TRANSPORTATION PLANNERS AND ENGINEERS

# City of Vernon Traffic Modelling

# Transportation Report

FINAL VERSION

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Prepared for

City of Vernon

Date

May 13, 2025

Project No.

07-24-0038

*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.*

May 13, 2025
07-24-0038

Anne Huisken, MSc
Transportation Planner
City of Vernon
3001 - 32 Avenue
Vernon, BC
V1T 2L8

Dear Anne:

**Re: City of Vernon - Citywide Traffic Modelling – FINAL VERSION**

Bunt & Associates Engineering Ltd. (Bunt) has conducted a Transportation Modelling assessment for 40 select City intersections to evaluate traffic operations for the Existing Conditions and the 2030 (+5 years), 2035 (+10 years), and 2045 (+20 years) future horizons. The report also contains Bunt's recommended intersection upgrades and mitigation strategies to improve traffic performance at critical horizon years. This Final Version of the report incorporates City review and feedback on Version 1.

We trust that this Transportation Assessment will help inform the City of Vernon's Transportation Plan Updates and capital plans for future transportation upgrades.

Please do not hesitate to contact us should you have any questions.

Yours truly,
**Bunt & Associates**





Kyle Briggs, P.Eng., PTOE, RSP1
Transportation Engineer

Christephen Cheng, M.Eng., P.Eng.
Principal

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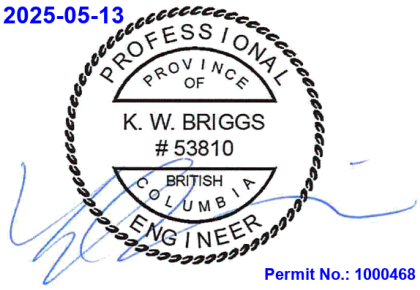
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Date: May 13, 2025
Project No. 07-24-0038
**FINAL VERSION**

Approved By: Christephen Cheng, P.Eng., M.Eng.
Principal




*Written with respect and gratitude for the Traditional Territories upon which we work and live.*

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# EXECUTIVE SUMMARY

## Study Purpose

The City of Vernon commissioned Bunt & Associates to undertake a traffic modelling assessment for 40 select intersections across the City. The study intersections included various traffic control types such as two-way stop control, all-way stop control, stop control with pedestrian crosswalk facilities, pedestrian signals, and full traffic signals, with different roadway classifications (i.e., local, collector, arterial, etc.). The purpose of the modelling assessment is to identify at which horizon year the study intersections would exceed acceptable traffic performance and to recommend mitigation measures. The study will help support and inform the City in their Official Community Plan and Transportation Plan publication updates.

## Methodology

The traffic modelling and analysis were conducted for the AM and PM peak hours of the study intersections utilizing the HCM 2000 Edition methodology for reporting performance metrics. The 40 intersections were divided into 10 unique groups for the purposes of analysis and reporting. The analysis was conducted for the Existing Conditions, +5 Years Horizon (2030), +10 Years Horizon (2035), and +20 Years Horizon (2045). To forecast future traffic volumes, Bunt applied a linear 1.5% traffic growth rate to Existing Conditions traffic following information supplied by the City's OCP on population growth.

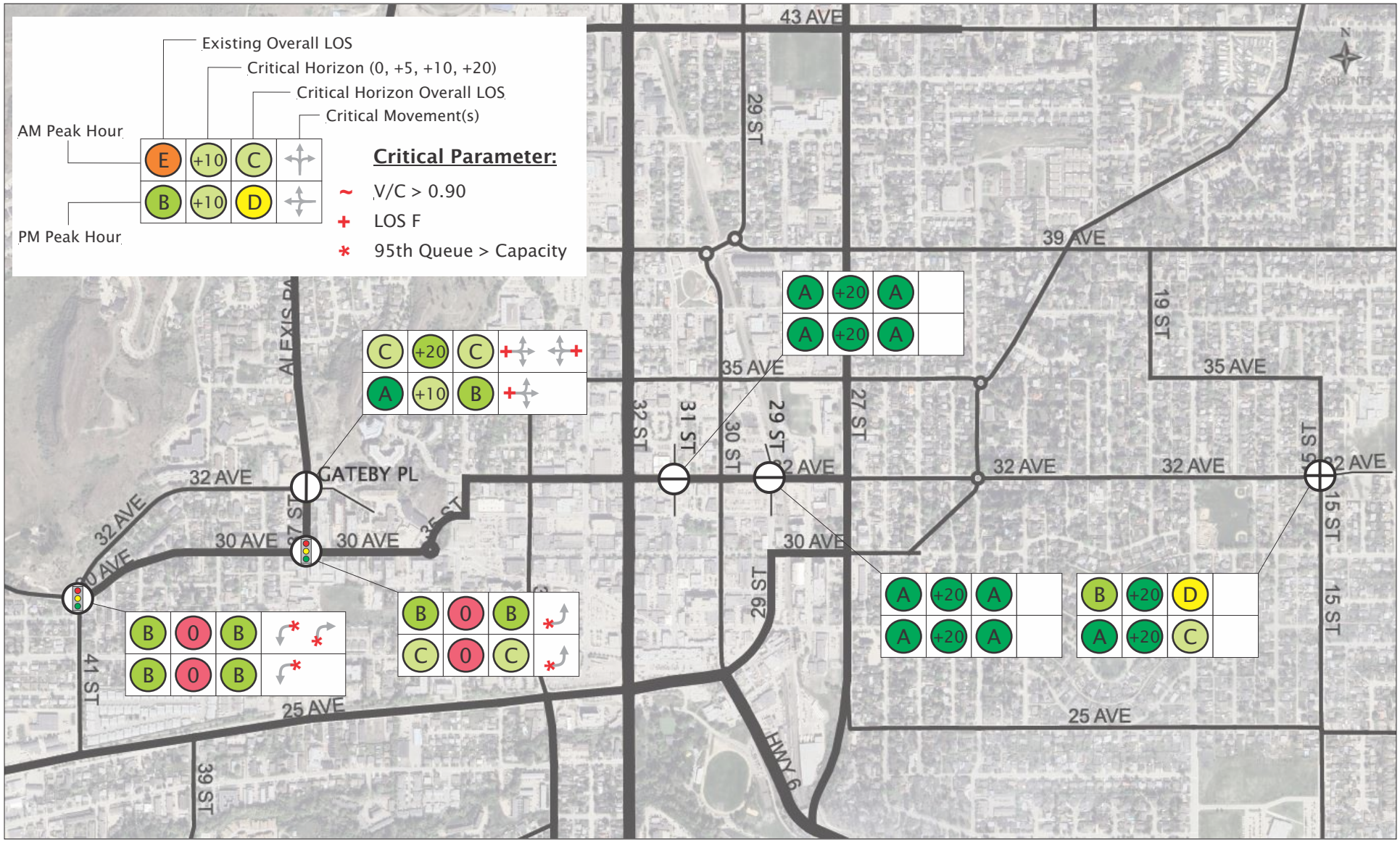
The traffic analysis was conducted in a step-wise method, identifying intersections exceeding acceptable performance at each horizon year. Where acceptable traffic performance was exceeded, Bunt investigated and recommended mitigation strategies to improve operations.

## Traffic Operations Analysis

The results of the traffic modelling and operations analysis are summarized in the following performance results graphics **ES.1** to **ES.10**. The graphics provide a visual summary of the traffic operations analysis, including the following:

- Existing Conditions Intersection Level of Service
- Critical Horizon Year
- Critical Horizon Overall Level of Service
- Critical Movement(s)
- Critical Performance Measure (Volume-to-Capacity Ratio, Level of Service, or 95$^{th}$ Percentile Queue Length)

Note, if no Critical Horizon Year is reported, the future Level of Service corresponds to the +20 year horizon.



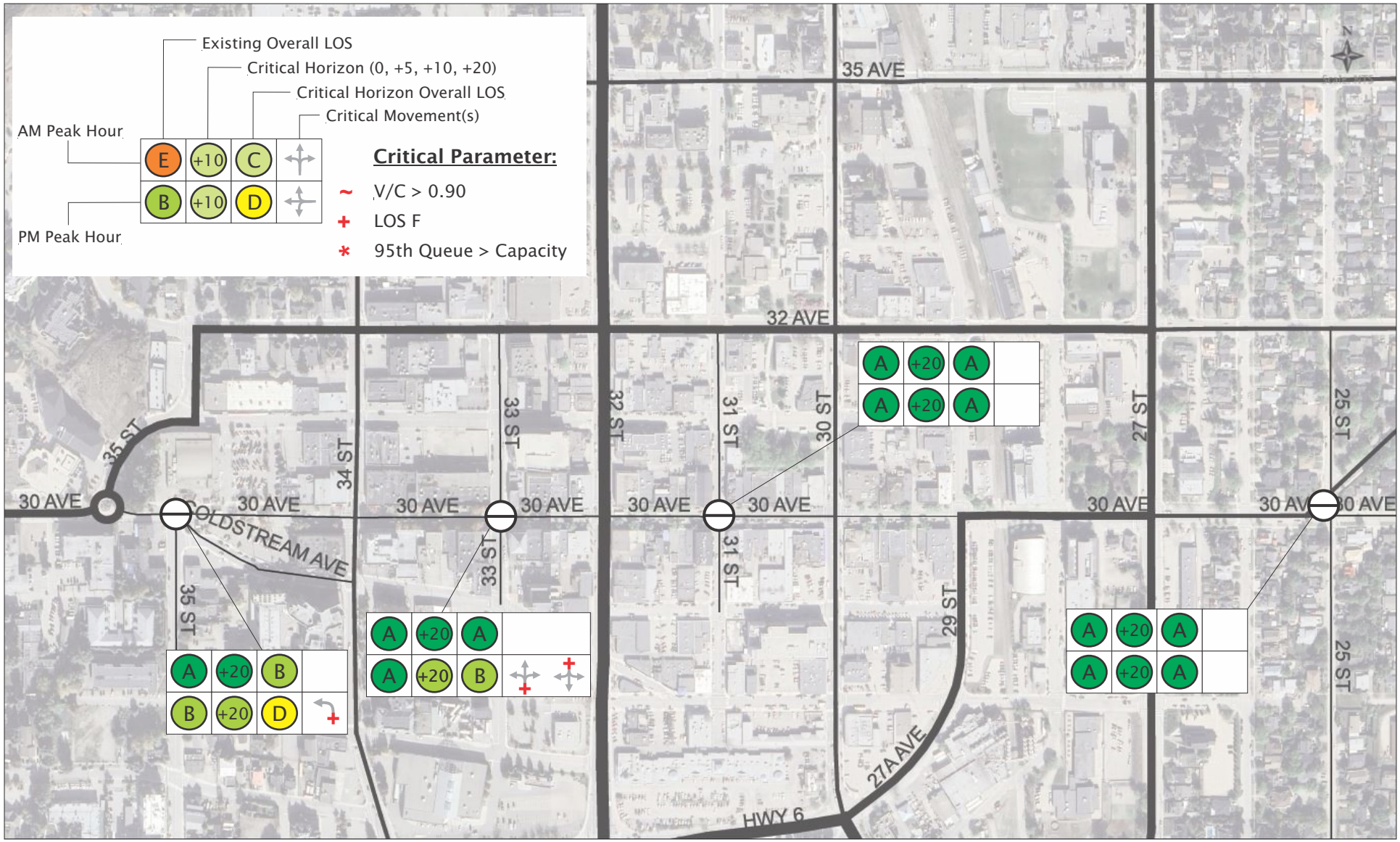

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**Exhibit ES.1**

## Traffic Operations Summary - Group 1

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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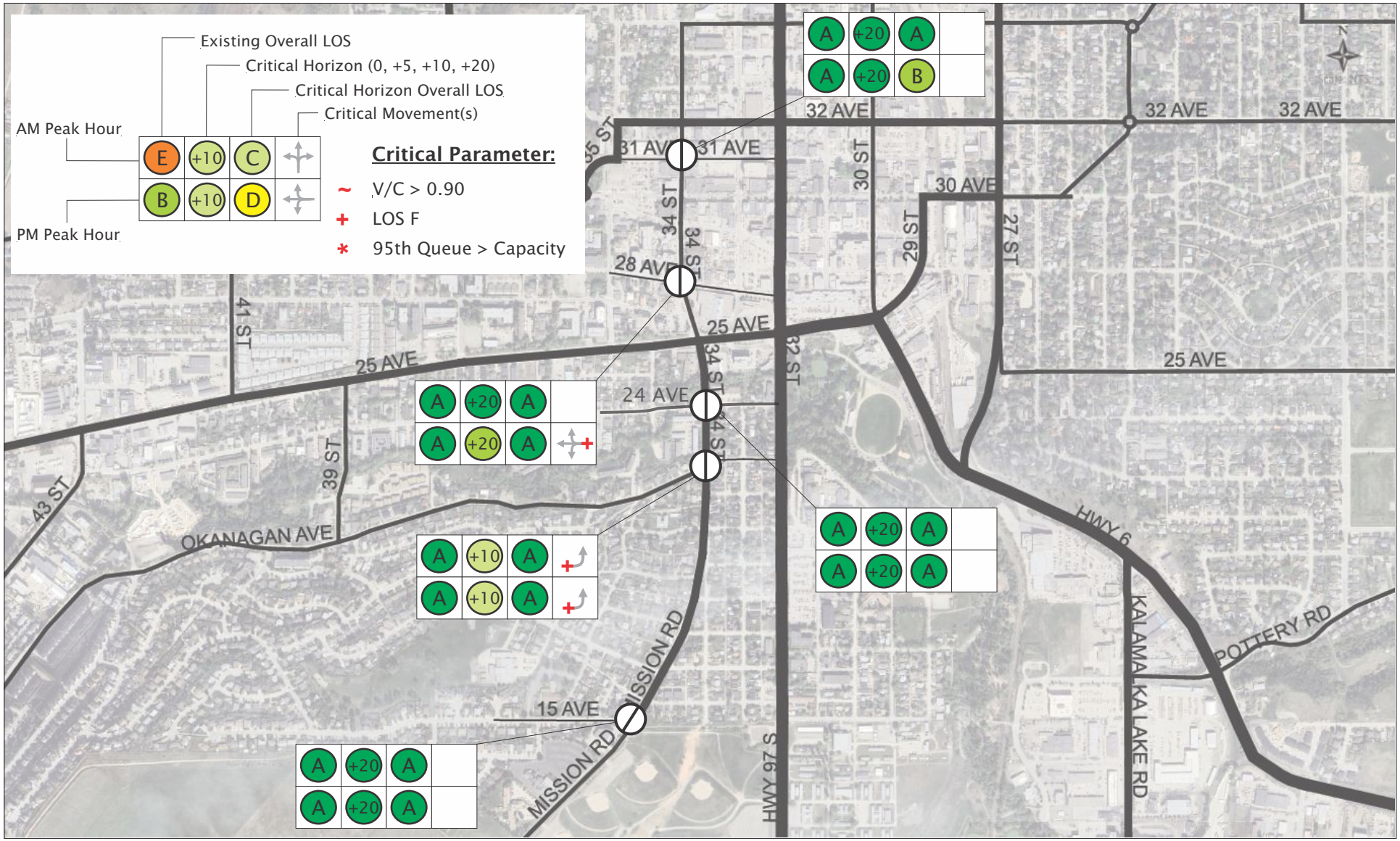

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**Exhibit ES.2**

# Traffic Operations Summary - Group 2

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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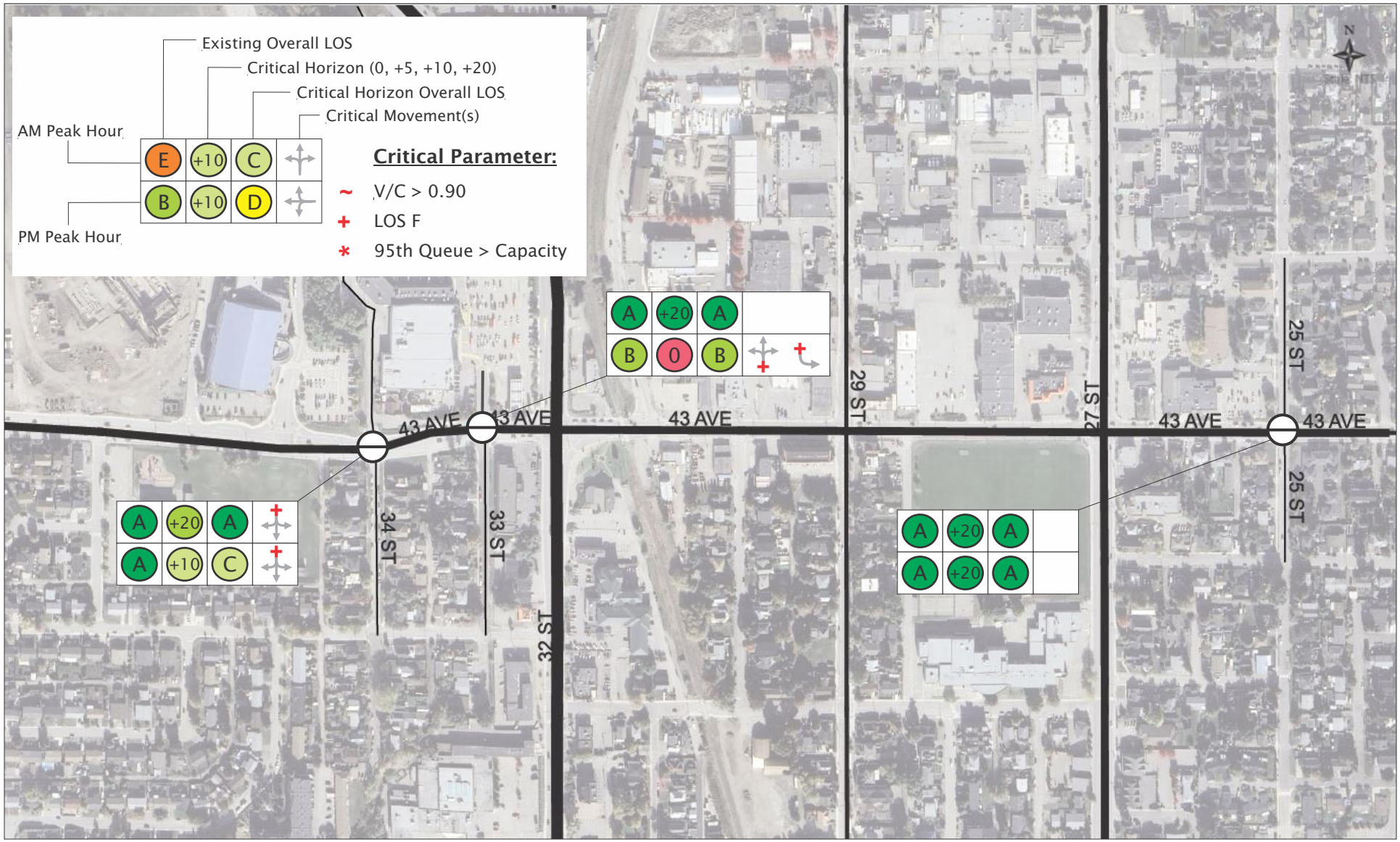

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**Exhibit ES.3**

## Traffic Operations Summary - Group 3

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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**Exhibit ES.4**

# Traffic Operations Summary - Group 4

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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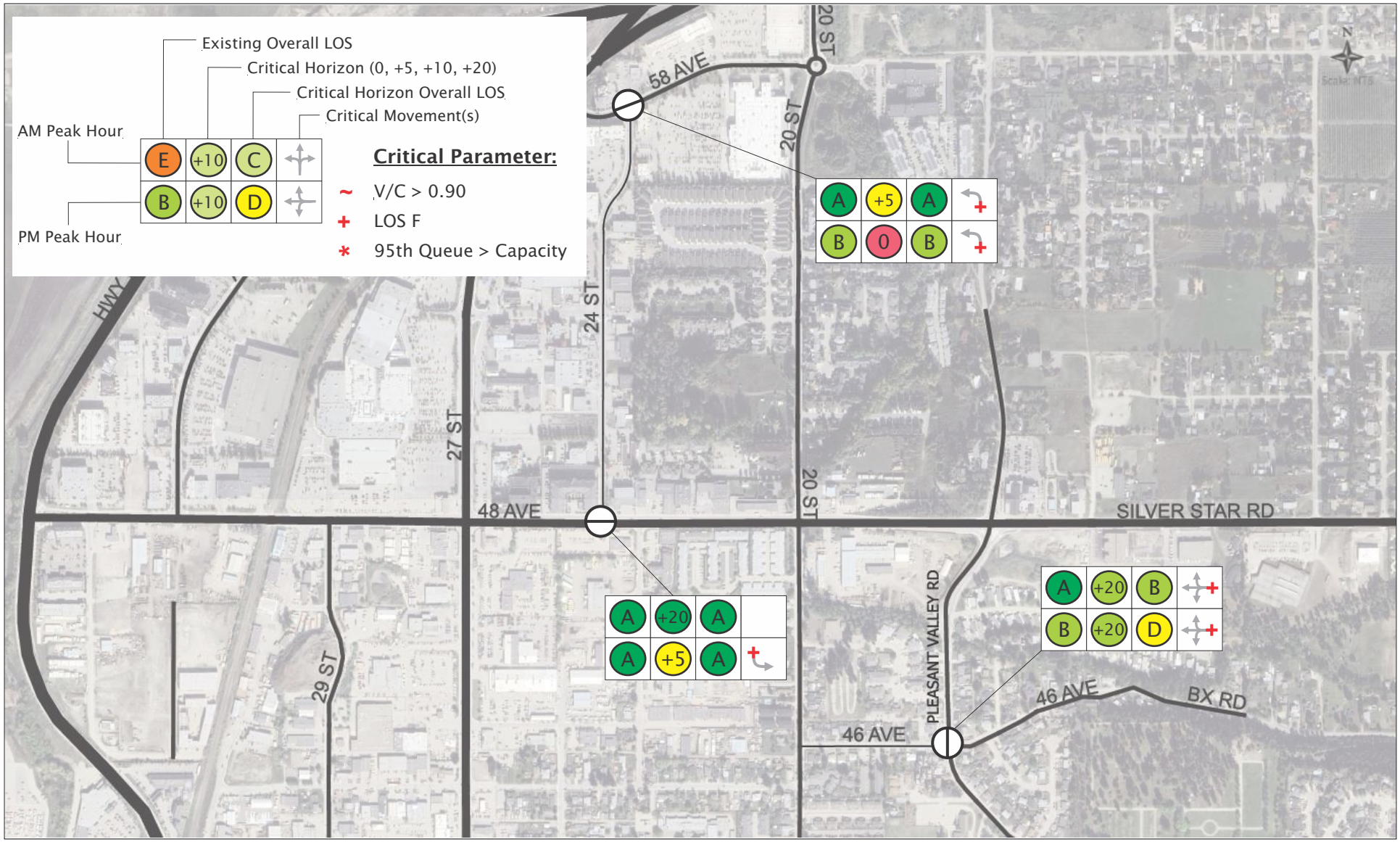

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**Exhibit ES.5**

# Traffic Operations Summary - Group 5

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07-24-0038 March 2025

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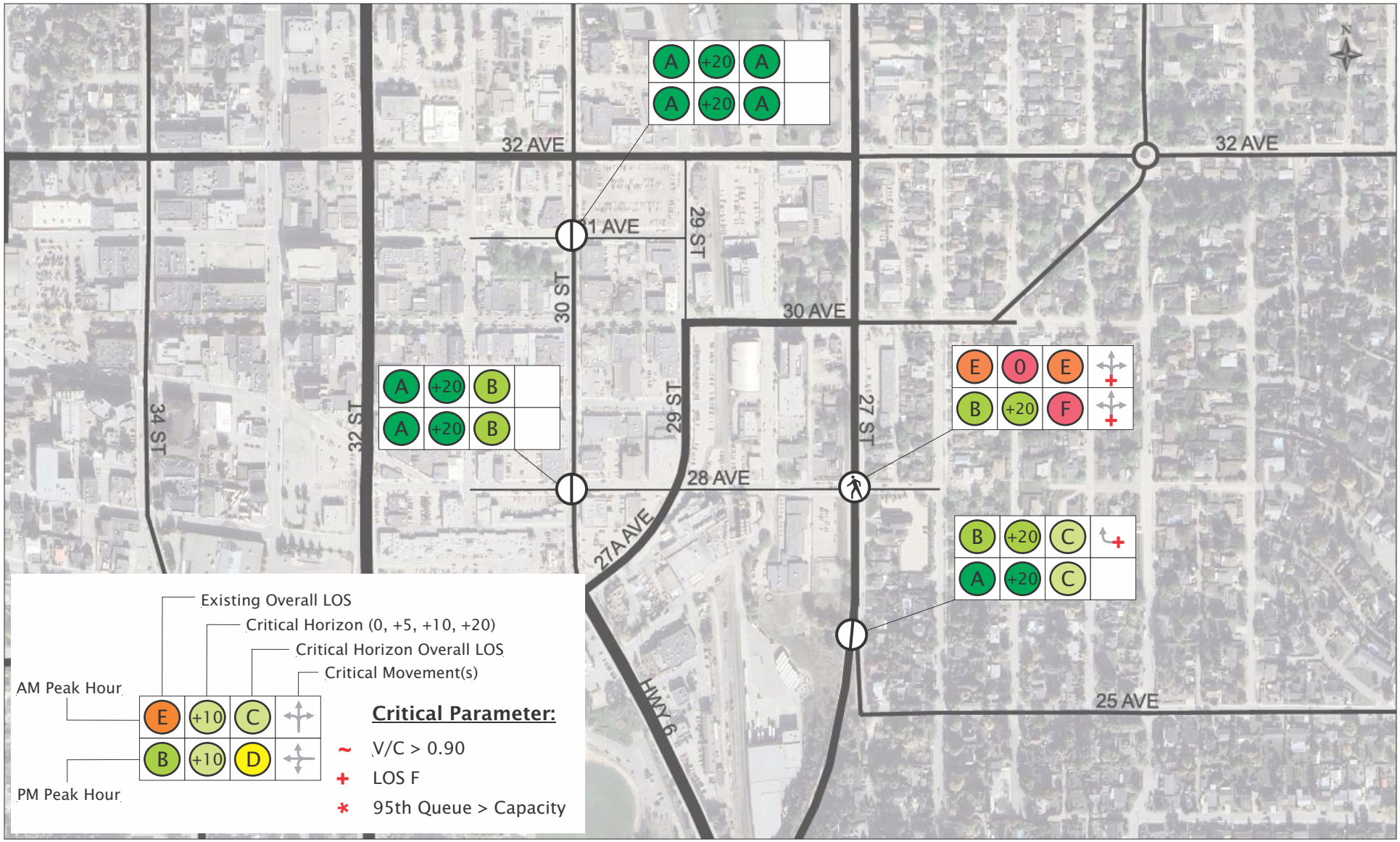

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**Exhibit ES.6**

## Traffic Operations Summary - Group 6

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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**Exhibit ES.7**

# Traffic Operations Summary - Group 7

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07-24-0038 March 2025

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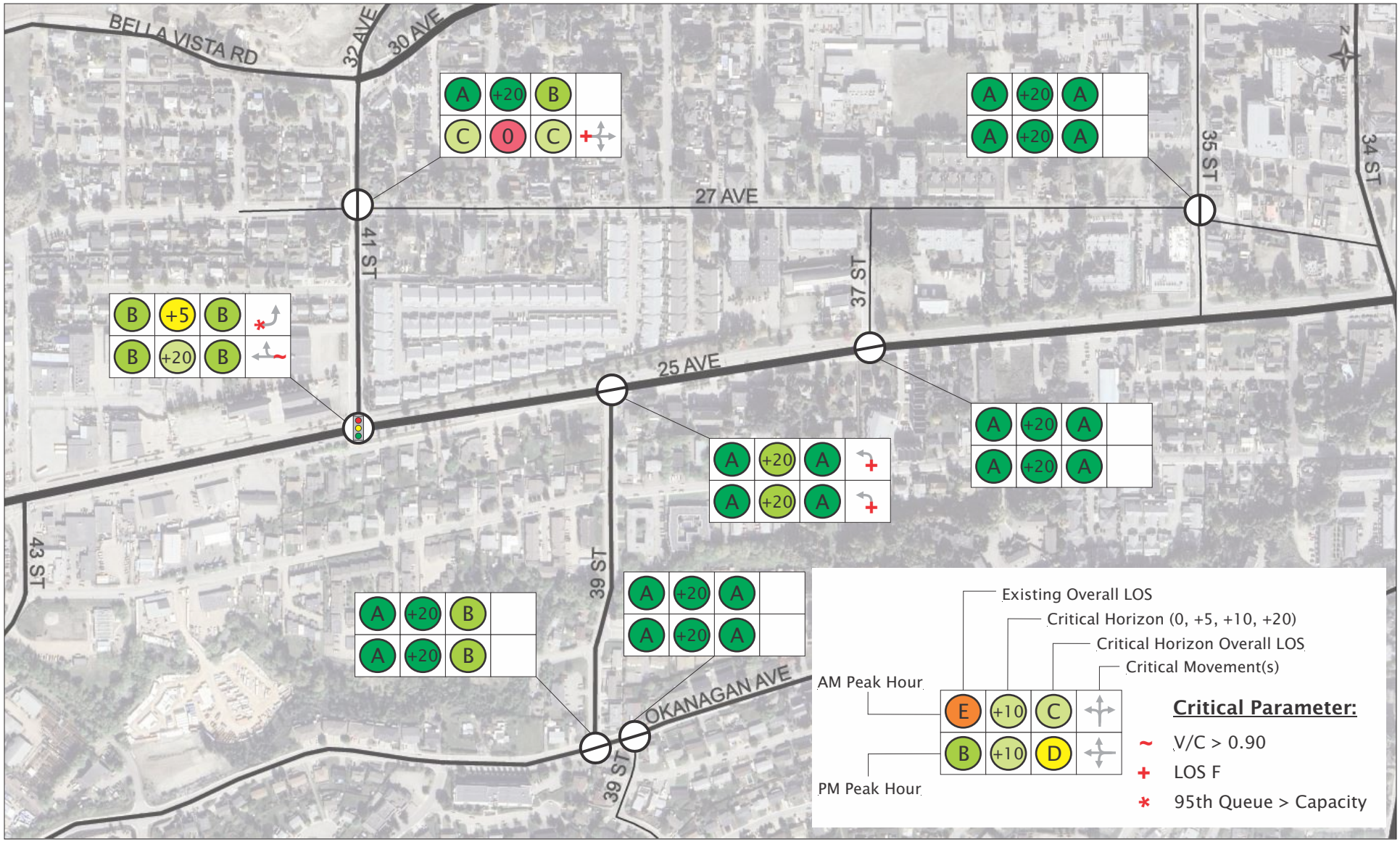


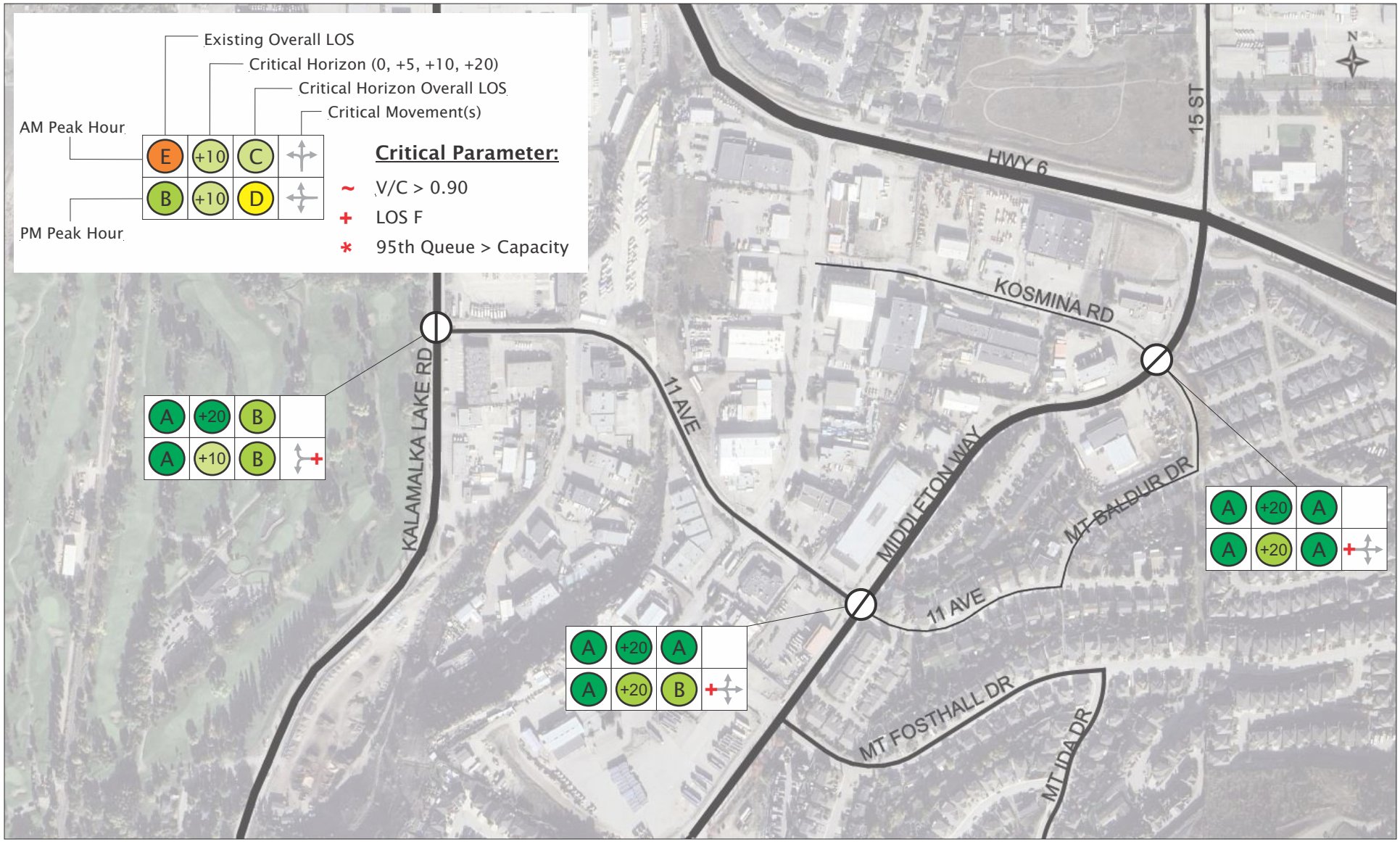

**Exhibit ES.8**

# Traffic Operations Summary - Group 8

City of Vernon Traffic Modelling Services
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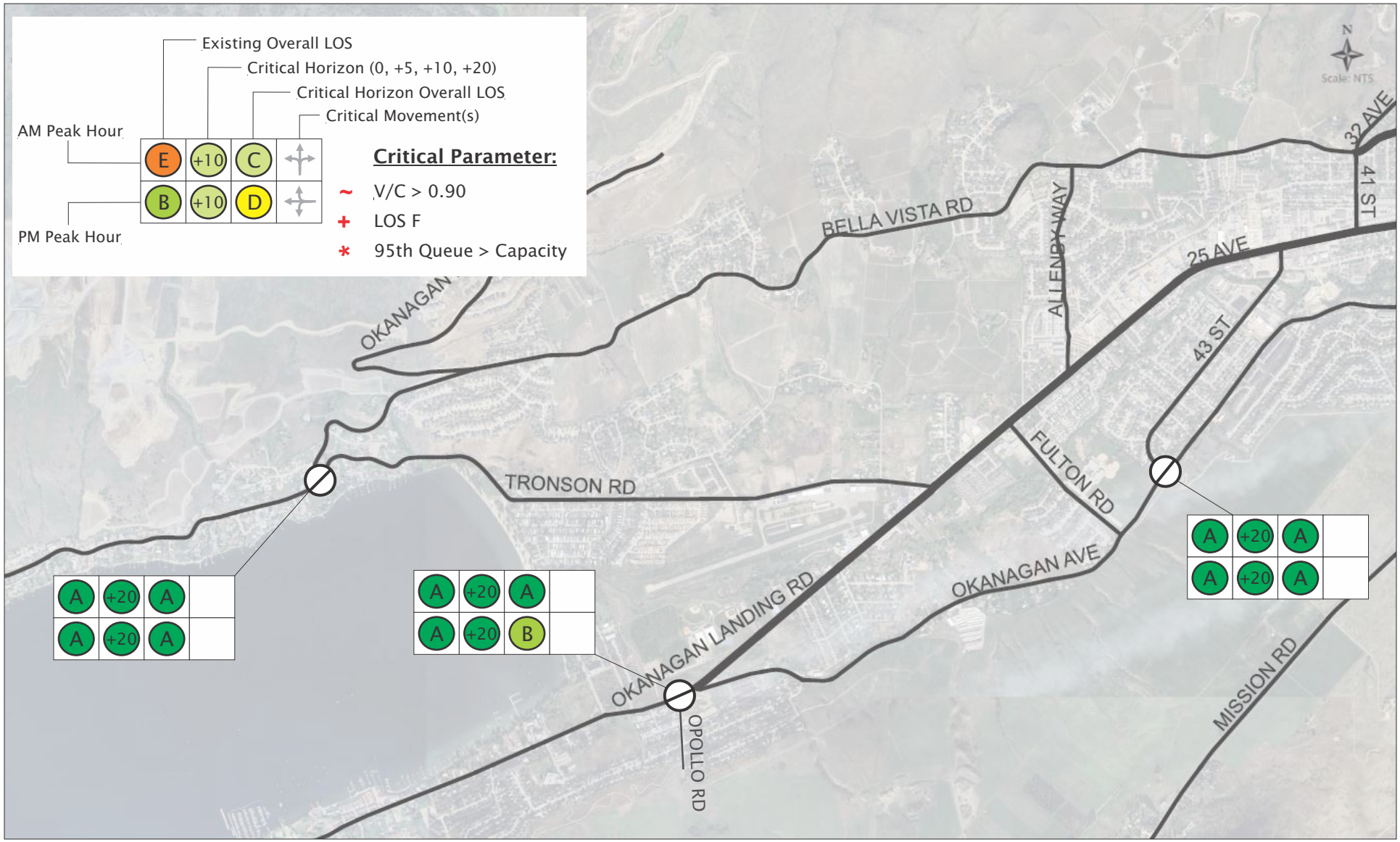

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**Exhibit ES.9**

## Traffic Operations Summary - Group 9

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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**Exhibit ES.10**

## Traffic Operations Summary - Group 10

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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## Mitigation Measures

Mitigation strategies were developed for intersections exceeding acceptable performance thresholds. Several mitigation strategies were considered based on engineering judgement, the traffic modelling, and on-site field observations, including:

- Upgrading to a full traffic signal.
- Upgrading to a roundabout.
- Upgrading pedestrian crossing controls, including Rectangular Rapid Flashing Beacons (RRFBs), Overhead or side-mounted flashing beacons, or pedestrian-actuated traffic signals.
- Turn controls (i.e., restrictions or prohibition of movements).
- Additional signage, pavement markings, and/or other traffic control devices.

In summary, the recommended mitigation strategies for the study intersections include:

- 1 signal or roundabout option upgrade
- 5 roundabout upgrades
- 6 traffic signal upgrades
- 4 signal optimization and left turn storage extensions
- 5 turn control or movement prohibitions
- Options to implement turn controls instead of upgrading traffic control to signal or roundabouts

## ICBC Crash Data Analysis

ICBC crash data for the 2019-2023 time period for the 40 study intersections was reviewed in aggregate to evaluate:

- Crash Severity
- Crash Frequency
- Crash Type
- Active Transportation Related Crashes
- Crash Time of Day / Day of Week

The key findings of the crash data assessment include:

- Casualty crashes formed 39% of total crashes.
- Side impact and rear-end crashes were the most prevalent crash types at 29% and 24%, respectively.
- Crashes occurred most frequently on Tuesday and Friday.
- Crashes frequencies were highest in December, October, or July. This may be attributed to higher exposure (traffic volumes) during the summer months or winter conditions in December.
- 19 crashes occurred involving active transportation users. Of note:
    - 34th Street & 24th Street, which is a two-way stop-controlled intersection with a signed and marked pedestrian crosswalk had the most cyclist crashes (3).

- 39th Street & 33rd Street, which is a two-way stop-controlled intersection with signed and marked pedestrian crosswalks, had the most pedestrian crashes (3).

## Implementation Plan

A summary of the recommended upgrades and implementation horizon years was developed to help the City prepare its OCP and TP updates. The tabulated summary is presented in **Table ES.1**.

