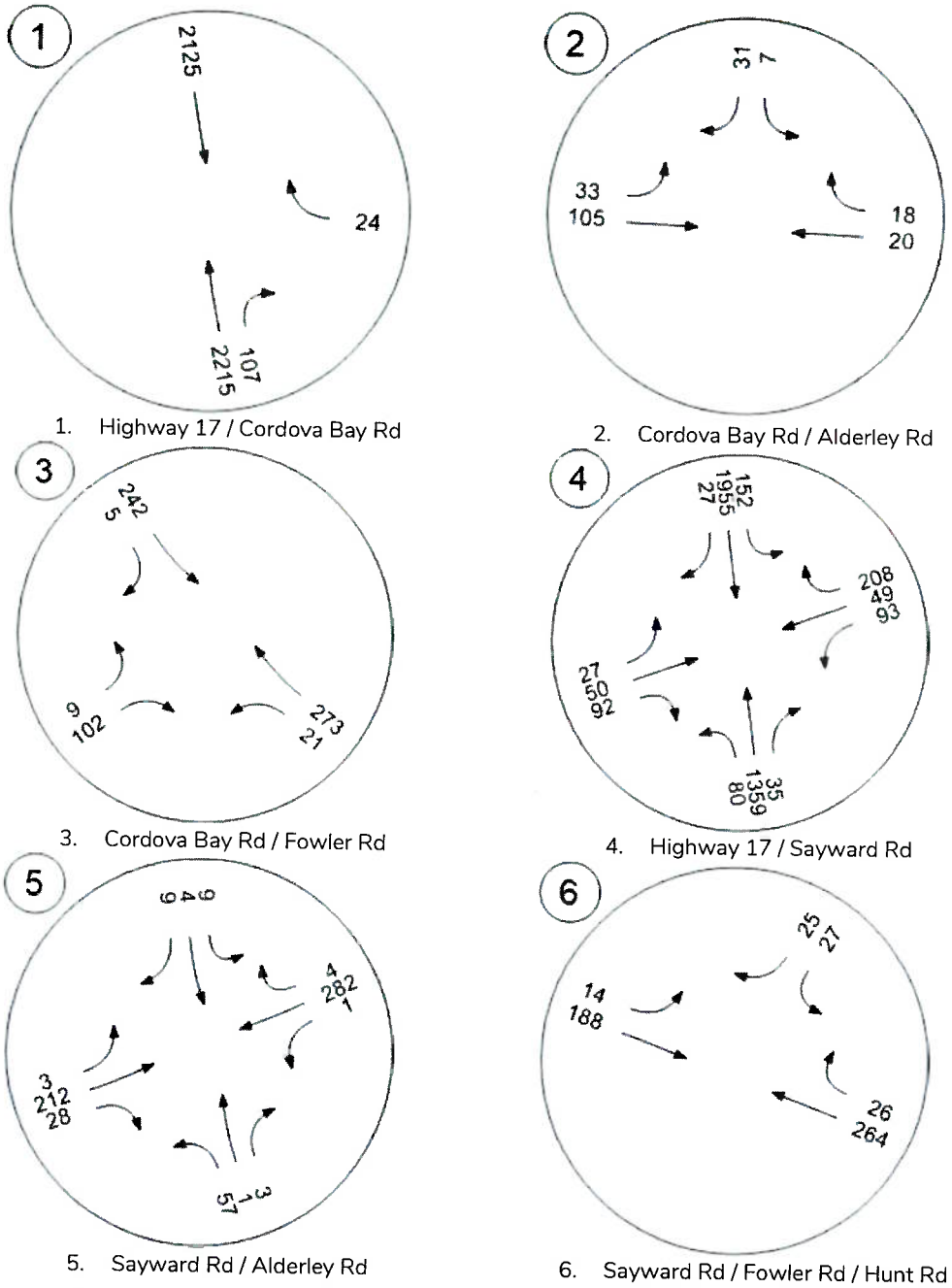


Figure 10 – Opening Day Background Traffic Volumes – AM Peak Hour

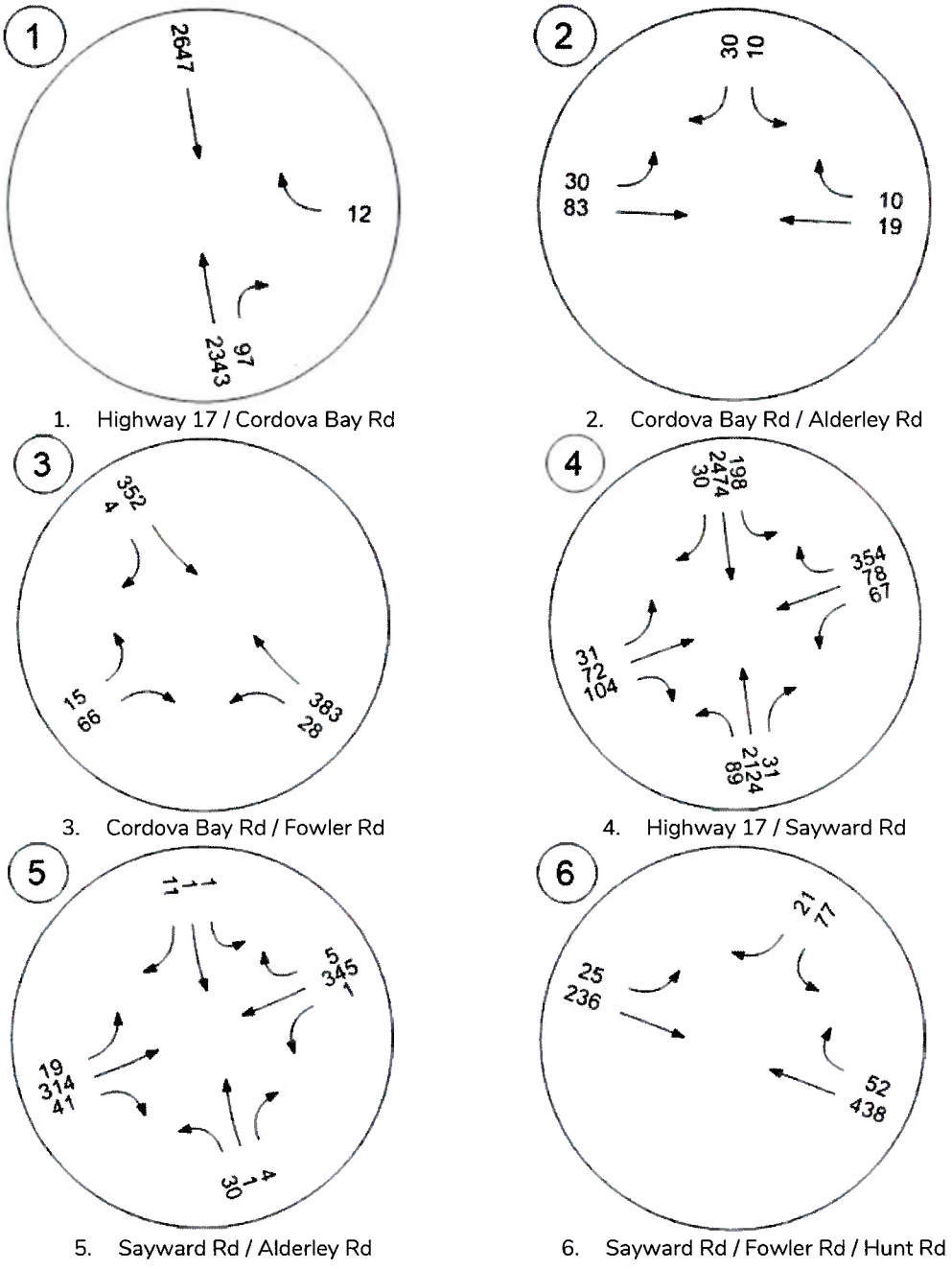


Figure 11 – Opening Day Background Traffic Volumes – PM Peak Hour

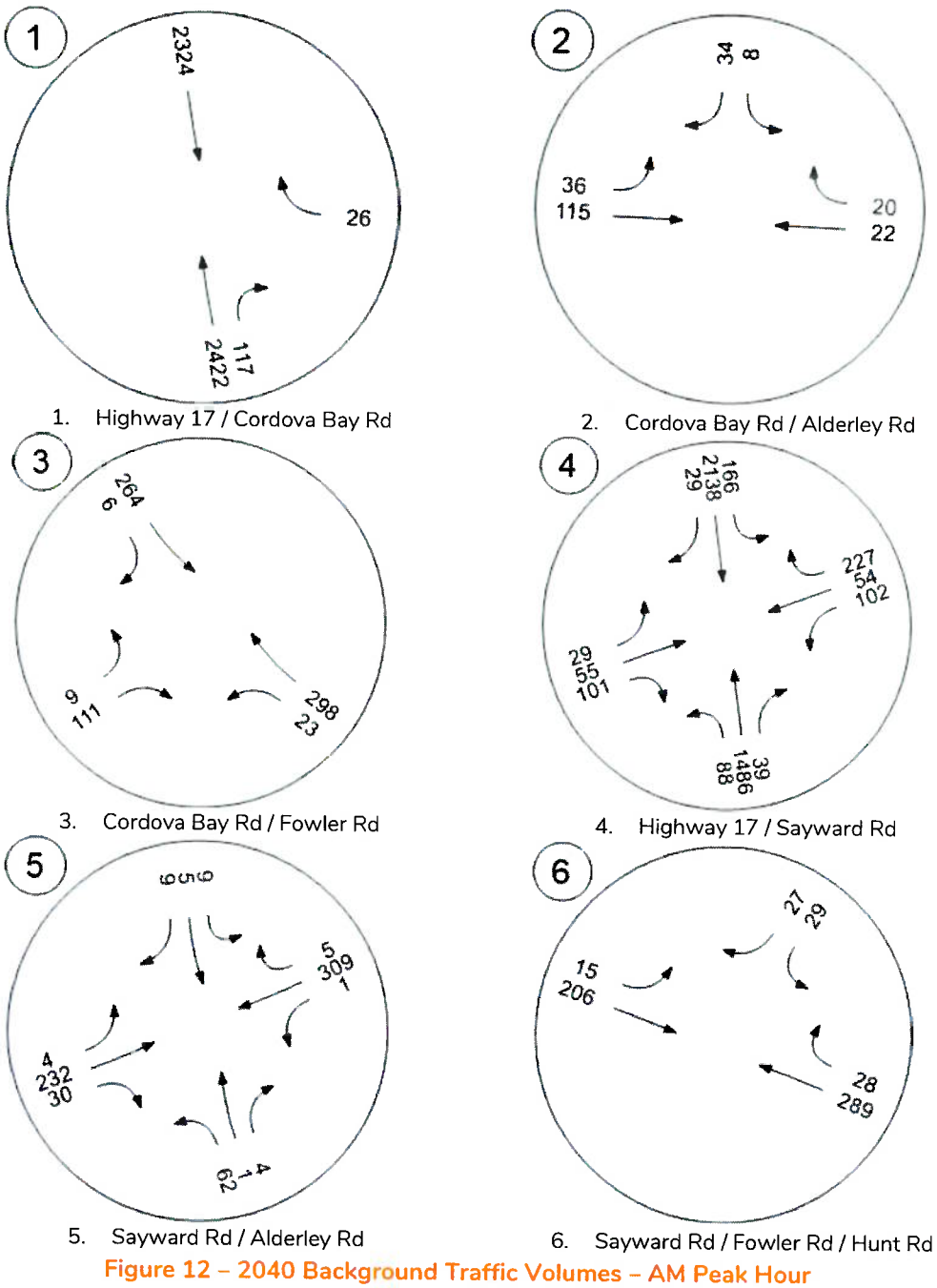


Figure 12 – 2040 Background Traffic Volumes – AM Peak Hour

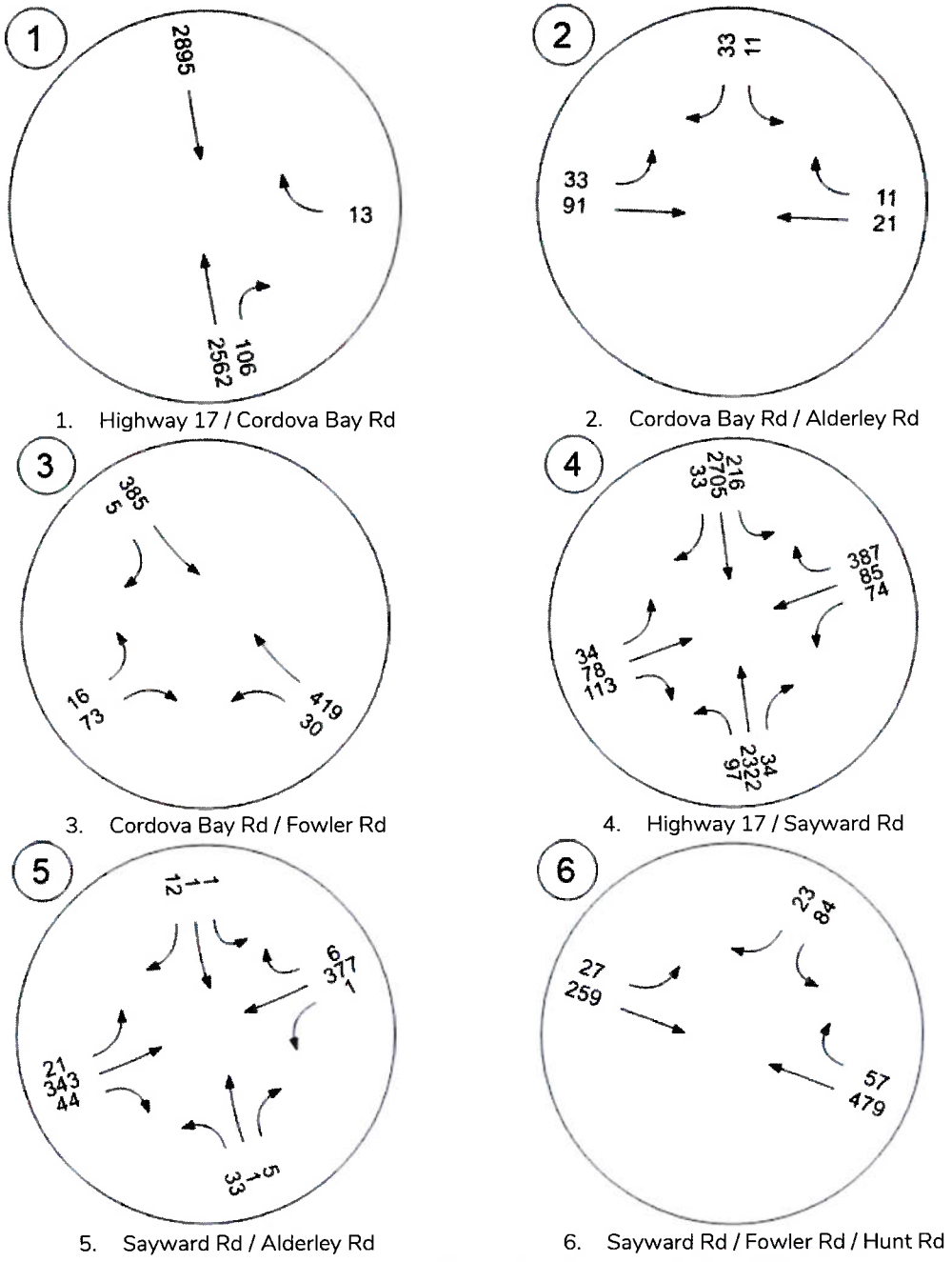


Figure 13 – 2040 Background Traffic Volumes – PM Peak Hour

4.4 Site Traffic Volumes

4.4.1 Existing Trips

The Trio Gravel Pit currently occupying the site is no longer in operation. As such, no existing trips were removed from the site.

4.4.2 Trip Generation

Residential trip generation was based on a previous version of the site plan that included 1179 units (19 additional units relative to the current site plan).

Commercial trip generation was based on a previous version of the site plan that included 20,250 square feet (1,881 square metres) of commercial GFA (4,292 square feet / 400 square metres less than the current site plan). The current site plan does not specify an exact GFA for each commercial use to allow for flexibility as each development area is planned in detail. As such, the commercial trip generation potential of the site is an approximation at this time. The commercial uses studied for the purposes of trip generation include childcare, café, office, and medical office. Personal services, restaurant, and commercial retail are also permitted on the site.

Vehicular trip generation rates for the proposed mixed-use development are generally based on the ITE Trip Generation Manual (11th Edition). The coffee shop rate is based on the café land use from the Trip-Generation rates for Urban Infill Land Uses in California report prepared for the California Department of Transportation (June 2009), as the ITE rate does not consider neighbourhood coffee shops where trips are generally based on walking/cycling rather than driving to a destination for coffee.

The trip generation forecast for the site is provided in **Table 6**, **Table 7**, and **Table 8**. The proposed development is forecast to generate 572 new two-way trips in the AM peak hour and 567 new two-way trips in the PM peak hour.

Table 6 –Site Trip Generation - Residential

Use	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE Trip Generation Manual 11th Edition Rates						
Multifamily Housing (Mid-Rise) (General Urban/Suburban) (ITE LU 221)[1] (4-10 storeys)	0.09	0.28	0.37	0.24	0.15	0.39
Multifamily Housing (High-Rise) (General Urban/Suburban) (ITE LU 222)[1] (10+ storeys)	0.07	0.20	0.27	0.20	0.12	0.32