**Table ES.1: Summary of Recommended Transportation Upgrades**

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 3 | 41 Street & 25 Avenue *(Signal)* | Implement traffic signage and pavement markings to restrict the south leg's movements to inbound only | 2025 |
| | | Optimize signal timing plan | 2035 |
| | | Increase the eastbound left storage lane to 95 meters | 2045 |
| 7 | 34 Street & 24 Avenue *(EB/WB Stop)* | Implement turn controls and concrete median to restrict intersection to right-in/right-out.<br><br>Optional Addition: Install ladder pedestrian crosswalk markings for the north leg crosswalk.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons for the north leg crossing. | 2025 |
| 8 | 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2035 |
| 11 | 41 Street & 27 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2025 |
| 13 | 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | Optimize signal timing plan<br>Increase westbound left turn storage lane to 75 meters | 2025 |
| | | Increase westbound left turn storage lane to 105 meters | 2030 |
| | | Increase westbound left turn storage lane to 130 meters<br>Increase northbound right turn storage lane to 50 meters | 2035 |
| | | Upgrade to 95-meter dual-left turn westbound lanes<br>Increase northbound right turn storage lane to 85 meters | 2045 |
| 14 | 37 Street & 30 Avenue *(Signal)* | Install concrete median along 30 Avenue extending from 37 Street to just beyond 38 Street and implement turn controls such that 30 Avenue & 38 Street is restricted to right-in right-out movements only. | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 115 meters | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 140 meters | 2030 |
| | | Upgrade to roundabout | 2035 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 16 | 34 Street & 43 Avenue *(NB/SB Stop)* | Monitor intersection traffic operations as development in the area occurs and review applicability of signalization upgrades.<br><br>With future redevelopment potential of the Vernon Square Mall, consider providing bicycle facilities (bike lanes, protected bicycle tacks, etc.) along 34 Street north of 43 Avenue connecting to 32 Street/Highway 97. | 2035 |
| 17 | 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement | 2025 |
| 19 | Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | Option 1: Upgrade to traffic signal. Note, this option is preferred as there are less land acquisition and regrading requirements.<br><br>Option 2: Upgrade to roundabout | 2045 |
| 20 | 24 Street/Driveway & 48 Avenue *(NB/SB Stop)* | Upgrade to full traffic signal | 2030 |
| 21 | 24 Street/Driveway & 58 Avenue *(NB/SB Stop)* | Upgrade to roundabout | 2025 |
| 24 | 33 Street & 39 Avenue *(NB/SB Stop)* | Option 1: Upgrade to signal<br>Option 2: Upgrade to roundabout | 2025 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 30 meters | 2035 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 45 meters | 2045 |
| 25 | 25 Street & 39 Avenue *(NB Stop)* | Monitor traffic operations as delays are approaching acceptable thresholds. | 2030 |
| 26 | 31 Street & 32 Avenue *(NB/SB Stop)* | Install concrete median to restrict vehicle movements to right-in/right-out including a pedestrian refuge for the north-south crosswalks.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons (RRFBs) for the north-south crosswalks.<br><br>Optional Addition: Update zebra pedestrian crosswalk markings to ladder crosswalk marking pattern. | 2030 |
| 29 | 27 Street & 25 Avenue *(WB Stop)* | Close the east leg of the intersection on 25 Avenue and modify it to cul-de-sac | 2045 |
| 30 | 27 Street & 28 Avenue *(Ped Signal)* | Optimize signal timing plan | 2025 |
| | | Upgrade to a full traffic signal | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 31 | Middleton Way & Kosmina Road *(EB/WB Stop)* | Implement turn controls to restrict intersection to right-in/right-out with a concrete median on Middleton Way. | 2030 |
| | | Upgrade to traffic signal | 2045 |
| 32 | Middleton Way & 11 Avenue *(EB/WB Stop)* | Upgrade to traffic signal | 2045 |
| 33 | Kalamalka Lake Road & 11 Avenue *(WB Stop)* | Upgrade to traffic signal | 2035 |
| 34 | 34 Street & 31 Avenue *(EB/WB Stop)* | Install turn controls and concrete median along 34 Street at this intersection to restrict movements to right-in/right-out.<br><br>Optional Addition: Install concrete curb extensions at each intersection corner<br><br>Optional Addition: Install ladder pedestrian crosswalk markings<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacon pedestrian control for the north and south leg crosswalks. | 2030 |
| 35 | 30 Street & 31 Avenue *(NB/SB Stop)* | Continue monitoring this location for transit safety.<br><br>While traffic volumes may remain low, the primary vehicles exiting are buses and the intersection functions in a unique way.<br><br>Ongoing monitoring may should review potential for future transit station upgrades and ensure the design continues to meet operational and safety needs for transit vehicles and users. | - |
| 36 | 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement<br><br>Install a concrete median along 30 Avenue at this intersection to support the right-in/right-out turn controls that can also accommodate semi-truck vehicle access to the Safeway grocery store to the north. | 2045 |
| 37 | 33 Street & 30 Avenue *(NB/SB Stop)* | Option 1: Upgrade to full traffic signal.<br><br>Option 2: Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 38 | 31 Street & 30 Avenue *(NB/SB Stop)* | Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2030 |
| 39 | 34 Street & 28 Avenue *(EB/WB Stop)* | Implement turn controls prohibiting westbound left turn and through movement | 2045 |
| | | | |

# 1. INTRODUCTION

## 1.1 Study Purpose and Objectives

The City of Vernon (City) is updating their Official Community Plan (OCP) and Transportation Plan (TP) to support the vision for the community's long-term growth and identity. The TP will help guide the City in managing and upgrading its multi-modal transportation system, including roads, public transit, pedestrian networks, and bicycle networks to meet current and future demands. With the BC Government publishing new policies on Transit Oriented Areas (TOAs) and housing, the OCP and TP updates will help the City align with these new policies.

Bunt & Associates Engineering Ltd. (Bunt) has been retained by the City to conduct a city-wide traffic modelling assessment at 40 selected intersections to review existing and future traffic operations and performance and to identify upgrade requirements to continue accommodating the City's traffic demands. Note, Bunt was also retained by the City to review and evaluate 15 Highway crossing locations which will be documented in a separate report.

An overview of the 40 intersections is presented in **Exhibit 1.1**. Note, the intersections were assembled into 10 groups based on their locations for the purposes of this analysis. The detailed groupings and intersection characteristics are provided in **Section 2**.

## 1.2 Study Scope and Area

This report has been prepared in accordance with the City RFP and subsequent discussions with Bunt to determine an agreeable study area, study horizons, and analysis methodology.

Key tasks identified include:

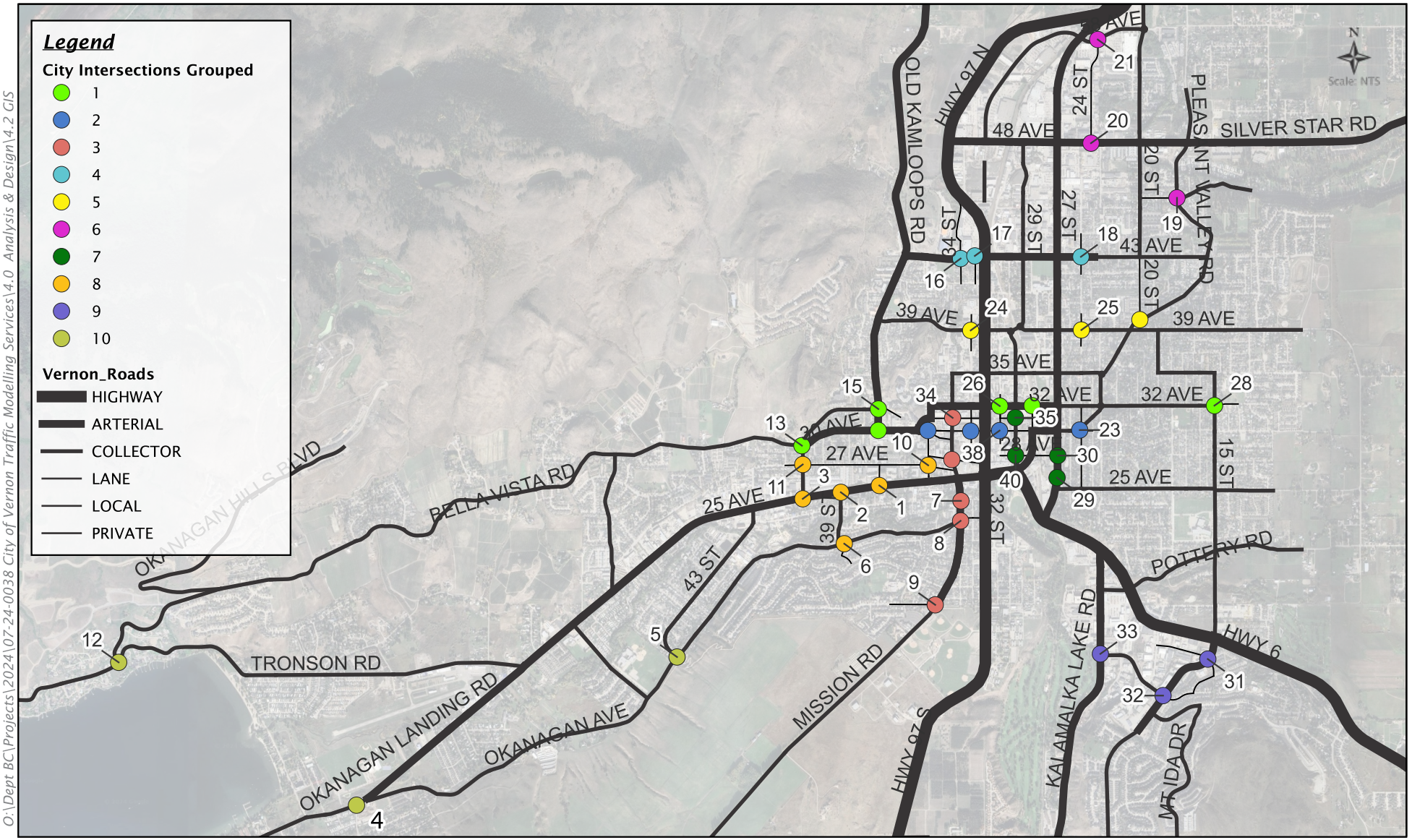
1. Assessing existing traffic volumes and traffic operations performance.
2. Reviewing relevant transportation plans and policies.
3. Forecasting future traffic volumes for the study intersections for 2030 (+5 years), 2035 (+10 years), and 2045 (+20 years), assuming an annual linear traffic growth rate.
4. Evaluating future traffic operations at each horizon year and identifying issues.
5. Reviewing intersection traffic controls and analyzing options for upgrades.
6. Developing a timeline for intersection upgrades and mitigation strategies.

## 1.3 Organization of Report and Study Scope

The sections of this report have been organized as follows:

- **Section 1** presents the study purpose, key tasks, and the study extent.

- **Section 2** describes the Existing Conditions at the study intersection, the existing road network, existing traffic volumes, and existing traffic operations.
- **Section 3** presents the Future Traffic Conditions for the study intersection, including projected traffic volumes, traffic operations analysis, and issue identification.
- **Section 4** provides an overview of the mitigation development strategies and implementation timeline.
- **Section 5** lists the study conclusions and recommendations.




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Exhibit 1.1

# Study Intersections

City of Vernon Traffic Modelling Services

07-24-0038 March 2025

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# 2. EXISTING TRAFFIC CONDITIONS

## 2.1 Traffic Volume Data

Turning Movement Count (TMC) data for the study intersections were provided to Bunt by the City to utilize for the traffic analysis. The TMCs provide the following details at each intersection:

- Individual vehicle movement counts;
- Vehicle classifications for passenger vehicles and heavy vehicles;
- Bicycle movement counts;
- Pedestrian crosswalk volumes; and
- Aggregation of counts at 15-minute intervals.

Diagrams showcasing the traffic volumes for each intersection are presented in the Group Subsections **2.2** to **2.11**. Furthermore, the full TMC data sheets are provided in **Appendix A** for reference.

## 2.2 Group 1 – 32 Avenue

Group 1 encompasses intersections along 32 Avenue and 30 Avenue between 15 Street and 37 Street / Alexis Park Drive. 32 Avenue and 30 Avenue are arterial roadways that span the east-west directions and connect through the Alexis Park, City Centre, and East Hill neighbourhoods. The study intersections within the scope of this group are presented in **Exhibit 2.1**.

Within the group, there is a mix of signalized and stop-controlled intersections. The characteristics of the roadways within this group are presented in **Table 2.1**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.2** and **2.3**.

**Table 2.1: Group 1 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 32 Avenue | Arterial | 1 EB<br>1 WB<br>LT Lanes at Intersection | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 30 Avenue | Arterial | 1 EB<br>1 WB<br>LT Lanes at Intersection | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 15 Street | Collector | 1 NB<br>1 SB | 50 km/hr<br>With School Zones | On-Street<br>Both Sides | Sidewalks<br>Both Sides<br><br>On-Street<br>Bike Lanes |
| 29 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>At Least One Side |

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 31 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>At Least One Side |
| Alexis Park Drive | Arterial | 1 to 2 NB<br>1 to 2 SB<br>LT Lanes at Select Intersections | 50 km/hr | None | Sidewalks<br>Both Sides<br><br>On-Street<br>Bike Lanes |
| | | | | | |

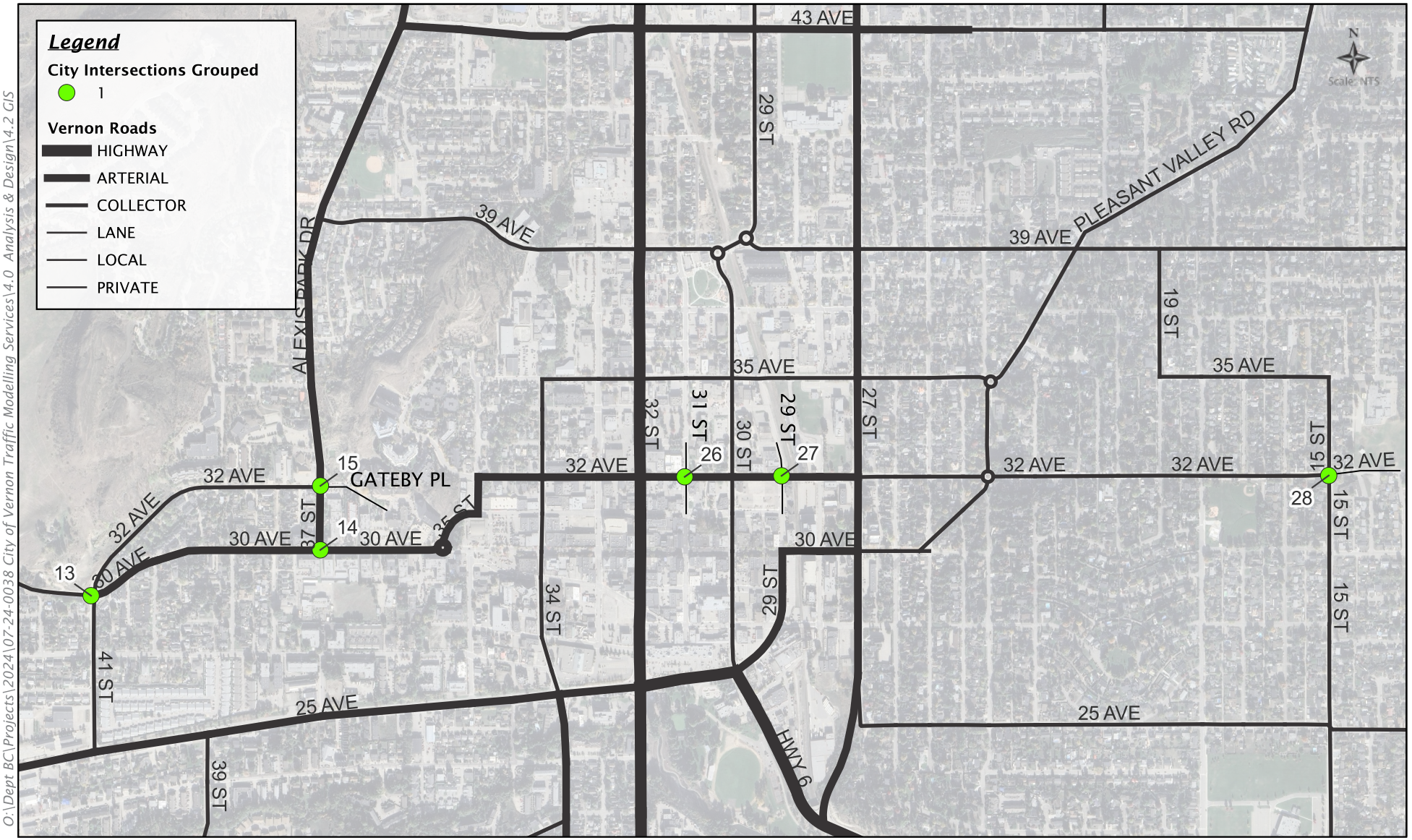
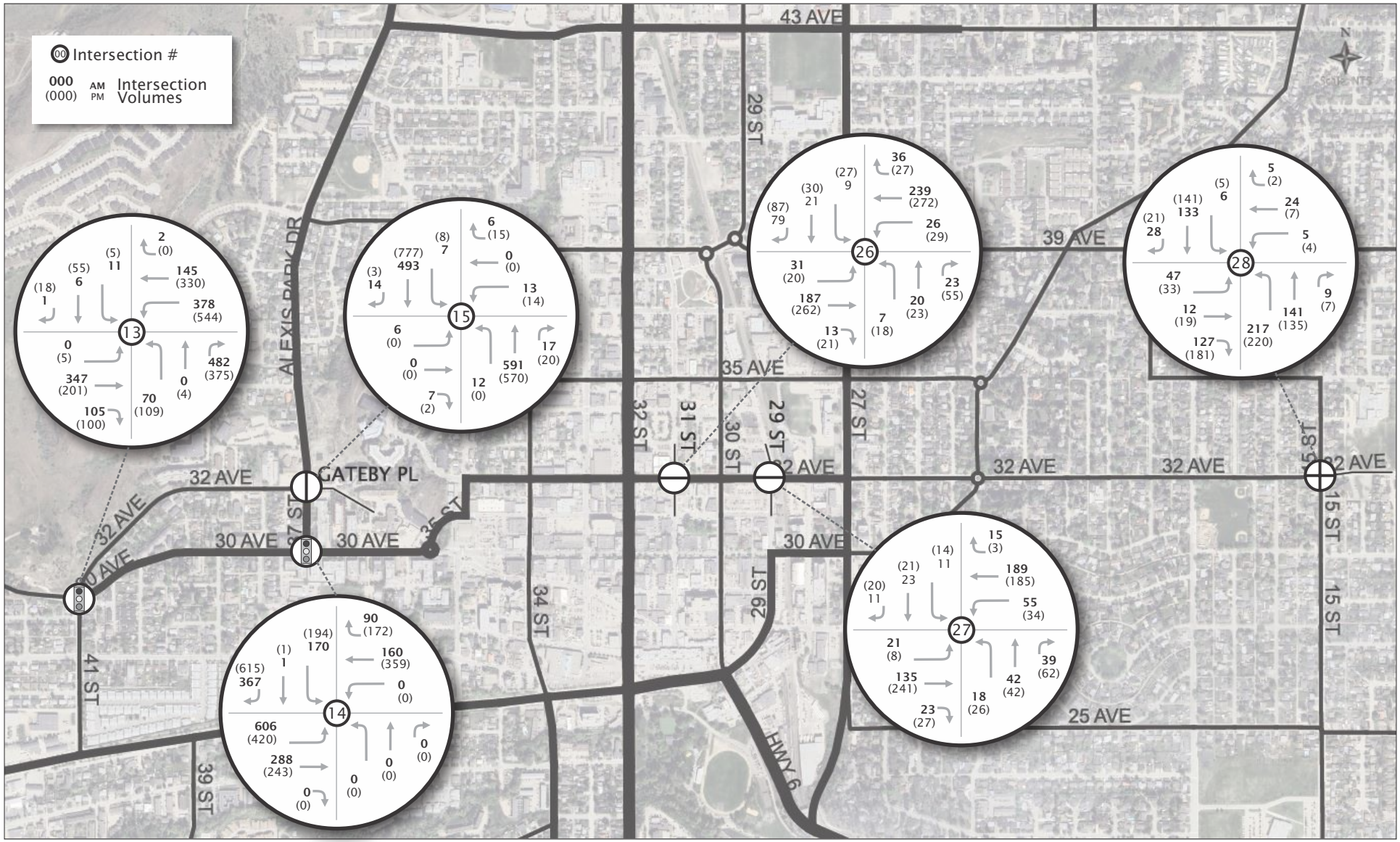



Exhibit 2.1

# Group 1 Study Intersections

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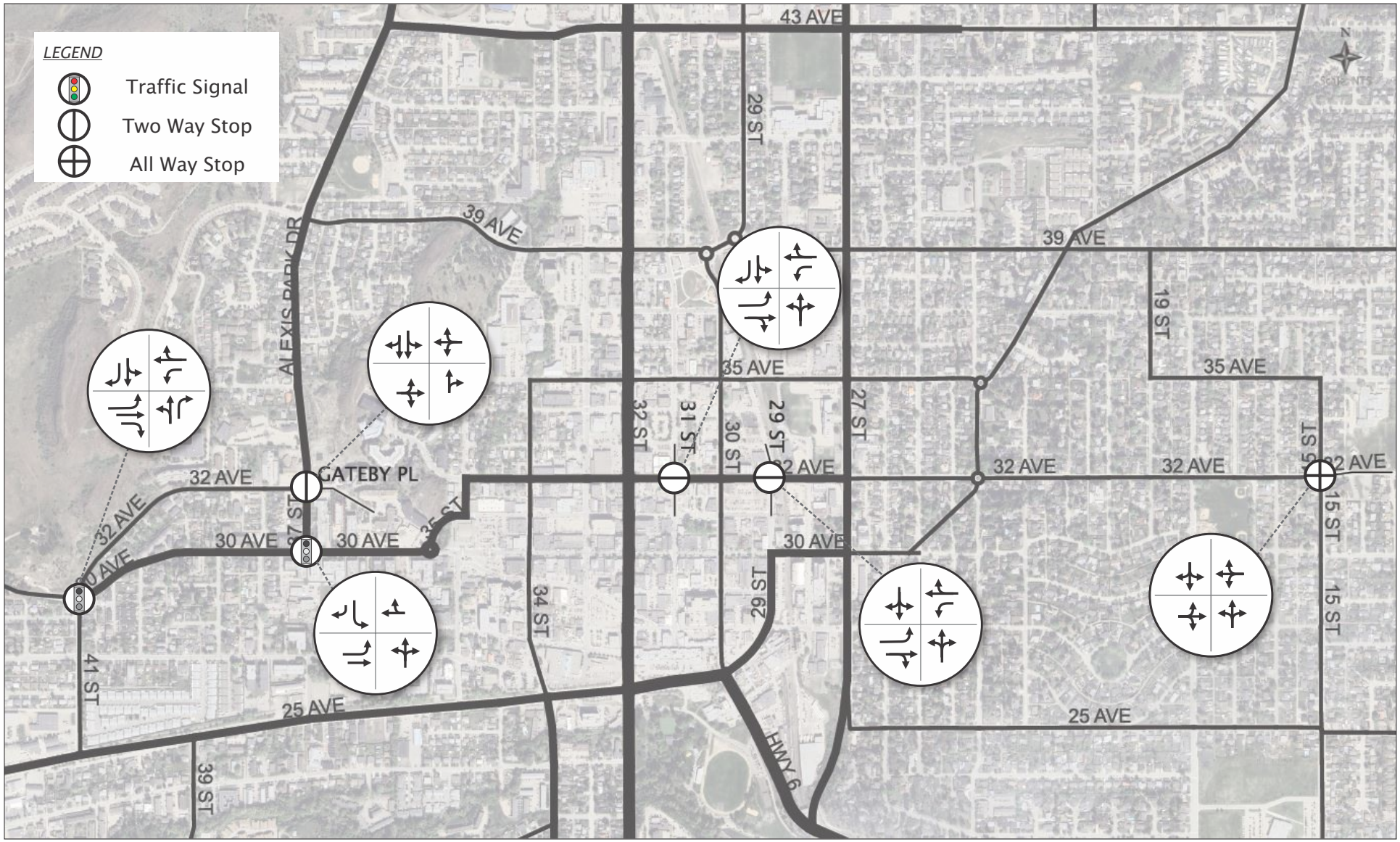

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**Exhibit 2.2**

# Group 1 TMCs

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**Exhibit 2.3**

## Group 1 Laning and Traffic Control

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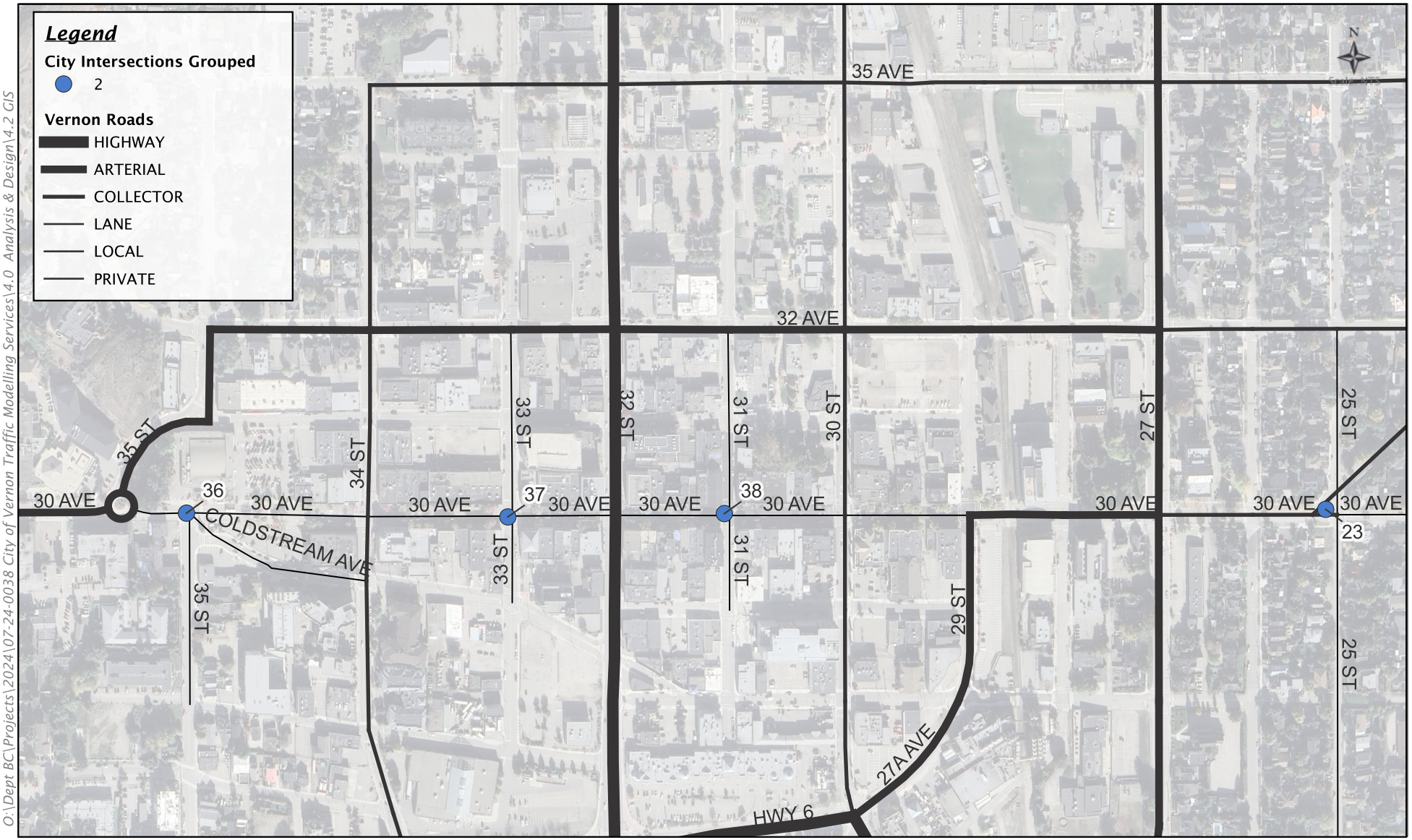
## 2.3 Group 2 – 30 Avenue

Group 2 includes intersections along 30 Avenue between 25 Street and 35 Street. 30 Avenue is an arterial roadway that operates east-west and connects through the City Centre neighbourhood. Note, 30 Avenue is the City's main high street directly within the Central Business District. Within the group, the intersections are all stop-controlled, with several featuring crosswalks. The study intersections within the scope of this group are presented in **Exhibit 2.4**.

The characteristics of the roadways within this group are presented in **Table 2.2**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.5** and **2.6**.

**Table 2.2: Group 2 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 30 Avenue | Arterial | 1 EB<br>1 WB<br>LT Lanes at Intersection | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 25 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>On one side<br><br>Some sections missing sidewalks (1 or both sides) |
| 31 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 33 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 35 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| | | | | | |




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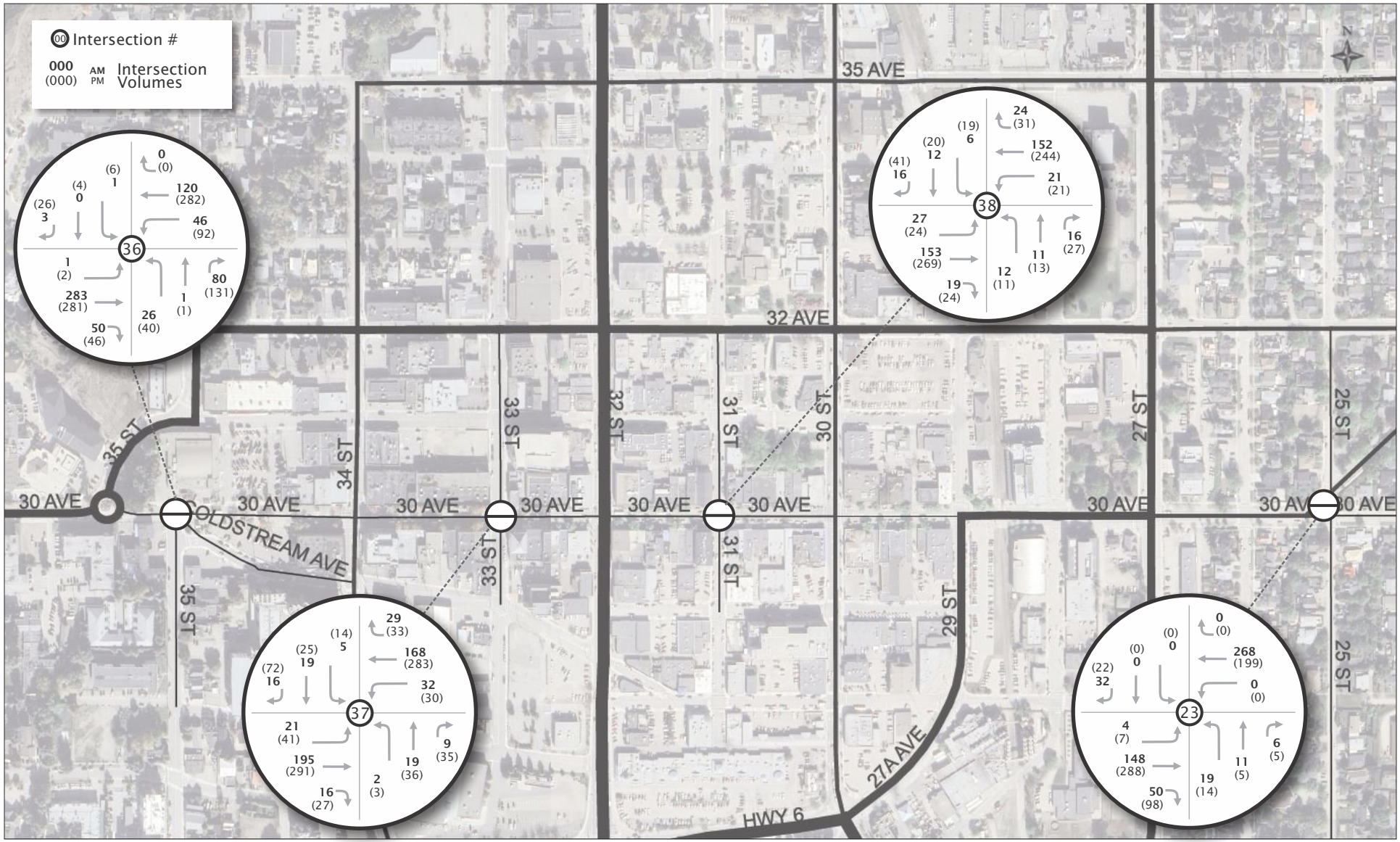
Exhibit 2.4

# Group 2 Study Intersections

City of Vernon Traffic Modelling Services

07-24-0038 March 2025

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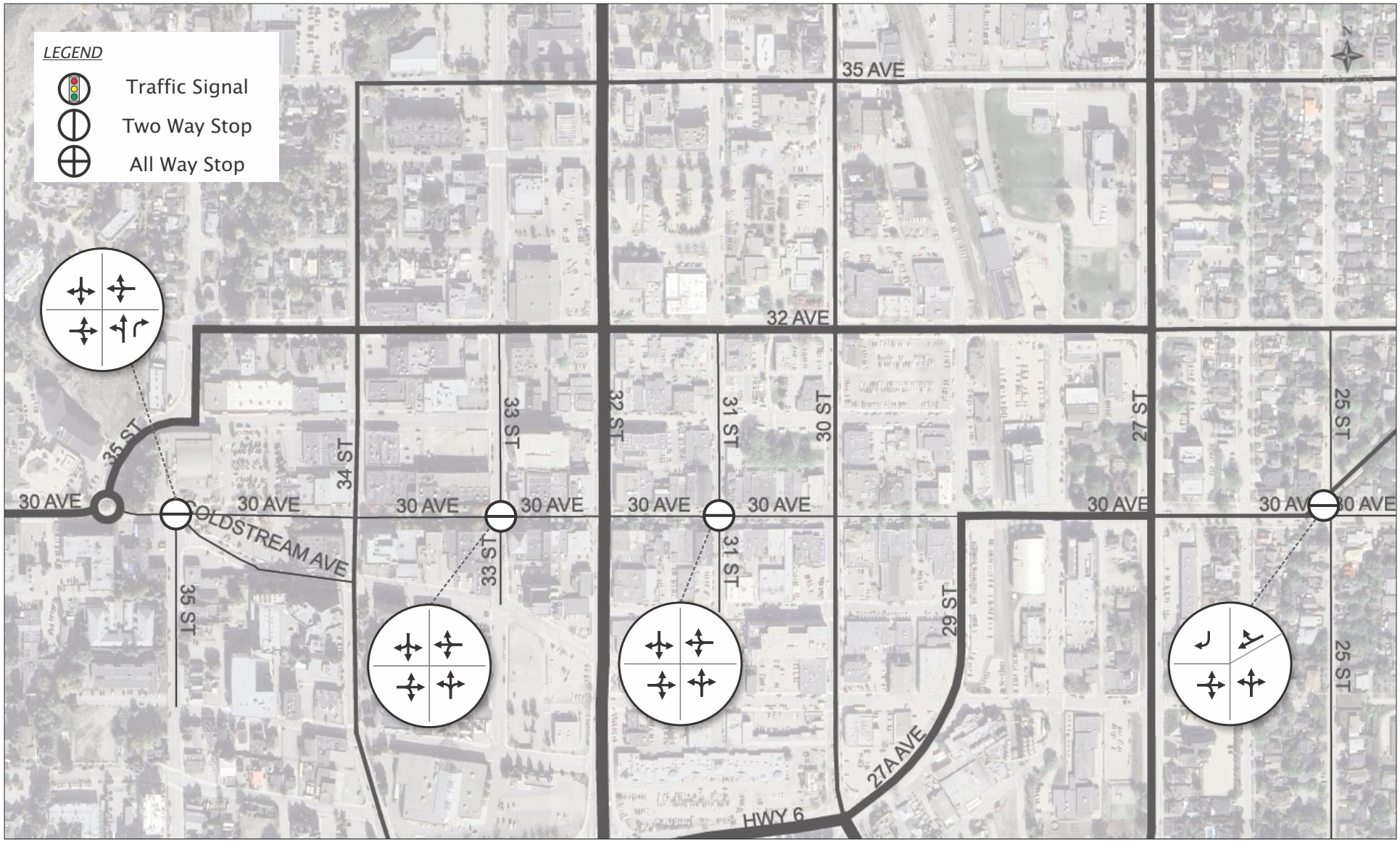

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**Exhibit 2.5**

# Group 2 TMCs

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**Exhibit 2.6**

# Group 2 Laning and Traffic Control

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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## 2.4 Group 3 – 34 Street

Group 3 contains intersections along 34 Street between Okanagan Avenue and 31 Avenue. 34 Street is a collector roadway that operates north-south and connects through the City Centre neighbourhood. Within the group, the intersections are stop-controlled with crosswalk facilities. The study intersections within the scope of this group are presented in **Exhibit 2.7**.

The characteristics of the roadways within this group are presented in **Table 2.3**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.8** and **2.9**.

**Table 2.3: Group 3 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 34 Street | Arterial | 1 SB<br>1 NB<br>LT Lanes at Intersection | 50 km/hr | Parking Prohibited | Sidewalks Both Sides<br><br>On-Street Marked Bike Lanes Both Sides |
| Okanagan Avenue | Collector | 1 EB<br>1 WB | 50 km/hr | Parking On-Street One Side | Sidewalk South Side Only |
| 24 Avenue | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street Both Sides | Sidewalk South Side Only |
| 28 Avenue | Local | 1 EB<br>1 WB<br>One-way EB between 34 Street and 35 Street | 50 km/hr | Parking On-Street At-least one side | Sidewalks Both Sides |
| 31 Avenue | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street Both Sides | Sidewalks Both Sides |
| | | | | | |

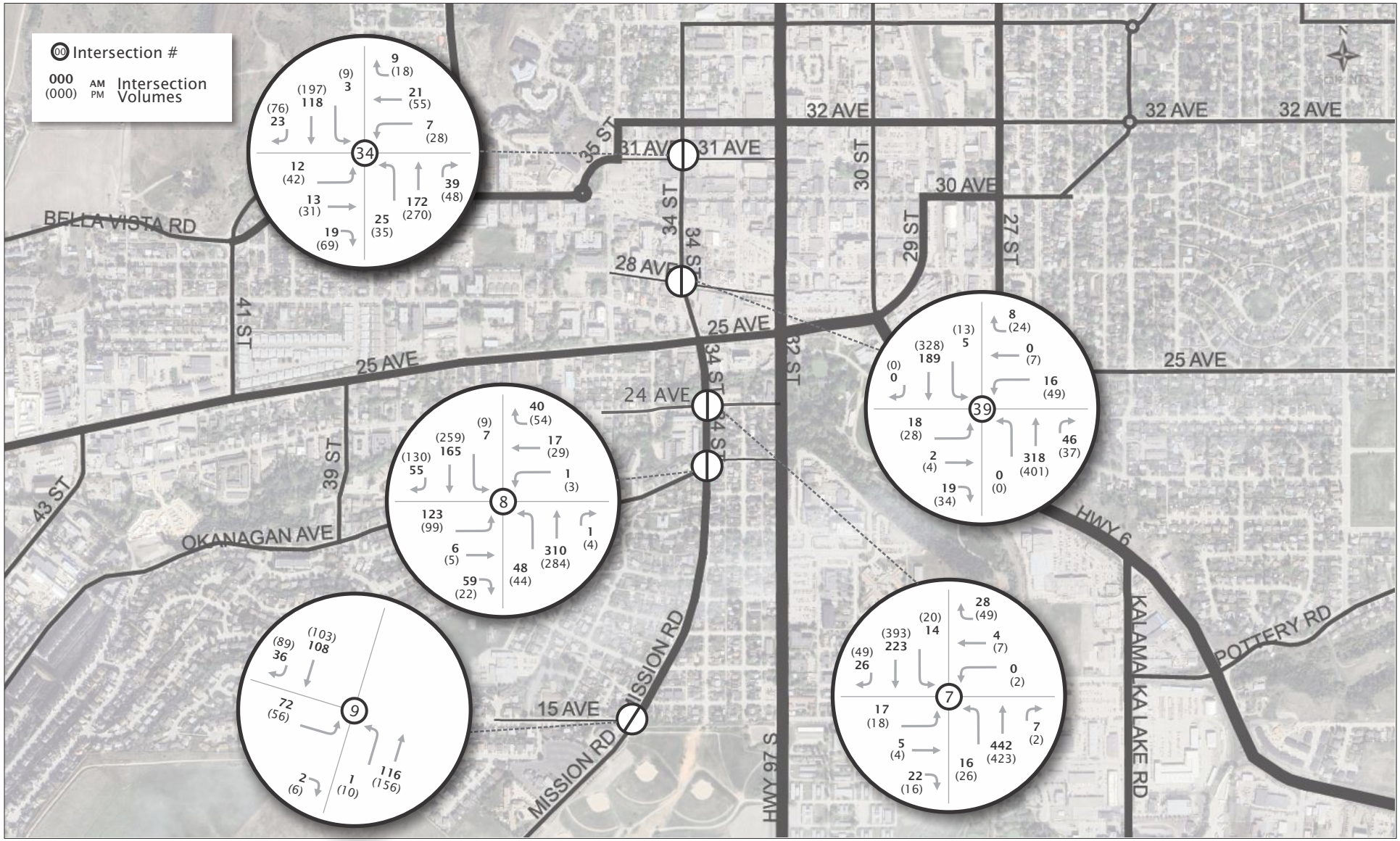



Exhibit 2.7

# Group 3 Study Intersections

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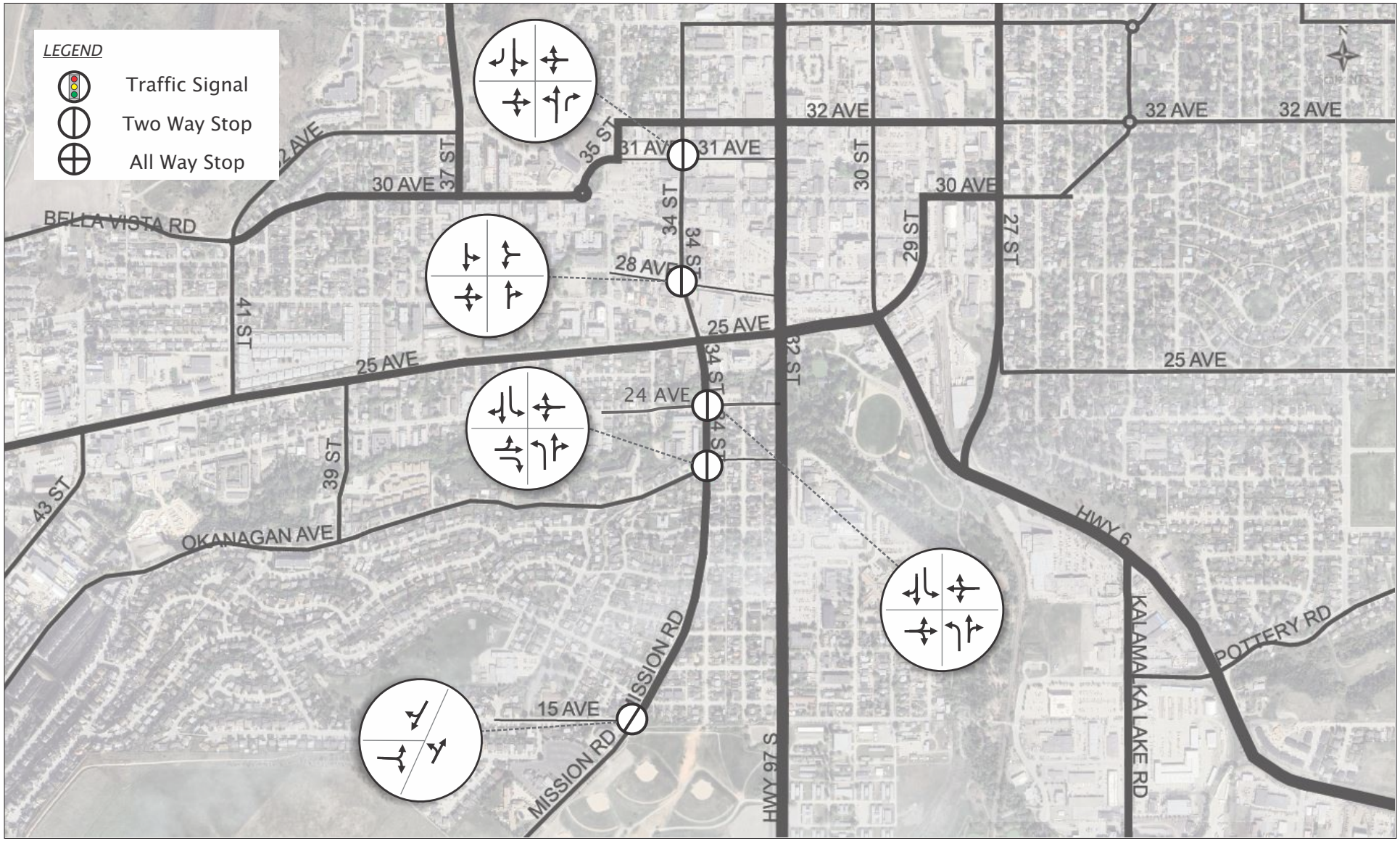

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**Exhibit 2.8**

## Group 3 TMCs

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07-24-0038 March 2025

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**Exhibit 2.9**

# Group 3 Laning and Traffic Control

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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## 2.5 Group 4 – 43 Avenue

Group 4 includes intersections along 43 Avenue between 25 Street and 34 Street. 43 Avenue is an arterial roadway that operates east-west and connects through the City Centre and Alexis Park neighbourhoods. Within the group, the intersections are two-way stop-controlled with a side-mounted flasher crosswalk facility positioned at 25 Street. Note, adjacent to the 43 Avenue corridor, there is the Kal Tire Place Multiplex Hockey Area, the Vernon Square Mall and Safeway, and several other commercial developments. The study intersections within the scope of this group are presented in **Exhibit 2.10**.

The characteristics of the roadways within this group are presented in **Table 2.4**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.11** and **2.12**.

**Table 2.4: Group 4 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 43 Avenue | Arterial | 1 EB/1WB east of 43 Avenue<br>2 EB/2WB west of 43 Avenue<br><br>LT Lanes at Intersection | 50 km/hr | On-Street Parking Limited Sections | Sidewalks Both Sides<br><br>On-Street Marked Bike Lanes Both Sides East of 27 Street |
| 34 Street | Local | 1 NB<br>1 SB | 50 km/hr | Parking On-Street Both Sides | Sidewalk Both Sides |
| 33 Street | Local | 1 NB<br>1 SB | 50 km/hr | Parking On-Street One Sides | Sidewalk One Side Only |
| 25 Street | Local | 1 NB<br>1 SB | 50 km/hr | Parking On-Street Both Sides | Sidewalk One Side Only |
| | | | | | |



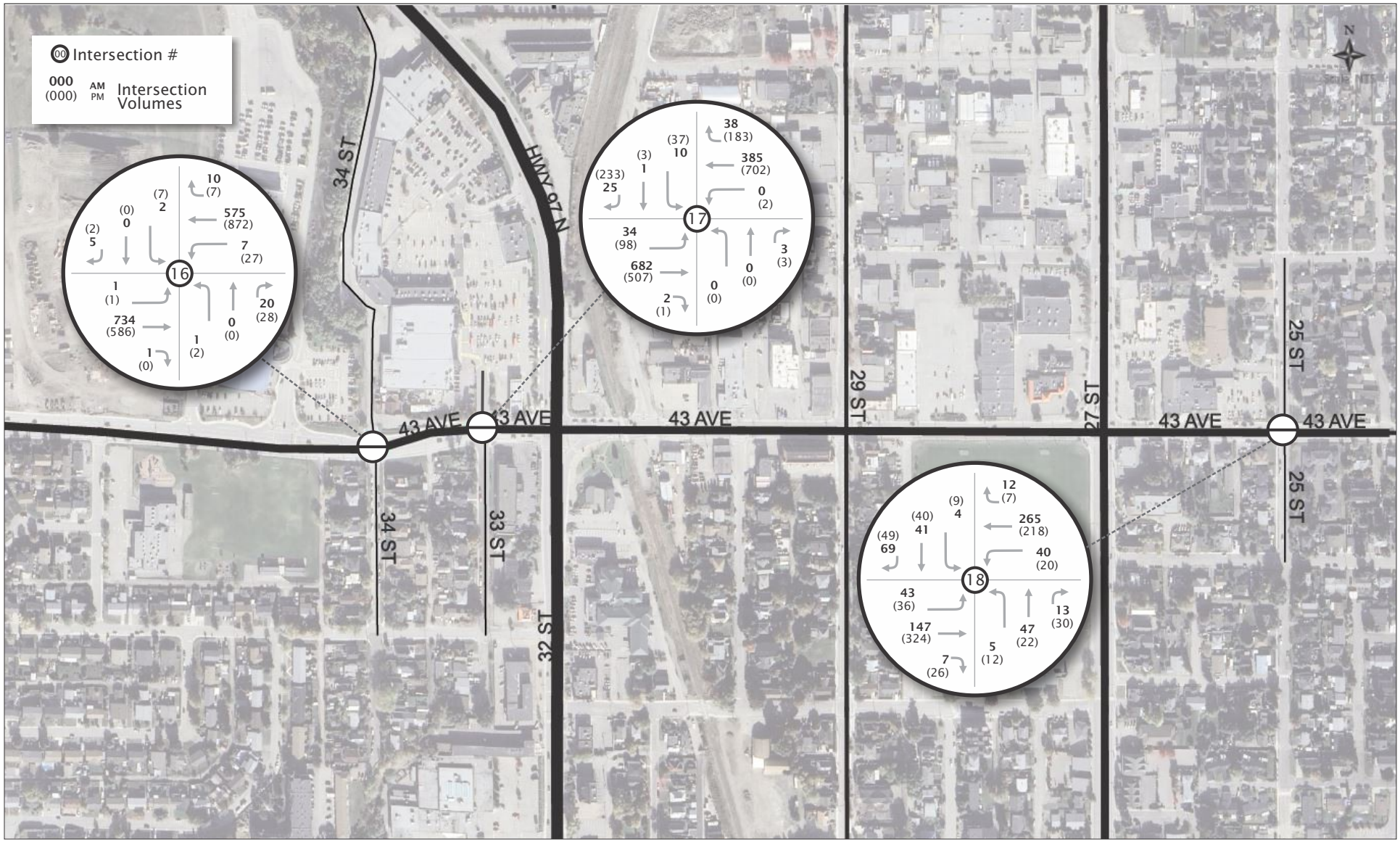

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Exhibit 2.10

# Group 4 Study Intersections

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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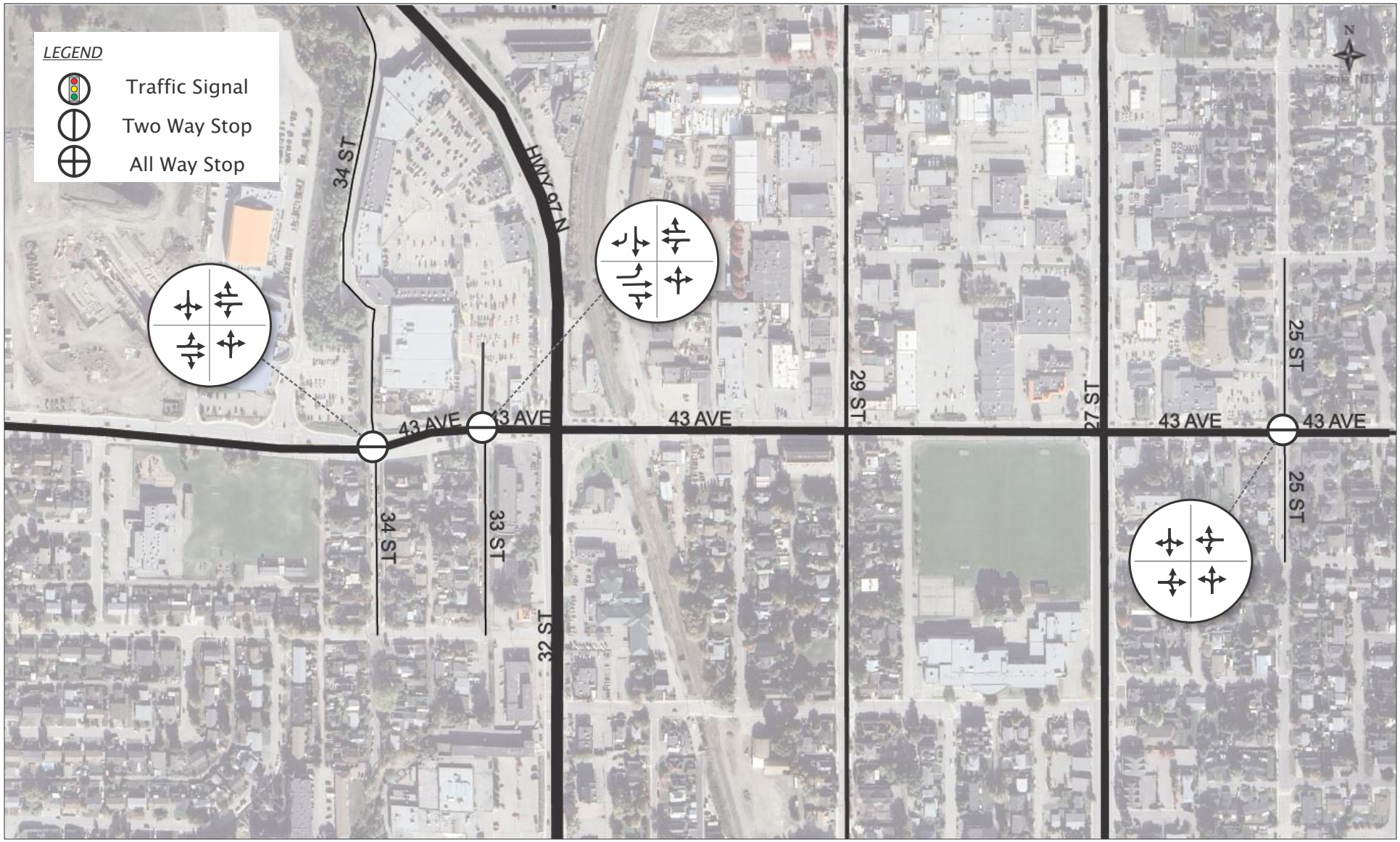

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**Exhibit 2.11**

## Group 4 TMCs

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**Exhibit 2.12**

## Group 4 Laning and Traffic Control

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07-24-0038 March 2025

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## 2.6 Group 5 – 39 Avenue & Pleasant Valley Road

Group 5 features intersections along 39 Avenue between 25 Street and 33 Street and along Pleasant Valley Road at 20 Street. 43 Avenue is an arterial roadway that operates east-west and connects through the City Centre and Alexis Park neighbourhoods. Within the group, the intersections are two-way stop-controlled with a side-mounted flasher crosswalk facility positioned at 25 Street. The study intersections within the scope of this group are presented in **Exhibit 2.13**.

The characteristics of the roadways within this group are presented in **Table 2.5**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.14** and **2.15**.

**Table 2.5: Group 5 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 39 Avenue | Collector | 1 EB<br>1 WB<br>LT Lanes at Intersection | 50 km/hr | Parking Prohibited | Sidewalks<br>Both Sides<br><br>On-Street Marked Bike Lanes<br>Both Sides |
| 20 Street | Local | 1 EB<br>1 WB | 50 km/hr<br><br>30 km/hr playground and school zones | Parking Prohibited | Sidewalks<br>Both Sides |
| 25 Street | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>Both Sides | Sidewalk<br>South Side Only |
| 33 Street | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>At-least one side | Sidewalks<br>At least One Side |
| | | | | | |

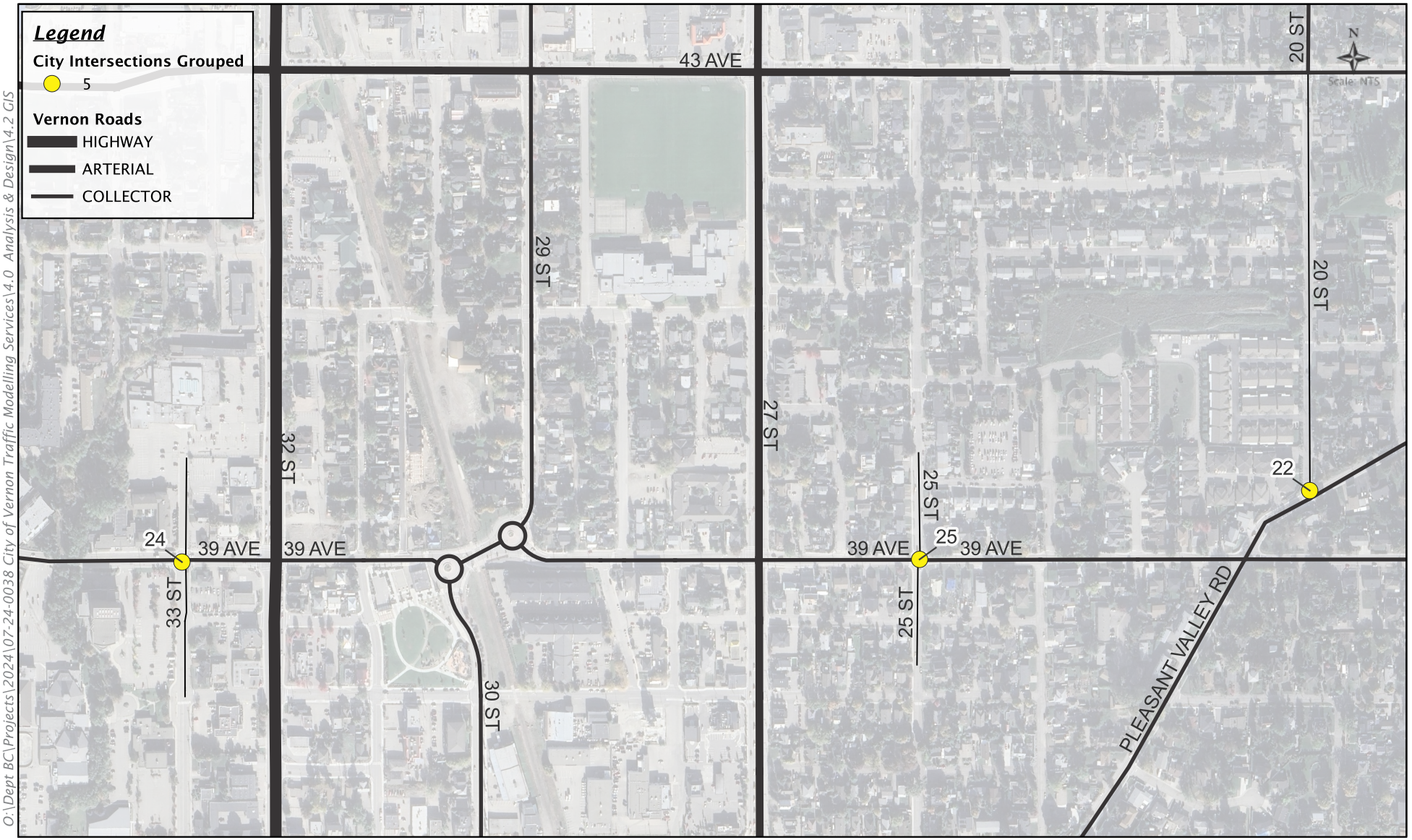
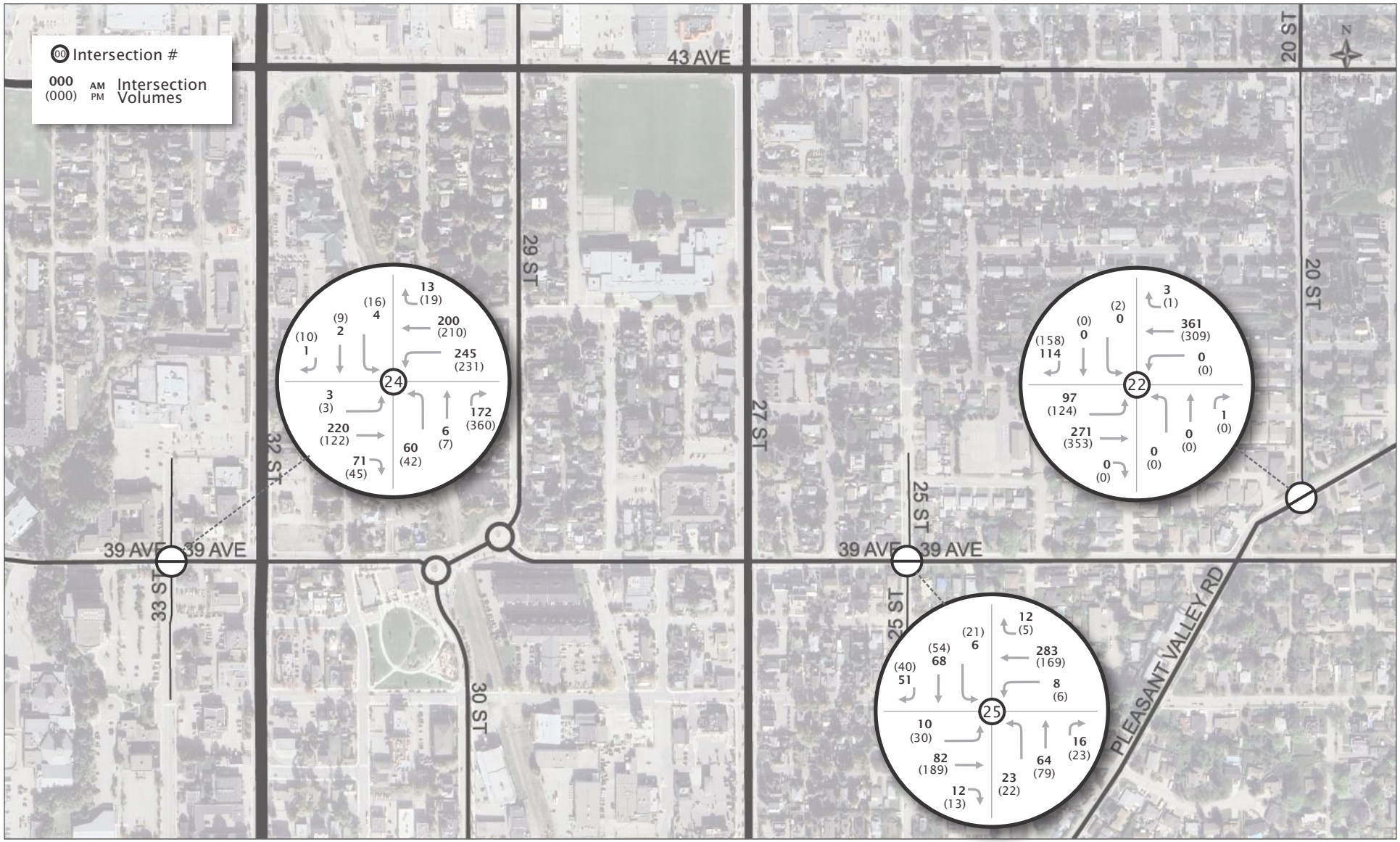



Exhibit 2.13

# Group 5 Study Intersections

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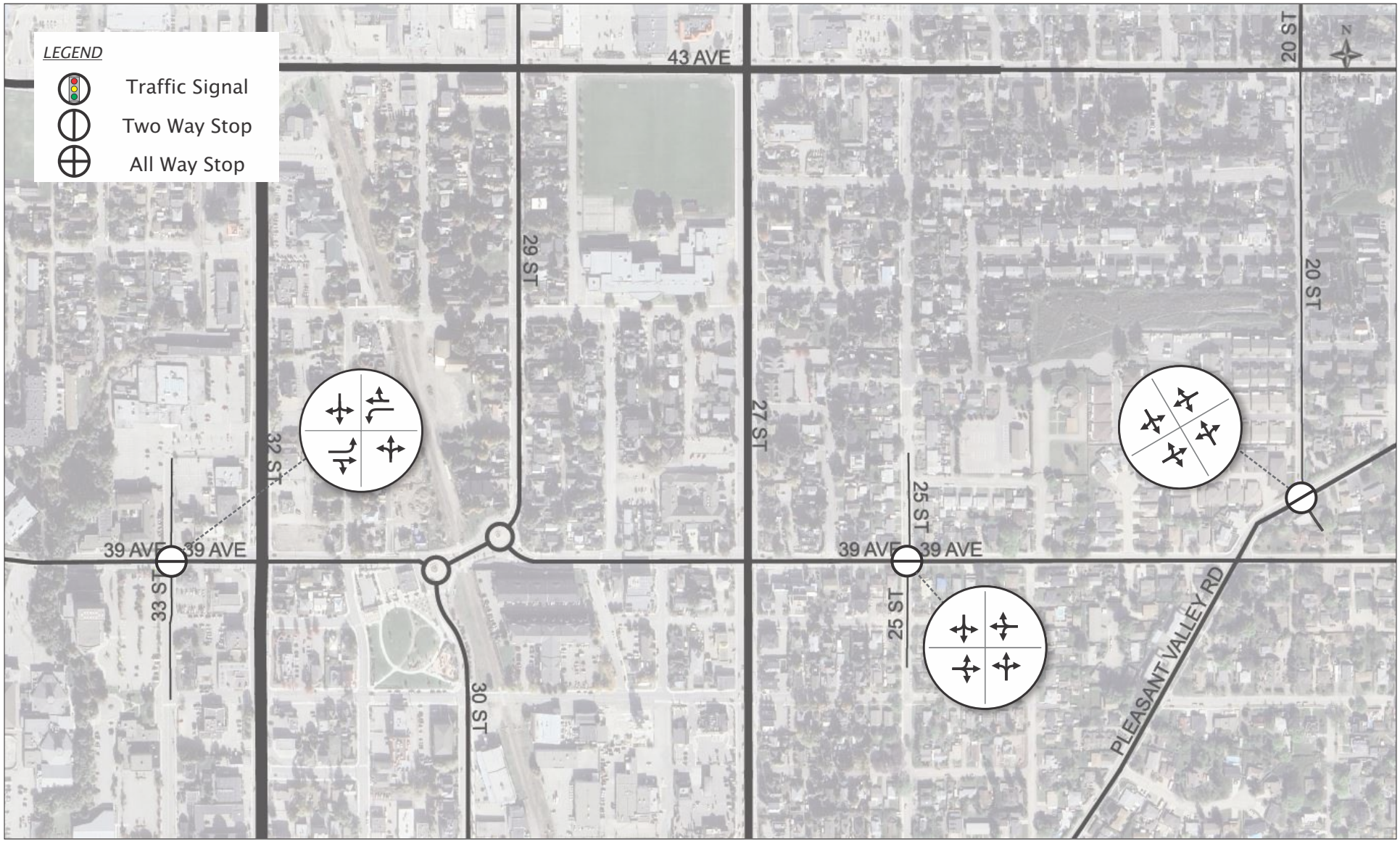

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**Exhibit 2.14**

# Group 5 TMCs

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**Exhibit 2.15**

## Group 5 Laning and Traffic Control

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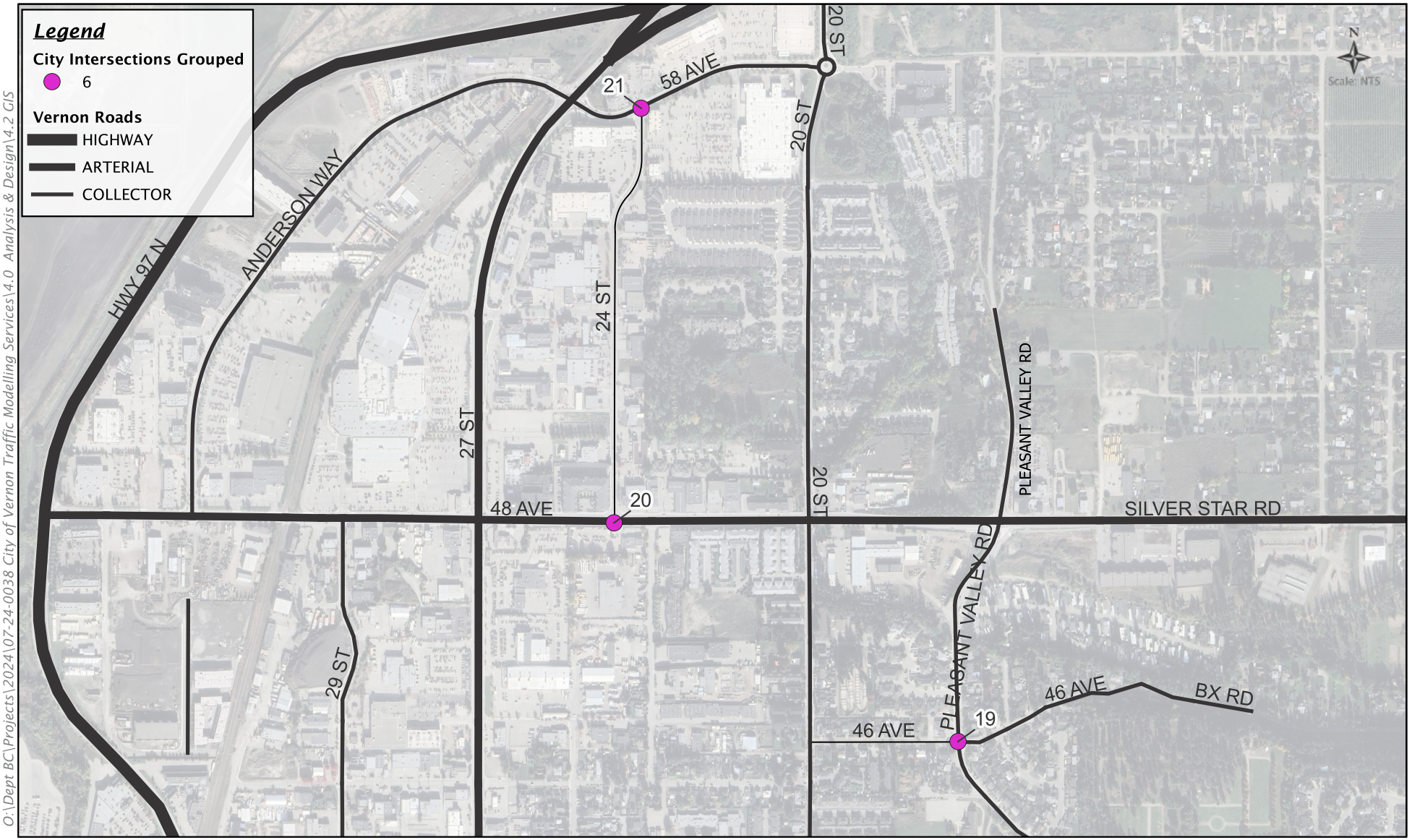
## 2.7 Group 6 – 46 Avenue, 48 Avenue, and 58 Avenue

Group 6 features intersections along 46 Avenue at Pleasant Valley Road, 48 Avenue at 24 Street, and 58 Avenue at 24 Street. The study intersections of this group are located in the North Vernon neighbourhood. In terms of road classifications, 46 Avenue is a collector roadway, 48 Avenue an arterial roadway, and 58 Avenue a collector roadway. The subject roadways are situated within the North Vernon neighbourhood. Within the group, the intersections are two-way stop-controlled with signed and marked crosswalk facilities. The study intersections within the scope of this group are presented in **Exhibit 2.16**.

The characteristics of the roadways within this group are presented in **Table 2.6**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.17** and **2.18**.

**Table 2.6: Group 6 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 39 Avenue | Collector | 1 EB<br>1 WB<br>LT Lanes at Intersection | 50 km/hr | Parking Prohibited | Sidewalks<br>Both Sides<br><br>On-Street Marked Bike Lanes<br>Both Sides |
| 20 Street | Local | 1 EB<br>1 WB | 50 km/hr<br><br>30 km/hr playground and school zones | Parking Prohibited | Sidewalks<br>Both Sides |
| 25 Street | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>Both Sides | Sidewalk<br>South Side Only |
| 33 Street | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>At-least one side | Sidewalks<br>At least One Side |
| | | | | | |



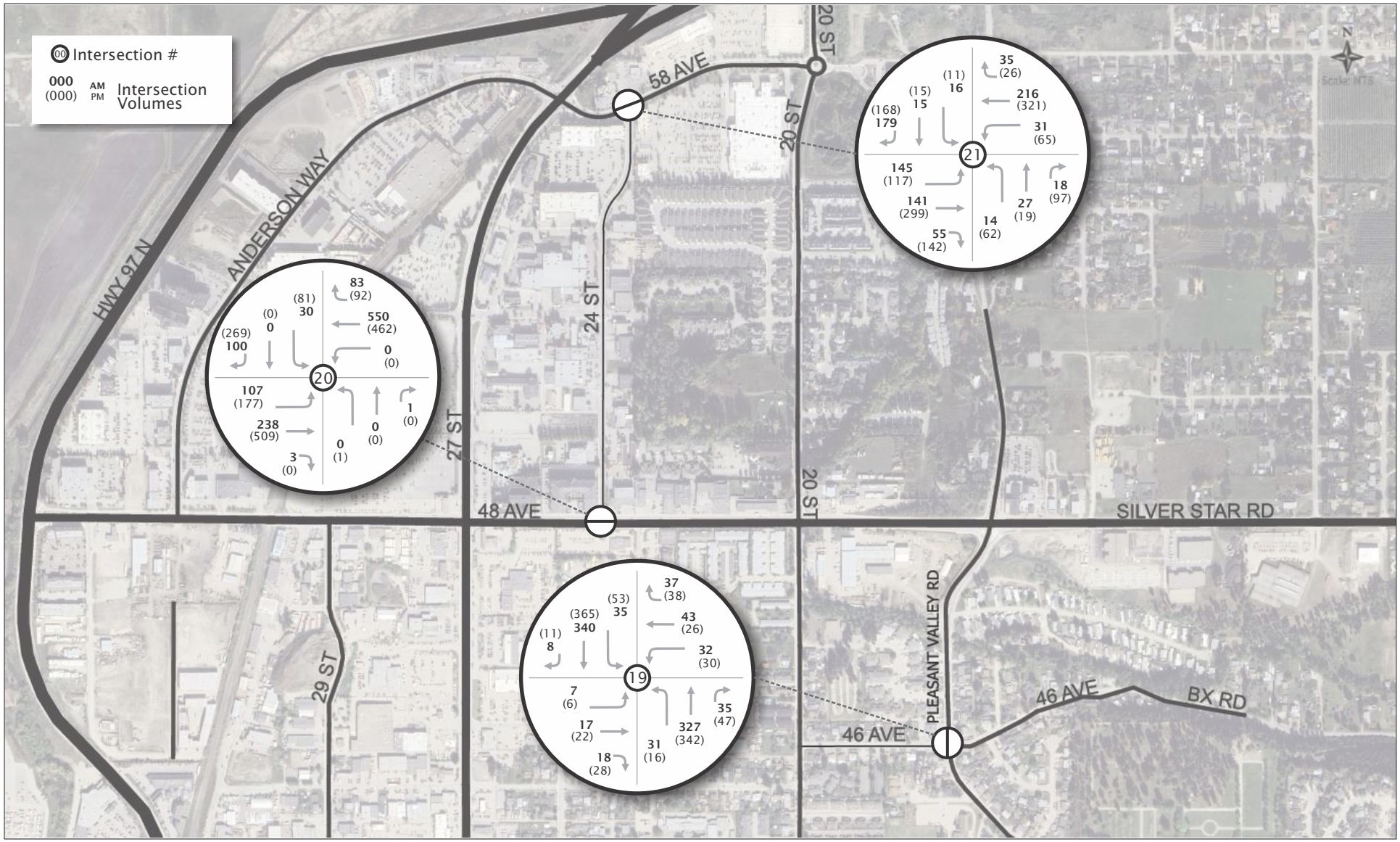

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Exhibit 2.16

# Group 6 Study Intersections

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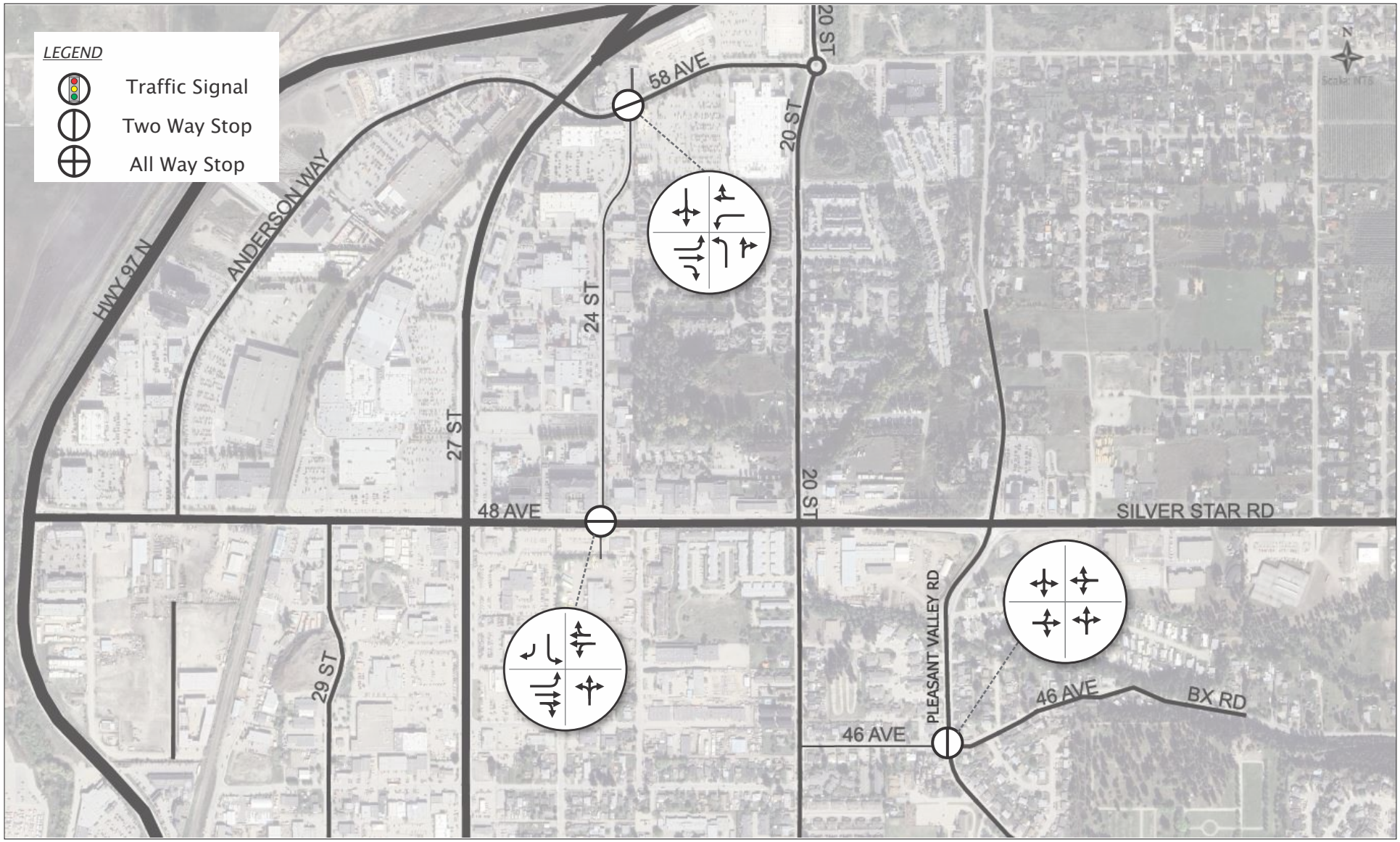

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**Exhibit 2.17**

# Group 6 TMCs

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**Exhibit 2.18**

## Group 6 Laning and Traffic Control

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## 2.8 Group 7 – 25 Avenue, 28 Avenue, and 31 Avenue

Group 7 includes intersections on 25 Avenue at 27 Street, 28 Avenue at 27 Street and 30 Street, and 31 Avenue at 30 Street. In terms of road classifications, 25 Avenue is a collector roadway, 27 Street is an arterial roadway, 30 Street is a collector roadway, and 28 Avenue is a local roadway, and 31 Avenue is a local roadway. The study intersections of this group are situated in the Harwood and East Hills neighbourhoods of the City.

Within the group, the intersections are two-way stop-controlled with signed and marked crosswalk facilities, with the 28 Avenue & 27 Street intersection controlled by a pedestrian actuated traffic signal. The study intersections within the scope of this group are presented in **Exhibit 2.19**.

The characteristics of the roadways within this group are presented in **Table 2.7**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.20** and **2.21**.