Single-Family Attached (General Urban/Suburban) (ITE LU 215)[1]	0.12	0.36	0.48	0.34	0.23	0.57
Affordable Housing (Income Limits) (ITE LU 223)[1]	0.145	0.355	0.50	0.27	0.19	0.46
Vehicular Trip Generation						
Mid-Rise - 572 units	49	163	212	136	87	223
High-Rise – 208 units	15	41	56	41	26	67
Attached - 68 units	8	25	33	23	16	39
Affordable - 331 units	48	118	166	90	62	152
Total	**120**	**347**	**467**	**290**	**191**	**481**

Notes:
1. Trip rates are per dwelling unit

Table 7 - Site Trip Generation - Commercial

Use	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE Trip Generation Manual 11th Edition Rates						
Day Care Center[1] [2] (ITE LU 565)	5.83	5.17	11	5.23	5.89	11.12
Single Tenant Office Building[1] [2] (ITE LU 715)	1.65	0.20	1.85	0.26	1.50	1.76
Coffee Shop[1] (ITE Caltrans)	8.95	8.94	17.89	3.92	3.95	7.85
Medical-Dental Office Building[1] [2] (ITE LU 720)	2.45	0.65	3.10	1.18	2.75	3.93
Vehicular Trip Generation						
Day Care – 4400 sq. ft.	26	22	48	23	26	49
Office – 9500 sq. ft.	16	2	18	3	14	17
Café – 3350 sq. ft.	30	30	60	13	13	26
Medical Office – 3000 sq. ft.	7	2	9	4	8	12
Total	**79**	**56**	**135**	**43**	**61**	**104**

Notes:
1. Trip rates are per 1000 sq. ft. (GFA)
2. General Urban/Suburban context

Table 8 – Trip Generation Totals

Use	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Total Residential	120	347	467	290	191	481
Total Commercial	79	56	135	43	61	104
Total Trips Generated	**199**	**403**	**602**	**333**	**252**	**585**

4.4.3 Internal Trip Reduction

It is assumed that residents of the development will patronize the commercial businesses on the site without the use of a vehicle. This reduces the overall expected number of vehicular trips. The National Cooperative Highway Research Program (NCHRP) method was used to account for these internal trips and reduce the overall external vehicle trips. The internal trip reduction is summarized below in **Table 9**.

Table 9 – Internal Trip Generation After Trip Reduction

Use	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
NCHRP Internal Capture Reduction						
All Vehicle Trips	199	403	602	333	252	585
Internal Capture Percentage	5%	5%	5%	3%	3%	3%
Trips Reduced	-10	-20	-30	-10	-8	-18
External Vehicle Trips	**148**	**360**	**572**	**323**	**244**	**567**

4.4.4 Trip Distribution and Assignment

The trip distribution pattern for site traffic was established based on existing traffic patterns and key origin/destinations in the region. The distribution of inbound and outbound traffic adopted for the proposed development is outlined in **Table 10**.