**Table 2.7: Group 7 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| 25 Avenue | Collector | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>Both Sides | Sidewalk<br>One Side |
| 28 Avenue | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>One Side | Sidewalk<br>One Side |
| 31 Avenue | Local | 1 EB<br>1 WB | 50 km/hr | Parking On-Street<br>Both Sides | Sidewalks<br>Both Sides |
| 27 Street | Arterial | 2 NB<br>2 SB | 50 km/hr | Parking<br>Prohibited | Sidewalks<br>At Least One Side |
| 30 Street | Collector | 1 NB<br>1 SB<br>Left Turn Lanes<br>at Intersections | 50 km/hr | Parking On-Street<br>Limited Sections | Sidewalks<br>Both Sides<br><br>Two-Way Protected<br>Bike Lane<br>East Side |
| | | | | | |




Exhibit 2.19

# Group 7 Study Intersections

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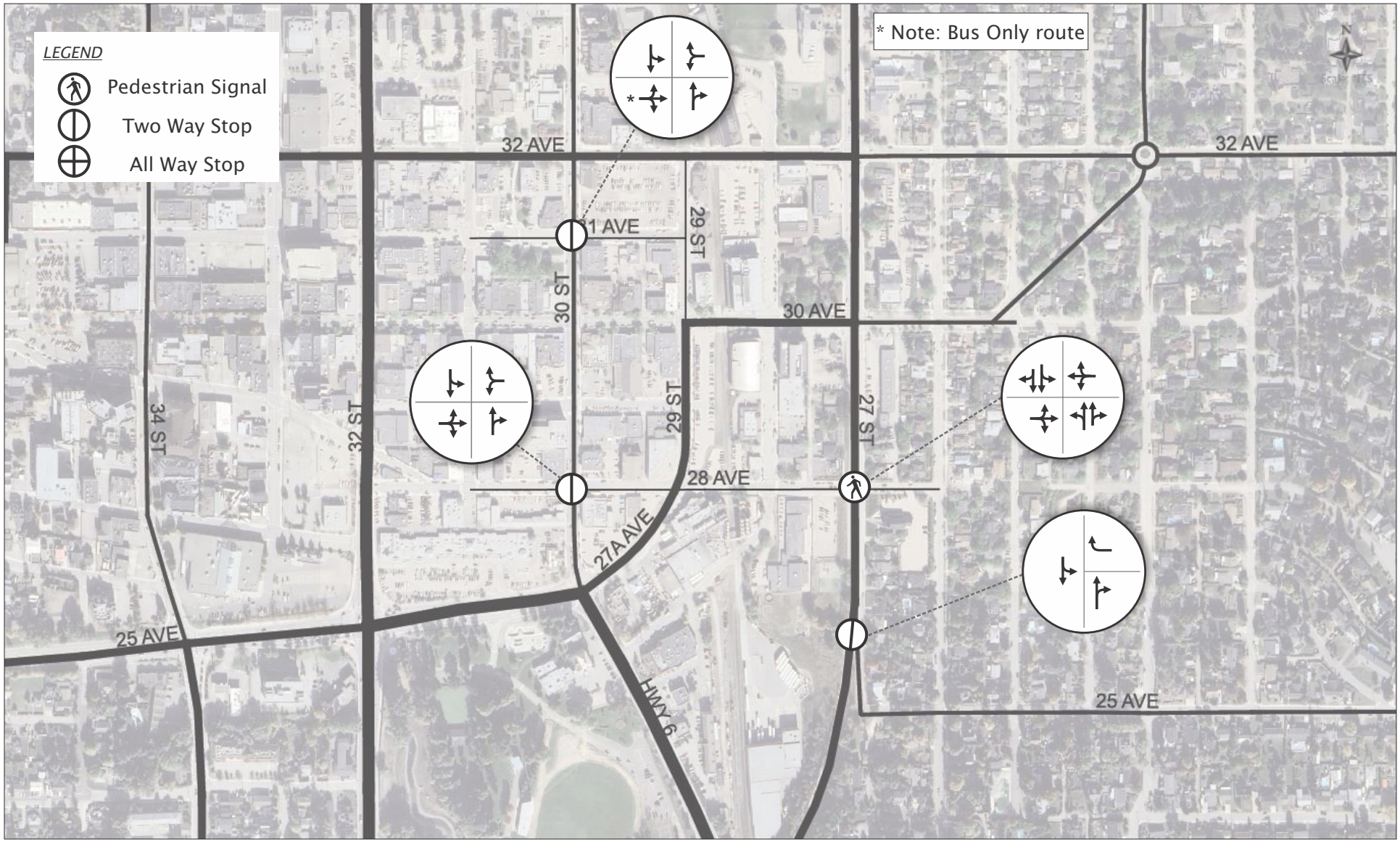

**Exhibit 2.20**

## Group 7 TMCs

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**Exhibit 2.21**

## Group 7 Laning and Traffic Control

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## 2.9 Group 8 – Okanagan Avenue, 25 Avenue, and 27 Avenue

Group 8 includes intersections on Okanagan Avenue at 39 Street, 25 Avenue at 41 Street, 39 Street, and 37 Street, and 27 Avenue at 41 Street and 35 Street. In terms of road classifications, 25 Avenue is a collector roadway, 27 Street is an arterial roadway, 30 Street is a collector roadway, and 28 Avenue is a local roadway, and 31 Avenue is a local roadway. The study intersections in this group are located west of the City Centre neighbourhood.

Within the group, the intersections are two-way stop-controlled with signed and marked crosswalk facilities, with the 28 Avenue & 27 Street intersection controlled by a pedestrian actuated traffic signal. The study intersections within the scope of this group are presented in **Exhibit 2.22**.

The characteristics of the roadways within this group are presented in **Table 2.8**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.23** and **2.24**.

**Table 2.8: Group 8 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| Okanagan Avenue | Collector | 1 EB<br>1 WB | 50 km/hr | Limited Parking On-Street<br>One Side | Sidewalk<br>One Side<br><br>On-Street Marked Bike Lanes |
| 25 Avenue | Arterial | 2 EB<br>2 WB<br>Auxiliary Turn Lanes at Intersections | 50 km/hr | Parking Prohibited | Sidewalks with Boulevard Separation<br>Both Sides<br><br>On-Street Marked Bike Lanes<br>Both Sides |
| 27 Avenue | Local | 1 EB<br>1 WB | 50 km/hr | Limited Parking On-Street<br>One Side | Sidewalks<br>Both Sides |
| 39 Street | Collector | 1 NB<br>1 SB | 50 km/hr | On-Street Parking<br>Both Sides | Sidewalk<br>One Side |
| 37 Street | Local | 1 NB<br>1 SB | 50 km/hr | On-Street Parking<br>Both Sides | Sidewalk<br>One Side |
| 35 Street | Local | 1 NB<br>1 SB | 50 km/hr | Limited Parking On-Street<br>One Side | Sidewalks<br>Both Sides |
| | | | | | |

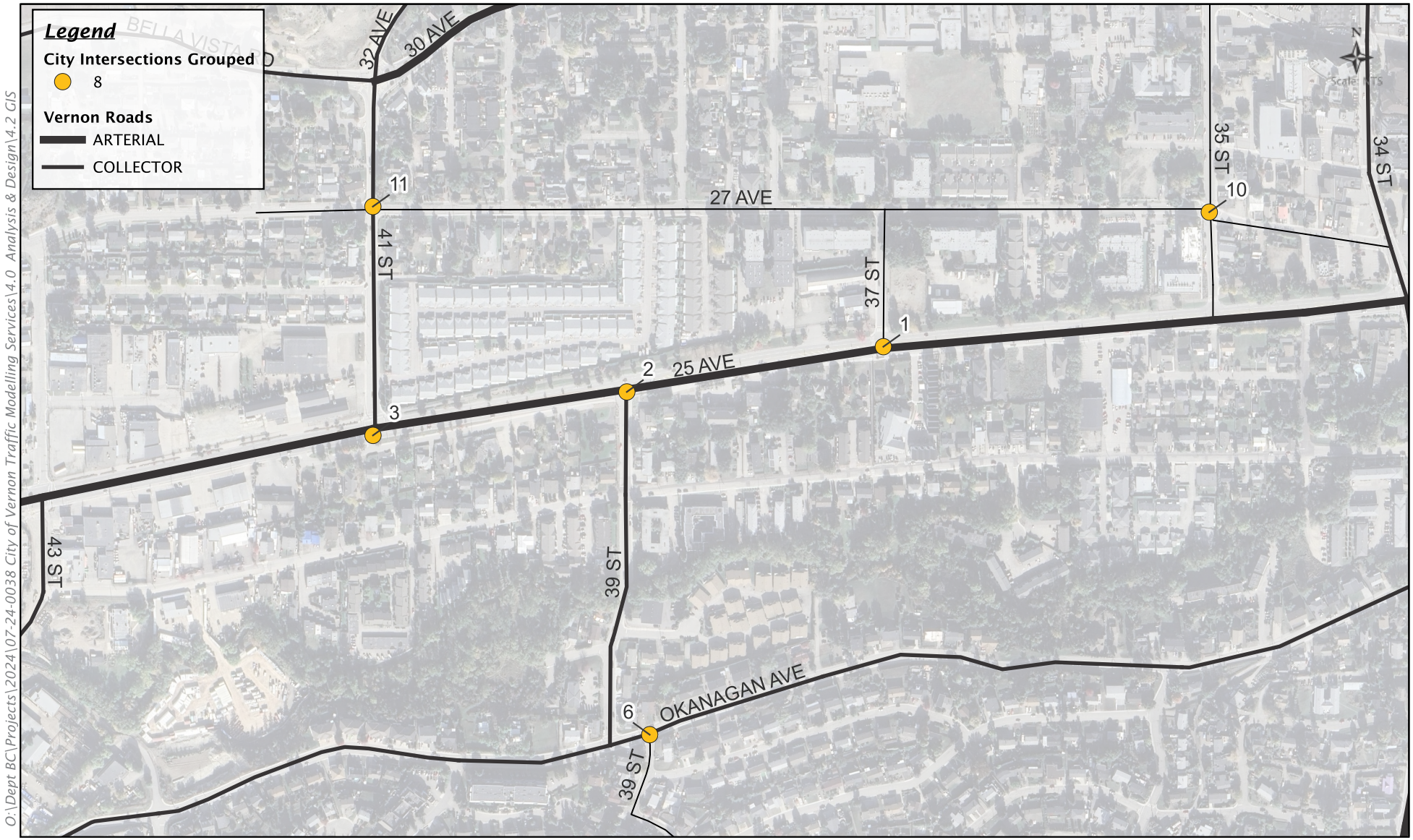


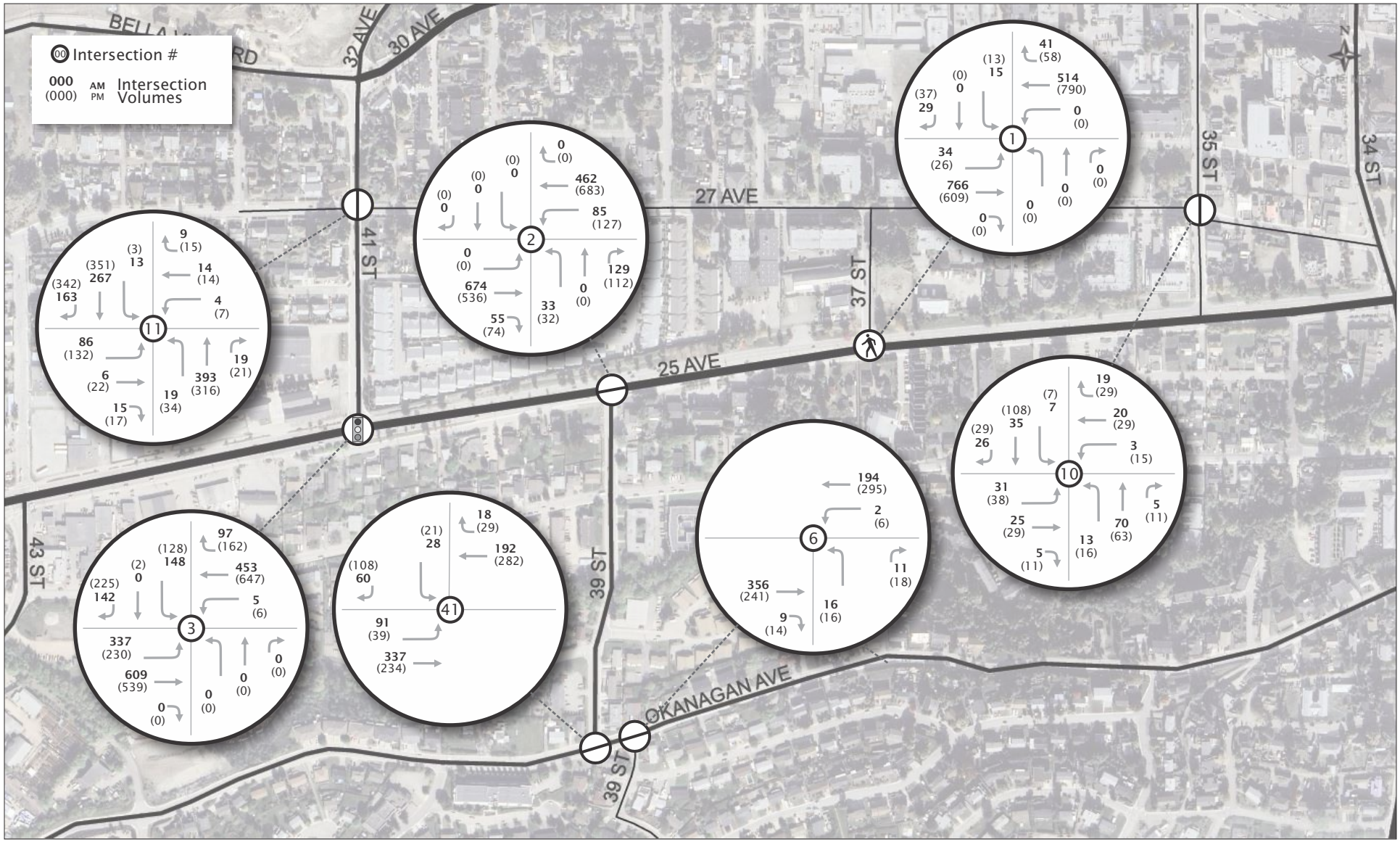

Exhibit 2.22

# Group 8 Study Intersections

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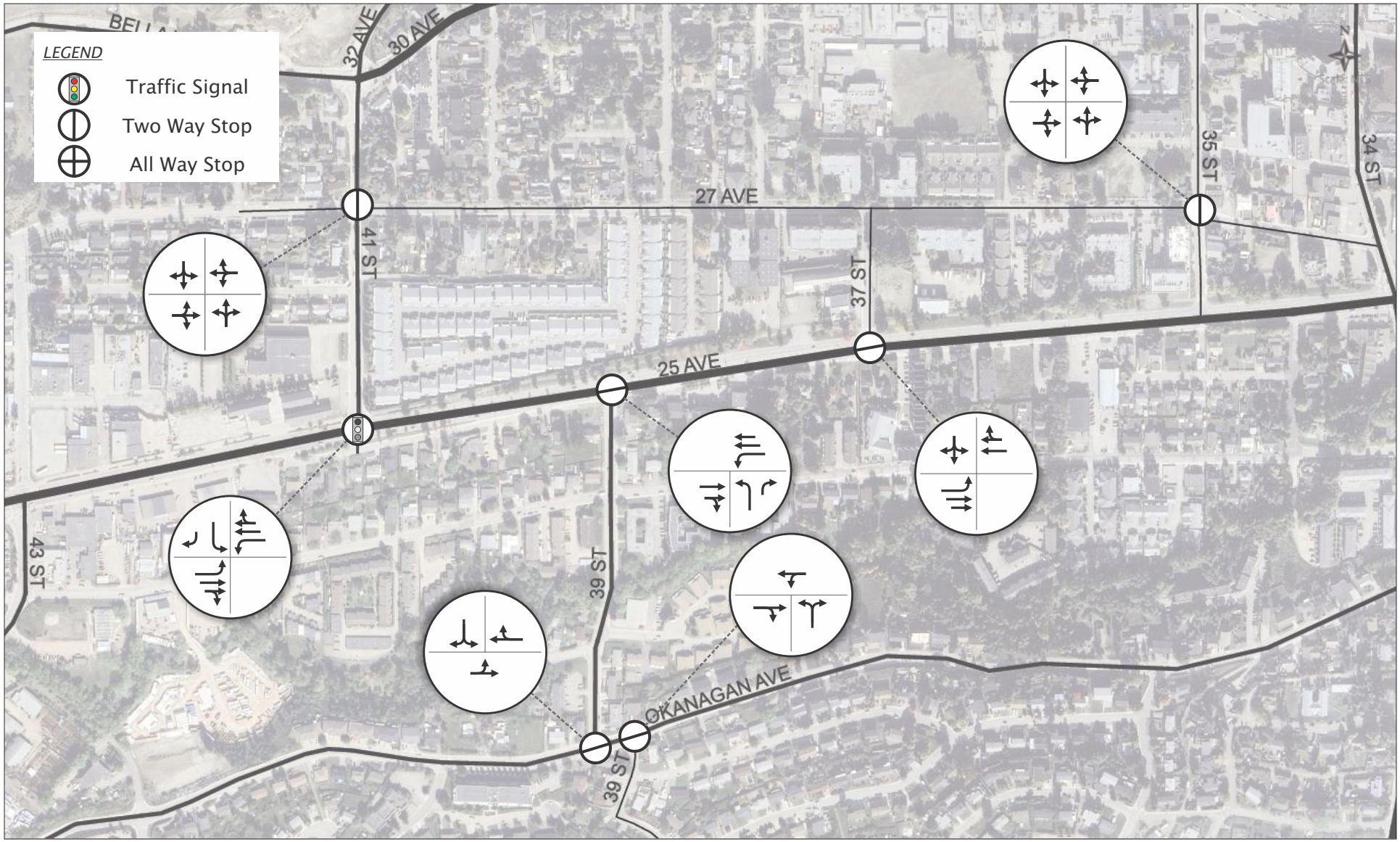

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**Exhibit 2.23**

# Group 8 TMCs

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**Exhibit 2.24**

## Group 8 Laning and Traffic Control

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## 2.10 Group 9 – 11 Avenue and Middleton Way

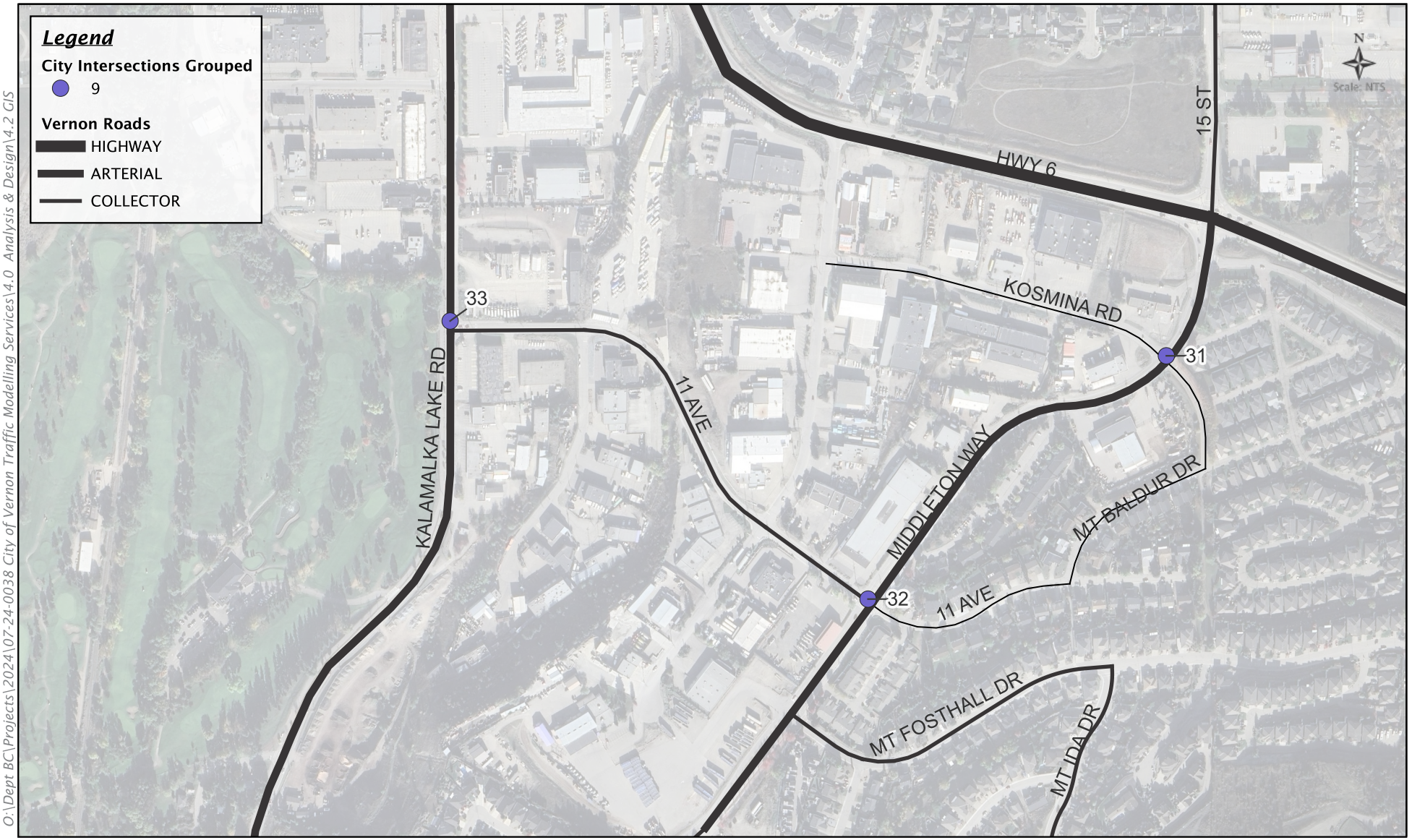
Group 9 includes intersections on Kalamalka Lake Road and Middleton Way. In terms of road classifications, Kalamalka Lake Road is an arterial roadway, 11 Avenue is a collector roadway, Middleton Way is an arterial roadway, and Kosmina Road is a local roadway. The study intersections of this group are located in the East Hills neighbourhood and the areas to the south.

Within the group, the intersections are two-way stop-controlled with signed and marked flashing beacon crosswalk facilities at Kalamalka Road and Middleton Way. The study intersections within the scope of this group are presented in **Exhibit 2.25**.

The characteristics of the roadways within this group are presented in **Table 2.17**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.26** and **2.27**.

**Table 2.9: Group 9 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| Kalamalka Lake Road | Arterial | 1 NB<br>1 SB<br>Auxiliary Turn Lanes at Intersections | 50 km/hr | Parking Prohibited | Two-Way Multi-Use Pathway with Boulevard Separation |
| Middleton Way | Arterial | 1-2 NB<br>1-2 SB<br>Auxiliary Turn Lanes at Intersection | 50 km/hr | Parking Prohibited | Sidewalk One-Side<br><br>On-Street Bike Lanes Both Sides |
| 11 Avenue | Collector | 1 EB<br>1 WB | 50 km/hr | Parking Prohibited | Sidewalk One-Side<br><br>On-Street Bike Lanes Both Sides |
| Kosmina Road | Local | 1 EB<br>1 WB | 50 km/hr | On-Street Parking Both Sides | None |
| | | | | | |




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Exhibit 2.25

## Group 9 Study Intersections

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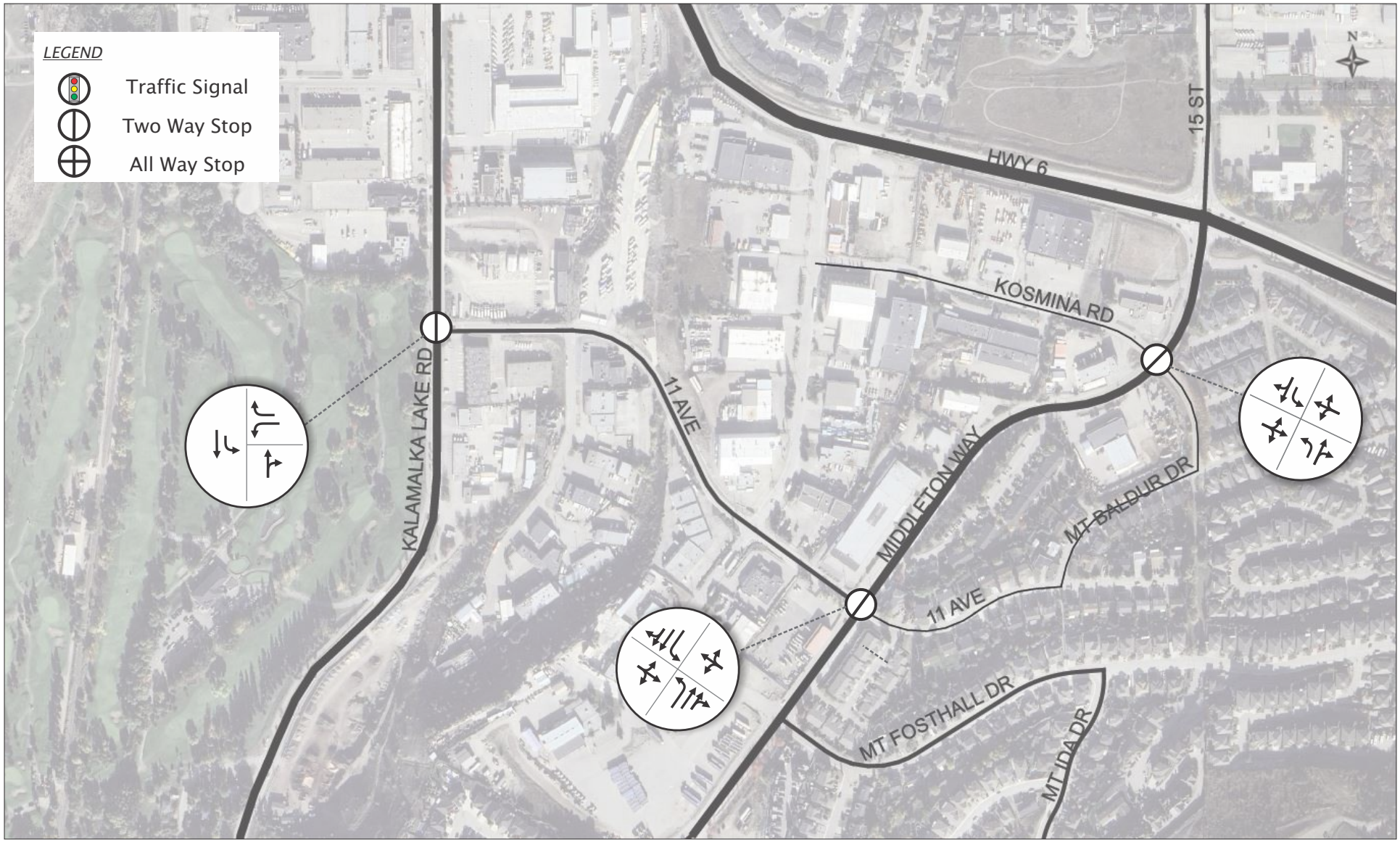

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**Exhibit 2.26**

## Group 9 TMCs

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**Exhibit 2.27**

# Group 9 Laning and Traffic Control

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## 2.11 Group 10 – Tronson Road, Okanagan Landing Road, and Okanagan Avenue

Group 10 includes intersections on Tronson Road, Bella Vista Road, Okanagan Landing Road, and Okanagan Avenue. In terms of road classifications, Okanagan Landing Road is an arterial roadway while Tronson Road, Bella Vista Road, and Okanagan Avenue are collector roadways. Within the group, the intersections are two-way stop-controlled with a signed and marked crosswalk facilities at Okanagan Avenue and 43 Street. The study intersections within the scope of this group are presented in **Exhibit 2.28**.

The characteristics of the roadways within this group are presented in **Table 2.19**. Furthermore, graphical summaries of the TMCs and intersection traffic control and approach lane configurations are displayed in **Exhibits 2.29** and **2.30**.

**Table 2.10: Group 10 Roadway Characteristics**

| ROADWAY | CLASSIFICATION | NUMBER OF TRAVEL LANES | POSTED SPEED | PARKING FACILITIES | ACTIVE TRANSPORTATION FACILITIES |
|---|---|---|---|---|---|
| Kalamalka Lake Road | Arterial | 1 NB<br>1 SB<br>Auxiliary Turn Lanes at Intersections | 50 km/hr | Parking Prohibited | Two-Way Multi-Use Pathway with Boulevard Separation |
| Middleton Way | Arterial | 1-2 NB<br>1-2 SB<br>Auxiliary Turn Lanes at Intersection | 50 km/hr | Parking Prohibited | Sidewalk One-Side<br><br>On-Street Bike Lanes Both Sides |
| 11 Avenue | Collector | 1 EB<br>1 WB | 50 km/hr | Parking Prohibited | Sidewalk One-Side<br><br>On-Street Bike Lanes Both Sides |
| Kosmina Road | Local | 1 EB<br>1 WB | 50 km/hr | On-Street Parking Both Sides | None |
| | | | | | |

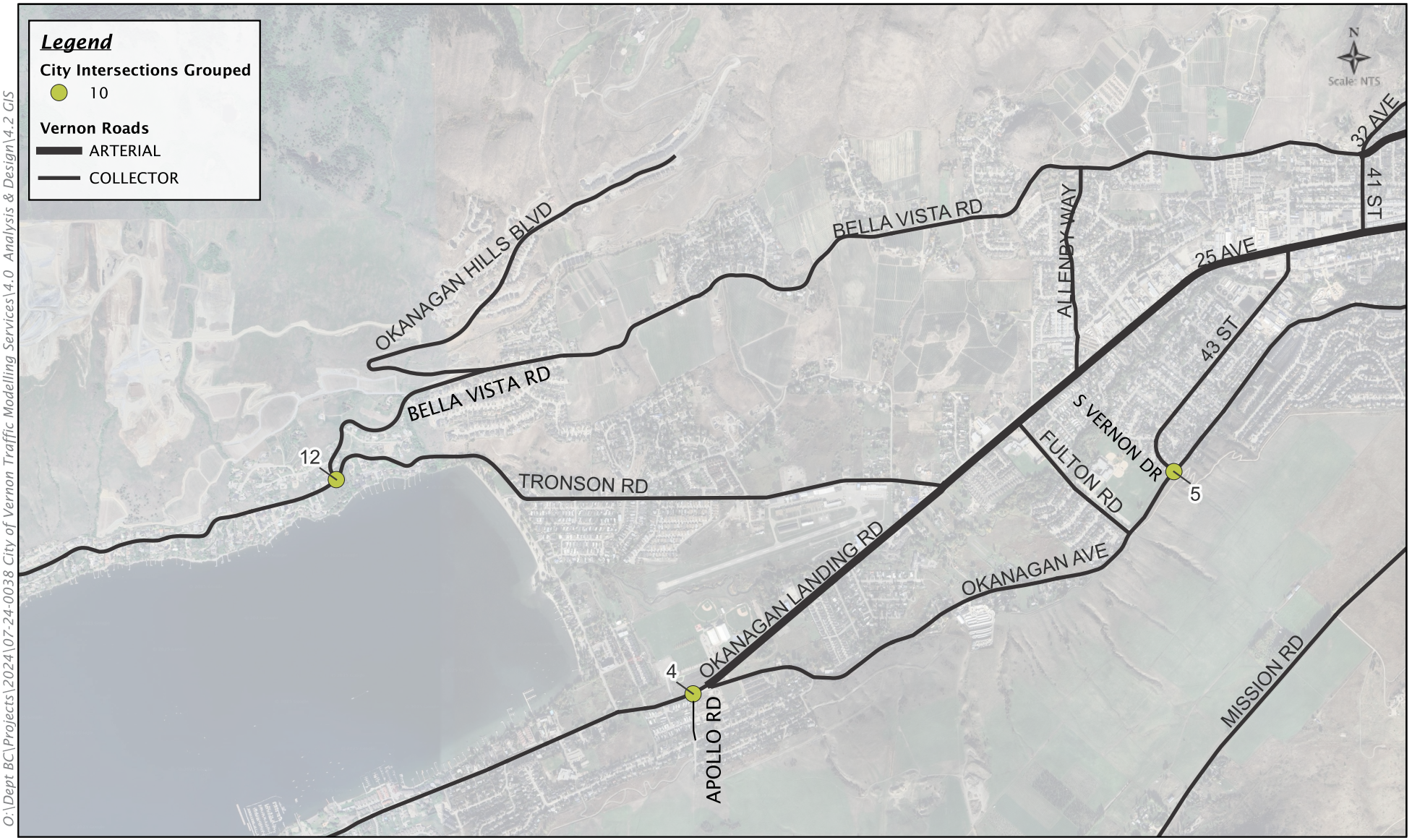



Exhibit 2.28

# Group 10 Study Intersections

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**Exhibit 2.29**

## Group 10 TMCs

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**Exhibit 2.30**

## Group 10 Laning and Traffic Control

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## 2.12 Site Visits

Bunt staff conducted site visits to the study intersections and surrounding area throughout the day from 9AM to 5PM on September 24, 25, 26, and 27. The purpose of the site visits were to observe existing peak hour traffic conditions, traffic control devices (i.e., signals, signs, and pavement markings, etc.), and local travel behaviours. The data and observations obtained from the site visits will assisted with calibrating the traffic models. Photographs from the site visits are presented in **Appendix C**.

# 3. TRAFFIC MODELLING AND OPERATIONS ANALYSIS

## 3.1 Traffic Performance Analysis and Metrics

The traffic operations of the study area intersections were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 11 analysis software. The traffic operations were assessed using the performance measures of Level of Service (LOS), volume-to-capacity (V/C) ratio, and 95$^{th}$ percentile vehicle queue length.

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

**Table 3.1: 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.

The standard performance thresholds that were used to trigger consideration of roadway or traffic control improvements to support roadway or traffic control improvements employed in this study are listed below:

Signalized Intersections:

- Overall intersection Level of Service = LOS D or better;

- Overall intersection V/C ratio = 0.85 or less;
- Individual movement Level of Service = LOS E or better; and,
- Individual movement V/C ratio = 0.90 or less.

Unsignalized Intersections and Roundabouts:

- Individual movement Level of Service = LOS E or better, unless the volume is very low in which case LOS F is acceptable.

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 and V/C output is reported just for individual lanes, as the HCM methodology does not report overall performance.
- For unsignalized All-way Stop-controlled intersections: HCM 2000 unsignalized LOS is reported for the overall intersection as well as by intersection approach LOS. The HCM 2000 methodology does not report an overall V/C ratio for All Way Stop controlled intersections. Degree of Utilization calculated with the HCM 2000 methodology is reported for individual movements in place of V/C, which is not part of the HCM 2000 report;
- For roundabouts: the SIDRA analysis software and outputs are reported since as HCM 2000 does not calculate LOS for roundabouts. Overall LOS, and LOS and V/C by movement are provided for roundabouts but no overall V/C ratio is provided for roundabouts in the HCM 2010 methodology.

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

### 3.1.1 Modelling Analysis Assumptions

#### *Signal Timing*

Signal timing plans were obtained from the City for the study intersections. Signal timing (i.e., minimum green, yellow, red, Walk, Flash Don't Walk, etc.) and coordination parameters (cycle lengths, split times, offsets, etc.) identified within the plans were input to the traffic models to evaluate the existing traffic operations.

*Synchro Parameters*

The Synchro network was created to best represent the existing road network. Lane settings, such as grade, storage length, and curb radius, were determined using both the City's maps and Google Maps. Approach lanes at certain intersections wide enough to accommodate two vehicles. At these locations, short turning lanes were provided to model the additional storage space.

Synchro parameters for the Peak Hour Factors (PHFs) and heavy vehicle percentages were obtained from the existing traffic count data. Overall intersection PHFs were applied to each intersection, whereas the individual movement heavy vehicle percentages were used for this analysis.

## 3.2 Methodology

### 3.2.1 Study Horizons and Traffic Growth

Future Conditions traffic analysis was conducted for the 2030 (+5 years), 2035 (+10 years), and 2045 (+20 years) horizon scenarios. To forecast future traffic volumes at each horizon, the existing conditions traffic volumes were increased utilizing a linear 1.5% per annum traffic growth rate. The selected growth rate aligns with population growth information supplied in the City's Official Community Plan (OCP).

### 3.2.2 Future Traffic Forecasts

The sets of Future Conditions traffic volumes were calculated for each group and each study horizon year. For reference, diagrams showcasing the Future Conditions traffic volumes for each horizon year and group are presented in the following subsections.

### 3.2.3 Future Traffic Operations

Traffic analysis was conducted for the Future Conditions horizon years in a stepwise manner utilizing the same methodology as the operations review of the Existing Conditions. Note, any upgrades recommended for the Existing Conditions were assumed to be implemented for the Future Horizons.

### 3.2.4 Mitigation Measures

Mitigation strategies were developed for intersections not meeting performance thresholds. Multiple mitigation strategies were considered based on engineering judgement, the traffic modelling, and on-site field observations, including:

- Upgrading to a full traffic signal.
- Upgrading to a roundabout.
- Upgrading pedestrian crossing controls including Rectangular Rapid Flashing Beacons (RRFBs), Overhead of side-mounted flashers, of pedestrian actuated traffic signals.
- Turn controls (i.e., restrictions or prohibition of movements).
- Additional signage, pavement markings, and/or other traffic control devices.

To confirm adequacy of the mitigation measure, the traffic operations for each intersection including mitigation strategies were modelled to confirm satisfactory performance.

### 3.2.5 Signal Warrant Analysis

To investigate the appropriate level of traffic control for the study intersections, Bunt conducted the TAC standard analysis for a traffic signal warrant where performance standards were not met. The Canadian Traffic Signal Warrant Procedure (the Procedure) is outlined in TAC's Section B of *"Manual of Uniform Traffic Control Devices for Canada, 2021"* (MUTCDC). The Procedure is a tool used to determine whether a traffic control signal is warranted for an intersection based on multiple factors.

The full Procedure is described in further detail within the *"Canadian Traffic Signal Warrant Matrix Procedure, 2005"* and "*Traffic Signal and Pedestrian Signal Head Warrant Handbook, 2014"*.

Note, where an intersection is warranted for a full traffic signal upgrade, Bunt first considered a roundabout configuration following the City's roundabout first policy.

#### Key Assumptions

The key assumptions used in this analysis are listed as follows:

1. The City of Vernon population of about 45,000 was assumed from the 2021 Canadian Census.
2. An average 6-hour peak TMC is required to complete the traffic warrant analysis. Most of the traffic data provided by the City included met these requirements. Where MD data was missing at just two intersections, the values were extrapolated based on the AM and PM peak period data.

### 3.2.6 Warrant Calculations

The TAC Signal Warrant Procedure considers factors such as vehicle-vehicle conflicts, vehicle-pedestrian conflicts, pedestrian demographics, roadway characteristics, and pedestrian exposure to calculate "Cumulative Warrant Points" (W). A value of 100 or greater, indicates that a traffic signal is warranted. Traffic signals may or may not be warranted despite the value of W, when certain safety, operational, physical, strategic, and special aspects are considered.

A summary of the Warrant Calculations for intersections not meeting performance thresholds is presented in the following subsections.

## 3.3 Existing Conditions Traffic Operations

### 3.3.1 Existing Traffic Operations for Group 1 Intersections

Existing Conditions analysis results for Group 1 intersections are summarized in **Table 3.2** based on the group traffic volumes and intersection configurations from **Section 2**.

***41 Street/32 Avenue & Bella Vista Road/30 Avenue***

The analysis indicates that the intersection of 41 Street/32 Avenue & Bella Vista Road/30 Avenue is operating acceptably, with an overall LOS B and V/C ratios of 0.69 and 0.78 during the AM and PM peak hours, respectively. However, the westbound left-turn (WBL) movement occasionally experiences queue lengths that exceed the available storage capacity during both peak hours. Similarly, the northbound right-turn (NBR) movement may approach the storage lane capacity during the AM peak hour.

To address these issues, signal timing plan optimization is recommended to enhance traffic flow for the WBL and NBR movements. The optimized signal timing is expected to improve operations and reduce queue lengths for these movements. It is recommended to extend WBL lane capacity to 75 m to maintain the queue within the storage length.

***37 Street & 30 Avenue***

The intersection capacity analysis for 37 Street & 30 Avenue shows that the intersection is performing acceptably, with an overall LOS B and a V/C ratio of 0.78 during the AM peak hour, and LOS C with a V/C ratio of 0.80 during the PM peak hour. However, the eastbound left-turn (EBL) movement is estimated to occasionally exceed the available storage length capacity during both peak periods.

Signal timing optimization is recommended to improve overall traffic operations at this intersection. However, the 95th percentile queue for the EBL movement is still expected to surpass the current lane capacity. It is recommended to extend EBL lane length to 115 m to maintain the queue within the storage lane capacity.

Furthermore, to help with traffic flows on 30 Avenue, it is recommended to install a concrete median along 30 Avenue extending from 37 Street to just beyond 38 Street and implement turn controls such that the 30 Avenue & 38 Street intersection is restricted to right-in right-out movements only.

All other study intersections within Group 1 are expected to operate within acceptable capacity limits for the existing traffic conditions.

The mitigated traffic performance including the recommendations for each intersection is presented in **Table 3.3**.

**Table 3.2: Existing Traffic Operations – Group 1**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *B* | *0.69* | - | *B* | *0.78* | - |
| | EBL | B | <0.02 | 5 | B | 0.02 | 5 |
| | EBT | B | 0.63 | 80 | B | 0.43 | 45 |
| | EBR | B | 0.08 | 10 | B | 0.07 | 10 |
| | WBL | B | 0.71 | 65 | B | 0.81 | 110 |
| | WBTR | A | 0.14 | 20 | A | 0.32 | 40 |
| | NBTL | C | 0.34 | 25 | C | 0.49 | 30 |
| | NBR | C | 0.44 | 30 | B | 0.28 | 20 |
| | SBTL | B | 0.07 | 10 | B | 0.17 | 15 |
| | SBR | B | <0.02 | <5 | B | <0.02 | <5 |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *B* | *0.78* | - | *C* | *0.80* | - |
| | EBL | B | 0.80 | 120 | C | 0.74 | 100 |
| | EBT | A | 0.25 | 30 | A | 0.20 | 25 |
| | WBTR | C | 0.52 | 55 | D | 0.88 | 165 |
| | SBL | C | 0.54 | 45 | C | 0.61 | 55 |
| | SBR | A | 0.23 | 10 | B | 0.64 | 90 |
| 37 Street/Alexis Park Drive & 32 Avenue/Gateby Pl *(EB/WB Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | EBLTR | D | 0.13 | 5 | E | 0.11 | 5 |
| | WBLTR | D | 0.16 | 5 | D | 0.17 | 5 |
| | NBLTR | A | 0.02 | <5 | A | <0.02 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.18 | <5 | A | 0.24 | <5 |
| 31 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | A | 0.02 | <5 |
| | EBTR | A | 0.13 | <5 | A | 0.18 | <5 |
| | WBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.18 | <5 | A | 0.20 | <5 |
| | NBLTR | B | 0.13 | 5 | C | 0.28 | 10 |
| | SBLTR | B | 0.13 | 5 | C | 0.24 | 5 |
| 29 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.11 | <5 | A | 0.17 | <5 |

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| | WBL | A | 0.05 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.14 | <5 | A | 0.12 | <5 |
| | NBLTR | C | 0.26 | 10 | C | 0.29 | 10 |
| | SBLTR | C | 0.14 | 5 | B | 0.14 | 5 |
| 15 Street & 32 Avenue *(All Way Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | EBLTR | B | 0.32 | 30 | B | 0.33 | 20 |
| | WBLTR | A | 0.07 | 10 | A | 0.03 | 10 |
| | NBLTR | C | 0.61 | 5 | B | 0.52 | 5 |
| | SBLTR | B | 0.28 | 10 | A | 0.25 | 5 |
| | | | | | | | |

**Table 3.3: Existing Traffic Operations – Group 1 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *B* | *0.65* | - | *B* | *0.74* | - |
| | EBL | B | <0.02 | 5 | B | 0.02 | 5 |
| | EBT | B | 0.63 | 90 | C | 0.45 | 55 |
| | EBR | B | 0.08 | 10 | B | 0.07 | 15 |
| | WBL | B | 0.69 | 50 | B | 0.74 | 75 |
| | WBTR | A | 0.14 | 15 | A | 0.31 | 40 |
| | NBTL | C | 0.36 | 25 | C | 0.52 | 35 |
| | NBR | C | 0.37 | 25 | C | 0.28 | 25 |
| | SBTL | C | 0.07 | 10 | C | 0.18 | 20 |
| | SBR | C | <0.02 | <5 | C | <0.02 | <5 |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *B* | *0.74* | - | *C* | *0.77* | - |
| | EBL | B | 0.74 | 105 | C | 0.78 | 115 |
| | EBT | A | 0.24 | 30 | A | 0.20 | 30 |
| | WBTR | C | 0.57 | 70 | D | 0.86 | 160 |
| | SBL | C | 0.59 | 55 | C | 0.56 | 60 |
| | SBR | C | 0.26 | 25 | C | 0.57 | 55 |
| | | | | | | | |

### 3.3.2 Existing Traffic Operations for Group 2 Intersections

Existing Conditions analysis results for Group 2 intersections are summarized in **Table 3.4** based on the traffic volumes and the intersection configurations in presented in **Section 2**.

The analysis results indicate that existing traffic operations at the study intersections within Group 2 are operating acceptably with overall LOS B or better during both AM and PM peak hours. No appreciable queuing issue is estimated for these intersections.

**Table 3.4: Existing Traffic Operations – Group 2**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Street & Pleasant Valley Road *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.17 | <5 | A | 0.13 | <5 |
| | NBLTR | B | 0.08 | <5 | B | 0.06 | <5 |
| | SBR | B | 0.05 | <5 | A | 0.03 | <5 |
| 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBLTR | A | 0.05 | <5 | A | 0.09 | <5 |
| | NBLT | C | 0.09 | <5 | D | 0.23 | 5 |
| | NBR | B | 0.15 | 5 | B | 0.23 | 5 |
| | SBLTR | B | 0.04 | <5 | C | 0.11 | 5 |
| 33 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | A | 0.02 | <5 | A | 0.04 | <5 |
| | WBLTR | A | 0.03 | <5 | A | 0.03 | <5 |
| | NBLTR | C | 0.10 | 5 | D | 0.34 | 10 |
| | SBLTR | B | 0.11 | 5 | D | 0.42 | 15 |
| 31 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.03 | <5 | A | 0.02 | <5 |
| | WBLTR | A | 0.02 | <5 | A | 0.02 | <5 |
| | NBLTR | B | 0.09 | <5 | C | 0.13 | 5 |
| | SBLTR | B | 0.08 | <5 | C | 0.23 | 5 |

### 3.3.3 Existing Traffic Operations for Group 3 Intersections

Existing Conditions analysis results for Group 3 intersections are summarized in **Table 3.5** based on the traffic volumes and the intersection configurations from **Section 2**. The analysis demonstrates that traffic operations at the study intersections within Group 3 are performing well, with an overall LOS A during both the AM and PM peak hours. No significant queuing issues are anticipated at these intersections.

**Table 3.5: Existing Traffic Operations – Group 3**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 24 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.14 | 5 | D | 0.19 | 5 |
| | WBLTR | B | 0.10 | 5 | C | 0.16 | 5 |
| | NBL | A | <0.02 | <5 | A | 0.03 | <5 |
| | NBTR | A | 0.30 | <5 | A | 0.27 | <5 |
| | SBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.17 | <5 | A | 0.28 | <5 |
| 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | D | 0.49 | 20 | D | 0.47 | 20 |
| | EBR | A | 0.08 | <5 | B | 0.03 | <5 |
| | WBLTR | B | 0.13 | 5 | B | 0.20 | 5 |
| | NBL | A | 0.04 | <5 | A | 0.04 | <5 |
| | NBTR | A | 0.20 | <5 | A | 0.18 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.14 | <5 | A | 0.24 | <5 |
| Mission Road & 15 Avenue *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.11 | 5 | B | 0.11 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.09 | <5 | A | 0.13 | <5 |
| 34 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.09 | 5 | C | 0.38 | 15 |
| | WBLTR | B | 0.08 | <5 | C | 0.33 | 10 |
| | NBLT | A | 0.02 | <5 | A | 0.03 | <5 |
| | NBR | A | 0.03 | <5 | A | 0.03 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBR | A | 0.02 | <5 | A | 0.05 | <5 |
| 34 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.10 | 5 | C | 0.24 | 10 |
| | WBLR | B | 0.07 | <5 | C | 0.30 | 10 |
| | NBTR | A | 0.24 | <5 | A | 0.29 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |

### 3.3.4 Existing Traffic Operations for Group 4 Intersections

Existing Conditions analysis results for Group 4 intersections are summarized in **Table 3.6** based on the traffic volumes and the intersection configurations detailed in **Section 2**.

*33 Street/Driveway & 43 Avenue*

The analysis shows that traffic operations at the 33 Street/Driveway & 43 Avenue intersection are operating with LOS F for the northbound and southbound movements during both the AM and PM peak hours. To improve traffic operation, it is recommended to implement turn controls prohibiting northbound left turn and through movement (NBLT) and southbound left turn and through (SBLT) movement. **Table 3.7** summarizes the intersection improved performance following the lane upgrade.

All other study intersections within Group 4 are operating acceptably with overall LOS B or better during the AM and PM peak hours.

**Table 3.6: Existing Traffic Operations – Group 4**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.25 | <5 | A | 0.18 | <5 |
| | WBLT | A | <0.02 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.20 | <5 | A | 0.27 | <5 |
| | NBLTR | C | 0.14 | 5 | C | 0.13 | 5 |
| | SBLTR | E | 0.13 | 5 | E | 0.13 | 5 |
| 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBL | A | 0.03 | <5 | B | 0.14 | 5 |
| | EBT | A | 0.28 | <5 | A | 0.21 | <5 |
| | EBTR | A | 0.14 | <5 | A | 0.11 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.14 | <5 | A | 0.32 | <5 |
| | NBLTR | C | 0.07 | <5 | F | 0.17 | 5 |
| | SBLT | C | 0.07 | <5 | F | 0.46 | 15 |
| | SBR | A | 0.03 | <5 | C | 0.45 | 20 |
| 25 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.04 | <5 | A | 0.03 | <5 |
| | WBLTR | A | 0.04 | <5 | A | 0.02 | <5 |
| | NBLTR | C | 0.24 | 5 | C | 0.16 | 5 |
| | SBLTR | C | 0.31 | 10 | B | 0.22 | 5 |

**Table 3.7: Existing Traffic Operations – Group 4 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | B | 0.14 | 5 |
| | EBT | A | 0.28 | <5 | A | 0.21 | <5 |
| | EBTR | A | 0.14 | <5 | A | 0.11 | <5 |
| | WBT | A | 0.16 | <5 | A | 0.28 | <5 |
| | WBTR | A | 0.10 | <5 | A | 0.25 | <5 |
| | NBR | B | <0.02 | <5 | A | <0.02 | <5 |
| | SBR | A | 0.05 | <5 | C | 0.53 | 25 |
| | | | | | | | |

### 3.3.5 Existing Traffic Operations for Group 5 Intersections

Existing Conditions analysis results for Group 5 intersections are summarized in **Table 3.8** based on the traffic volumes and the intersection configurations displayed in **Section 2**.

#### *33 Street & 39 Avenue*

The analysis indicates that existing traffic operations at the intersection of 33 Street & 39 Avenue are operating with an overall LOS B during both the AM and PM peak hours. However, the northbound movement is the critical movement at this intersection, experiencing a LOS F and a V/C ratio exceeding 1.00 during the AM peak hour, resulting in a condition with considerable congestion and delay.

Two potential mitigation measures are identified to improve traffic operations at the intersection: upgrading the intersection with a traffic signal; or converting it to a single-lane roundabout. **Table 3.9** provides a summary of the results for each scenario.

Following the traffic signal upgrade, the intersection is expected to operate with an overall LOS B and a V/C ratio of 0.57 during the AM peak hour, and LOS A with a V/C ratio of 0.52 during the PM peak hour. For the roundabout upgrade, the intersection is projected to operate with an overall LOS A during both peak hours. Additionally, the 95th percentile queue for the westbound movement is estimated to remain within the link capacity under both scenarios.

All other study intersections within Group 5 are operating acceptably with overall LOS B or better during the AM and PM peak hours.

**Table 3.8: Existing Traffic Operations – Group 5**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 20 Street *(SB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLT | A | 0.09 | <5 | A | 0.10 | 5 |
| | WBTR | A | 0.23 | <5 | A | 0.19 | <5 |
| | SBLR | B | 0.21 | 5 | B | 0.25 | 10 |
| 33 Street & 39 Avenue *(NB/SB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.20 | <5 | A | 0.10 | <5 |
| | WBL | A | 0.26 | 10 | A | 0.17 | 5 |
| | WBTR | A | 0.15 | <5 | A | 0.14 | <5 |
| | NBLTR | F | >1 | 85 | C | 0.66 | 40 |
| | SBLTR | E | 0.15 | 5 | E | 0.28 | 10 |
| 25 Street & 39 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | 0.02 | <5 |
| | WBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLTR | C | 0.29 | 10 | C | 0.27 | 10 |
| | SBLTR | C | 0.30 | 10 | B | 0.23 | 5 |

**Table 3.9: Existing Traffic Operations – Group 5 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 33 Street & 39 Avenue *(Signal)* | *OVERALL* | *B* | *0.57* | - | *A* | *0.52* | - |
| | EBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | EBTR | B | 0.60 | 40 | B | 0.33 | 20 |
| | WBL | A | 0.56 | 25 | A | 0.49 | 25 |
| | WBTR | A | 0.24 | 20 | A | 0.26 | 20 |
| | NBLTR | B | 0.39 | 20 | B | 0.38 | 20 |
| | SBLTR | B | 0.04 | 5 | B | 0.09 | 5 |
| 33 Street & 39 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.39* | - | *A* | *0.34* | - |
| | EBLTR | A | 0.33 | 15 | A | 0.16 | 5 |
| | WBLTR | A | 0.39 | 20 | A | 0.33 | 15 |
| | NBLTR | A | 0.26 | 10 | A | 0.34 | 15 |
| | SBLTR | A | 0.02 | <5 | A | 0.04 | <5 |

### 3.3.6 Existing Traffic Operations for Group 6 Intersections

Existing Conditions analysis results for Group 6 intersections are summarized in **Table 3.10** based on the traffic volumes and the intersection configurations from **Section 2**.

*24 Street/Driveway & 58 Avenue*

The analysis indicates that current traffic operations at the intersection of 24 Street/Driveway & 58 Avenue are experiencing a LOS F for the northbound left approach during the PM peak hour. To enhance traffic flow, upgrading the intersection to a single-lane roundabout is recommended. **Table 3.11** summarizes the intersection performance under the roundabout configuration. The results show that, with the roundabout upgrade, the intersection will operate with a LOS A for all individual movements during both the AM and PM peak hours.

All other study intersections within Group 6 are operating acceptably with overall LOS B or better during the AM and PM peak hours.

**Table 3.10: Existing Traffic Operations – Group 6**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | C | 0.13 | 5 | C | 0.17 | 5 |
| | WBLTR | C | 0.36 | 15 | C | 0.34 | 10 |
| | NBLTR | A | 0.03 | <5 | A | <0.02 | <5 |
| | SBLTR | A | 0.03 | <5 | A | 0.05 | <5 |
| 24 Street/Driveway & 48 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.13 | 5 | A | 0.18 | 5 |
| | EBT | A | 0.10 | <5 | A | 0.20 | <5 |
| | EBTR | A | 0.05 | <5 | A | 0.10 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.23 | <5 | A | 0.19 | <5 |
| | NBLTR | C | 0.06 | <5 | E | 0.12 | 5 |
| | SBLTR | C | 0.24 | 10 | E | 0.78 | 55 |
| 24 Street/Driveway & 58 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBL | A | 0.14 | 5 | A | 0.10 | 5 |
| | EBT | A | 0.10 | <5 | A | 0.19 | <5 |
| | EBR | A | 0.04 | <5 | A | 0.09 | <5 |
| | WBL | A | 0.03 | <5 | A | 0.06 | <5 |
| | WBTR | A | 0.17 | <5 | A | 0.21 | <5 |
| | NBL | E | 0.14 | 5 | F | 0.69 | 30 |
| | NBTR | C | 0.16 | 5 | C | 0.25 | 10 |
| | SBLTR | C | 0.45 | 20 | C | 0.45 | 20 |

**Table 3.11: Existing Traffic Operations – Group 6 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 24 Street/Driveway & 58 Avenue *(Roundabout)* | *OVERALL* | *A* | 0.27 | - | *A* | 0.44 | - |
| | EBLTR | A | 0.27 | 10 | A | 0.44 | 25 |
| | WBLTR | A | 0.26 | 10 | A | 0.38 | 20 |
| | NBLTR | A | 0.06 | <5 | A | 0.21 | 10 |
| | SBLTR | A | 0.21 | 10 | A | 0.23 | 10 |
| | | | | | | | |

### 3.3.7 Existing Traffic Operations for Group 7 Intersections

Existing Conditions analysis results for Group 7 intersections are summarized in **Table 3.12** based on the traffic volumes and the intersection configurations summarized in **Section 2**.

*27 Street & 28 Avenue*

The analysis of existing conditions shows that the intersection of 27 Street & 28 Avenue operates with a LOS F and a V/C ratio exceeding 1.00 during the AM peak hour. To improve traffic flow, optimization of the existing pedestrian signal timing plan is recommended. **Table 3.13** presents the improved operations following the signal timing plan adjustment. After optimization, the intersection is expected to operate with a LOS B during both the AM and PM peak hours.

All other study intersections within Group 7 are operating acceptably with overall LOS A during the AM and PM peak hours.

**Table 3.12: Existing Traffic Operations – Group 7**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 25 Avenue *(WB Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | WBR | C | 0.45 | 20 | C | 0.19 | 5 |
| | NBT | A | 0.51 | <5 | A | 0.49 | <5 |
| | SBT | A | 0.37 | <5 | A | 0.58 | <5 |
| 27 Street & 28 Avenue *(Ped Signal)* | *OVERALL* | *E* | *0.66* | - | *B* | *0.51* | - |
| | EBLTR | A | 0.16 | 15 | C | 0.40 | 40 |
| | WBLTR | A | 0.03 | 5 | C | 0.03 | 5 |
| | NBLTR | F | >1 | 105 | B | 0.47 | 50 |
| | SBLTR | B | 0.66 | 50 | B | 0.56 | 65 |
| | | | | | | | |

**Table 3.12: Existing Traffic Operations – Group 7 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 30 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.06 | <5 | C | 0.07 | 40 |
| | WBLTR | B | 0.06 | <5 | B | 0.10 | 5 |
| | NBLT | A | <0.02 | <5 | A | <0.02 | 50 |
| | SBTR | A | <0.02 | <5 | A | <0.02 | 65 |
| 30 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.05 | <5 | C | 0.16 | 5 |
| | WBLTR | B | 0.12 | 5 | C | 0.23 | 5 |
| | NBLT | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.15 | <5 | A | 0.28 | <5 |
| | | | | | | | |

**Table 3.13: Existing Traffic Operations – Group 7 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 28 Avenue *(Ped Signal)* | *OVERALL* | *B* | *0.58* | - | *B* | *0.51* | - |
| | EBLTR | C | 0.25 | 25 | C | 0.40 | 40 |
| | WBLTR | C | 0.04 | 10 | C | 0.03 | 5 |
| | NBLTR | B | 0.75 | 85 | B | 0.47 | 50 |
| | SBLTR | B | 0.44 | 45 | B | 0.56 | 65 |
| | | | | | | | |

### 3.3.8 Existing Traffic Operations for Group 8 Intersections

Existing Conditions analysis results for Group 8 intersections are summarized in **Table 3.14** based on the traffic volumes and intersection configurations presented in **Section 2**.

#### *41 Street & 27 Avenue*

The analysis of existing conditions indicates that the intersection of 41 Street & 27 Avenue operates with a LOS F and a V/C ratio exceeding 0.90 during the PM peak hour. To enhance traffic operations, upgrading the intersection to a single-lane roundabout is recommended. **Table 3.15** presents the improved operations following the roundabout upgrade. With this upgrade, the intersection is expected to operate with LOS A for all individual movements during both the AM and PM peak hours.

All other study intersections within Group 8 are operating acceptably with overall LOS B or better during the AM and PM peak hours.

**Table 3.14: Existing Traffic Operations – Group 8**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Avenue & 37 Street *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.04 | <5 | A | 0.04 | <5 |
| | EBT1 | A | 0.24 | <5 | A | 0.19 | <5 |
| | EBT2 | A | 0.24 | <5 | A | 0.19 | <5 |
| | WBT | A | 0.22 | <5 | A | 0.32 | <5 |
| | WBTR | A | 0.13 | <5 | A | 0.20 | <5 |
| | SBLR | C | 0.13 | 5 | C | 0.16 | 5 |
| 39 Street & 25 Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBT | A | 0.28 | <5 | A | 0.21 | <5 |
| | EBTR | A | 0.18 | <5 | A | 0.15 | <5 |
| | WBL | A | 0.11 | 15 | A | 0.14 | 20 |
| | WBT1 | A | 0.14 | <5 | A | 0.20 | <5 |
| | WBT2 | A | 0.14 | <5 | A | 0.20 | <5 |
| | NBL | B | 0.21 | 15 | C | 0.21 | 15 |
| | NBR | A | 0.22 | 20 | A | 0.17 | 15 |
| 41 Street & 25 Avenue *(Signal)* | *OVERALL* | *B* | *0.62* | - | *B* | *0.56* | - |
| | EBL | A | 0.66 | 60 | A | 0.55 | 40 |
| | EBTR | A | 0.32 | 35 | A | 0.26 | 30 |
| | WBL | B | 0.02 | 5 | B | 0.02 | 5 |
| | WBTR | B | 0.55 | 50 | B | 0.71 | 85 |
| | SBL | B | 0.37 | 30 | B | 0.33 | 25 |
| | SBTR | B | 0.11 | 10 | B | 0.16 | 15 |
| 39 Street S & Okanagan Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBTR | A | 0.25 | <5 | A | 0.16 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLR | B | 0.07 | <5 | B | 0.07 | <5 |
| 35 Street & 27 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.10 | 5 | B | 0.14 | 5 |
| | WBLTR | B | 0.06 | <5 | B | 0.11 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | | | | | | | |

**Table 3.14: Existing Traffic Operations – Group 8 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 27 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLTR | D | 0.40 | 15 | **F** | **0.95** | 60 |
| | WBLTR | C | 0.09 | <5 | C | 0.16 | 5 |
| | NBLTR | A | 0.02 | <5 | A | 0.05 | <5 |
| | SBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| Okanagan Avenue & 39 Street N *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.08 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.15 | <5 | A | 0.20 | <5 |
| | SBLR | B | 0.21 | 5 | B | 0.23 | 5 |
| | | | | | | | |

**Table 3.15: Existing Traffic Operations – Group 8 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 27 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.36* | - | *A* | *0.51* | - |
| | EBLTR | A | 0.11 | 5 | A | 0.19 | 10 |
| | WBLTR | A | 0.04 | <5 | A | 0.04 | <5 |
| | NBLTR | A | 0.36 | 20 | A | 0.33 | 15 |
| | SBLTR | A | 0.32 | 15 | A | 0.51 | 30 |
| | | | | | | | |

### 3.3.9 Existing Traffic Operations for Group 9 Intersections

Existing Conditions analysis results for Group 9 intersections are summarized in **Table 3.16** based on the traffic volumes and the intersection configurations in presented in **Section 2**.

All study intersections within Group 9 are operating acceptably with overall LOS A during the AM and PM peak hours.

**Table 3.16: Existing Traffic Operations – Group 9**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & Kosmina Road *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.16 | 5 | C | 0.40 | 15 |
| | WBLTR | B | 0.05 | <5 | B | 0.06 | <5 |
| | NBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | NBTR | A | 0.28 | <5 | A | 0.22 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.17 | <5 | A | 0.25 | <5 |
| Middleton Way & 11 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.28 | 10 | C | 0.64 | 35 |
| | WBLTR | C | 0.07 | <5 | C | 0.07 | <5 |
| | NBL | A | 0.11 | 5 | A | 0.07 | <5 |
| | NBT | A | 0.17 | <5 | A | 0.11 | <5 |
| | NBTR | A | 0.09 | <5 | A | 0.06 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBT | A | 0.07 | <5 | A | 0.15 | <5 |
| | SBTR | A | 0.08 | <5 | A | 0.10 | <5 |
| Kalamalka Lake Road & 11 Avenue *(WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | WBLR | C | 0.35 | 10 | D | 0.46 | 20 |
| | NBTR | A | 0.36 | <5 | A | 0.37 | <5 |
| | SBL | A | 0.08 | <5 | A | 0.21 | 5 |
| | SBT | A | 0.19 | <5 | A | 0.43 | <5 |
| | | | | | | | |

### 3.3.10 Existing Traffic Operations for Group 10 Intersections

Existing analysis results for Group 10 intersections are summarized in **Table 3.17** based on the traffic volumes and the intersection configurations summarized in **Section 2**.

All study intersections within Group 10 are operating acceptably with overall LOS A during the AM and PM peak hours.

**Table 3.17: Existing Traffic Operations – Group 10**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Apollo Road & Okanagan Landing Road *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBTR | A | 0.22 | <5 | A | 0.20 | <5 |
| | WBLT | A | 0.02 | <5 | A | 0.05 | <5 |
| | NBLR | B | 0.10 | 5 | B | 0.10 | 5 |
| Okanagan Avenue & S Vernon Drive *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.11 | 5 | A | 0.05 | <5 |
| | NBLT | A | 0.04 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.14 | <5 | A | 0.08 | <5 |
| Tronson Road & Bella Vista Road *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.04 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.04 | <5 | A | 0.08 | <5 |
| | SBLR | B | 0.09 | <5 | A | 0.12 | 5 |
| | | | | | | | |

## 3.4 + 5 Future Horizon (2030) Traffic Operations

Analysis assumptions for the + 5 future conditions were maintained from the Existing Conditions, as detailed in **Section 3.3**.

### 3.4.1 + 5 Future Horizon (2030) Traffic Operations for Group 1 Intersections

+ 5 Future Horizon (2030) analysis results for Group 1 intersections are summarized in **Table 3.18** based on the traffic volumes in **Exhibit 3.1**.

#### *41 Street/32 Avenue & Bella Vista Road/30 Avenue*

The intersection of 41 Street/32 Avenue & Bella Vista Road/30 Avenue is projected to continue operating well within capacity, with an overall LOS B during both peak hours. To better accommodate the anticipated traffic volumes, it is recommended that the westbound left-turn storage lane be extended to 105 m.

#### *37 Street & 30 Avenue*

The intersection of 37 Street & 30 Avenue is projected to operate within acceptable capacity thresholds by the 2030 future horizon. However, it is recommended to extend the westbound left-turn (WBL) lane capacity to 140 meters to ensure the queue remains within the storage length.

#### *31 Street & 32 Avenue*

Whilst it is projected that this intersection operates within acceptable thresholds, the following upgrades are recommended to improve traffic flow and safety:

- Install concrete median to restrict vehicle movements to right-in/right-out including a pedestrian refuge for the north-south crosswalks.
- Optional Addition: Install Rectangular Rapid Flashing Beacons (RRFBs) for the north-south crosswalks.
- Optional Addition: Update zebra pedestrian crosswalk markings to ladder crosswalk marking pattern.

All other study intersections within Group 1 are expected to continue operating acceptably with an overall LOS B or better by the 2030 future year.

**Table 3.18: + 5 Future Horizon (2030) Traffic Operations – Group 1**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *B* | *0.73* | - | *B* | *0.79* | - |
| | EBL | B | 0.02 | 5 | B | 0.02 | 5 |
| | EBT | C | 0.70 | 100 | C | 0.52 | 65 |
| | EBR | B | 0.09 | 10 | C | 0.08 | 15 |
| | WBL | B | 0.75 | 85 | B | 0.81 | 105 |
| | WBTR | A | 0.15 | 20 | A | 0.34 | 45 |
| | NBTL | C | 0.38 | 25 | C | 0.55 | 40 |
| | NBR | C | 0.48 | 30 | C | 0.30 | 25 |
| | SBTL | C | 0.08 | 10 | C | 0.19 | 20 |
| | SBR | C | <0.02 | <5 | C | <0.02 | <5 |
| | | | | | | | |

**Table 3.18: + 5 Future Horizon (2030) Traffic Operations – Group 1 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *B* | *0.80* | - | *C* | *0.88* | - |
| | EBL | B | 0.80 | 140 | C | 0.86 | 135 |
| | EBT | A | 0.25 | 35 | A | 0.21 | 25 |
| | WBTR | C | 0.66 | 80 | D | 0.89 | 170 |
| | SBL | D | 0.65 | 60 | D | 0.68 | 70 |
| | SBR | A | 0.28 | 15 | C | 0.70 | 135 |
| 37 Street/Alexis Park Drive & 32 Avenue/Gateby Pl *(EB/WB Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | EBLTR | E | 0.17 | 5 | E | 0.14 | 5 |
| | WBLTR | D | 0.20 | 5 | D | 0.21 | 5 |
| | NBLTR | A | 0.02 | <5 | A | <0.02 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.20 | <5 | A | 0.27 | <5 |
| 31 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | A | 0.02 | <5 |
| | EBTR | A | 0.15 | <5 | A | 0.20 | <5 |
| | WBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.20 | <5 | A | 0.21 | <5 |
| | NBLTR | C | 0.16 | 5 | C | 0.34 | 10 |
| | SBLTR | B | 0.14 | 5 | C | 0.29 | 10 |

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 29 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.12 | <5 | A | 0.18 | <5 |
| | WBL | A | 0.05 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.15 | <5 | A | 0.13 | <5 |
| | NBLTR | C | 0.31 | 10 | C | 0.33 | 10 |
| | SBLTR | C | 0.16 | 5 | C | 0.16 | 5 |
| 15 Street & 32 Avenue *(All Way Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLTR | B | 0.36 | 35 | B | 0.37 | 25 |
| | WBLTR | A | 0.08 | 10 | A | 0.03 | 10 |
| | NBLTR | C | 0.68 | <5 | B | 0.58 | <5 |
| | SBLTR | B | 0.32 | 10 | B | 0.28 | 10 |
| | | | | | | | |

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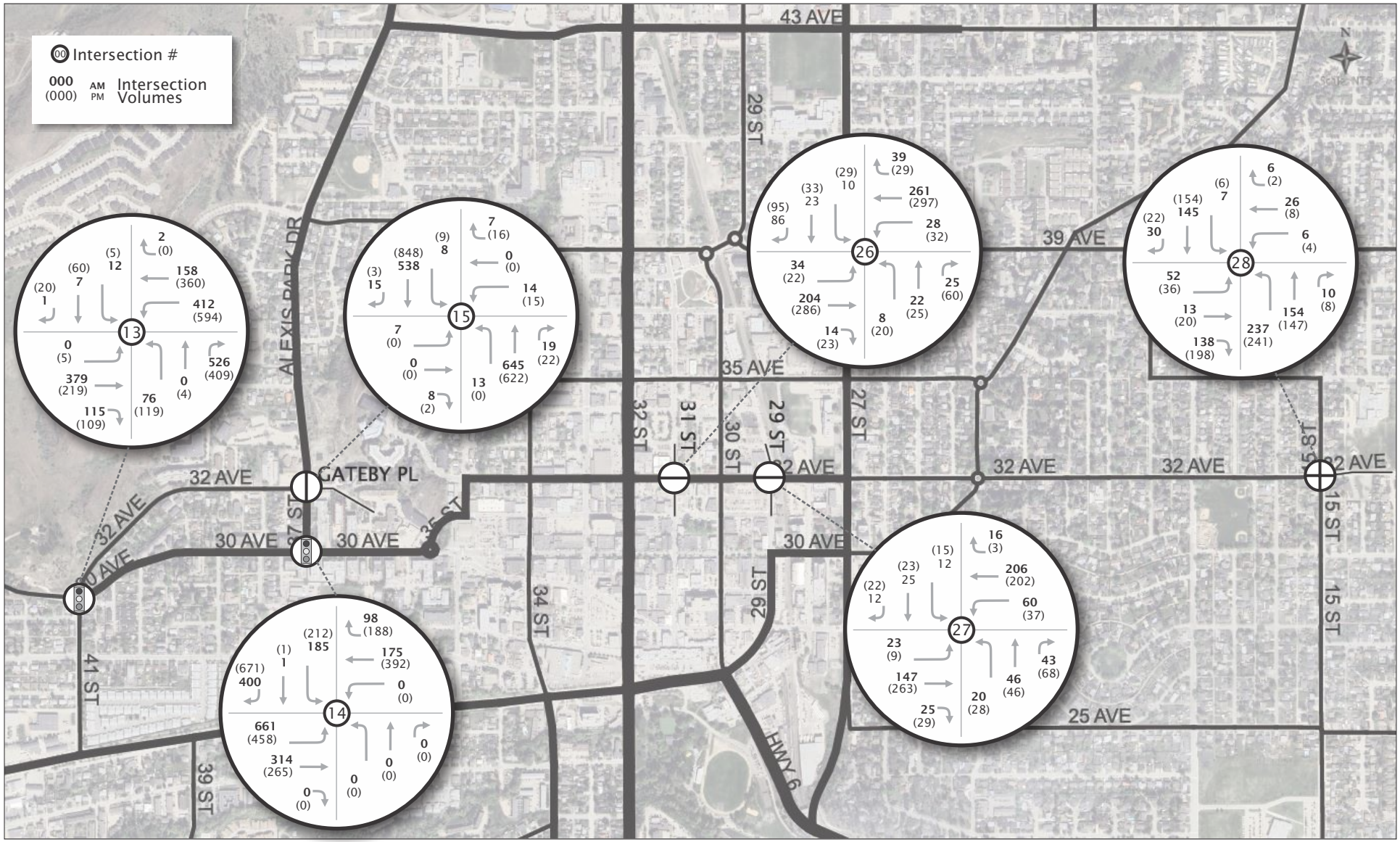



**Exhibit 3.1**

# +5 Future Horizon (2030) – Group 1 Traffic Volumes

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

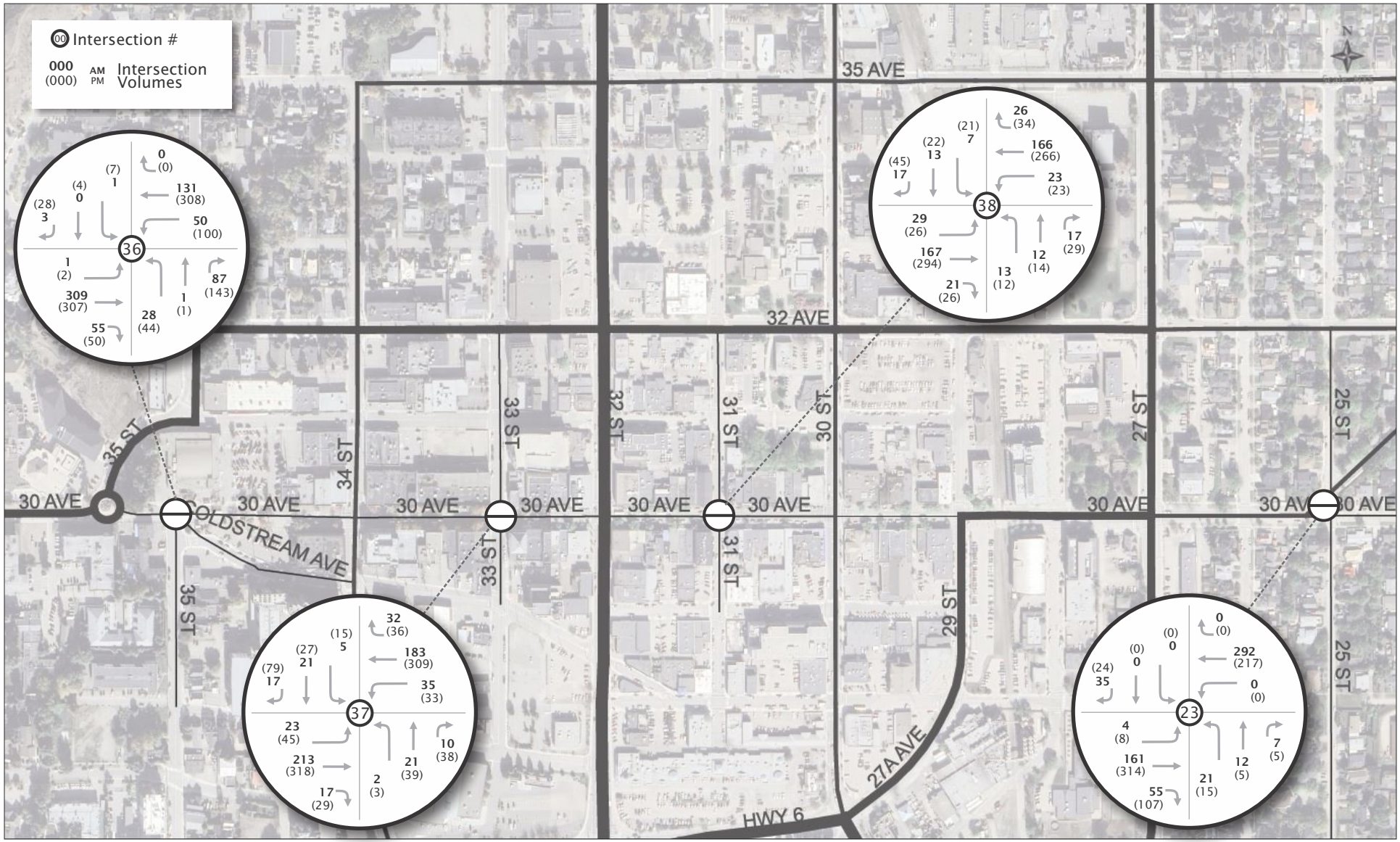
### 3.4.2 + 5 Future Horizon (2030) Traffic Operations for Group 2 Intersections

+ 5 Future Horizon (2030) analysis results for Group 2 intersections are summarized in **Table 3.19** based on the traffic volumes in **Exhibit 3.2**.

All study intersections within Group 2 are expected to continue operating acceptably with an overall LOS A by the 2030 future year.

**Table 3.19: + 5 Future Horizon (2030) Traffic Operations – Group 2**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Street & Pleasant Valley Road *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.19 | <5 | A | 0.14 | <5 |
| | NBLTR | B | 0.10 | 5 | B | 0.07 | <5 |
| | SBR | B | 0.05 | <5 | A | 0.03 | <5 |
| 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBLTR | A | 0.05 | <5 | A | 0.10 | 5 |
| | NBLT | C | 0.11 | 5 | D | 0.28 | 10 |
| | NBR | B | 0.17 | 5 | B | 0.27 | 10 |
| | SBLTR | C | 0.04 | <5 | C | 0.14 | 5 |
| 33 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.02 | <5 | A | 0.05 | <5 |
| | WBLTR | A | 0.03 | <5 | A | 0.04 | <5 |
| | NBLTR | C | 0.12 | 5 | D | 0.40 | 15 |
| | SBLTR | C | 0.13 | 5 | D | 0.51 | 20 |
| 31 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.03 | <5 | A | 0.02 | <5 |
| | WBLTR | A | 0.02 | <5 | A | 0.02 | <5 |
| | NBLTR | B | 0.10 | 5 | C | 0.15 | 5 |
| | SBLTR | B | 0.09 | <5 | C | 0.27 | 10 |




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**Exhibit 3.2**

# +5 Future Horizon (2030) – Group 2 Traffic Volumes

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

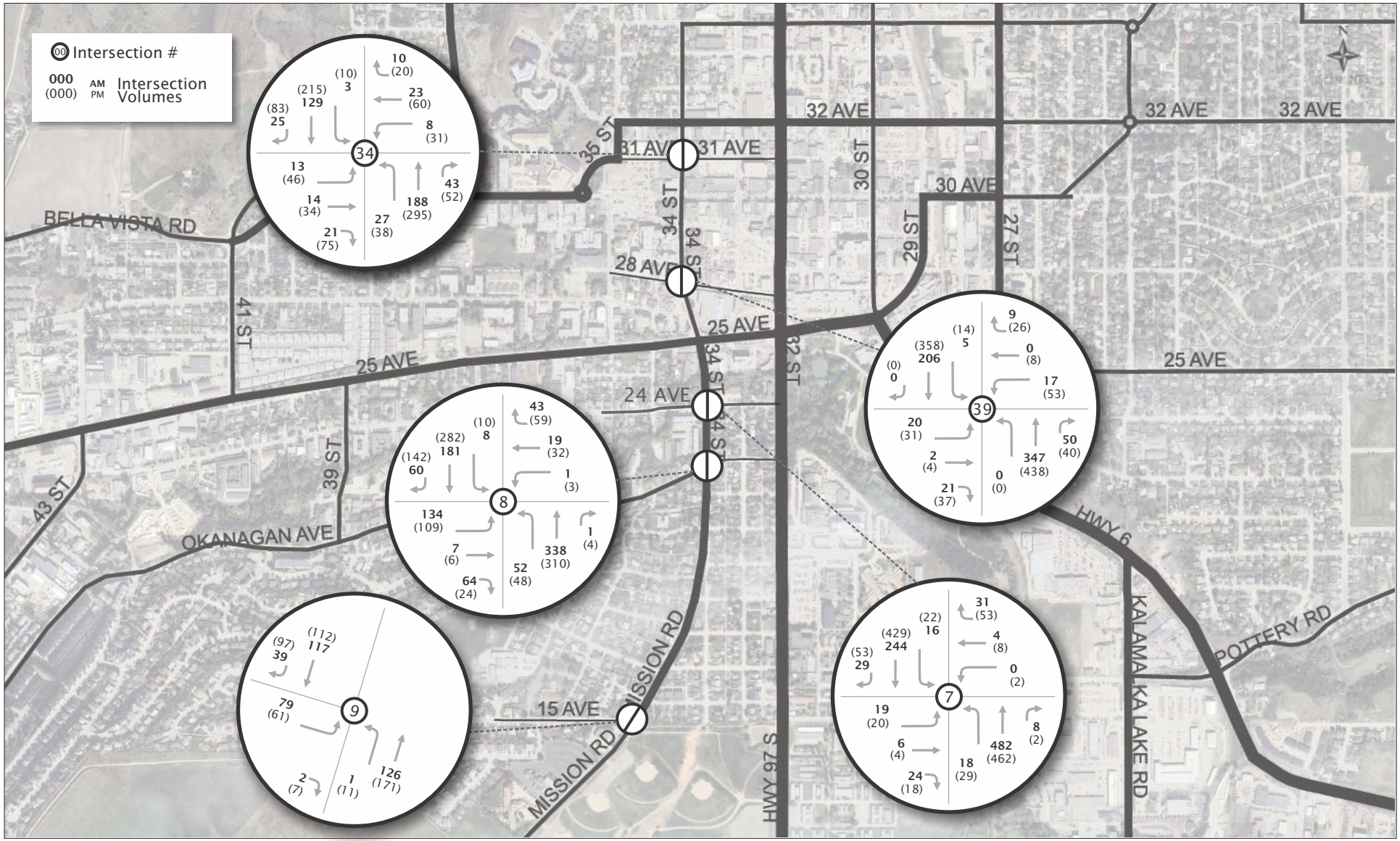
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### 3.4.3 + 5 Future Horizon (2030) Traffic Operations for Group 3 Intersections

+ 5 Future Horizon (2030) analysis results for Group 3 intersections are summarized in **Table 3.20** based on the traffic volumes in **Exhibit 3.3**. All study intersections within Group 3 are expected to continue operating acceptably with an overall LOS A by the 2030 future year.