Table 10 – Site Traffic Distribution

Street	Direction	AM & PM
Highway 17	North	25% In / 25% Out
	South	55% In / 25% Out
Cordova Bay Road	South	20% In / 50% Out

The site traffic volumes assigned to the area road network are illustrated in **Figure 14** and **Figure 16.** The site access traffic volumes assigned to the accesses are illustrated in **Figure 15** and **Figure 17.**

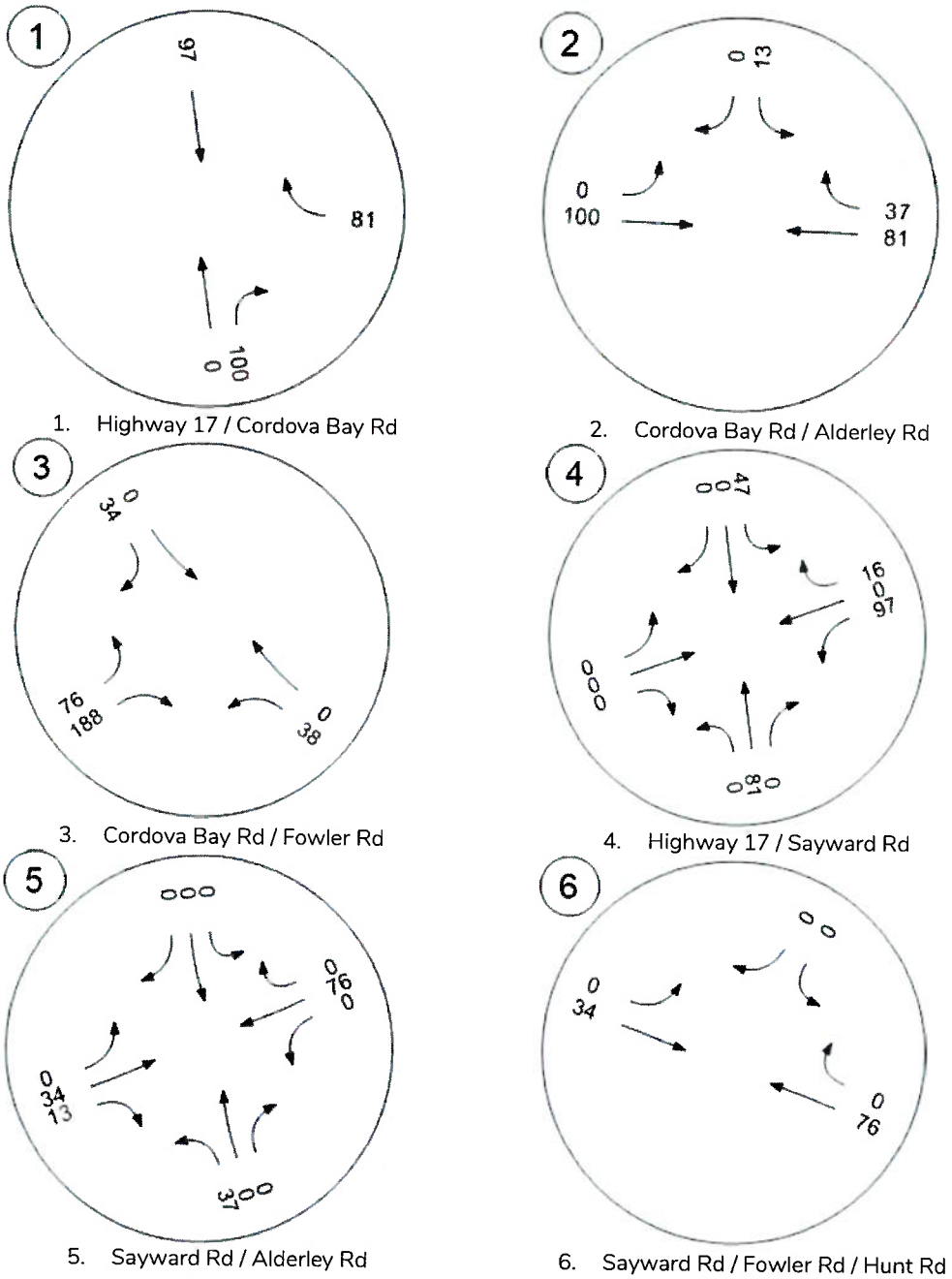
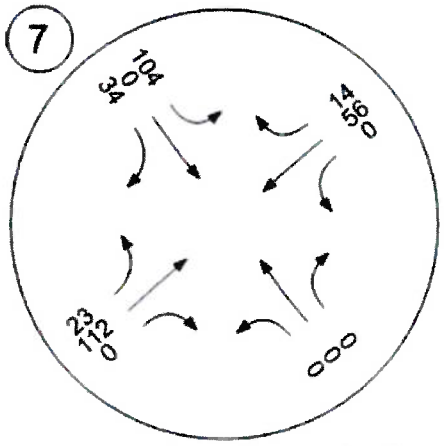
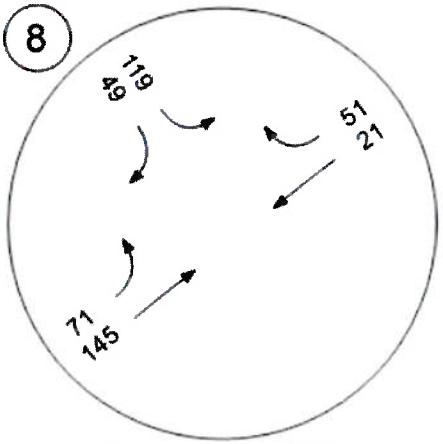


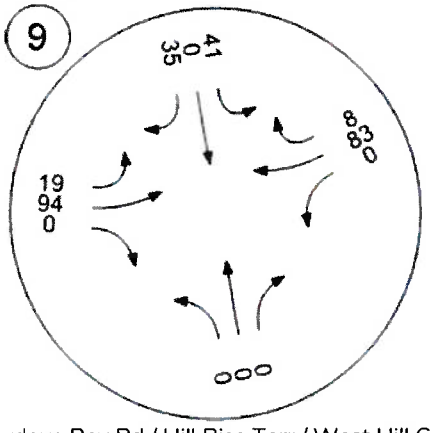
Figure 14 – Site Traffic Volumes – AM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 15 – Site Access Traffic Volumes – AM Peak Hour

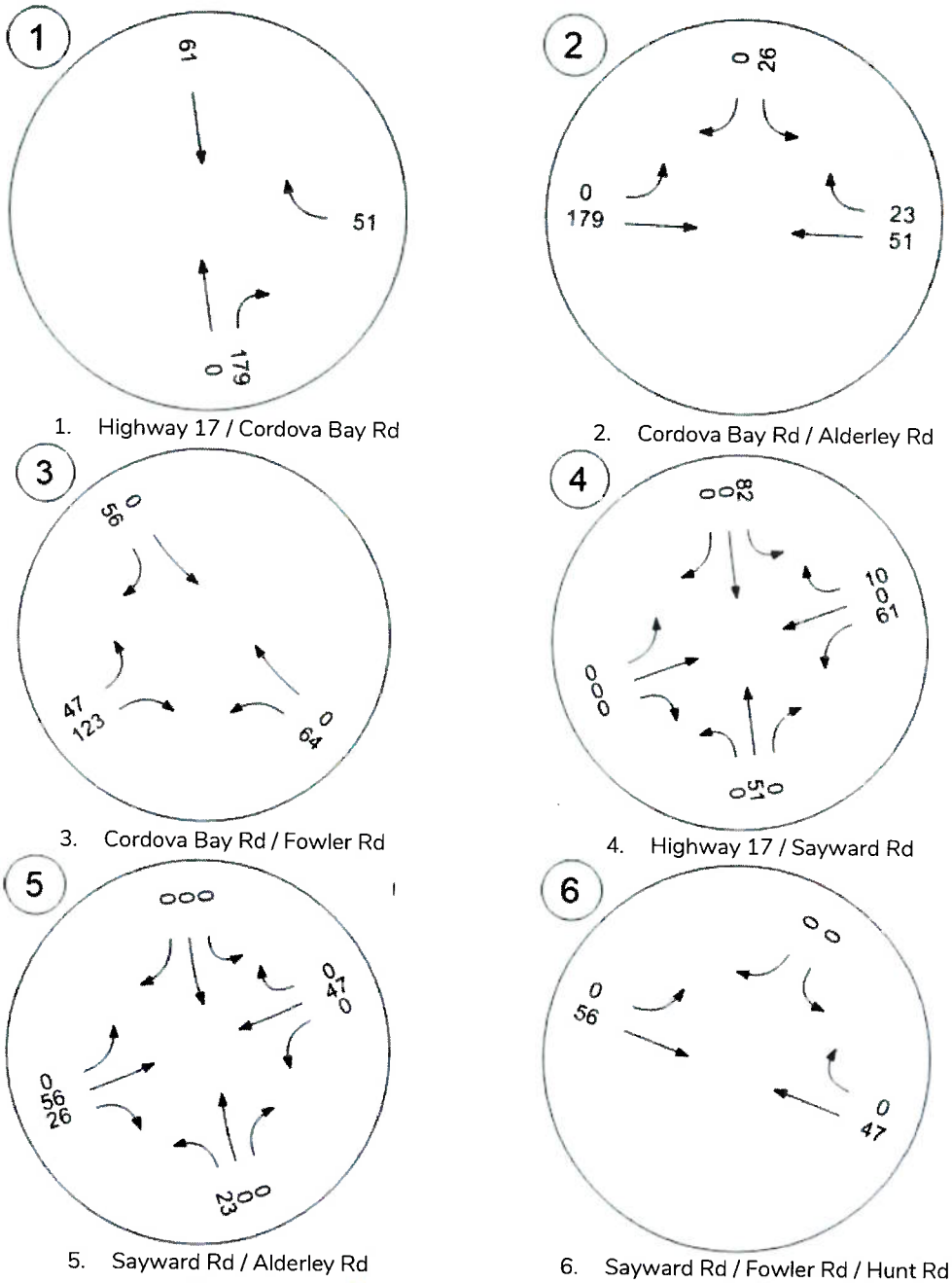
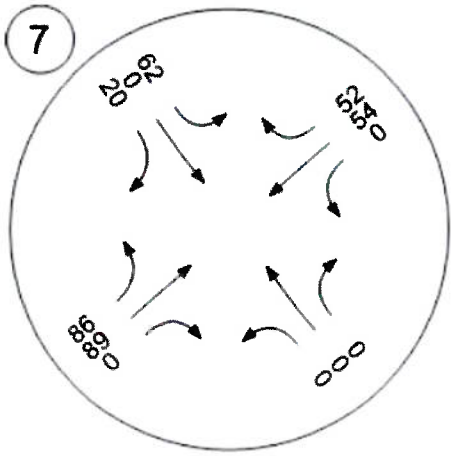
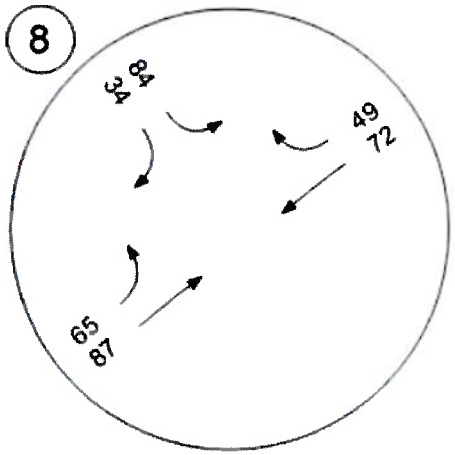


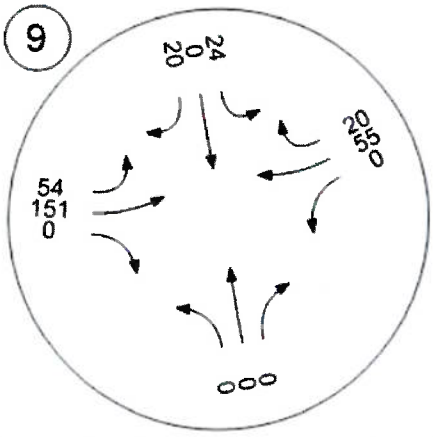
Figure 16 – Site Traffic Volumes – PM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 17 – Site Access Traffic Volumes – PM Peak Hour

4.5 Post-Development Traffic Volumes

Post-development traffic volumes are the sum of background traffic volumes and site traffic volumes. Post-development traffic volumes for opening day, 2040 horizon year, and the two-way traffic volumes are illustrated in **Figure 18** through **Figure 25**.