**Table 3.20: + 5 Future Horizon (2030) Traffic Operations – Group 3**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 24 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.18 | 5 | D | 0.25 | 10 |
| | WBLTR | C | 0.12 | 5 | C | 0.19 | 5 |
| | NBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | NBTR | A | 0.33 | <5 | A | 0.30 | <5 |
| | SBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.18 | <5 | A | 0.31 | <5 |
| 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | E | 0.61 | 30 | E | 0.60 | 25 |
| | EBR | A | 0.09 | <5 | B | 0.04 | <5 |
| | WBLTR | B | 0.16 | 5 | C | 0.23 | 5 |
| | NBL | A | 0.04 | <5 | A | 0.05 | <5 |
| | NBTR | A | 0.22 | <5 | A | 0.19 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.15 | <5 | A | 0.26 | <5 |
| Mission Road & 15 Avenue *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.12 | 5 | B | 0.12 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | <0.02 | <5 | A | 0.14 | <5 |
| 34 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.11 | 5 | C | 0.46 | 20 |
| | WBLTR | B | 0.10 | 5 | D | 0.41 | 15 |
| | NBLT | A | 0.02 | <5 | A | 0.04 | <5 |
| | NBR | A | 0.03 | <5 | A | 0.03 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBR | A | 0.02 | <5 | A | 0.05 | <5 |
| 34 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.12 | 5 | C | 0.29 | 10 |
| | WBLR | C | 0.08 | <5 | D | 0.38 | 15 |
| | NBTR | A | 0.27 | <5 | A | 0.31 | <5 |
| | SBLT | A | <0.02 | <5 | A | 0.02 | <5 |




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**Exhibit 3.3**

## +5 Future Horizon (2030) – Group 3 Traffic Volumes

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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### 3.4.4 + 5 Future Horizon (2030) Traffic Operations for Group 4 Intersections

+ 5 Future Horizon (2030) analysis results for Group 4 intersections are summarized in **Table 3.21** based on the traffic volumes in **Exhibit 3.4**.

***34 Street & 43 Avenue***

Whilst the traffic models indicate this intersection will perform within acceptable thresholds, it is recommended to monitor traffic operations as there is redevelopment and densification anticipated for the area. It is also noted that 34 Street is an identified bicycle route and connectivity to the north, including bicycle facilities (on-street bicycle lanes, protected bicycle lanes, etc.), should be contemplated.

***25 Street & 43 Avenue***

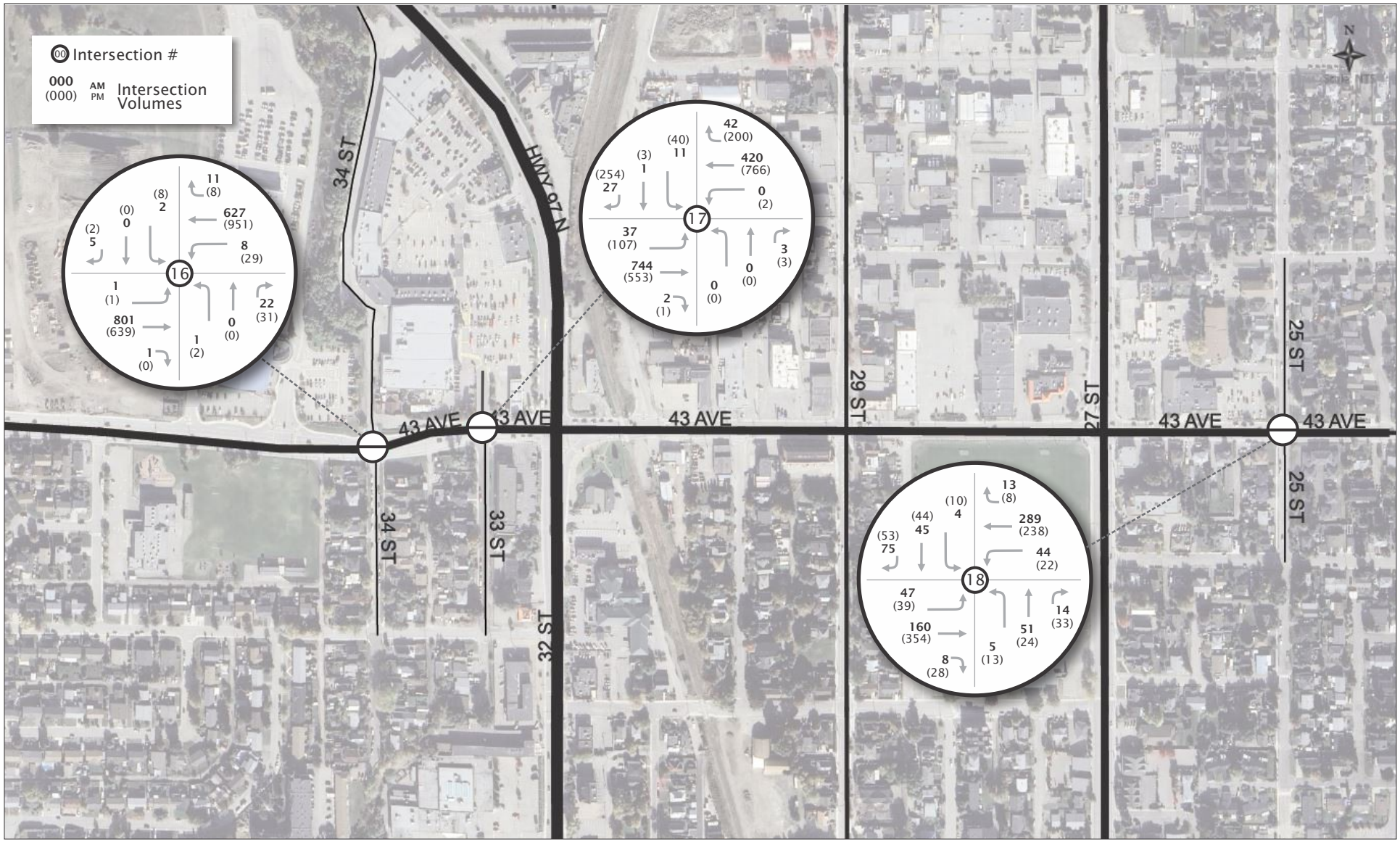
This intersection performs within acceptabe thresholds. However, it is recommended to continue monitoring operations, particularly for active modes of travel, as this forms a key connection along the 25 Street and 43 Avenue corridors.

All study intersections within Group 4 are expected to continue operating acceptably with an overall LOS B or better by the 2030 future year.

**Table 3.21: + 5 Future Horizon (2030) Traffic Operations – Group 4**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.27 | <5 | A | 0.20 | <5 |
| | WBLT | A | <0.02 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.22 | <5 | A | 0.29 | <5 |
| | NBLTR | D | 0.17 | 5 | C | 0.15 | 5 |
| | SBLTR | E | 0.16 | 5 | E | 0.17 | 5 |
| 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | B | 0.15 | 5 |
| | EBT | A | 0.30 | <5 | A | 0.22 | <5 |
| | EBTR | A | 0.15 | <5 | A | 0.11 | <5 |
| | WBT | A | 0.17 | <5 | A | 0.31 | <5 |
| | WBTR | A | 0.11 | <5 | A | 0.27 | <5 |
| | NBR | B | <0.02 | <5 | B | <0.02 | <5 |
| | SBR | A | 0.05 | <5 | C | 0.55 | 25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 25 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.05 | <5 | A | 0.03 | <5 |
| | WBLTR | A | 0.04 | <5 | A | 0.02 | <5 |
| | NBLTR | C | 0.28 | 10 | C | 0.19 | 5 |
| | SBLTR | C | 0.36 | 15 | C | 0.26 | 10 |
| | | | | | | | |




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**Exhibit 3.4**

# +5 Future Horizon (2030) – Group 4 Traffic Volumes

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### 3.4.5 + 5 Future Horizon (2030) Traffic Operations for Group 5 Intersections

+ 5 Future Horizon (2030) analysis results for Group 5 intersections are summarized in **Table 3.22** based on the traffic volumes in **Exhibit 3.5**.

All study intersections within Group 5 are expected to continue operating acceptably with an overall LOS C or better by the 2030 future year.

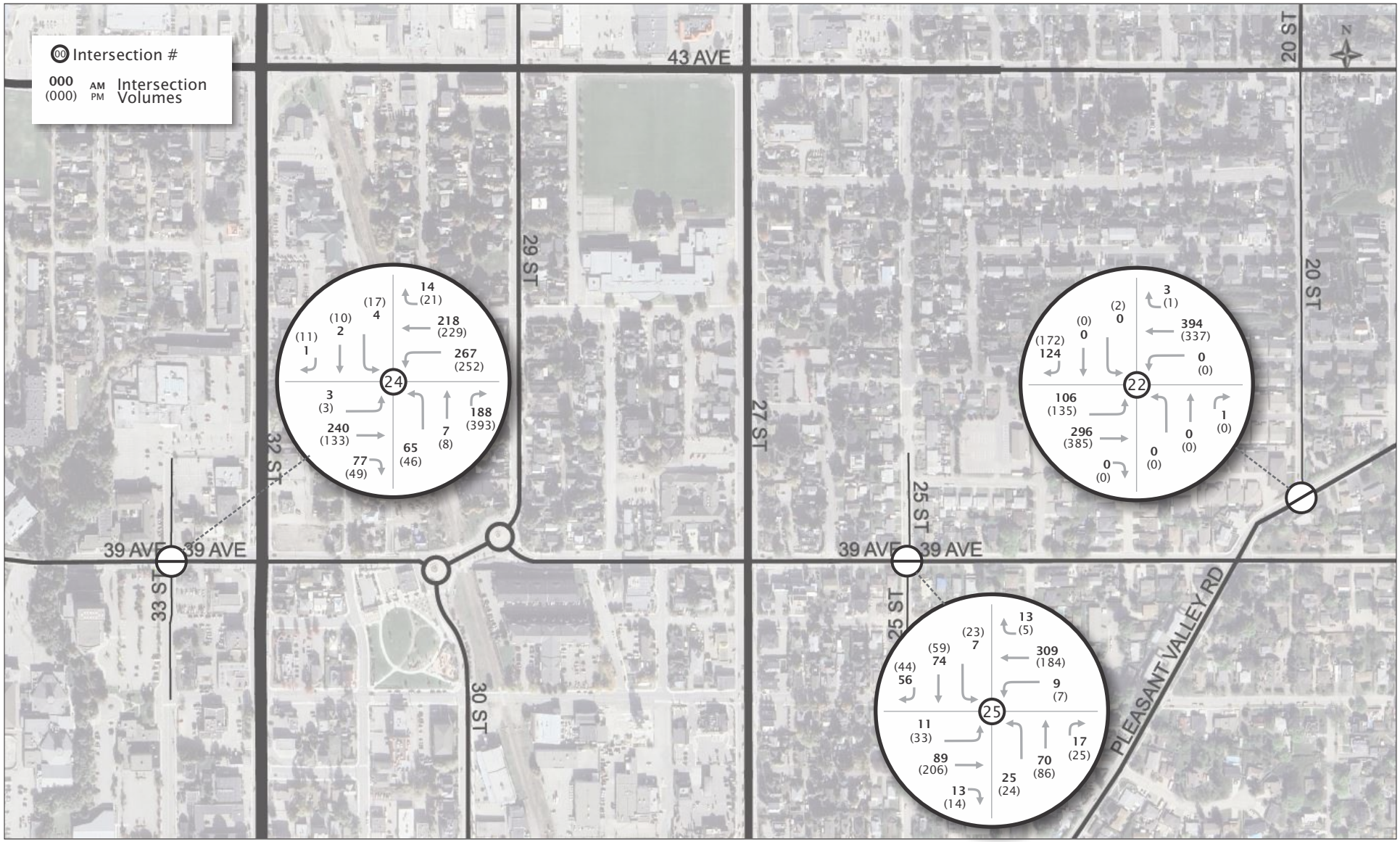
**Table 3.23** presents the analysis results for the intersection of 33 Street & 39 Avenue under the proposed roundabout upgrade. The results indicate that the intersection will operate efficiently, with all individual movements experiencing a LOS A during both the AM and PM peak hours. The 95th percentile queue for the westbound movement is estimated to be 25 meters during the PM peak hour, which remains within the available link capacity.

**Table 3.22: + 5 Future Horizon (2030) Traffic Operations – Group 5**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 20 Street *(SB Stop)* | *OVERALL* | *B* | - | - | *C* | - | - |
| | EBLT | A | 0.10 | 5 | A | 0.12 | 5 |
| | WBTR | A | 0.25 | <5 | A | 0.21 | <5 |
| | SBLR | B | 0.24 | 5 | B | 0.28 | 10 |
| 33 Street & 39 Avenue *(Signal)* | *OVERALL* | *B* | *0.58* | - | *A* | *0.57* | - |
| | EBL | B | 0.02 | 5 | A | 0.02 | <5 |
| | EBTR | B | 0.66 | 55 | B | 0.36 | 25 |
| | WBL | A | 0.56 | 25 | A | 0.54 | 25 |
| | WBTR | A | 0.25 | 25 | A | 0.28 | 25 |
| | NBLTR | B | 0.44 | 20 | B | 0.41 | 20 |
| | SBLTR | B | 0.04 | 5 | B | 0.10 | 5 |
| 25 Street & 39 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | 0.03 | <5 |
| | WBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLTR | C | 0.34 | 10 | C | 0.32 | 10 |
| | SBLTR | C | 0.35 | 15 | C | 0.27 | 10 |

**Table 3.23: + 5 Future Horizon (2030) Traffic Operations – Group 5 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 33 Street & 39 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.43* | - | *A* | *0.37* | - |
| | EBLTR | A | 0.37 | 15 | A | 0.18 | 5 |
| | WBLTR | A | 0.43 | 25 | A | 0.36 | 20 |
| | NBLTR | A | 0.30 | 15 | A | 0.37 | 20 |
| | SBLTR | A | 0.02 | <5 | A | 0.04 | <5 |
| | | | | | | | |




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**Exhibit 3.5**

## +5 Future Horizon (2030) – Group 5 Traffic Volumes

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### 3.4.6 + 5 Future Horizon (2030) Traffic Operations for Group 6 Intersections

+ 5 Future Horizon (2030) analysis results for Group 6 intersections are summarized in **Table 3.24** based on the traffic volumes in **Exhibit 3.6**.

*24 Street/Driveway & 48 Avenue*

By 2030, the intersection of 24 Street/Driveway & 48 Avenue is expected to experience a LOS F and a V/C ratio above capacity for the southbound movement during the PM peak hour. To improve traffic operations by that time, two mitigation options can be considered: upgrading the intersection to a single-lane roundabout or installing a traffic signal.

**Table 3.24: + 5 Future Horizon (2030) Traffic Operations – Group 6**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLTR | C | 0.16 | 5 | C | 0.22 | 5 |
| | WBLTR | D | 0.44 | 15 | D | 0.43 | 15 |
| | NBLTR | A | 0.03 | <5 | A | 0.02 | <5 |
| | SBLTR | A | 0.03 | <5 | A | 0.06 | <5 |
| 24 Street/Driveway & 48 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | B | 0.15 | 5 | A | 0.20 | 5 |
| | EBT | A | 0.11 | <5 | A | 0.22 | <5 |
| | EBTR | A | 0.06 | <5 | A | 0.11 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.25 | <5 | A | 0.21 | <5 |
| | NBLTR | C | 0.08 | <5 | E | 0.15 | 5 |
| | SBLTR | C | 0.31 | 10 | F | >1 | 125 |
| | | | | | | | |

**Table 3.24: + 5 Future Horizon (2030) Traffic Operations – Group 6 (Cont.)**

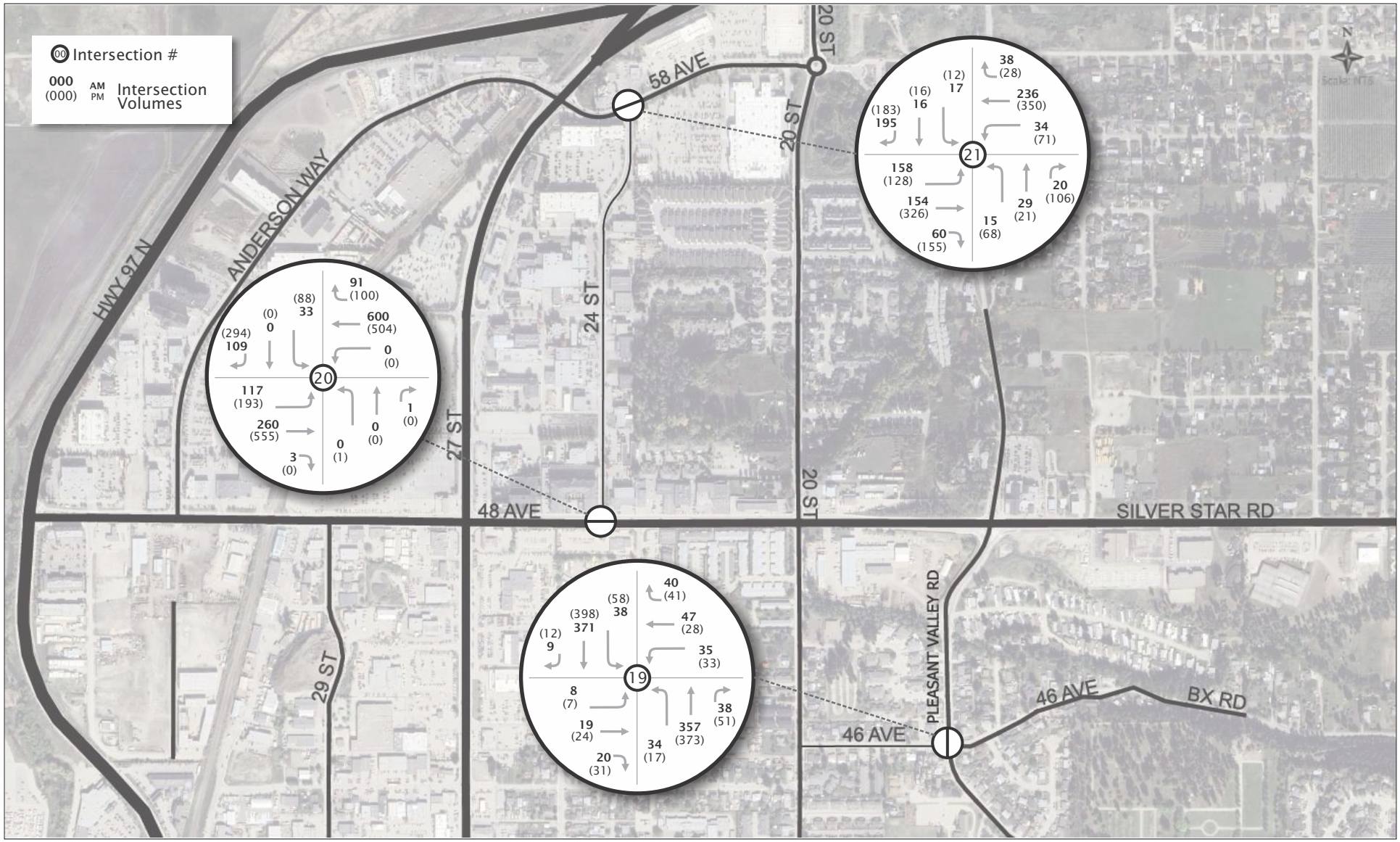
| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 24 Street/Driveway & 58 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.29* | - | *A* | *0.48* | - |
| | EBLTR | A | 0.29 | 15 | A | 0.48 | 30 |
| | WBLTR | A | 0.29 | 15 | A | 0.42 | 20 |
| | NBLTR | A | 0.07 | <5 | A | 0.24 | 10 |
| | SBLTR | A | 0.24 | 10 | A | 0.26 | 10 |
| | | | | | | | |

**Table 3.25** provides a summary of the results for each scenario. With the traffic signal upgrade, the intersection is anticipated to operate acceptably with an overall LOS A and V/C ratios of 0.35 and 0.43 during the AM and PM peak hours, respectively. Under the roundabout upgrade, the intersection is expected to perform efficiently, with all individual movements achieving a LOS A during both peak hours.

All other study intersections within Group 6 are projected to continue operating acceptably with an overall LOS C or better by the 2030 future horizon.

**Table 3.25: + 5 Future Horizon (2030) Traffic Operations – Group 6 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 24 Street/Driveway & 48 Avenue *(Signal)* | *OVERALL* | *A* | *0.35* | - | *A* | *0.43* | - |
| | EBL | A | 0.33 | 10 | A | 0.50 | 20 |
| | EBTR | A | 0.15 | 10 | A | 0.32 | 20 |
| | WBLTR | A | 0.39 | 20 | A | 0.36 | 20 |
| | NBLTR | B | 0.05 | 5 | A | 0.03 | 5 |
| | SBLT | B | 0.20 | 10 | B | 0.29 | 15 |
| | SBR | B | 0.08 | 10 | B | 0.21 | 15 |
| 24 Street/Driveway & 48 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.58* | - | *A* | *0.50* | - |
| | EBLTR | A | 0.29 | 15 | A | 0.55 | 40 |
| | WBLTR | A | 0.58 | 35 | A | 0.51 | 30 |
| | NBLTR | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBLTR | A | 0.21 | 10 | A | 0.45 | 25 |
| | | | | | | | |




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**Exhibit 3.6**

## +5 Future Horizon (2030) – Group 6 Traffic Volumes

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### 3.4.7 + 5 Future Horizon (2030) Traffic Operations for Group 7 Intersections

+ 5 Future Horizon (2030) analysis results for Group 7 intersections are summarized in **Table 3.26** based on the traffic volumes in **Exhibit 3.7**.

***30 Street & 31 Avenue***

Whilst this intersection operates within traffic operations thresholds, it is recommended to continue monitoring this location for transit safety. Traffic volumes may remain low, however the primary vehicles exiting are buses and the intersection functions in a unique way. Ongoing monitoring may should review potential for future transit station upgrades and ensure the design continues to meet operational and safety needs for transit vehicles and users.

All study intersections within Group 7 are projected to continue operating acceptably with an overall LOS B or better by the 2030 future horizon.

**Table 3.26: + 5 Future Horizon (2030) Traffic Operations – Group 7**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 25 Avenue *(WB Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | WBR | D | 0.54 | 25 | C | 0.23 | 5 |
| | NBT | A | 0.55 | <5 | A | 0.53 | <5 |
| | SBT | A | 0.40 | <5 | A | 0.63 | <5 |
| 27 Street & 28 Avenue *(Ped Signal)* | *OVERALL* | *B* | *0.67* | - | *B* | *0.55* | - |
| | EBLTR | C | 0.27 | 25 | C | 0.44 | 45 |
| | WBLTR | C | 0.04 | 10 | C | 0.03 | 5 |
| | NBLTR | C | 0.86 | 115 | B | 0.53 | 55 |
| | SBLTR | B | 0.49 | 50 | B | 0.61 | 75 |
| 30 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.07 | <5 | C | 0.07 | <5 |
| | WBLTR | C | 0.07 | <5 | B | 0.12 | 5 |
| | NBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.02 | <5 | A | <0.02 | <5 |
| 30 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.06 | <5 | C | 0.19 | 5 |
| | WBLTR | C | 0.14 | 5 | C | 0.28 | 10 |
| | NBLT | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.16 | <5 | A | 0.30 | <5 |




**Exhibit 3.7**

## +5 Future Horizon (2030) – Group 7 Traffic Volumes

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### 3.4.8 + 5 Future Horizon (2030) Traffic Operations for Group 8 Intersections

+ 5 Future Horizon (2030) analysis results for Group 8 intersections are summarized in **Table 3.27** based on the traffic volumes in **Exhibit 3.8**.

#### *41 Street & 25 Avenue*

The 41 Street & 25 Avenue intersection is expected to operate acceptably during both the AM and PM peak hours, with all individual movements achieving a LOS B or better. However, it is recommended to optimize signal timing plan by 2030 to ensure the queue for the EBL movement remains within the storage length capacity. **Table 3.28** provides a summary of the improved intersection operation following signal optimization.

All other study intersections within Group 8 are projected to continue operating acceptably, with an overall LOS B or better by the 2030 future horizon.

**Table 3.27: + 5 Future Horizon (2030) Traffic Operations – Group 8**

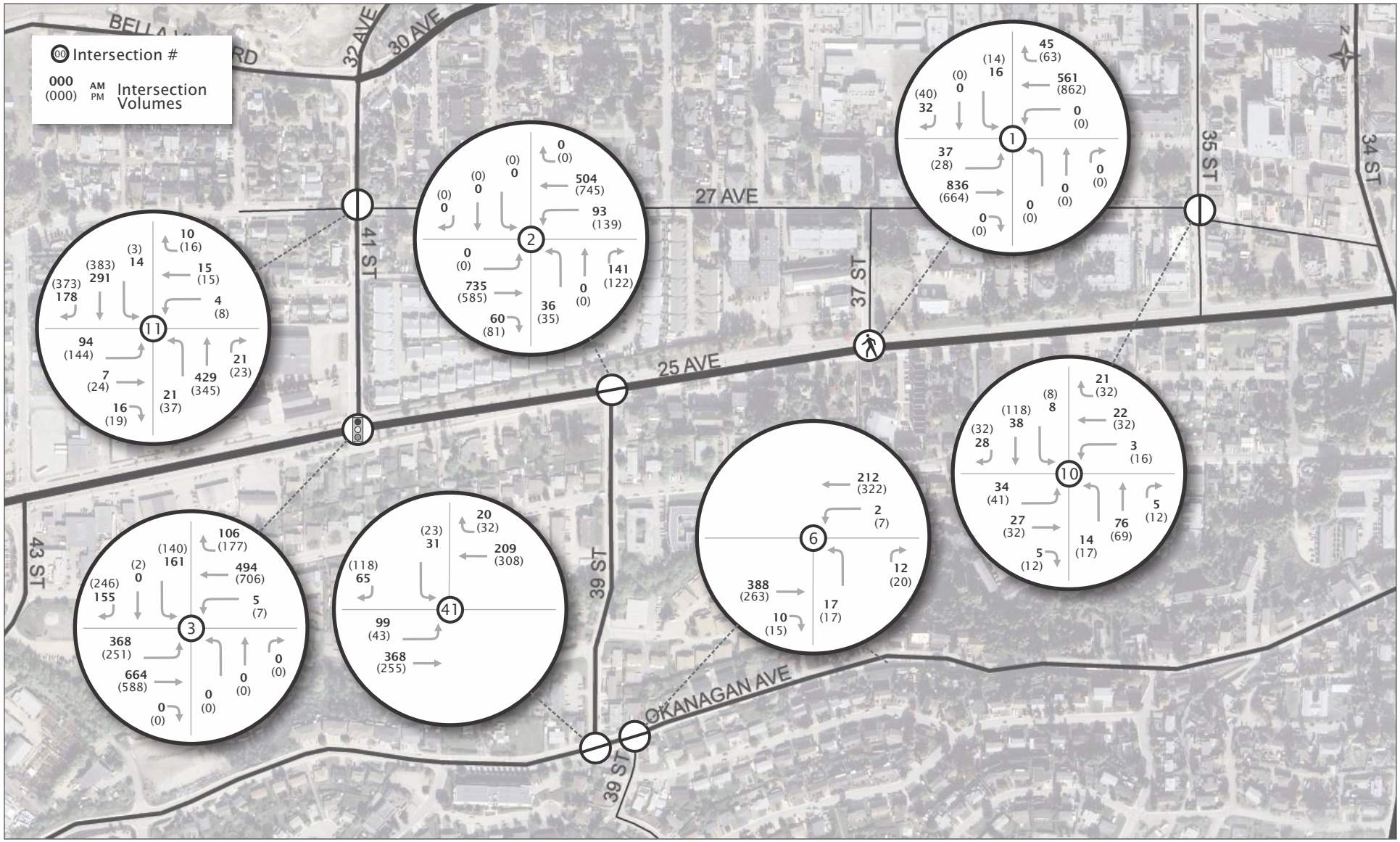
| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Avenue & 37 Street *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.05 | <5 | B | 0.04 | <5 |
| | EBT1 | A | 0.26 | <5 | A | 0.20 | <5 |
| | EBT2 | A | 0.26 | <5 | A | 0.20 | <5 |
| | WBT | A | 0.24 | <5 | A | 0.35 | <5 |
| | WBTR | A | 0.15 | <5 | A | 0.21 | <5 |
| | SBLR | C | 0.16 | 5 | C | 0.19 | 5 |
| 39 Street & 25 Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBT | A | 0.31 | <5 | A | 0.23 | 5 |
| | EBTR | A | 0.19 | <5 | A | 0.16 | <5 |
| | WBL | A | 0.13 | 20 | A | 0.16 | 20 |
| | WBT1 | A | 0.16 | <5 | A | 0.22 | <5 |
| | WBT2 | A | 0.16 | <5 | A | 0.22 | <5 |
| | NBL | C | 0.27 | 15 | C | 0.27 | 15 |
| | NBR | A | 0.24 | 20 | A | 0.19 | 15 |
| | | | | | | | |

**Table 3.27: + 5 Future Horizon (2030) Traffic Operations – Group 8 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 25 Avenue *(Signal)* | *OVERALL* | *B* | *0.69* | - | *B* | *0.61* | - |
| | EBL | B | 0.75 | 75 | B | 0.60 | 50 |
| | EBTR | A | 0.34 | 40 | A | 0.29 | 35 |
| | WBL | B | 0.02 | 5 | B | 0.03 | 5 |
| | WBTR | B | 0.60 | 55 | B | 0.76 | 95 |
| | SBL | B | 0.40 | 30 | B | 0.36 | 25 |
| | SBTR | B | 0.12 | 10 | B | 0.18 | 15 |
| 39 Street S & Okanagan Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBTR | A | 0.28 | <5 | A | 0.18 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLR | B | 0.08 | <5 | B | 0.08 | <5 |
| 35 Street & 27 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.11 | 5 | B | 0.16 | 5 |
| | WBLTR | B | 0.07 | <5 | B | 0.13 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| 41 Street & 27 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.39* | - | *A* | *0.55* | - |
| | EBLTR | A | 0.12 | 5 | A | 0.21 | 10 |
| | WBLTR | A | 0.04 | <5 | A | 0.05 | <5 |
| | NBLTR | A | 0.39 | 20 | A | 0.36 | 20 |
| | SBLTR | A | 0.35 | 20 | A | 0.55 | 35 |
| Okanagan Avenue & 39 Street N *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.09 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.16 | <5 | A | 0.22 | <5 |
| | SBLR | C | 0.25 | 10 | B | 0.26 | 10 |
| | | | | | | | |

**Table 3.28: + 5 Future Horizon (2030) Traffic Operations – Group 8 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 25 Avenue *(Signal)* | *OVERALL* | *B* | *0.61* | - | *B* | *0.60* | - |
| | EBL | A | 0.63 | 60 | A | 0.55 | 45 |
| | EBTR | A | 0.32 | 40 | A | 0.27 | 35 |
| | WBL | B | 0.02 | 5 | B | 0.03 | 5 |
| | WBTR | C | 0.64 | 65 | C | 0.75 | 90 |
| | SBL | C | 0.44 | 35 | C | 0.38 | 30 |
| | SBTR | B | 0.12 | 15 | C | 0.18 | 15 |
| | | | | | | | |




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**Exhibit 3.8**

# +5 Future Horizon (2030) – Group 8 Traffic Volumes

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### 3.4.9 + 5 Future Horizon (2030) Traffic Operations for Group 9 Intersections

+ 5 Future Horizon (2030) analysis results for Group 9 intersections are summarized in **Table 3.29** based on the traffic volumes in **Exhibit 3.9**.

All study intersections within Group 9 are projected to continue operating acceptably, with an overall LOS B or better by the 2030 future horizon.

#### *Middleton Way & Kosmina Road*

The Middleton Way & Kosmina Road intersection is anticipated to perform within acceptable thresholds. As an option to help improve traffic flow and conflict points, considerations could be made to implementing right-in/right-out turn controls with a concrete median barrier on Middleton Way.

**Table 3.29: + 5 Future Horizon (2030) Traffic Operations – Group 9**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & Kosmina Road *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.20 | 5 | D | 0.48 | 20 |
| | WBLTR | C | 0.06 | <5 | C | 0.06 | <5 |
| | NBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | NBTR | A | 0.31 | <5 | A | 0.24 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.19 | <5 | A | 0.27 | <5 |
| | | | | | | | |

**Table 3.29: + 5 Future Horizon (2030) Traffic Operations – Group 9 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & 11 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.35 | 10 | D | 0.75 | 50 |
| | WBLTR | C | 0.08 | <5 | C | 0.09 | <5 |
| | NBL | A | 0.12 | 5 | A | 0.07 | <5 |
| | NBT | A | 0.19 | <5 | A | 0.11 | <5 |
| | NBTR | A | 0.10 | <5 | A | 0.06 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBT | A | 0.08 | <5 | A | 0.16 | <5 |
| | SBTR | A | 0.08 | <5 | A | 0.11 | <5 |
| Kalamalka Lake Road & 11 Avenue *(WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | WBLR | C | 0.40 | 15 | E | 0.66 | 35 |
| | NBTR | A | 0.40 | <5 | A | 0.40 | <5 |
| | SBL | A | 0.09 | <5 | B | 0.24 | 10 |
| | SBT | A | 0.21 | <5 | A | 0.47 | <5 |
| | | | | | | | |




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**Exhibit 3.9**

## +5 Future Horizon (2030) – Group 9 Traffic Volumes

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### 3.4.10 + 5 Future Horizon (2030) Traffic Operations for Group 10 Intersections

+ 5 Future Horizon (2030) analysis results for Group 10 intersections are summarized in **Table 3.30** based on the traffic volumes in **Exhibit 3.10**.

All study intersections within Group 10 are projected to continue operating acceptably, with an overall LOS B or better by the 2030 future horizon.

**Table 3.30: + 5 Future Horizon (2030) Traffic Operations – Group 10**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Apollo Road & Okanagan Landing Road *(NB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBTR | A | 0.24 | <5 | A | 0.22 | <5 |
| | WBLT | A | 0.02 | <5 | A | 0.06 | <5 |
| | NBLR | B | 0.11 | 5 | B | 0.12 | 5 |
| Okanagan Avenue & S Vernon Drive *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.12 | 5 | A | 0.06 | <5 |
| | NBLT | A | 0.05 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.15 | <5 | A | 0.09 | <5 |
| Tronson Road & Bella Vista Road *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.04 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.04 | <5 | A | 0.09 | <5 |
| | SBLR | B | 0.10 | 5 | A | 0.14 | 5 |
| | | | | | | | |




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**Exhibit 3.10**

## +5 Future Horizon (2030) – Group 10 Traffic Volumes

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## 3.5 + 10 Future Horizon (2035) Traffic Operations

Analysis assumptions for the + 10 future conditions were maintained from the + 5 future conditions, as detailed in **Section 3.4**.

### 3.5.1 + 10 Future Horizon (2035) Traffic Operations for Group 1 Intersections

+ 10 Future Horizon (2035) analysis results for Group 1 intersections are summarized in **Table 3.31** based on the traffic volumes in **Exhibit 3.11**.

#### *41 Street/32 Avenue & Bella Vista Road/30 Avenue*

The intersection of 41 Street/32 Avenue & Bella Vista Road/30 Avenue is expected to continue operating within capacity thresholds, with an overall LOS C during both peak hours. To accommodate the projected traffic volumes, it is recommended to extend the WBL storage lane to 130 m and the NBR storage lane to 50 m.

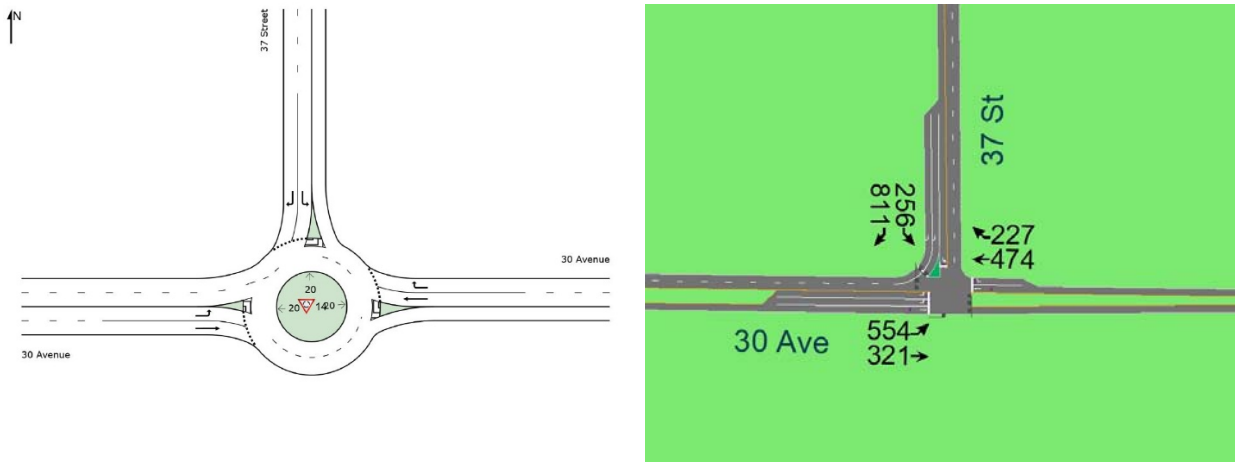
#### *37 Street & 30 Avenue*

The intersection of 37 Street & 30 Avenue is projected to operate near capacity, with an overall LOS D during the PM peak hour. The critical movements are eastbound left and westbound, where V/C ratios exceed 0.90, and the 95th percentile queues are expected to reach approximately 180 meters. To improve traffic operations, two potential enhancements are recommended:

1. Upgrading the lane configuration to include a dual-left eastbound movement and a dual-right southbound movement;
2. Converting the intersection to a single-lane roundabout with storage bays for westbound right, southbound right, and eastbound left movements.

**Figure 3.1** illustrates the proposed lane configurations for each option. **Table 3.32** summarizes the intersection performance under both scenarios. With the signal and updated lane configuration, the intersection is expected to perform acceptably, achieving an overall LOS B with a V/C ratio of 0.56 during the AM and 0.65 during the PM peak hour. Alternatively, upgrading to a roundabout would result in improved operations, with the intersection achieving an overall LOS A and V/C ratio of 0.54 in the AM peak and 0.66 in the PM peak hour. Additionally, no significant queuing issues are anticipated with the roundabout option.

**Figure 3.1: Proposed Intersection Layout and Lane Configuration**




### *37 Street/Alexis Park Drive & 32 Avenue/Gateby PI*

It is projected that the eastbound movement at the intersection of 37 Street/Alexis Park Drive & 32 Avenue will experience a LOS F during the PM peak hour. However, as the eastbound movement operates below capacity with low vehicle volumes, no improvements are recommended at + 10 future horizon.

All other study intersections within Group 1 are expected to continue operating acceptably with an overall LOS B or better by the 2035 future year.

**Table 3.31: + 10 Future Horizon (2035) Traffic Operations – Group 1**

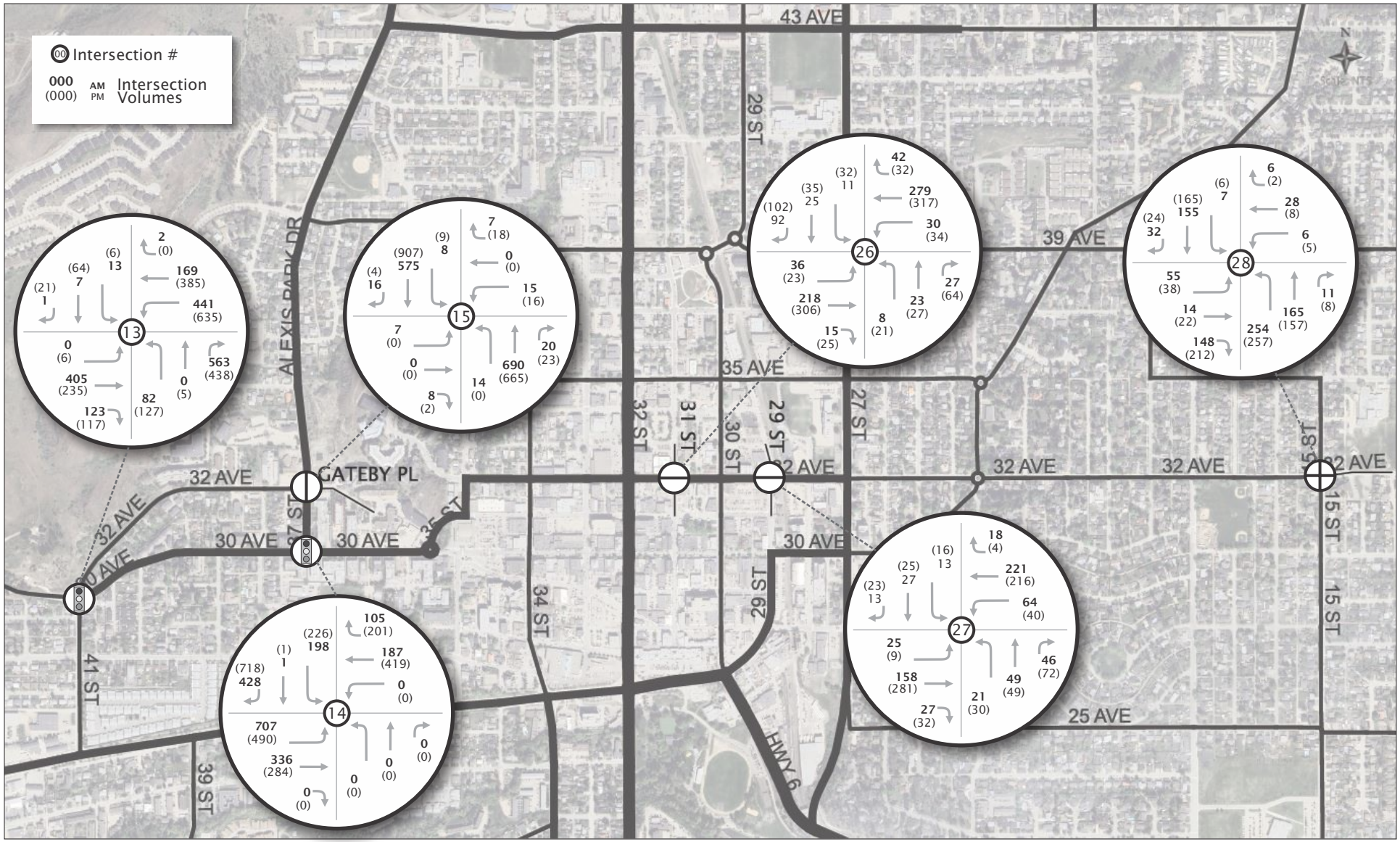
| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *C* | *0.79* | - | *C* | *0.83* | - |
| | EBL | B | 0.02 | 5 | C | 0.03 | 5 |
| | EBT | C | 0.75 | 120 | C | 0.57 | 75 |
| | EBR | B | 0.13 | 15 | C | 0.09 | 15 |
| | WBL | C | 0.80 | 110 | B | 0.84 | 130 |
| | WBTR | A | 0.16 | 25 | A | 0.35 | 50 |
| | NBTL | C | 0.39 | 30 | C | 0.59 | 45 |
| | NBR | C | 0.61 | 50 | C | 0.33 | 30 |
| | SBTL | C | 0.08 | 10 | C | 0.21 | 25 |
| | SBR | C | <0.02 | <5 | C | <0.02 | <5 |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *C* | *0.87* | - | *D* | ***0.95*** | - |
| | EBL | C | 0.88 | 185 | D | **0.92** | 155 |
| | EBT | A | 0.27 | 35 | A | 0.22 | 30 |
| | WBTR | D | 0.74 | 95 | D | **0.93** | 195 |
| | SBL | D | 0.67 | 60 | D | 0.75 | 70 |
| | SBR | A | 0.33 | 20 | C | 0.79 | 190 |
| 37 Street/Alexis Park Drive & 32 Avenue/Gateby Pl *(EB/WB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLTR | E | 0.20 | 5 | **F** | 0.17 | 5 |
| | WBLTR | E | 0.24 | 5 | D | 0.25 | 5 |
| | NBLTR | A | 0.02 | <5 | A | <0.02 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.21 | <5 | A | 0.28 | <5 |
| 31 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | A | 0.02 | <5 |
| | EBTR | A | 0.16 | <5 | A | 0.22 | <5 |
| | WBL | A | 0.03 | <5 | A | 0.03 | <5 |
| | WBTR | A | 0.21 | <5 | A | 0.23 | <5 |
| | NBLTR | C | 0.18 | 5 | C | 0.40 | 15 |
| | SBLTR | B | 0.16 | 5 | C | 0.35 | 15 |
| | | | | | | | |

**Table 3.31: + 10 Future Horizon (2035) Traffic Operations – Group 1 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 29 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.13 | <5 | A | 0.20 | <5 |
| | WBL | A | 0.06 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.17 | <5 | A | 0.14 | <5 |
| | NBLTR | C | 0.35 | 10 | C | 0.37 | 15 |
| | SBLTR | C | 0.19 | 5 | C | 0.18 | 5 |
| 15 Street & 32 Avenue *(All Way Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLTR | B | 0.40 | 45 | B | 0.41 | 30 |
| | WBLTR | B | 0.08 | 15 | A | 0.03 | 15 |
| | NBLTR | C | 0.75 | <5 | C | 0.64 | <5 |
| | SBLTR | B | 0.35 | 10 | B | 0.30 | 10 |
| | | | | | | | |

**Table 3.32: + 10 Future Horizon (2035) Traffic Operations – Group 1 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 37 Street & 30 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.54* | - | *A* | *0.66* | - |
| | EBL | B | 0.54 | 35 | B | 0.38 | 20 |
| | EBT | A | 0.33 | 15 | A | 0.28 | 15 |
| | WBT | A | 0.24 | 15 | A | 0.40 | 20 |
| | WBR | A | 0.18 | 10 | A | 0.26 | 10 |
| | SBL | A | 0.20 | 10 | A | 0.30 | 15 |
| | SBR | A | 0.34 | 20 | A | 0.66 | 55 |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *B* | *0.56* | - | *B* | *0.65* | - |
| | EBL | C | 0.69 | 80 | C | 0.63 | 65 |
| | EBT | A | 0.29 | 40 | A | 0.25 | 35 |
| | WBT | C | 0.41 | 55 | C | 0.69 | 100 |
| | WBR | C | 0.08 | 15 | B | 0.25 | 30 |
| | SBL | C | 0.58 | 60 | C | 0.59 | 70 |
| | SBR | A | 0.17 | 5 | B | 0.37 | 35 |
| | | | | | | | |




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**Exhibit 3.11**

# +10 Future Horizon (2035) – Group 1 Traffic Volumes

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### 3.5.2 + 10 Future Horizon (2035) Traffic Operations for Group 2 Intersections

+ 10 Future Horizon (2035) analysis results for Group 2 intersections are summarized in **Table 3.33** based on the traffic volumes in **Exhibit 3.12**.

All study intersections within Group 2 are expected to continue operating acceptably with an overall LOS C or better by the 2035 future year.

***31 Street & 30 Avenue***

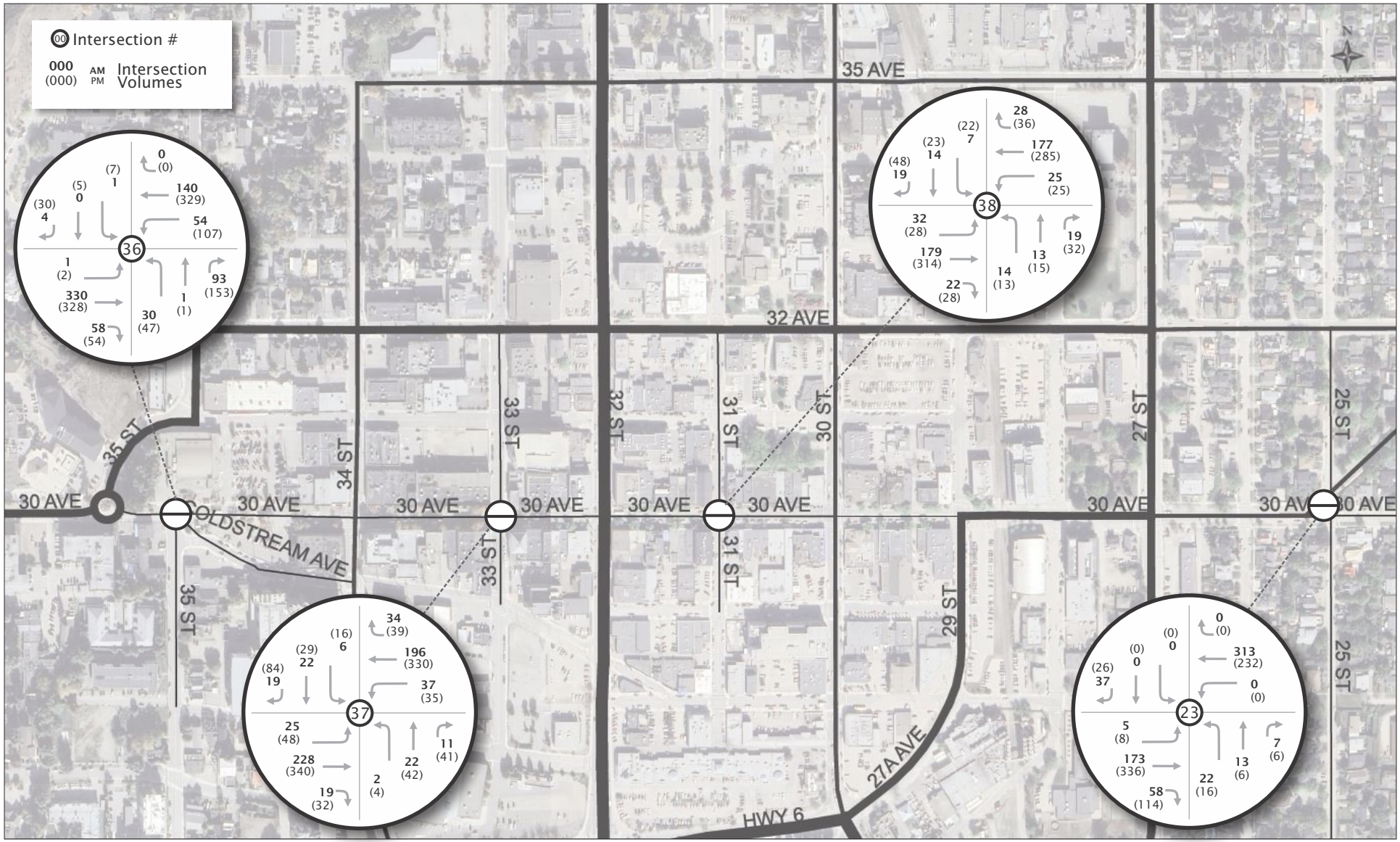
Whilst this intersection performs within acceptable thresholds, turn controls and a concrete median along 30 Avenue could be considered to convert intersection to a right-in/right-out configuration. This would help reduce traffic conflicts and improve traffic flow. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.

Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks.

**Table 3.33: + 10 Future Horizon (2035) Traffic Operations – Group 2**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Street & Pleasant Valley Road *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.20 | <5 | A | 0.15 | <5 |
| | NBLTR | B | 0.11 | 5 | C | 0.08 | <5 |
| | SBR | B | 0.06 | <5 | A | 0.04 | <5 |
| 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBLTR | A | 0.06 | <5 | A | 0.11 | 5 |
| | NBLT | C | 0.13 | 5 | E | 0.34 | 10 |
| | NBR | B | 0.18 | 5 | B | 0.30 | 10 |
| | SBLTR | C | 0.05 | <5 | C | 0.17 | 5 |
| 33 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.02 | <5 | A | 0.05 | <5 |
| | WBLTR | A | 0.04 | <5 | A | 0.04 | <5 |
| | NBLTR | C | 0.13 | 5 | E | 0.47 | 20 |
| | SBLTR | C | 0.15 | 5 | E | 0.60 | 30 |

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 31 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.03 | <5 | A | 0.03 | <5 |
| | WBLTR | A | 0.02 | <5 | A | 0.02 | <5 |
| | NBLTR | B | 0.12 | 5 | C | 0.18 | 5 |
| | SBLTR | B | 0.10 | 5 | C | 0.30 | 10 |
| | | | | | | | |




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**Exhibit 3.12**

# +10 Future Horizon (2035) – Group 2 Traffic Volumes

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### 3.5.3 + 10 Future Horizon (2035) Traffic Operations for Group 3 Intersections

+ 10 Future Horizon (2035) analysis results for Group 3 intersections are summarized in **Table 3.34** based on the traffic volumes in **Exhibit 3.13**.

#### *34 Street & Okanagan Avenue/23 Avenue*

The intersection of 34 Street & Okanagan Avenue/23 Avenue is projected to experience LOS F for the eastbound left and through movements during the AM and PM peak hours by 2035. To enhance traffic operations, upgrading the intersection to a single-lane roundabout is recommended. As shown in **Table 3.35**, under this roundabout scenario, all individual movements are anticipated to achieve LOS A during both peak hours.

#### *34 Street & 24 Avenue*

Whilst this intersection is projected to operate within acceptable performance thresholds, implementing a right-in/right-out turn control with a supporting concrete median through the intersection could be considered.

Furthermore, to support pedestrian safety, upgrades including pedestrian ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) crosswalk control could be considered.

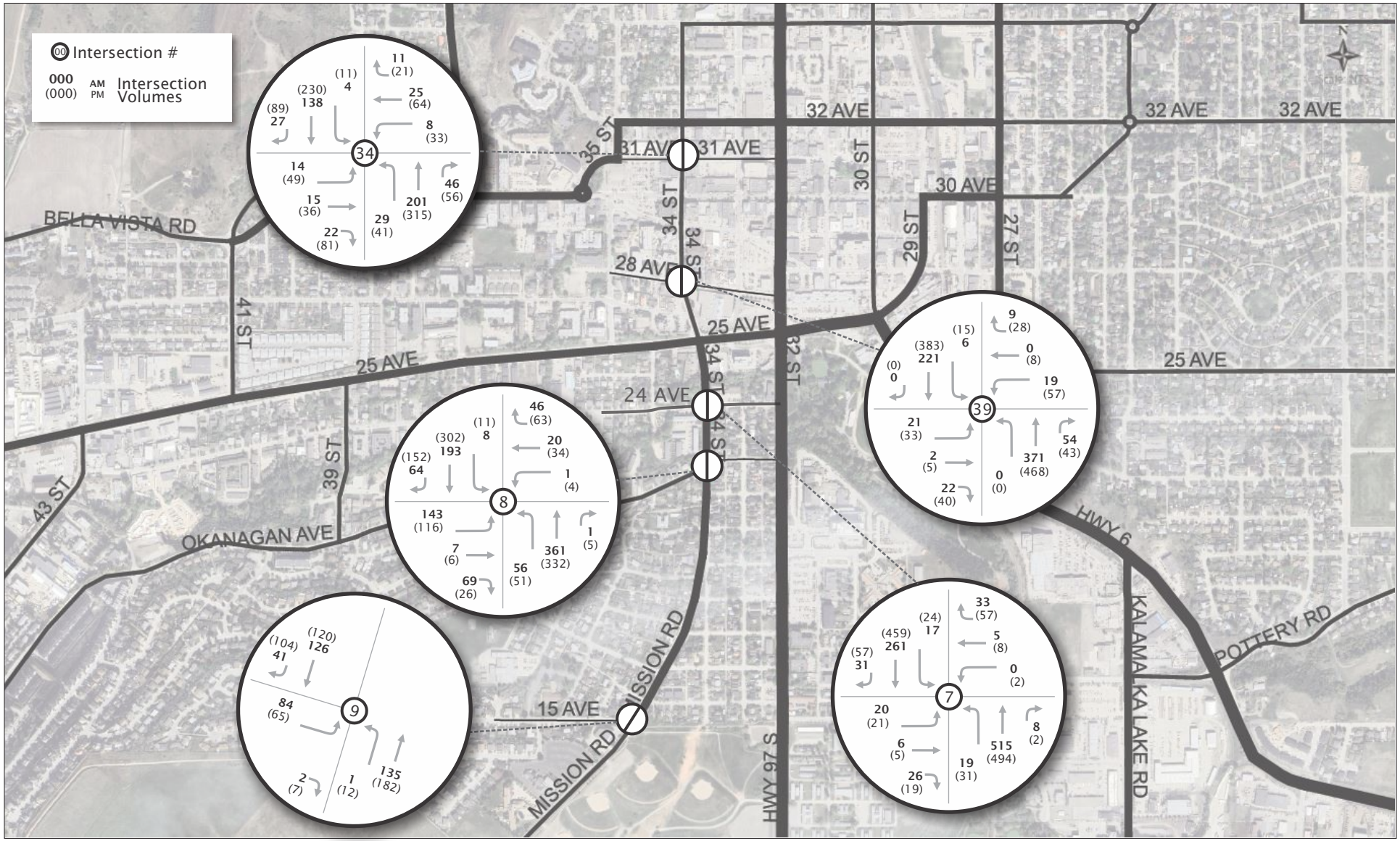
All study intersections within Group 3 are expected to continue operating acceptably with an overall LOS C or better by the 2035 future year.

**Table 3.34: + 10 Future Horizon (2035) Traffic Operations – Group 3**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 24 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.21 | 5 | E | 0.29 | 10 |
| | WBLTR | C | 0.14 | 5 | C | 0.21 | 5 |
| | NBL | A | 0.02 | <5 | A | 0.04 | <5 |
| | NBTR | A | 0.35 | <5 | A | 0.32 | <5 |
| | SBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.20 | <5 | A | 0.33 | <5 |
| 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | F | 0.71 | 40 | F | 0.73 | 35 |
| | EBR | B | 0.10 | 5 | B | 0.04 | <5 |
| | WBLTR | C | 0.18 | 5 | C | 0.26 | 10 |
| | NBL | A | 0.05 | <5 | A | 0.05 | <5 |
| | NBTR | A | 0.23 | <5 | A | 0.21 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.16 | <5 | A | 0.28 | <5 |
| Mission Road & 15 Avenue *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.14 | 5 | B | 0.14 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.10 | <5 | A | 0.15 | <5 |
| 34 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | B | 0.12 | 5 | D | 0.54 | 25 |
| | WBLTR | B | 0.11 | 5 | D | 0.47 | 20 |
| | NBLT | A | 0.03 | <5 | A | 0.04 | <5 |
| | NBR | A | 0.03 | <5 | A | 0.04 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBR | A | 0.02 | <5 | A | 0.06 | <5 |
| 34 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.13 | 5 | D | 0.35 | 10 |
| | WBLR | C | 0.09 | <5 | E | 0.45 | 15 |
| | NBTR | A | 0.28 | <5 | A | 0.33 | <5 |
| | SBLT | A | <0.02 | <5 | A | 0.02 | <5 |

**Table 3.35: + 10 Future Horizon (2035) Traffic Operations – Group 3 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & Okanagan Avenue/23 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.37* | - | *A* | *0.35* | - |
| | EBLTR | A | 0.21 | 10 | A | 0.15 | 5 |
| | WBLTR | A | 0.10 | 5 | A | 0.12 | 5 |
| | NBLTR | A | 0.37 | 20 | A | 0.32 | 15 |
| | SBLTR | A | 0.22 | 10 | A | 0.35 | 15 |
| | | | | | | | |




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**Exhibit 3.13**

## +10 Future Horizon (2035) – Group 3 Traffic Volumes

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### 3.5.4 + 10 Future Horizon (2035) Traffic Operations for Group 4 Intersections

+ 10 Future Horizon (2035) analysis results for Group 4 intersections are summarized in **Table 3.36** based on the traffic volumes in **Exhibit 3.14**.

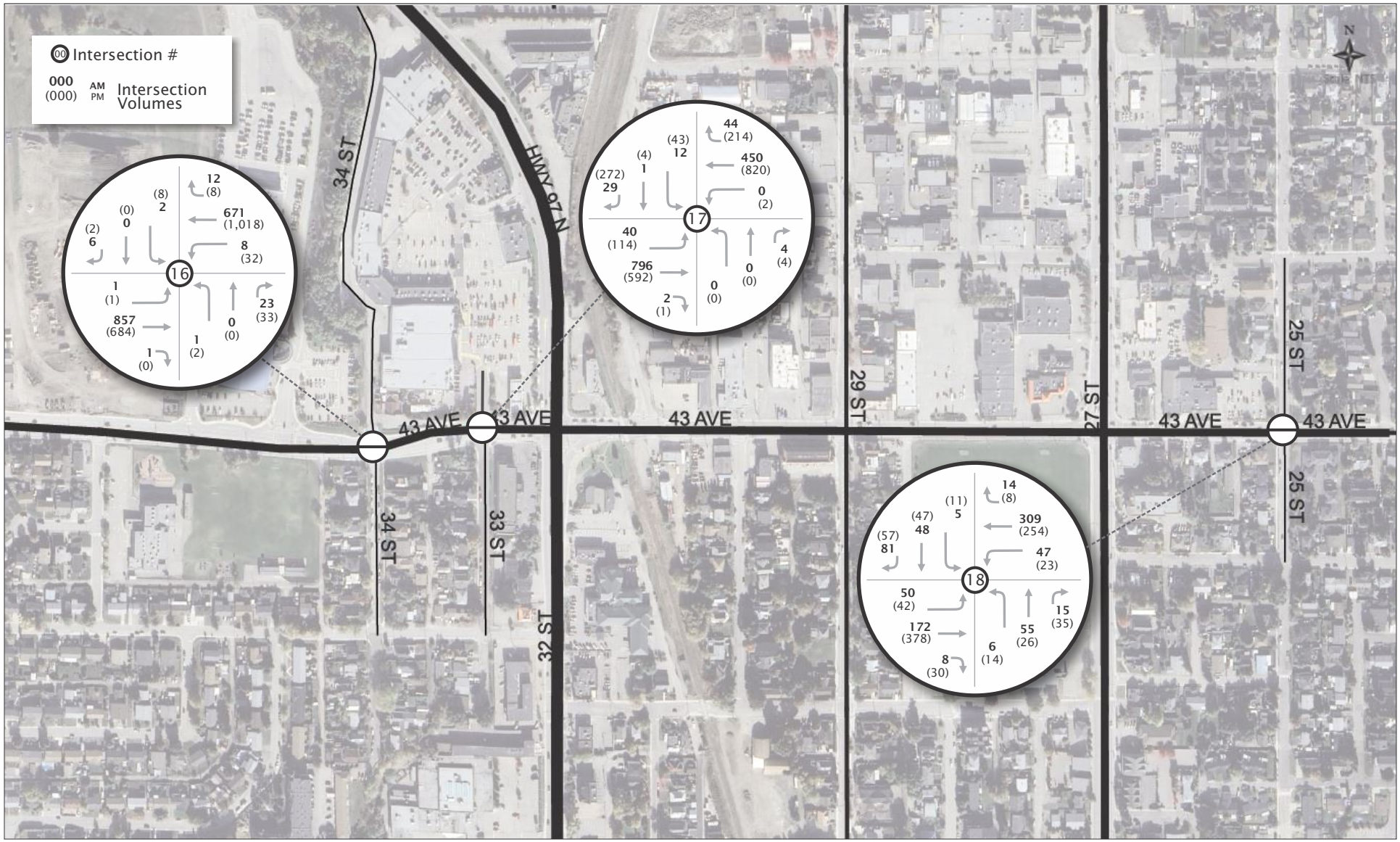
*34 Street & 43 Avenue*

The intersection of 34 Street & 43 Avenue is projected to experience a LOS F for the southbound approach during the PM peak hour by 2035. However, as the southbound movement operates below capacity with low vehicle volumes, no improvements are recommended at + 10 future horizon.

All other study intersections within Group 4 are expected to continue operating acceptably with an overall LOS B or better by the 2035 future year.

**Table 3.36: + 10 Future Horizon (2035) Traffic Operations – Group 4**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.29 | <5 | A | 0.21 | <5 |
| | WBLT | A | <0.02 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.23 | <5 | A | 0.31 | <5 |
| | NBLTR | D | 0.20 | 5 | C | 0.18 | 5 |
| | SBLTR | E | 0.19 | 5 | F | 0.20 | 5 |
| 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | | |
| | EBL | A | 0.03 | <5 | B | 0.15 | 5 |
| | EBT | A | 0.33 | <5 | A | 0.24 | <5 |
| | EBTR | A | 0.17 | <5 | A | 0.12 | <5 |
| | WBT | A | 0.18 | <5 | A | 0.33 | <5 |
| | WBTR | A | 0.12 | <5 | A | 0.28 | <5 |
| | NBR | B | <0.02 | <5 | B | <0.02 | <5 |
| | SBR | B | 0.05 | <5 | C | 0.58 | 30 |
| 25 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.05 | <5 | A | 0.03 | <5 |
| | WBLTR | A | 0.04 | <5 | A | 0.02 | <5 |
| | NBLTR | C | 0.33 | 10 | C | 0.22 | 5 |
| | SBLTR | C | 0.41 | 15 | C | 0.30 | 10 |




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**Exhibit 3.14**

# +10 Future Horizon (2035) – Group 4 Traffic Volumes

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### 3.5.5 + 10 Future Horizon (2035) Traffic Operations for Group 5 Intersections

+ 10 Future Horizon (2035) analysis results for Group 5 intersections are summarized in **Table 3.37** based on the traffic volumes in **Exhibit 3.15**.

*33 Street & 39 Avenue*

The intersection of 33 Street & 39 Avenue is projected to operate acceptably during both the AM and PM peak hours, with all individual movements achieving LOS B or better. It is required to increase the westbound left-turn storage lane to 30 meters to accommodate vehicle queues within the lane's capacity. However, there is no available space within the existing road layout to extend the lane length. **Table 3.38** outlines the intersection's performance under the alternative roundabout upgrade. It is anticipated that the intersection would operate well with an overall LOS A during both peak hours. No queuing issues are anticipated with the roundabout configuration.

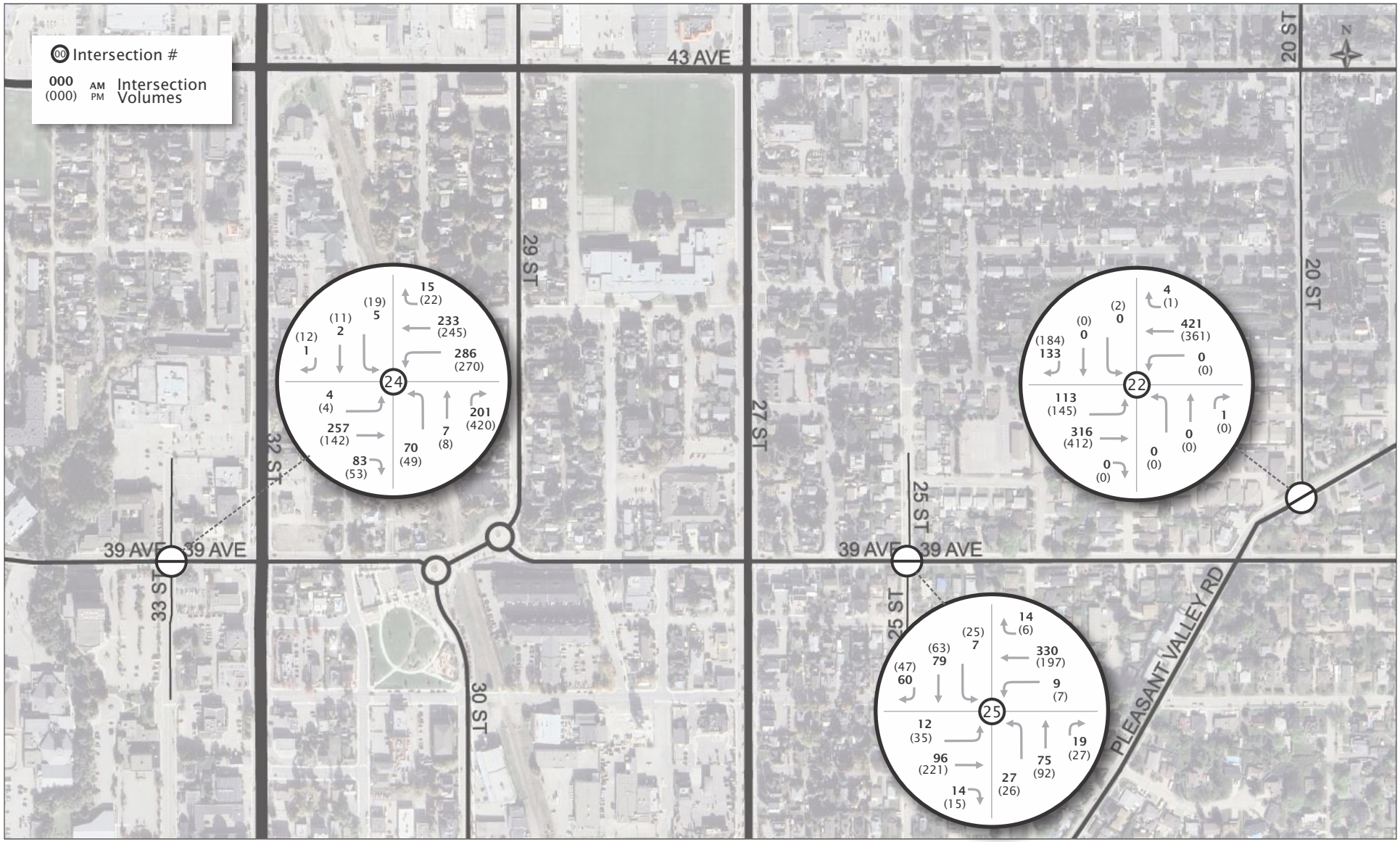
All other study intersections within Group 5 are expected to continue operating acceptably with an overall LOS C or better by the 2035 future year.

**Table 3.37: + 10 Future Horizon (2035) Traffic Operations – Group 5**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 20 Street *(SB Stop)* | *OVERALL* | *C* | - | - | *C* | - | - |
| | EBLT | A | 0.11 | 5 | A | 0.13 | 5 |
| | WBTR | A | 0.27 | <5 | A | 0.22 | <5 |
| | SBLR | B | 0.27 | 10 | B | 0.31 | 10 |
| 33 Street & 39 Avenue *(Signal)* | *OVERALL* | *B* | *0.63* | - | *A* | *0.57* | - |
| | EBL | B | 0.02 | <5 | B | 0.02 | <5 |
| | EBTR | B | 0.71 | 70 | B | 0.40 | 25 |
| | WBL | A | 0.61 | 30 | A | 0.52 | 30 |
| | WBTR | A | 0.26 | 25 | A | 0.29 | 30 |
| | NBLTR | B | 0.49 | 25 | B | 0.44 | 20 |
| | SBLTR | B | 0.04 | 5 | B | 0.12 | 5 |
| 25 Street & 39 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | 0.03 | <5 |
| | WBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLTR | C | 0.39 | 15 | C | 0.36 | 15 |
| | SBLTR | C | 0.39 | 15 | C | 0.31 | 10 |

**Table 3.38: + 10 Future Horizon (2035) Traffic Operations – Group 5 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 33 Street & 39 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.46* | - | *A* | *0.40* | - |
| | EBLTR | A | 0.40 | 20 | A | 0.20 | 10 |
| | WBLTR | A | 0.46 | 25 | A | 0.39 | 20 |
| | NBLTR | A | 0.32 | 15 | A | 0.40 | 20 |
| | SBLTR | A | 0.02 | <5 | A | 0.05 | <5 |
| | | | | | | | |




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**Exhibit 3.15**

## +10 Future Horizon (2035) – Group 5 Traffic Volumes

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### 3.5.6 + 10 Future Horizon (2035) Traffic Operations for Group 6 Intersections

+ 10 Future Horizon (2035) analysis results for Group 6 intersections are summarized in **Table 3.39** based on the traffic volumes in **Exhibit 3.16**.

All study intersections within Group 6 are expected to continue operating acceptably with an overall LOS C or better by the 2035 future year.

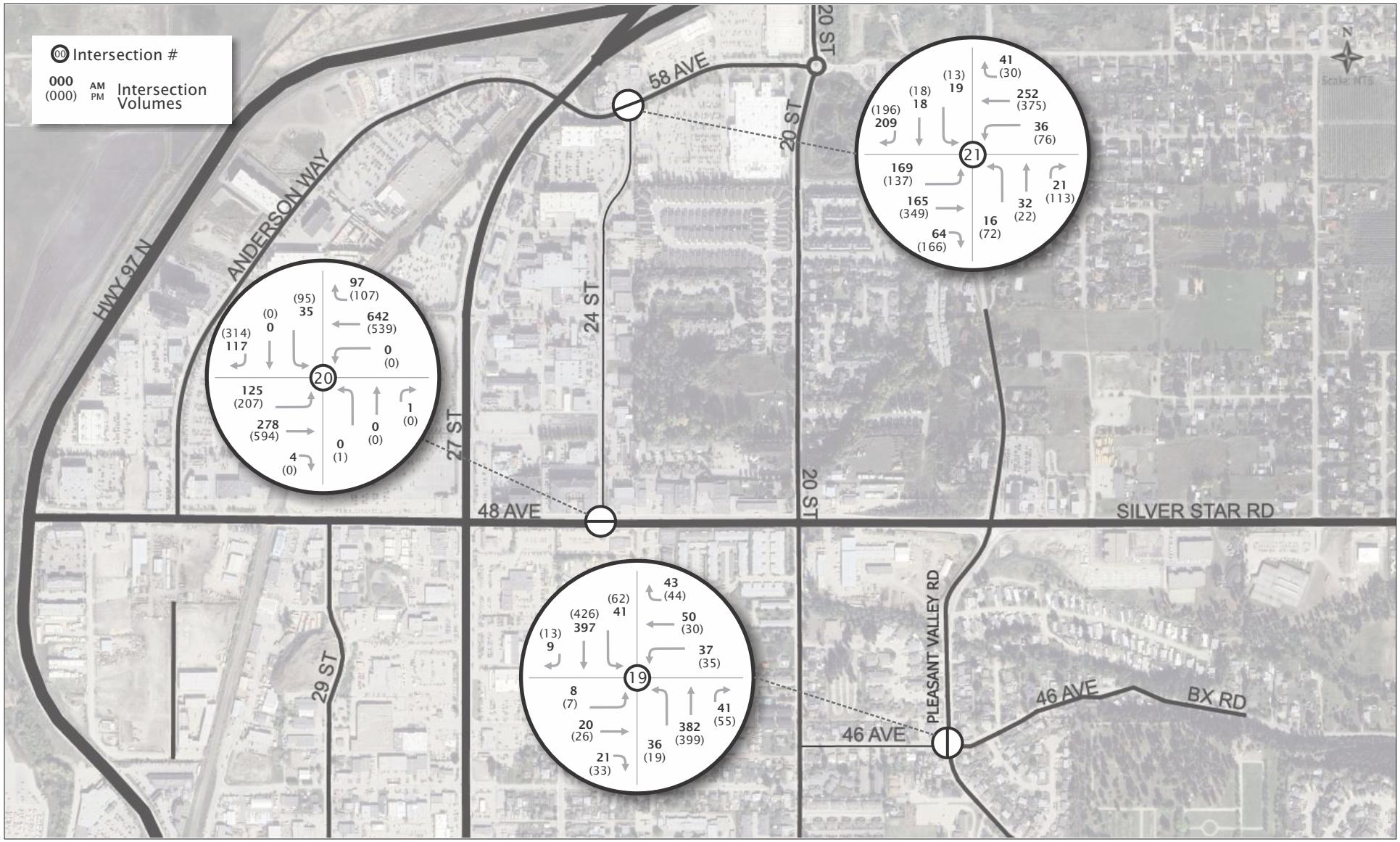
**Table 3.40** outlines the performance of the 24 Street/Driveway & 48 Avenue intersection under an alternative roundabout configuration. As indicated, the intersection is expected to perform well, achieving an overall LOS A during both the AM and PM peak hours.

**Table 3.39: + 10 Future Horizon (2035) Traffic Operations – Group 6**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLTR | C | 0.19 | 5 | C | 0.26 | 10 |
| | WBLTR | D | 0.52 | 20 | E | 0.51 | 20 |
| | NBLTR | A | 0.03 | <5 | A | 0.02 | <5 |
| | SBLTR | A | 0.04 | <5 | A | 0.06 | <5 |
| 24 Street/Driveway & 48 Avenue *(Signal)* | *OVERALL* | *A* | *0.37* | - | *A* | *0.47* | - |
| | EBL | A | 0.36 | 15 | A | 0.55 | 30 |
| | EBTR | A | 0.16 | 10 | A | 0.34 | 25 |
| | WBLTR | A | 0.41 | 20 | A | 0.38 | 25 |
| | NBLTR | B | 0.05 | 5 | B | 0.03 | 5 |
| | SBLT | B | 0.21 | 10 | B | 0.31 | 15 |
| | SBR | B | 0.08 | 10 | B | 0.31 | 20 |
| 24 Street/Driveway & 58 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.32* | - | *A* | *0.52* | - |
| | EBLTR | A | 0.32 | 15 | A | 0.52 | 30 |
| | WBLTR | A | 0.32 | 15 | A | 0.46 | 25 |
| | NBLTR | A | 0.08 | 5 | A | 0.26 | 10 |
| | SBLTR | A | 0.26 | 10 | A | 0.29 | 15 |
| | | | | | | | |

**Table 3.40: + 10 Future Horizon (2035) Traffic Operations – Group 6 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 24 Street/Driveway & 48 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.62* | - | *A* | *0.60* | - |
| | EBLTR | A | 0.31 | 15 | A | 0.60 | 45 |
| | WBLTR | A | 0.62 | 40 | A | 0.55 | 35 |
| | NBLTR | A | 0.02 | <5 | B | 0.03 | <5 |
| | SBLTR | A | 0.24 | 10 | A | 0.50 | 30 |
| | | | | | | | |




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**Exhibit 3.16**

## +10 Future Horizon (2035) – Group 6 Traffic Volumes

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### 3.5.7 + 10 Future Horizon (2035) Traffic Operations for Group 7 Intersections

+ 10 Future Horizon (2035) analysis results for Group 7 intersections are summarized in **Table 3.41** based on the traffic volumes in **Exhibit 3.17**.

*27 Street & 28 Avenue*

The northbound movement at the 27 Street & 28 Avenue intersection is projected to experience a V/C ratio of 0.92 during the AM peak hour, which slightly exceeds the set threshold. However, since the other movements and the overall intersection performance remain within acceptable limits, no improvements are recommended for this intersection by 2035.

Additionally, all other study intersections within Group 7 are expected to continue operating acceptably, with an overall LOS B or better by the 2035 horizon year.