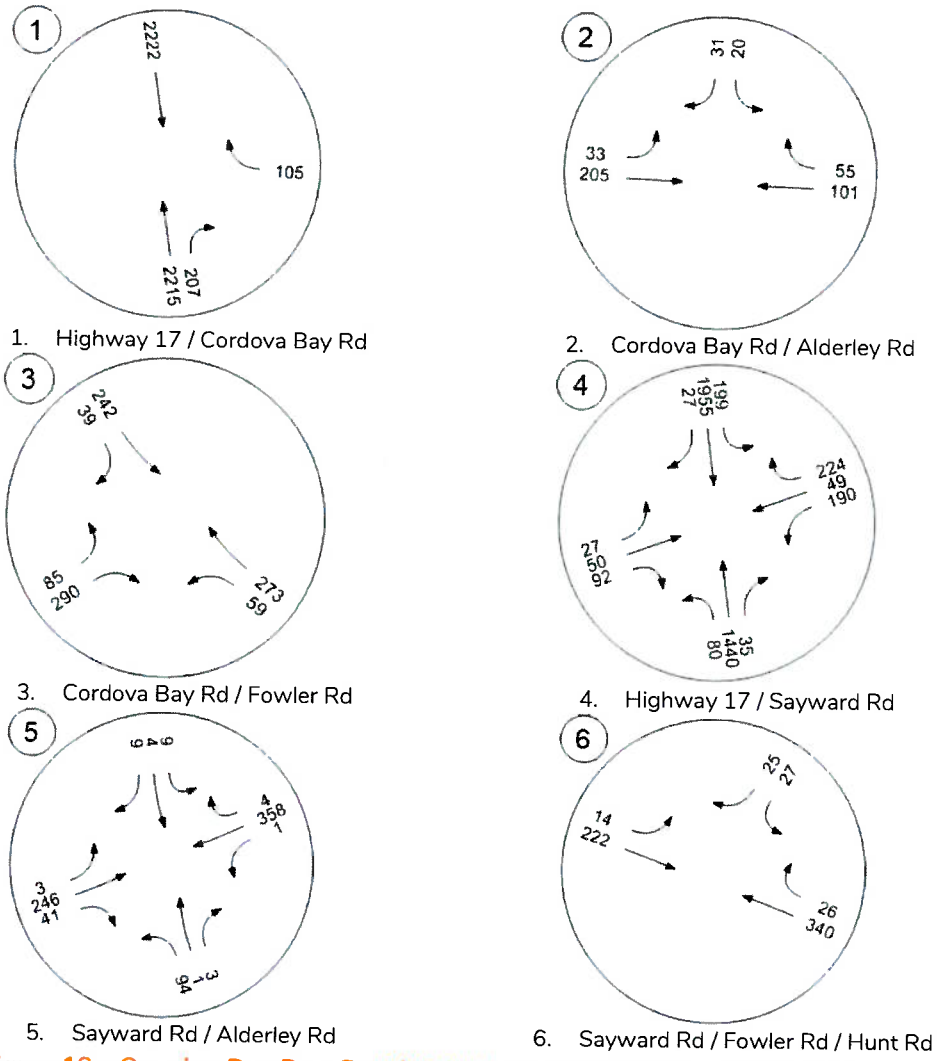
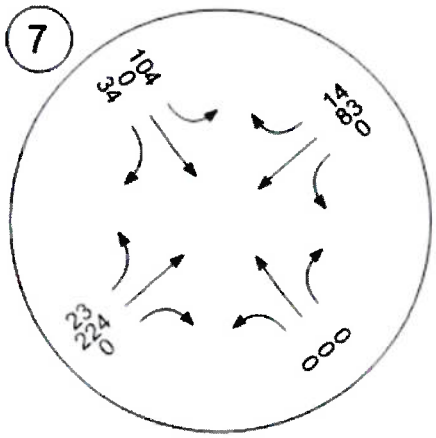
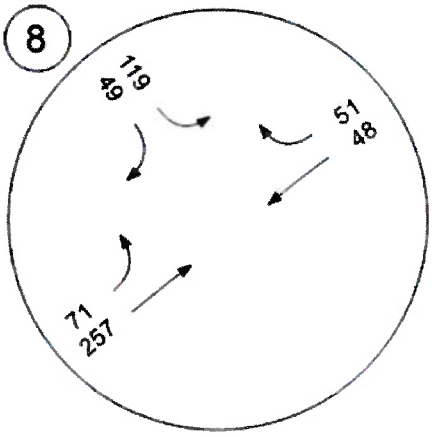


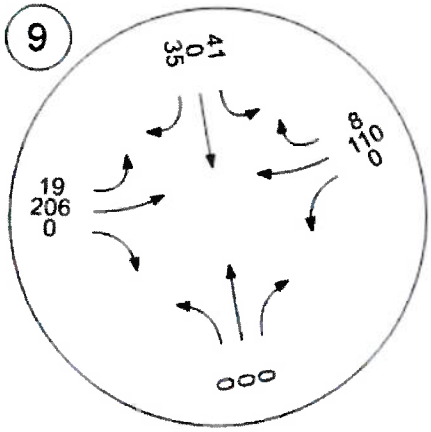
Figure 18 – Opening Day Post Development Traffic Volumes – AM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 19 – Opening Day Post Development Site Access Traffic Volumes – AM Peak Hour

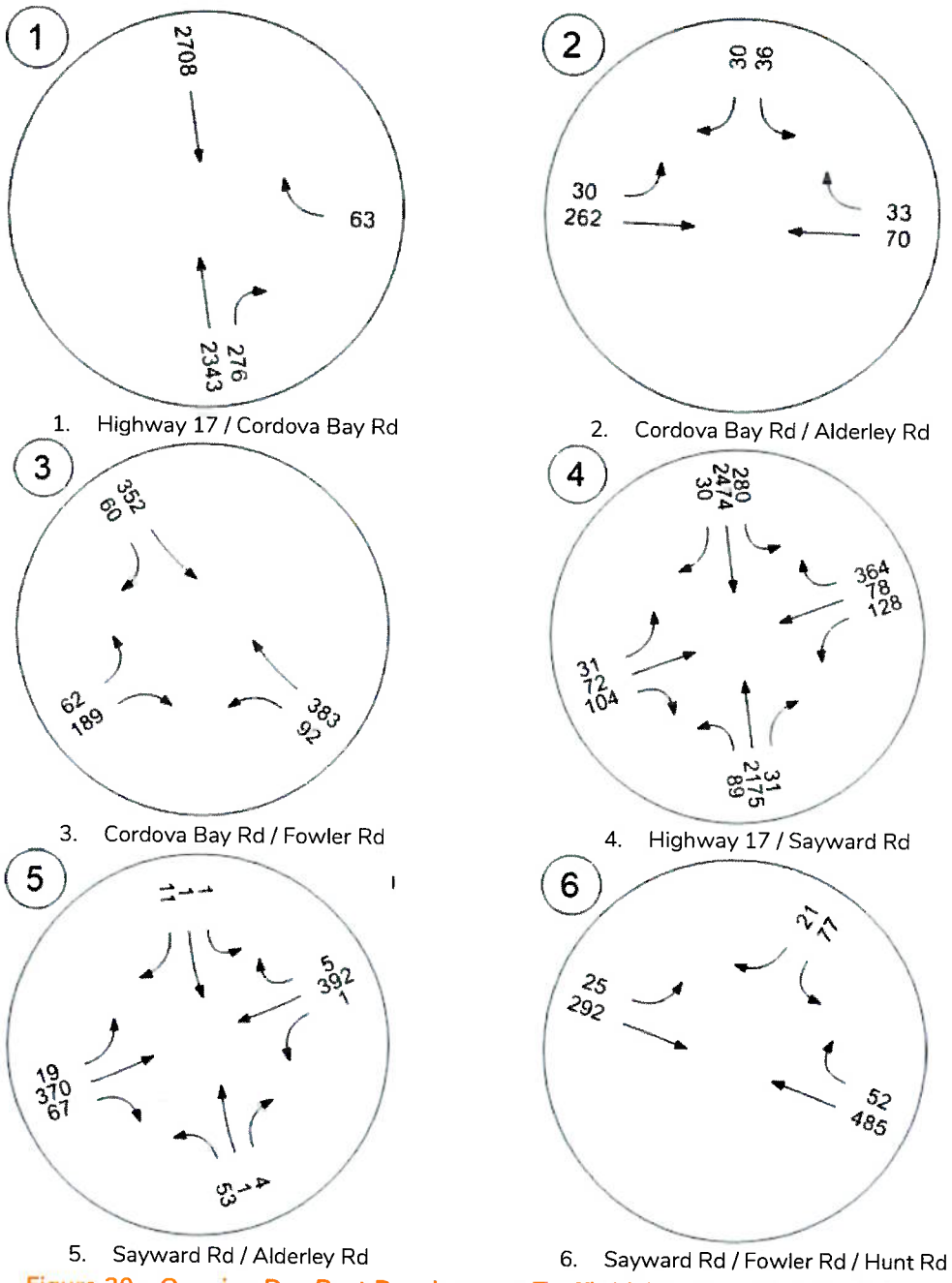
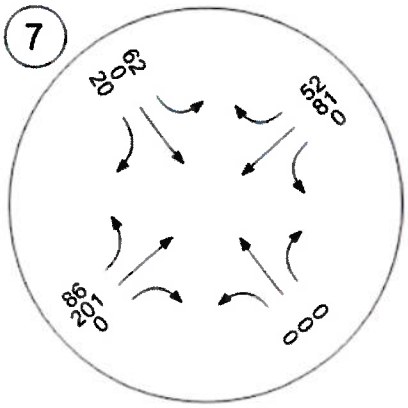
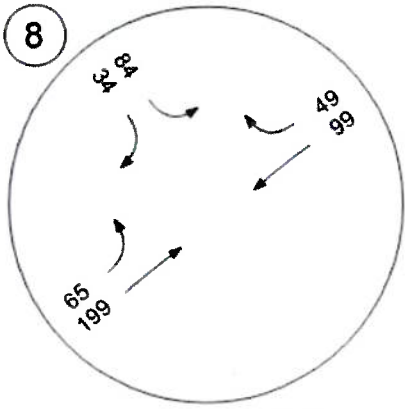


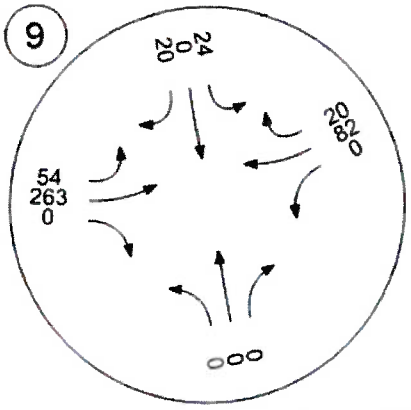
Figure 20 – Opening Day Post Development Traffic Volumes – PM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 21 – Opening Day Post Development Site Access Traffic Volumes – PM Peak Hour

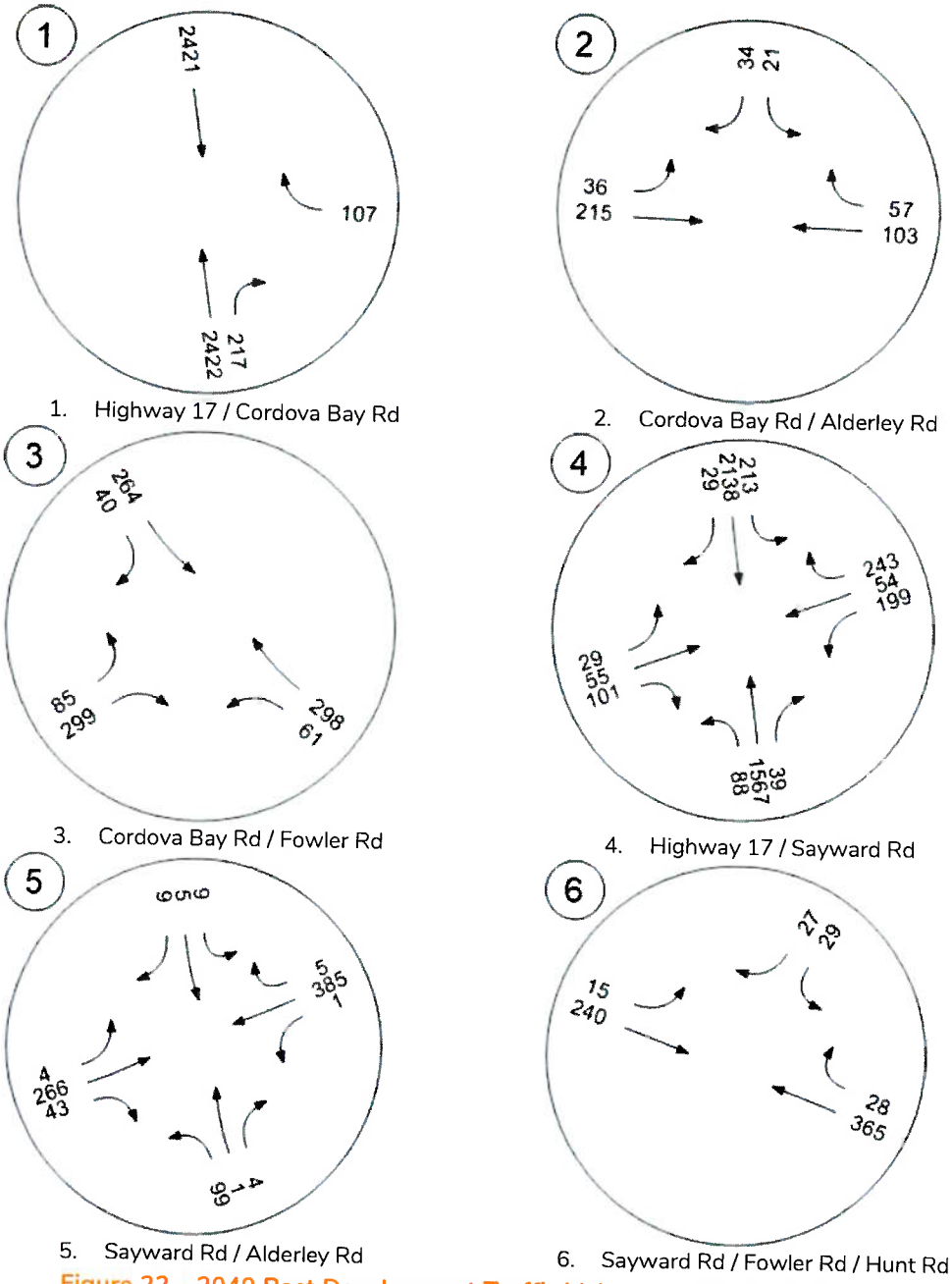
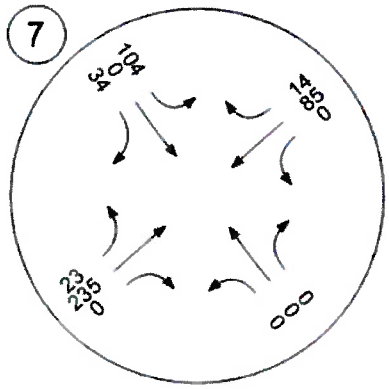
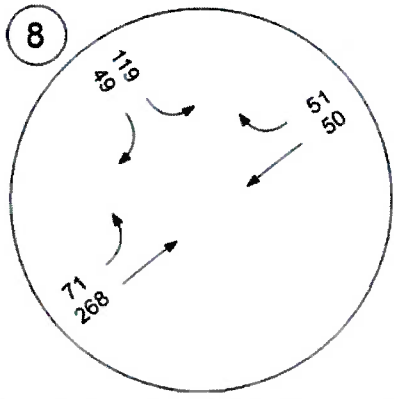


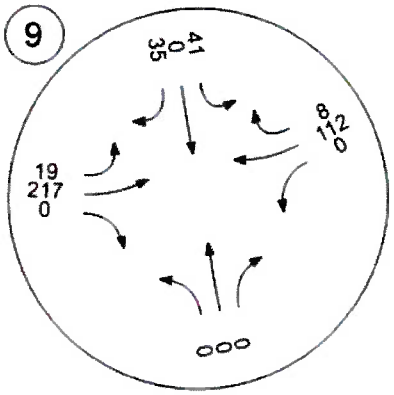
Figure 22 – 2040 Post Development Traffic Volumes – AM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 23 – 2040 Post Development Site Access Traffic Volumes – AM Peak Hour

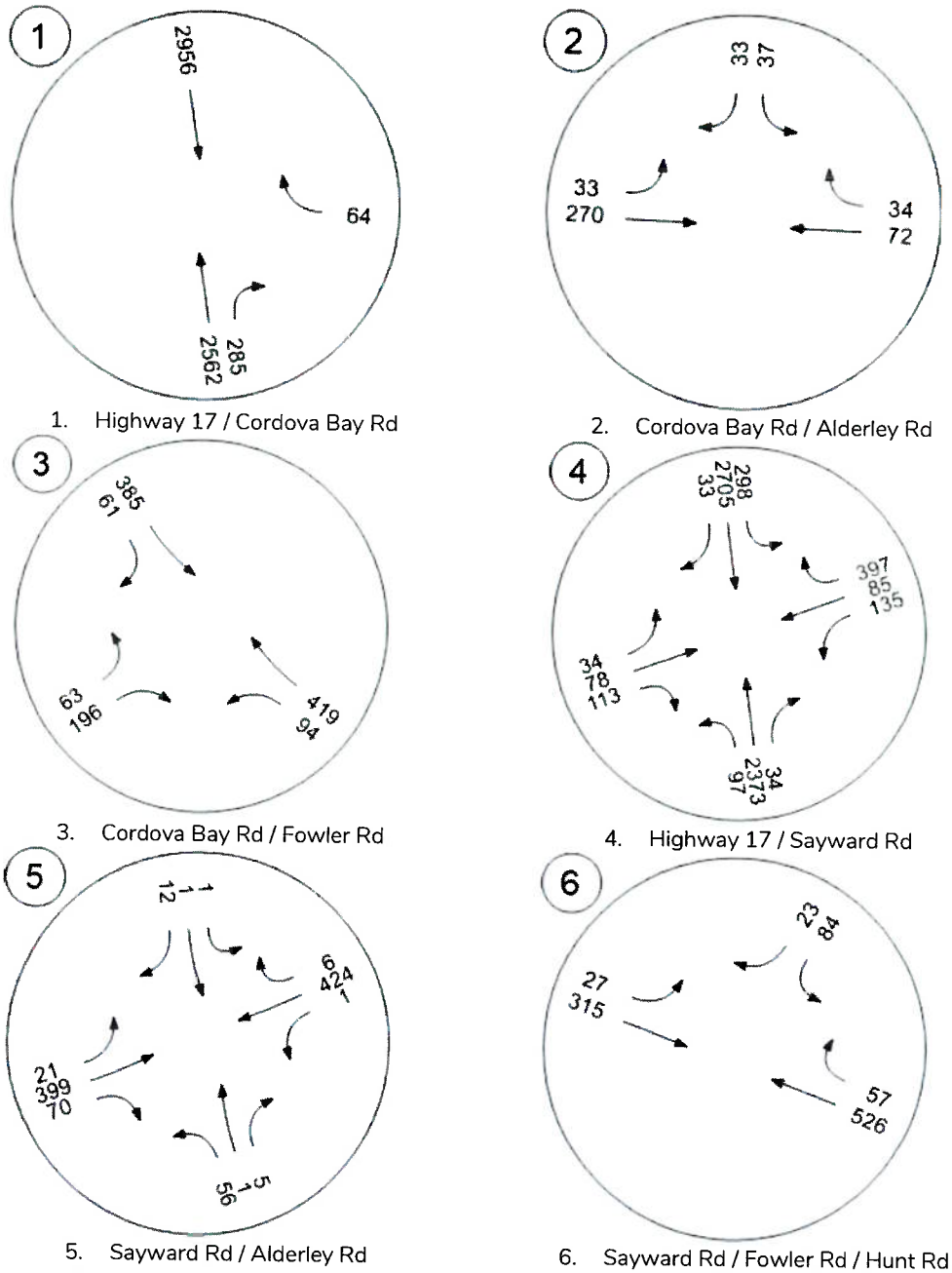
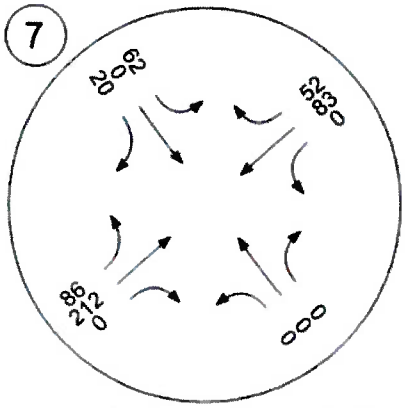
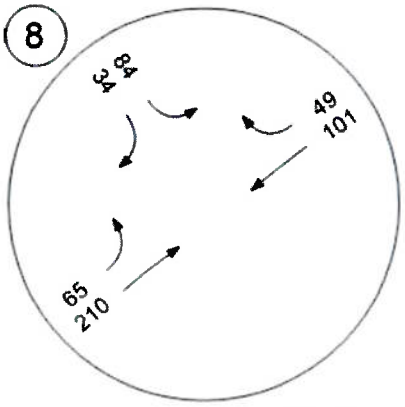


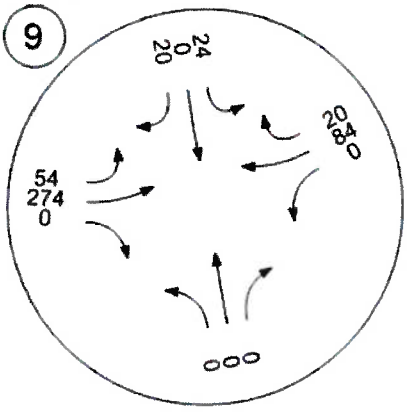
Figure 24 – 2040 Post Development Traffic Volumes – PM Peak Hour



7. Cordova Bay Rd / Sayward Hill Cres / Cordova Hill Rd Access



8. Cordova Bay Rd / East Hill Cres Access



9. Cordova Bay Rd / Hill Rise Terr / West Hill Cres Access

Figure 25 – 2040 Post Development Site Access Traffic Volumes – PM Peak Hour

4.5.1 Post Development Road Classifications

The roads in the vicinity of the site will retain their current classification after development traffic volumes are added. Internal roads within the site are to be classified as Local/Residential Roads. Average daily traffic volumes (estimated) and site road classifications are summarized in **Table 11**.

Table 11 – Site Road Classifications

Site Road	Average Daily Traffic Volumes	Road Classification	
		TAC*	Saanich
West Hill Crescent	1200	Local	Residential
Cordova Hill Road	1900	Local	Residential
East Hill Crescent	2250	Local	Residential

*As per 2017 TAC Geometric Design Guide for Canadian Road Chapter 2 - Table 2.6.5: Characteristics of Urban Roads

The District of Saanich has specified that design considerations such as network layout and traffic calming should be taken to ensure Cordova Hill Road functions as the main entrance to the site. The recommended traffic calming measures that may be taken to encourage residents to use the Cordova Hill Road access whenever possible are raised crosswalks, speed cushions, on-street parking, lane narrowing, and curb extensions.

5.0 TRAFFIC OPERATIONS ANALYSIS

5.1 Methodology

Intersection capacity analysis for the existing and proposed conditions was completed using the Vistro software package, which uses the Highway Capacity Manual (HCM) evaluation methodology.

Results are measured in volume-to-capacity ratio (v/c), delay (seconds), level of service (LOS), and 95th percentile queue lengths (metres).

The v/c is an indicator of the capacity utilization for each movement at the intersection. A v/c of 1.0 indicates that a traffic movement is operating at maximum capacity. The maximum threshold for this analysis is 0.80 due to the rural nature of the highway and a lower tolerance for congestion in more suburban and rural areas than in more urban areas.

The LOS for unsignalized (stop-controlled and roundabout) intersections is determined by the calculated delay for each movement. The LOS for a signalized intersection includes additional factors such as geometry, traffic and pedestrian volumes, and signal phasing / timing. LOS is broken down into six letter grades, with LOS a being excellent operation, and LOS F being unstable / failing operations. Any LOS reaching level E/F in this analysis is determined to have exceeded the maximum threshold.

5.2 Input and Calibration Parameters

Heavy Vehicle Percentage

The percentage of heavy vehicles for each movement was based on the information collected as part of the turning movement counts. Where not available, a default value of two percent heavy vehicles was assumed.

Peak Hour Factor

The Peak Hour Factor (PHF) was based on the information collected as part of the turning movement counts. PHFs were calculated for each intersection using the overall intersection volumes. Where not available, a default PHF of 0.90 was used.

Storage Capacity For 95th Percentile Queues

Maximum thresholds for 95th percentile storage capacities are the maximum number of metres that can hold cars in the lane (queue storage) and/or the point that the queue backs up so far that it is now blocking other intersections and/or roads. Most intersections in this report have only one movement with a defined queue storage capacity. Highway 17 / Cordova Bay Road has a 45-metre queue storage capacity on the northbound right movement, Cordova Bay Road / Fowler Road has a 30-metre storage capacity on the northbound left movement, and Sayward Road / Fowler Road / Hunt Road has a 35-metre capacity on the eastbound left movement. The intersection of Highway 17 / Sayward Road has several movements with storage queues. The Highway 17 / Sayward Road maximum queue storages are listed in **Table 12**.

Table 12 – Highway 17 / Sayward Road Maximum Queue Storage Thresholds

Highway 17 / Sayward Road						
NBL	**NBR**	**SBL**	**SBR**	**EBL**	**WBL**	**WBR**
60m	140m	200m	60m	45m	55m	45m

Vistro Setup at Sayward Road / Fowler Road / Hunt Road

HCM requires that free flow traffic have opposing directions (i.e., northbound opposite southbound). The intersection of Sayward Road / Fowler Road / Hunt Road has been modelled in Vistro to have northbound (Fowler Road) and southbound (Sayward Road) directions to properly analyze the stop control on Hunt Road at this intersection. Sayward has been modeled as southbound in Vistro and will appear that way in the Vistro reports, however it is identified as westbound in this report.

Signal Timing Sheet for Highway 17 / Sayward Road

Signal timing sheet for the intersection of Highway 17 / Sayward Road was provided by the Ministry of Transportation and Transit (MOTT) and was used in the Vistro model.

5.3 Intersection Analysis

5.3.1 Existing Conditions (2023)

Intersection analysis results for the existing conditions (2023) are summarized in **Table 13** and **Table 14**

Table 13 – Unsignalized Intersections – Existing Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Cordova Bay Road						
NBT	AM	0.02	A	0	0	
	PM	0.02	A	0	0	
NBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	
SBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
WBR	AM	0.10	C	24	3	
	PM	0.06	D	27	2	
Cordova Bay Road / Alderley Road						
SBLR	AM	0.03	A	9	1	
	PM	0.03	A	9	1	
EBLT	AM	0.02	A	2	0	
	PM	0.02	A	2	0	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

Cordova Bay Road / Fowler Road						
NBL	AM	0.02	A	8	0	30
	PM	0.02	A	8	1	
NBT	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
SBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
EBLR	AM	0.12	B	10	4	
	PM	0.09	B	12	3	
Sayward Road / Fowler Road / Hunt Road						
NBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
SBL	AM	0.01	A	8	0	35
	PM	0.02	A	8	0	
SBT	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
WBLR	AM	0.05	B	11	2	
	PM	0.19	C	16	6	
Sayward Road / Alderley Road						
NB	AM	0.12	B	14	3	
	PM	0.08	C	16	2	
SB	AM	0.02	B	12	1	
	PM	0.01	B	11	0	
EB	AM	0.00	A	0	0	
	PM	0.01	A	0	0	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

= Value exceeding threshold

Currently, all of the unsignalized intersections in the study area are operating at a LOS D or better and delays of 27 seconds or less in both the AM and PM peak hours. The maximum v/c ratio is 0.19 and the 95th percentile queues are all within their available storage.

Table 14 – Signalized Intersection – Existing Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Sayward Rd						
NBL	AM	0.28	C	22	7	140
	PM	0.63	E	67	42	
NBT	AM	0.62	B	17	126	
	PM	0.93	C	30	292	
NBR	AM	0.00	A	0	0	200
	PM	0.00	A	0	0	
SBL	AM	0.66	E	58	62	280
	PM	0.74	E	70	89	
SBT	AM	0.83	B	18	191	
	PM	0.99	D	39	370	
SBR	AM	0.01	A	7	2	140
	PM	0.01	A	8	2	
EBL	AM	0.13	D	54	11	45
	PM	0.18	E	62	15	
EBTR	AM	0.36	D	52	39	
	PM	0.49	E	60	57	
WBL	AM	0.55	E	64	43	55
	PM	0.50	E	71	34	
WBT	AM	0.17	D	50	19	
	PM	0.28	E	57	34	
WBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	

= Value exceeding threshold

The Highway 17 / Sayward Road intersection has several movements on the threshold of acceptable conditions. The v/c for the southbound through movement (in the AM and PM peak hours) and the northbound through movement (in the PM peak hour) is over the capacity threshold of 0.80, but not overly delayed, suggesting that the signal timing is effective, but demand is still high.

In the AM peak hour, the delay has risen above the threshold on the southbound left, and westbound left movements. In the PM peak hour, the movements delayed to LOS E include the northbound left, southbound left, eastbound left, eastbound through/right, westbound left, and westbound through.

The fact that the left turns and side streets show available capacity but are overly delayed may indicate that the turning movements are missing their phase due to shorter/limited green times being provided to them while over-providing extended green times on the highway to preserve the operations of that corridor. The prerogative for MOTT is to preserve the function of the highway over the side streets as the through movement serves the majority of the traffic demand.

The 95th percentile queues are within their storage capacity on all movements.

5.3.2 Opening Day Background Conditions (2030)

Intersection analysis results for Opening Day (2030) are summarized in **Table 15** and **Table 16**.

Table 15 – Unsignalized Intersection: Opening Day Background Conditions (2030)

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Cordova Bay Road						
NBT	**AM**	0.02	A	0	0	
	PM	0.02	A	0	0	
NBR	**AM**	0.00	A	0	0	45
	PM	0.00	A	0	0	
SBT	**AM**	0.02	A	0	0	
	PM	0.03	A	0	0	
WBR	**AM**	0.12	D	26	3	
	PM	0.07	D	29	2	

Cordova Bay Road / Alderley Road						
SBLR	**AM**	0.03	A	9	1	
	PM	0.03	A	9	1	
EBLT	**AM**	0.02	A	2	0	
	PM	0.02	A	2	0	
WBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
Cordova Bay Road / Fowler Road						
NBL	**AM**	0.02	A	8	0	30
	PM	0.02	A	8	1	
NBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
SBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
EBLR	**AM**	0.13	B	11	4	
	PM	0.10	B	12	4	
Sayward Road / Fowler Road / Hunt Road						
NBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
SBL	**AM**	0.01	A	8	0	35
	PM	0.02	A	8	1	
SBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
WBLR	**AM**	0.05	B	11	2	
	PM	0.21	C	17	7	

Sayward Road / Alderley Road						
NB	AM	0.13	B	14	4	
	PM	0.09	C	16	3	
SB	AM	0.02	B	12	1	
	PM	0.02	B	11	1	
EB	AM	0.00	A	0	0	
	PM	0.02	A	0	0	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

= Value exceeding threshold

The opening day background conditions for all unsignalized intersections do not significantly change from existing conditions with the LOS remaining at LOS D or less, maximum change in delay less than two seconds, and v/c ratio remaining the same.

Table 16 - Signalized Intersection: Opening Day Background Conditions (2030)

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Sayward Rd						
NBL	AM	0.60	E	62	36	140
	PM	0.64	E	67	44	
NBT	AM	0.65	B	17	137	
	PM	0.99	D	44	357	
NBR	AM	0.00	A	0	0	200
	PM	0.00	A	0	0	
SBL	AM	0.67	E	60	67	280
	PM	0.75	E	72	94	
SBT	AM	0.88	C	21	224	
	PM	1.04	F	102	578	
SBR	AM	0.01	A	8	2	140
	PM	0.01	A	8	2	
EBL	AM	0.13	E	55	12	45
	PM	0.19	E	63	15	
EBTR	AM	0.38	D	53	42	
	PM	0.52	E	61	60	
WBL	AM	0.60	E	67	47	55
	PM	0.54	E	74	37	
WBT	AM	0.18	D	51	20	
	PM	0.30	E	57	37	
WBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	

= Value exceeding threshold

The opening day background conditions for Highway 17 / Sayward Road sees small changes from existing conditions. The failing movements in existing conditions continue to be delayed under background conditions with delays increasing marginally (between 1-3 seconds) on most of the failing movements and substantially (63 second increase) for the PM peak hour southbound through movement. The northbound left movement in

the AM peak hour reaches LOS E. All other movements that function well remain under the threshold.

The v/c ratio remains the same on the majority of movements with the only significant increase on the northbound left movement with an increase of 0.32 while remaining under capacity.

All 95th percentile queues are within their storage capacity.

5.3.3 Opening Day Post Development Conditions (2030)

Intersection analysis results for Opening Day (2030) are summarized in **Table 17** and **Table 18**.

Table 17 – Unsignalized Intersection: Opening Day Post Development Conditions (2030)

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Cordova Bay Road						
NBT	AM	0.02	A	0	0	
	PM	0.02	A	0	0	
NBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	
SBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
WBR	AM	0.54	E	45	25	
	PM	0.39	E	41	14	
Cordova Bay Road / Alderley Road						
SBLR	AM	0.03	B	10	2	
	PM	0.06	B	11	2	
EBLT	AM	0.02	A	1	0	
	PM	0.02	A	1	0	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

Cordova Bay Road / Fowler Road						
NBL	**AM**	0.05	A	8	1	30
	PM	0.08	A	8	2	
NBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
SBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
EBLR	**AM**	0.37	C	18	30	
	PM	0.28	C	20	24	
Sayward Road / Fowler Road / Hunt Road						
NBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
SBL	**AM**	0.01	A	8	0	35
	PM	0.02	A	9	1	
SBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
WBLR	**AM**	0.06	B	12	2	
	PM	0.24	C	19	9	
Sayward Road / Alderley Road						
NB	**AM**	0.25	C	18	8	
	PM	0.19	C	21	6	
SB	**AM**	0.02	B	13	1	
	PM	0.02	B	12	1	
EB	**AM**	0.00	A	0	0	
	PM	0.02	A	0	0	
WB	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	

= Value exceeding threshold

Under post development conditions on opening day, the westbound right movement at Highway 17 / Cordova Bay begins to exceed the threshold during the AM and PM peak hours reaching LOS E. The v/c for this movement is still well within threshold (< 0.55) suggesting the movement is not overloaded but delayed due to heavy northbound

through traffic on Highway 17. Adding a longer merge lane is not an option due to the proximity of the Hamsterly Road / Commercial Vehicle Inspection Station to the intersection. No mitigation is needed at this time as traffic has other options for accessing the highway. All the other unsignalized intersections do not significantly change from background conditions with the LOS remaining at C or less, with maximum changes in delay of less than eight seconds, and v/c ratio at a maximum of 0.24 or less.

Table 18 - Signalized Intersection: Opening Day Post Development Conditions (2030)

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Sayward Rd						
NBL	AM	0.60	E	62	36	140
	PM	0.64	E	68	45	
NBT	AM	0.71	C	21	161	
	PM	1.03	F	92	497	
NBR	AM	0.00	A	0	0	200
	PM	0.00	A	0	0	
SBL	AM	0.74	E	65	87	280
	PM	0.96	F	138	175	
SBT	AM	0.88	C	21	224	
	PM	1.03	F	91	551	
SBR	AM	0.01	A	8	2	140
	PM	0.01	A	8	2	
EBL	AM	0.13	E	55	12	45
	PM	0.19	E	64	16	
EBTR	AM	0.38	D	53	42	
	PM	0.53	E	62	61	
WBL	AM	1.22	F	503	272	55
	PM	1.07	F	262	128	
WBT	AM	0.18	D	51	20	
	PM	0.30	E	59	37	
WBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	

= Value exceeding threshold

The addition of post development traffic at Highway 17 / Sayward Road sees the previously failing movements continue to be delayed at LOS E/F post development with the northbound through movement in the PM peak hour progressing to LOS F as well.

The v/c ratio remains the same on the majority of movements with significant increases on the southbound left in the PM peak hour and the westbound left in the AM and PM peak hour which were both already over capacity.

All 95th percentile queues are within their storage capacity, except for the westbound left movement which has exceeded its capacity in both peak hours by 73-217 metres (i.e., approximately 10–31 car lengths). Extension of the westbound left turn lane would only be a stopgap measure, as the queueing is primarily due to insufficient time allocated to the westbound left turn phase, resulting from the need to prioritize through movements on the highway.

5.3.4 2040 Background Conditions

Intersection analysis results for the 2040 background conditions are summarized in **Table 19** and **Table 20**.

Table 19 - Unsignalized Intersections – 2040 Background Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Cordova Bay Road						
NBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
NBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	
SBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
WBR	AM	0.16	D	31	4	
	PM	0.10	D	34	2	
Cordova Bay Road / Alderley Road						
SBLR	AM	0.03	A	9	1	
	PM	0.03	A	9	1	
EBLT	AM	0.02	A	2	0	
	PM	0.02	A	2	0	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
Cordova Bay Road / Fowler Road						
NBL	AM	0.02	A	8	0	30
	PM	0.03	A	8	1	
NBT	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
SBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
EBLR	AM	0.14	B	11	4	
	PM	0.11	B	13	4	

Sayward Road / Fowler Road / Hunt Road						
NBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
SBL	AM	0.01	A	8	0	35
	PM	0.03	A	9	1	
SBT	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
WBLR	AM	0.06	B	12	2	
	PM	0.25	C	19	9	
Sayward Road / Alderley Road						
NB	AM	0.15	C	15	4	
	PM	0.11	C	18	3	
SB	AM	0.02	B	13	1	
	PM	0.02	B	11	1	
EB	AM	0.00	A	0	0	
	PM	0.02	A	0	0	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

= Value exceeding threshold

The 2040 background conditions for all unsignalized intersections do not significantly change from opening day background conditions with the LOS remaining at LOS D or less, maximum change in delay less than five seconds, and v/c ratio remaining the same.

Table 20 - Signalized Intersection – 2040 Background Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Sayward Rd						
NBL	AM	0.62	E	62	40	140
	PM	0.66	E	68	49	
NBT	AM	0.71	B	20	160	
	PM	1.09	F	196	804	
NBR	AM	0.00	A	0	0	200
	PM	0.00	A	0	0	
SBL	AM	0.70	E	62	73	280
	PM	0.77	E	76	104	
SBT	AM	0.96	C	31	293	
	PM	1.14	F	277	1168	
SBR	AM	0.01	A	8	2	140
	PM	0.02	A	8	2	
EBL	AM	0.15	E	56	13	45
	PM	0.21	E	65	17	
EBTR	AM	0.42	D	54	46	
	PM	0.57	E	63	65	
WBL	AM	0.69	E	71	53	55
	PM	0.65	E	79	42	
WBT	AM	0.20	D	51	23	
	PM	0.33	E	58	41	
WBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	

= Value exceeding threshold

The 2040 background traffic at Highway 17 / Sayward Road sees small changes from the opening day background conditions. The previously failing movements continue to be delayed at LOS E/F with the northbound through movement in the PM peak hour progressing to LOS F as well. The northbound through movement was already over capacity in the 2030 background conditions so the corridor growth in the area has pushed this movement into LOS F.

The v/c ratio remains the same on the majority of movements with the maximum increase at 0.11 or less. The majority of movements are under the threshold of 0.80.

All 95th percentile queues are within their storage capacity.

5.3.5 2040 Post Development Conditions

Intersection analysis results for the 2040 post development conditions are summarized in **Table 21** and **Table 22**.

Table 21 - Unsignalized Intersections – 2040 Post Development Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Cordova Bay Road						
NBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
NBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	
SBT	AM	0.02	A	0	0	
	PM	0.03	A	0	0	
WBR	AM	0.65	F	65	37	
	PM	0.47	F	54	19	
Cordova Bay Road / Alderley Road						
SBLR	AM	0.04	B	10	2	
	PM	0.06	B	11	3	
EBLT	AM	0.03	A	1	0	
	PM	0.02	A	1	0	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

Cordova Bay Road / Fowler Road						
NBL	**AM**	0.05	A	8	1	30
	PM	0.09	A	9	2	
NBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
SBTR	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
EBLR	**AM**	0.40	C	20	35	
	PM	0.31	C	23	29	
Sayward Road / Fowler Road / Hunt Road						
NBTR	**AM**	0.00	A	0	0	
	PM	0.01	A	0	0	
SBL	**AM**	0.01	A	8	0	35
	PM	0.03	A	9	1	
SBT	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	
WBLR	**AM**	0.07	B	13	3	
	PM	0.29	C	22	11	
Sayward Road / Alderley Road						
NB	**AM**	0.29	C	20	10	
	PM	0.23	C	23	7	
SB	**AM**	0.03	B	14	1	
	PM	0.02	B	12	1	
EB	**AM**	0.00	A	0	0	
	PM	0.02	A	0	0	
WB	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	

Notes: ## = Value exceeding threshold

In 2040, the addition of the post development traffic makes only small changes to the majority of movements and the unsignalized intersections are still operating well. The majority of movements at all of the intersections are functioning well at LOS D or better with a maximum change in delay of ten seconds or less on all movements, and the v/c ratio remaining the same, except for the westbound right movement at Highway 17 /

Cordova Bay Road which increases to LOS F in both the AM and PM peak hours. As previously stated for the opening day analysis the movement is not over capacity but delayed due to heavy northbound through traffic on Highway 17 and no mitigation is needed as traffic has other options for accessing the highway.

Table 22 - Signalized Intersection – 2040 Post Development Conditions

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Highway 17 / Sayward Rd						
NBL	AM	0.62	E	63	41	140
	PM	0.66	E	68	49	
NBT	AM	0.78	C	23	188	
	PM	1.12	F	252	971	
NBR	AM	0.00	A	0	0	200
	PM	0.00	A	0	0	
SBL	AM	0.75	E	68	95	280
	PM	1.03	F	195	224	
SBT	AM	0.96	C	30	291	
	PM	1.14	F	272	1154	
SBR	AM	0.01	A	8	2	140
	PM	0.02	A	8	2	
EBL	AM	0.15	E	57	13	45
	PM	0.22	E	65	17	
EBTR	AM	0.42	E	55	47	
	PM	0.57	E	63	66	
WBL	AM	1.38	F	779	379	55
	PM	1.21	F	486	198	
WBT	AM	0.20	D	52	23	
	PM	0.33	E	59	41	
WBR	AM	0.00	A	0	0	45
	PM	0.00	A	0	0	

Notes: ## = Value exceeding threshold

The addition of post development traffic in the 2040 horizon year at Highway 17 / Sayward Road sees small changes from the 2040 background conditions. The previously failing movements continue to be delayed at LOS E/F post development with only the eastbound through/right movement moving over threshold to LOS E in 2040. The eastbound through/right movement was within one second of the threshold under background conditions and only increases by one second with post development traffic.

The v/c ratio remain the same on the majority of movements with the only significant increase on movements that were already over capacity.

All 95th percentile queues are still within their storage capacity, except for the westbound left movement which still exceeds its capacity in both peak hours, now by 143-324 metres (i.e., approximately 20–46 car lengths). The westbound left at Highway 17 / Sayward Road is the only southbound access to the highway for people living east of the highway. See **Section 5.3.7** for a discussion on Highway 17 / Sayward Road.

5.3.6 Site Driveways

Intersection analysis results for the three site driveways are summarized in **Table 23** and **Table 24**.

Table 23 – 2030 Post Development Site Accesses

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Cordova Bay Road / Hill Rise Terrace / West Hill Crescent Access						
NB	**AM**	0.00	B	11	0	
	PM	0.00	B	12	0	
SB	**AM**	0.07	B	11	3	
	PM	0.05	B	11	2	
EB	**AM**	0.01	A	1	0	
	PM	0.04	A	1	1	
WB	**AM**	0.00	A	0	0	
	PM	0.00	A	0	0	

Cordova Bay Road / Sayward Hill Crescent / Cordova Hill Road Access						
NB	AM	0.00	B	11	0	
	PM	0.00	B	12	0	
SB	AM	0.18	B	12	6	
	PM	0.13	B	13	4	
EB	AM	0.02	A	1	0	
	PM	0.06	A	2	1	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
Cordova Bay Road / East Hill Crescent Access						
SBLR	AM	0.23	B	13	9	
	PM	0.16	B	12	5	
EBLT	AM	0.05	A	2	1	
	PM	0.05	A	2	1	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

= Value exceeding threshold

In 2030 post-development conditions, all driveways will function well at LOS B or better with delays of no more than 13 seconds, v/c ratios of 0.23 or less, and limited queues.

Table 24 – 2040 Post Development Site Accesses

Movement		v/c	LOS	Delay (s)	95th Percentile Queue (m)	Storage (m)
Cordova Bay Road / Hill Rise Terrace / West Hill Crescent Access						
NB	AM	0.00	B	11	0	
	PM	0.00	B	12	0	
SB	AM	0.07	B	11	3	
	PM	0.05	B	11	2	
EB	AM	0.01	A	1	0	
	PM	0.04	A	1	1	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
Cordova Bay Road / Sayward Hill Crescent / Cordova Hill Road Access						
NB	AM	0.00	B	11	0	
	PM	0.00	B	12	0	
SB	AM	0.18	B	12	6	
	PM	0.14	B	13	4	
EB	AM	0.02	A	1	0	
	PM	0.06	A	2	1	
WB	AM	0.00	A	0	0	
	PM	0.00	A	0	0	
Cordova Bay Road / East Hill Crescent Access						
SBLR	AM	0.23	B	13	9	
	PM	0.16	B	12	6	
EBLT	AM	0.05	A	2	1	
	PM	0.05	A	2	1	
WBTR	AM	0.00	A	0	0	
	PM	0.00	A	0	0	

In 2040 post-development conditions, all driveways will continue to function well at LOS B or better with delays of no more than 13 seconds, v/c ratios of 0.23 or less, and limited queues.

5.3.7 Discussion on Highway 17 / Sayward Road Intersection

The Highway 17 / Sayward Road intersection has been identified as a potential candidate for conversion to a grade-separated interchange in Urban Systems' 2014 Highway 17 Planning Study report. The report identified the Cordova Bay / Sayward section of the Highway to be the second highest segment along the entire highway for collision rate (collisions per million vehicle kilometres).

In the interim, MOTT may be amenable to exploring modifications to the traffic signal timings to improve conditions for turning movements; however, the effectiveness of such measures will only be applicable up to a certain volume of traffic.

As the Cordova Bay area densifies, the District of Saanich should work with MOTT to prioritize the conversion of the Highway 17 / Sayward Road intersection to a grade-separated interchange.

6.0 CONCLUSIONS

Traffic from the proposed development can be accommodated at the unsignalized study intersections on both opening day and the 10-year post-development horizon year (2040), with only the westbound right movement at Highway 17 / Cordova Bay Road having operational issues. There is no room for a longer merge lane onto the highway due to Hamsterly Road / Commercial Vehicle Inspection Station's proximity to the intersection. The movement still has capacity at v/c 0.65 and does not need improvement at this time as traffic has an alternate route to Highway 17 northbound via Sayward Road if this movement is overly delayed.

Highway 17 / Sayward Road has existing capacity issues northbound and southbound, and operational performance issues eastbound and westbound resulting from the need to prioritize throughput on the highway. These issues will only be exacerbated by future growth and development in the area. The majority of the failing / over-capacity movements are not substantially impacted by this development except for the westbound left turn movement on both the opening day and the 10-year post-development horizon year which has substantial delay added and progresses from LOS E to LOS F. To support safety improvements and accommodate increased density in the Cordova Bay area, the District of Saanich and MOTT should prioritize the conversion of the Highway 17 / Sayward Road intersection to a grade-separated interchange, as recommended in the 2014 Highway 17 Planning Study.

In the interim, adjustments to the signal timings to mitigate excessive delays and queues on the side streets and left turn movements are recommended.

A safe and convenient connection to Lochside Trail would be very beneficial to promote active transportation options to the residents of the development. Currently the closest connection is to cycle or walk to Lochside Drive; however, the connection is not easily made as it is a left turn across Cordova Bay Road. There is a need to offer a more attractive connection if residents are to be encouraged to use the trail. It would be advisable for the developer to work with the District of Saanich to explore options to provide a safe and reliable connection more directly to Lochside Trail.

Continued investment in walking, cycling, and transit infrastructure by the District of Saanich and BC Transit will not only help to reduce vehicular traffic to/from this site, but also across the District. Shifting trips from vehicles to other modes will improve the expected long-term conditions.

7.0 RECOMMENDATIONS

WATT makes the following recommendations to the developer of the site:

1. Install bike lanes and sidewalks along the frontage of the site on Cordova Road between Alderley Road and Cordova Bay Road / Fowler Road to provide greater accessibility to the active transportation network for residents of the development.
2. Improve the Cordova Bay Road / Hill Rise Terrace bus stop along the site's frontage to have a shelter, bench, and trash can
3. Add unidirectional protected bike lanes to the internal roads.
4. Work with the District of Saanich to improve sightlines along Cordova Bay Road along the site's frontage to mitigate sightline issues. Parking restrictions may be necessary.
5. Ensure vegetation along the site frontage on Cordova Bay Road is minimized in the access corners to mitigate sightline issues.
6. Work with the District of Saanich to explore options to add a safe and reliable connection to Lochside Trail.

WATT makes the following recommendations to the District of Saanich:

1. Prioritize implementation of the Active Transportation Plan to install a sidewalk along at least one side of Sayward Road and Fowler Road, AAA cycling facilities along Sayward Road, and cycling facilities along Fowler Road.
2. Work with MOTT to support the conversion of the Highway 17 / Sayward Road intersection to a grade-separated interchange.

WATT makes the following recommendations to the Ministry of Transportation and Transit:

1. In the interim, consider updates to the traffic signal timing plan to mitigate excessive delays and queues on the side streets and left turn movements.
2. Per the 2014 Highway 17 Planning Study, prioritize the conversion of the Highway 17 / Sayward Road intersection to a grade-separated interchange.