**Table 3.41: + 10 Future Horizon (2035) Traffic Operations – Group 7**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 25 Avenue *(WB Stop)* | *OVERALL* | *B* | - | - | *A* | - | - |
| | WBR | E | 0.64 | 30 | C | 0.27 | 10 |
| | NBT | A | 0.59 | <5 | A | 0.57 | <5 |
| | SBT | A | 0.43 | <5 | A | 0.67 | <5 |
| 27 Street & 28 Avenue *(Ped Signal)* | *OVERALL* | *B* | *0.74* | - | *B* | *0.60* | - |
| | EBLTR | C | 0.33 | 35 | C | 0.48 | 50 |
| | WBLTR | C | 0.05 | 10 | C | 0.03 | 5 |
| | NBLTR | C | **0.92** | 145 | B | 0.60 | 65 |
| | SBLTR | B | 0.51 | 55 | B | 0.66 | 85 |
| 30 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.07 | <5 | C | 0.08 | <5 |
| | WBLTR | C | 0.08 | <5 | C | 0.13 | 5 |
| | NBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.02 | <5 | A | 0.02 | <5 |
| 30 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.07 | <5 | C | 0.23 | 5 |
| | WBLTR | C | 0.16 | 5 | D | 0.33 | 10 |
| | NBLT | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.17 | <5 | A | 0.33 | <5 |




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**Exhibit 3.17**

## +10 Future Horizon (2035) – Group 7 Traffic Volumes

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### 3.5.8 + 10 Future Horizon (2035) Traffic Operations for Group 8 Intersections

+ 10 Future Horizon (2035) analysis results for Group 8 intersections are summarized in **Table 3.42** based on the traffic volumes in **Exhibit 3.18**.

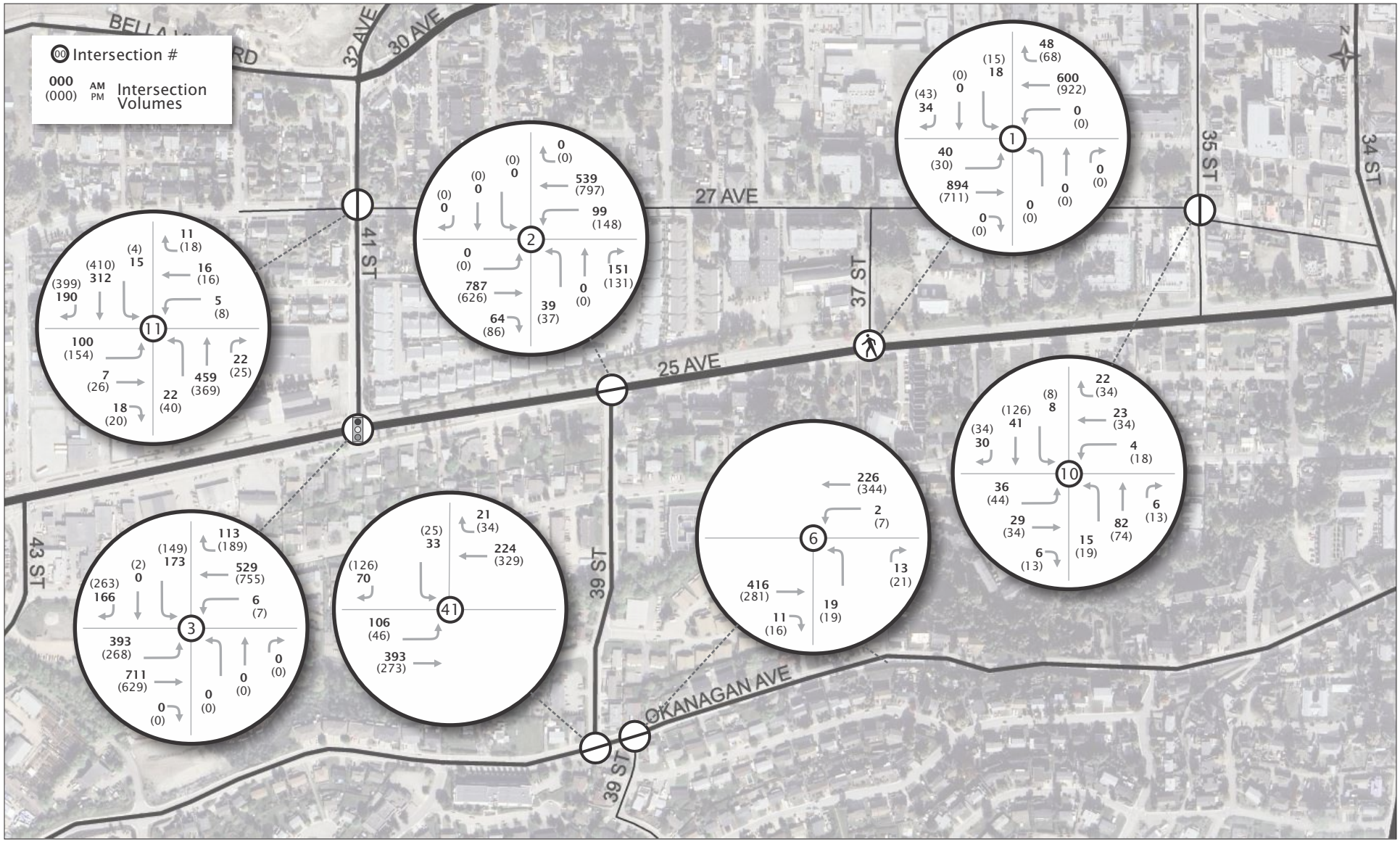
All study intersections within Group 8 are expected to continue operating acceptably, with an overall LOS B or better by the 2035 horizon year.

**Table 3.42: + 10 Future Horizon (2035) Traffic Operations – Group 8**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Avenue & 37 Street *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.05 | <5 | B | 0.05 | <5 |
| | EBT1 | A | 0.28 | <5 | A | 0.22 | <5 |
| | EBT2 | A | 0.28 | <5 | A | 0.22 | <5 |
| | WBT | A | 0.25 | <5 | A | 0.38 | <5 |
| | WBTR | A | 0.16 | <5 | A | 0.23 | <5 |
| | SBLR | C | 0.19 | 5 | C | 0.23 | 5 |
| 39 Street & 25 Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBT | A | 0.33 | <5 | A | 0.25 | <5 |
| | EBTR | A | 0.20 | <5 | A | 0.18 | 5 |
| | WBL | A | 0.14 | 20 | A | 0.17 | 25 |
| | WBT1 | A | 0.17 | <5 | A | 0.24 | <5 |
| | WBT2 | A | 0.17 | <5 | A | 0.24 | <5 |
| | NBL | C | 0.32 | 15 | C | 0.34 | 15 |
| | NBR | A | 0.25 | 20 | A | 0.21 | 20 |
| 41 Street & 25 Avenue *(Signal)* | *OVERALL* | *B* | *0.63* | - | *B* | *0.63* | - |
| | EBL | B | 0.63 | 70 | B | 0.56 | 50 |
| | EBTR | A | 0.33 | 45 | A | 0.28 | 35 |
| | WBL | B | 0.03 | 5 | B | 0.03 | 5 |
| | WBTR | C | 0.70 | 75 | C | 0.77 | 105 |
| | SBL | C | 0.49 | 45 | C | 0.43 | 40 |
| | SBTR | C | 0.13 | 15 | C | 0.19 | 20 |
| 39 Street S & Okanagan Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBTR | A | 0.30 | <5 | A | 0.19 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLR | B | 0.09 | <5 | B | 0.09 | <5 |
| 35 Street & 27 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.12 | 5 | B | 0.18 | 5 |
| | WBLTR | B | 0.07 | <5 | B | 0.14 | 5 |
| | NBLTR | A | <0.02 | <5 | A | 0.02 | <5 |
| | SBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | | | | | | | |

**Table 3.42: + 10 Future Horizon (2035) Traffic Operations – Group 8 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 27 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.42* | - | *A* | *0.59* | - |
| | EBLTR | A | 0.13 | 5 | A | 0.23 | 10 |
| | WBLTR | A | 0.05 | <5 | A | 0.05 | <5 |
| | NBLTR | A | 0.42 | 25 | A | 0.39 | 20 |
| | SBLTR | A | 0.38 | 20 | A | 0.59 | 40 |
| Okanagan Avenue & 39 Street N *(SB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLT | A | 0.10 | 5 | A | 0.04 | <5 |
| | WBTR | A | 0.17 | <5 | A | 0.23 | <5 |
| | SBLR | C | 0.29 | 10 | B | 0.29 | 10 |
| | | | | | | | |




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**Exhibit 3.18**

# +10 Future Horizon (2035) – Group 8 Traffic Volumes

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### 3.5.9 + 10 Future Horizon (2035) Traffic Operations for Group 9 Intersections

+ 10 Future Horizon (2035) analysis results for Group 9 intersections are summarized in **Table 3.43** based on the traffic volumes in **Exhibit 3.19**.

*Kalamalka Lake Road & 11 Avenue*

The westbound movement at the Kalamalka Lake Road & 11 Avenue intersection is projected to experience LOS F and a V/C ratio of 0.89 during the PM peak hour by 2035. To improve traffic operations, upgrading the intersection with a traffic signal is recommended at this horizon year. **Table 3.44** demonstrates the improved performance of the intersection after the traffic signal is implemented, showing that it is expected to operate acceptably with an overall LOS A during both peak hours.

All other study intersections within Group 9 are expected to continue operating acceptably, with an overall LOS A by the 2035 horizon year.

**Table 3.43: + 10 Future Horizon (2035) Traffic Operations – Group 9**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & Kosmina Road *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.24 | 5 | E | 0.57 | 25 |
| | WBLTR | C | 0.07 | <5 | C | 0.07 | <5 |
| | NBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | NBTR | A | 0.33 | <5 | A | 0.25 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.20 | <5 | A | 0.29 | <5 |
| Middleton Way & 11 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | D | 0.41 | 15 | E | 0.87 | 70 |
| | WBLTR | C | 0.09 | <5 | C | 0.10 | 5 |
| | NBL | A | 0.13 | 5 | A | 0.08 | <5 |
| | NBT | A | 0.20 | <5 | A | 0.12 | <5 |
| | NBTR | A | 0.10 | <5 | A | 0.06 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBT | A | 0.08 | <5 | A | 0.17 | <5 |
| | SBTR | A | 0.09 | <5 | A | 0.12 | <5 |
| Kalamalka Lake Road & 11 Avenue *(WB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | WBLR | C | 0.46 | 20 | F | 0.89 | 60 |
| | NBTR | A | 0.42 | <5 | A | 0.43 | <5 |
| | SBL | A | 0.10 | 5 | B | 0.27 | 10 |
| | SBT | A | 0.22 | <5 | A | 0.50 | <5 |

**Table 3.44: + 10 Future Horizon (2035) Traffic Operations – Group 9 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Kalamalka Lake Road & 11 Avenue *(Signal)* | *OVERALL* | *A* | *0.55* | - | *A* | *0.58* | - |
| | WBL | B | 0.22 | 15 | C | 0.17 | 15 |
| | WBR | B | 0.13 | 15 | B | 0.12 | 15 |
| | NBTR | A | 0.64 | 65 | A | 0.58 | 60 |
| | SBL | A | 0.25 | 10 | A | 0.59 | 35 |
| | SBT | A | 0.33 | 25 | A | 0.66 | 80 |
| | | | | | | | |




**Exhibit 3.19**

## +10 Future Horizon (2035) – Group 9 Traffic Volumes

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### 3.5.10 + 10 Future Horizon (2035) Traffic Operations for Group 10 Intersections

+ 10 Future Horizon (2035) analysis results for Group 10 intersections are summarized in **Table 3.45** based on the traffic volumes in **Exhibit 3.20**.

All study intersections within Group 10 are expected to continue operating acceptably, with an overall LOS A by the 2035 horizon year.

**Table 3.45: + 10 Future Horizon (2035) Traffic Operations – Group 10**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Apollo Road & Okanagan Landing Road *(NB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBTR | A | 0.25 | <5 | A | 0.23 | <5 |
| | WBLT | A | 0.02 | <5 | A | 0.06 | <5 |
| | NBLR | B | 0.12 | 5 | B | 0.14 | 5 |
| Okanagan Avenue & S Vernon Drive *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.14 | 5 | A | 0.06 | <5 |
| | NBLT | A | 0.05 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.16 | <5 | A | 0.09 | <5 |
| Tronson Road & Bella Vista Road *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.04 | <5 | A | 0.02 | <5 |
| | WBTR | A | 0.05 | <5 | A | 0.09 | <5 |
| | SBLR | B | 0.11 | 5 | A | 0.15 | 5 |
| | | | | | | | |




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**Exhibit 3.20**

## +10 Future Horizon (2035) – Group 10 Traffic Volumes

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## 3.6 + 20 Future Horizon (2045) Traffic Operations

Analysis assumptions for the + 20 future conditions were maintained from the +10 future conditions, as detailed in **Section 3.5**.

### 3.6.1 + 20 Future Horizon (2045) Traffic Operations for Group 1 Intersections

+ 20 Future Horizon (2045) analysis results for Group 1 intersections are summarized in **Table 3.46** based on the traffic volumes in **Exhibit 3.21**.

#### *41 Street/32 Avenue & Bella Vista Road/30 Avenue*

By 2045, the intersection of 41 Street/32 Avenue & Bella Vista Road/30 Avenue is expected to operate near capacity, with overall V/C ratios exceeding 0.90 during both the AM and PM peak hours. The westbound left-turn movement is critical, with the 95th percentile queue reaching 200 meters in the PM peak hour.

A potential improvement involves upgrading the westbound direction to dual left-turn lanes with 95 m of storage and extending the northbound right-turn storage lane to 85 m. **Table 3.47** presents the intersection's performance with these proposed upgrades, showing that it is estimated to operate within capacity thresholds with an overall LOS C, while all individual movements are expected to experience LOS D or better during both peak hours.

#### *37 Street/Alexis Park Drive & 32 Avenue/Gateby PI*

It is projected that the eastbound and westbound movements at the intersection of 37 Street/Alexis Park Drive & 32 Avenue will experience a LOS F during the AM peak hour. However, as the side streets operate below capacity with low vehicle volumes, no improvements are recommended at + 20 future horizon at this intersection.

#### *37 Street & 30 Avenue*

**Table 3.48** presents the performance of the 37 Street & 30 Avenue intersection under a roundabout upgrade, an alternative to the signal-controlled option. The intersection is expected to operate within acceptable thresholds, with all individual movements achieving LOS B or better during both the AM and PM peak hours. The longest queue is anticipated in the southbound right-turn direction, with a maximum queue length of approximately 95 meters in the PM peak hour.

All other study intersections within Group 1 are expected to continue operating acceptably with an overall LOS D or better by the 2045 future year.

**Table 3.46: + 20 Future Horizon (2045) Traffic Operations – Group 1**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *D* | ***0.98*** | - | *C* | ***0.91*** | - |
| | EBL | C | 0.02 | 5 | C | 0.04 | 5 |
| | EBT | D | 0.88 | 150 | D | 0.71 | 90 |
| | EBR | C | 0.16 | 20 | C | 0.10 | 15 |
| | WBL | E | **0.98** | **170** | C | **0.92** | **200** |
| | WBTR | A | 0.18 | 25 | A | 0.38 | 55 |
| | NBTL | C | 0.38 | 35 | D | 0.71 | 60 |
| | NBR | E | 0.87 | 110 | C | 0.37 | 35 |
| | SBTL | C | 0.07 | 10 | C | 0.25 | 30 |
| | SBR | C | <0.02 | <5 | C | 0.02 | <5 |
| 37 Street & 30 Avenue *(Signal)* | *OVERALL* | *B* | *0.63* | - | *C* | *0.72* | - |
| | EBL | C | 0.74 | 100 | C | 0.69 | 75 |
| | EBT | A | 0.33 | 50 | A | 0.28 | 35 |
| | WBT | C | 0.48 | 65 | C | 0.76 | 120 |
| | WBR | C | 0.12 | 20 | C | 0.30 | 35 |
| | SBL | C | 0.63 | 70 | C | 0.68 | 80 |
| | SBR | A | 0.19 | 5 | B | 0.47 | 55 |
| 37 Street/Alexis Park Drive & 32 Avenue/Gateby Pl *(EB/WB Stop)* | *OVERALL* | *C* | - | - | *B* | - | - |
| | EBLTR | **F** | 0.31 | 10 | **F** | 0.25 | 5 |
| | WBLTR | **F** | 0.36 | 10 | E | 0.35 | 10 |
| | NBLTR | A | 0.02 | <5 | A | <0.02 | <5 |
| | SBLT | A | 0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.24 | <5 | A | 0.32 | <5 |
| 31 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.04 | <5 | A | 0.03 | <5 |
| | EBTR | A | 0.18 | <5 | A | 0.24 | <5 |
| | WBL | A | 0.03 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.24 | <5 | A | 0.26 | <5 |
| | NBLTR | C | 0.23 | 5 | D | 0.54 | 25 |
| | SBLTR | C | 0.19 | 5 | C | 0.48 | 20 |
| | | | | | | | |

**Table 3.46: + 20 Future Horizon (2045) Traffic Operations – Group 1 (Cont.)**

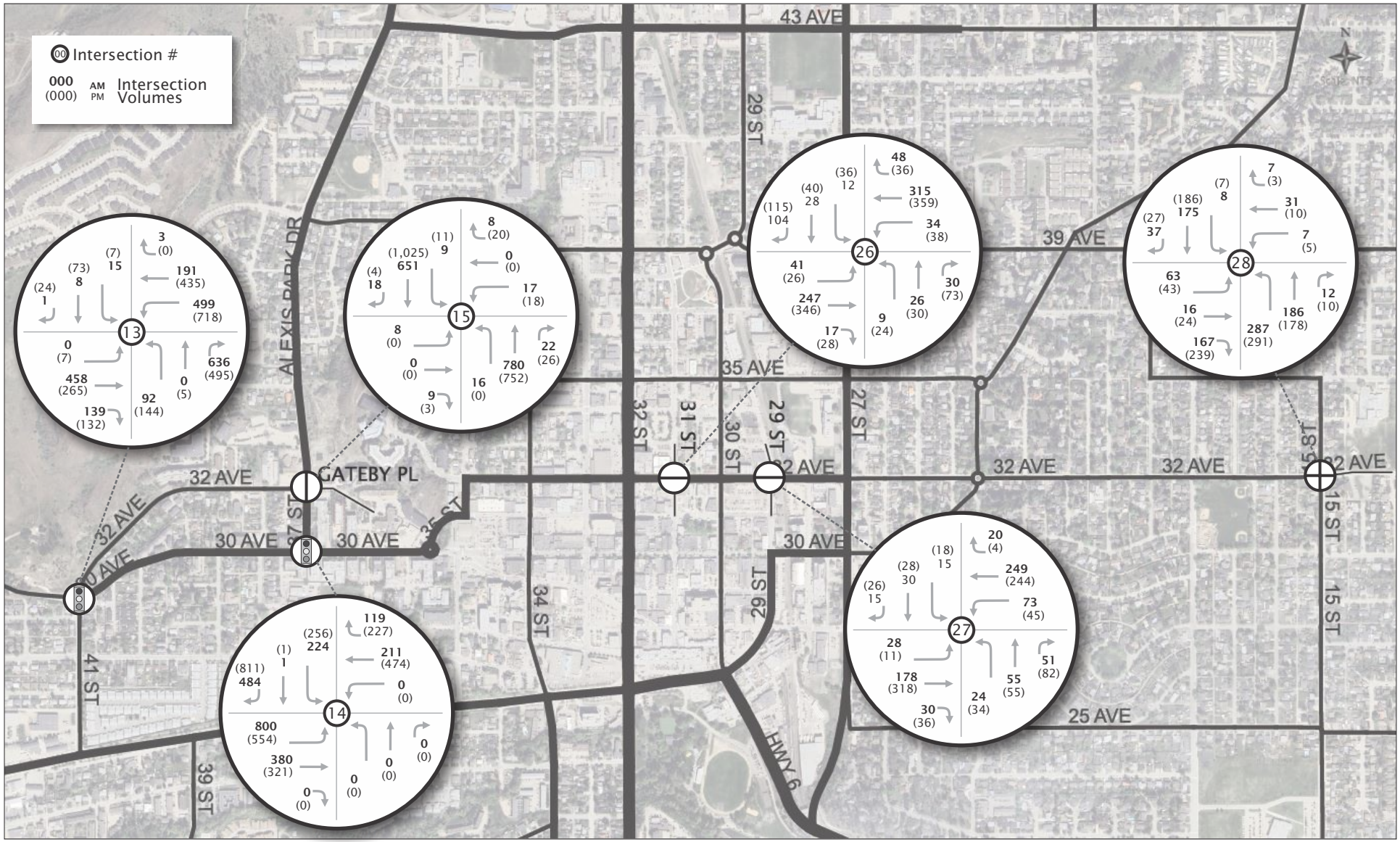
| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 29 Street & 32 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.03 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.14 | <5 | A | 0.22 | <5 |
| | WBL | A | 0.07 | <5 | A | 0.04 | <5 |
| | WBTR | A | 0.19 | <5 | A | 0.16 | <5 |
| | NBLTR | C | 0.44 | 20 | C | 0.48 | 20 |
| | SBLTR | C | 0.26 | 10 | C | 0.24 | 5 |
| 15 Street & 32 Avenue *(All Way Stop)* | *OVERALL* | *D* | - | - | *C* | - | - |
| | EBLTR | B | 0.49 | 75 | B | 0.49 | 45 |
| | WBLTR | B | 0.10 | 20 | A | 0.04 | 20 |
| | NBLTR | E | 0.89 | 5 | C | 0.75 | 5 |
| | SBLTR | B | 0.43 | 15 | B | 0.36 | 10 |
| | | | | | | | |

**Table 3.47: + 20 Future Horizon (2045) Traffic Operations – Group 1 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | *OVERALL* | *C* | *0.81* | - | *C* | *0.67* | - |
| | EBL | C | 0.02 | 5 | C | 0.03 | 5 |
| | EBT | D | 0.85 | 215 | C | 0.61 | 75 |
| | EBR | C | 0.20 | 35 | C | 0.10 | 15 |
| | WBL | D | 0.75 | 95 | C | 0.76 | 90 |
| | WBTR | A | 0.20 | 50 | A | 0.42 | 65 |
| | NBTL | C | 0.31 | 30 | C | 0.60 | 45 |
| | NBR | D | 0.81 | 85 | C | 0.37 | 30 |
| | SBTL | C | 0.06 | 10 | C | 0.21 | 25 |
| | SBR | C | <0.02 | <5 | C | 0.02 | <5 |
| | | | | | | | |

**Table 3.48: + 20 Future Horizon (2045) Traffic Operations – Group 1 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 37 Street & 30 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.63* | - | *B* | *0.80* | - |
| | EBL | B | 0.63 | 45 | B | 0.44 | 25 |
| | EBT | A | 0.39 | 20 | A | 0.32 | 15 |
| | WBT | A | 0.31 | 20 | A | 0.49 | 30 |
| | WBR | B | 0.23 | 10 | A | 0.31 | 15 |
| | SBL | A | 0.23 | 10 | B | 0.37 | 50 |
| | SBR | A | 0.39 | 25 | B | 0.80 | 95 |
| | | | | | | | |




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**Exhibit 3.21**

## +20 Future Horizon (2045) – Group 1 Traffic Volumes

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### 3.6.2 + 20 Future Horizon (2045) Traffic Operations for Group 2 Intersections

+ 20 Future Horizon (2045) analysis results for Group 2 intersections are summarized in **Table 3.49** based on the traffic volumes in **Exhibit 3.22**.

#### *35 Street/Driveway & 30 Avenue*

The northbound left and through movements at the intersection of 35 Street/Driveway & 30 Avenue are expected to operate at LOS F during the PM peak hour. By 2045, it is recommended to implement turn controls at this intersection, prohibiting the northbound left turn and through movements, as well as the southbound left turn and through movements. It is also recommended to install a concrete median along 30 Avenue at this intersection to support the right-in/right-out turn controls that can also accommodate semi-truck vehicle access to the Safeway grocery store to the north.

**Table 3.50** summarizes the improved operation of the intersection under the proposed lane configuration. This upgrade will ensure the intersection functions acceptably with overall LOS B or better for both peak hours.

#### *33 Street & 30 Avenue*

The 33 Street & 30 Avenue intersection is projected to experience LOS F for the northbound and southbound approaches during the PM peak hour. To mitigate traffic congestion, it is recommended to upgrade the intersection with a traffic signal.

Alternatively, implement turn controls and a concrete median along 30 Avenue to convert the intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.

As an additional option, install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks.

**Table 3.50** outlines the improved operation of the intersection with the traffic signal. As shown, the intersection is expected to operate within acceptable capacity limits, achieving an overall LOS A during both peak hours.

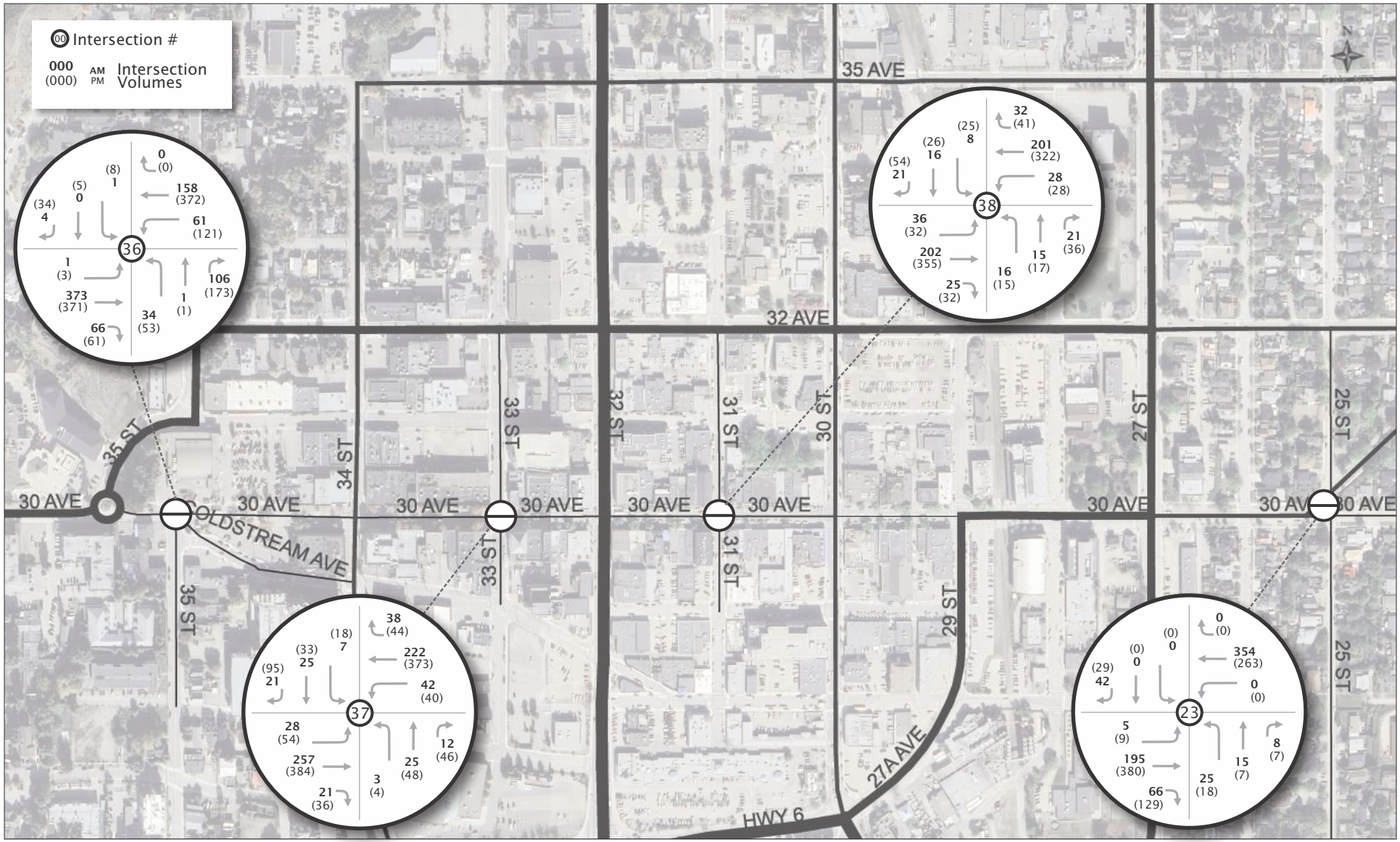
All other study intersections within Group 2 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.49: + 20 Future Horizon (2045) Vehicle Operations – Group 2**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Street & Pleasant Valley Road *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBTR | A | 0.23 | <5 | A | 0.17 | <5 |
| | NBLTR | C | 0.14 | 5 | C | 0.11 | 5 |
| | SBR | B | 0.07 | <5 | B | 0.04 | <5 |
| 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *B* | - | - | *D* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBLTR | A | 0.07 | <5 | A | 0.13 | 5 |
| | NBLT | C | 0.16 | 5 | F | 0.48 | 20 |
| | NBR | B | 0.22 | 5 | C | 0.35 | 15 |
| | SBLTR | C | 0.06 | <5 | D | 0.23 | 5 |
| 33 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | A | 0.03 | <5 | A | 0.06 | <5 |
| | WBLTR | A | 0.04 | <5 | A | 0.05 | <5 |
| | NBLTR | C | 0.16 | 5 | F | 0.63 | 30 |
| | SBLTR | C | 0.19 | 5 | F | 0.84 | 50 |
| 31 Street & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.04 | <5 | A | 0.03 | <5 |
| | WBLTR | A | 0.02 | <5 | A | 0.03 | <5 |
| | NBLTR | C | 0.14 | 5 | C | 0.24 | 5 |
| | SBLTR | B | 0.12 | 5 | D | 0.39 | 15 |
| | | | | | | | |

**Table 3.50: + 20 Future Horizon (2045) Vehicle Operations – Group 2 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | WBLTR | A | 0.07 | <5 | A | 0.13 | <5 |
| | NBR | B | 0.22 | 5 | C | 0.36 | 15 |
| | SBR | A | <0.02 | <5 | A | 0.08 | <5 |
| 33 Street & 30 Avenue *(Signal)* | *OVERALL* | *A* | *0.34* | - | *A* | *0.47* | - |
| | EBLTR | A | 0.33 | 20 | A | 0.54 | 40 |
| | WBLTR | A | 0.34 | 20 | A | 0.51 | 40 |
| | NBLTR | B | 0.26 | 5 | B | 0.22 | 10 |
| | SBLTR | B | 0.29 | 5 | B | 0.26 | 15 |
| | | | | | | | |




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**Exhibit 3.22**

# +20 Future Horizon (2045) – Group 2 Traffic Volumes

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### 3.6.3 + 20 Future Horizon (2045) Traffic Operations for Group 3 Intersections

+ 20 Future Horizon (2045) analysis results for Group 3 intersections are summarized in **Table 3.51** based on the traffic volumes in **Exhibit 3.23**.

#### *34 Street & 28 Avenue*

The westbound approach at the intersection of 34 Street & 28 Avenue is projected to operate at LOS F during the PM peak hour. By 2045, it is recommended to implement turn controls at this intersection, prohibiting the westbound left turn and through movement. **Table 3.52** summarizes the improved operation of the intersection with the proposed lane upgrade. This lane configuration will ensure the intersection functions well, with overall LOS B or better during both peak hours.

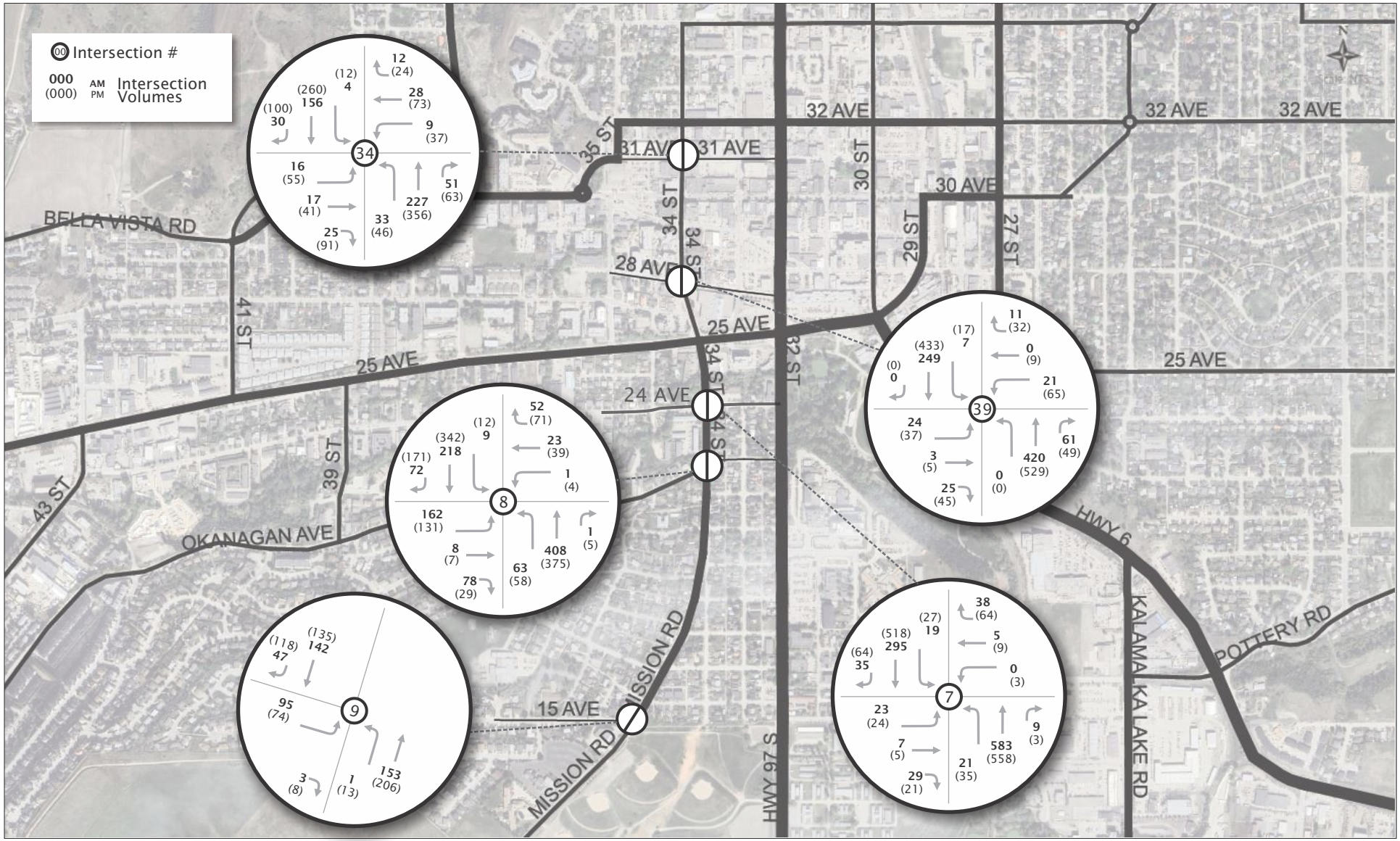
All other study intersections within Group 3 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.51: + 20 Future Horizon (2045) Traffic Operations – Group 3**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 24 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.21 | 5 | E | 0.29 | 10 |
| | WBLTR | C | 0.14 | 5 | C | 0.21 | 5 |
| | NBL | A | 0.02 | <5 | A | 0.04 | <5 |
| | NBTR | A | 0.35 | <5 | A | 0.32 | <5 |
| | SBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.20 | <5 | A | 0.33 | <5 |
| 34 Street & Okanagan Avenue/23 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.43* | - | *A* | *0.40* | - |
| | EBLTR | A | 0.24 | 10 | A | 0.17 | 5 |
| | WBLTR | A | 0.12 | 5 | A | 0.14 | 5 |
| | NBLTR | A | 0.43 | 20 | A | 0.37 | 20 |
| | SBLTR | A | 0.25 | 10 | A | 0.40 | 20 |
| Mission Road & 15 Avenue *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.16 | 5 | B | 0.17 | 5 |
| | NBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.12 | <5 | A | 0.17 | <5 |
| 34 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | B | 0.15 | 5 | E | 0.72 | 40 |
| | WBLTR | B | 0.13 | 5 | E | 0.63 | 30 |
| | NBLT | A | 0.03 | <5 | A | 0.04 | <5 |
| | NBR | A | 0.03 | <5 | A | 0.04 | <5 |
| | SBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBR | A | 0.02 | <5 | A | 0.06 | <5 |
| 34 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.16 | 5 | E | 0.47 | 20 |
| | WBLR | C | 0.12 | 5 | F | 0.64 | 30 |
| | NBTR | A | 0.32 | <5 | A | 0.38 | <5 |
| | SBLT | A | <0.02 | <5 | A | 0.02 | <5 |
| | | | | | | | |

**Table 3.52: + 20 Future Horizon (2045) Traffic Operations – Group 3 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLR | C | 0.16 | 5 | D | 0.44 | 15 |
| | WBR | B | 0.02 | <5 | B | 0.08 | <5 |
| | NBTR | A | 0.32 | <5 | A | 0.38 | <5 |
| | SBLT | A | <0.02 | <5 | A | 0.02 | <5 |
| | | | | | | | |




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**Exhibit 3.23**

# +20 Future Horizon (2045) – Group 3 Traffic Volumes

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### 3.6.4 + 20 Future Horizon (2045) Traffic Operations for Group 4 Intersections

+ 20 Future Horizon (2045) analysis results for Group 4 intersections are summarized in **Table 3.53** based on the traffic volumes in **Exhibit 3.24**.

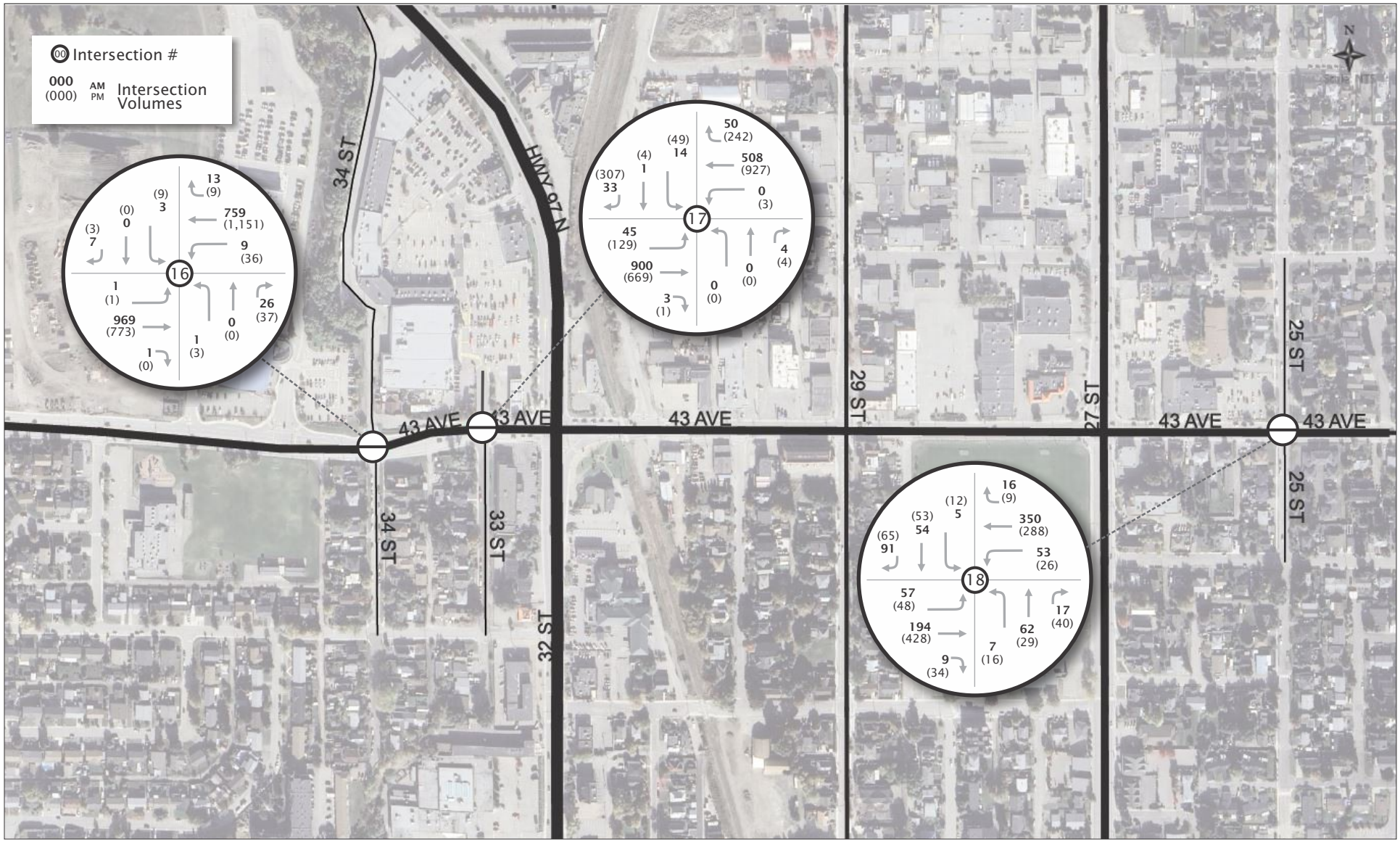
*34 Street & 43 Avenue*

The intersection of 34 Street & 43 Avenue is projected to experience a LOS F for the southbound approach during the AM and PM peak hours by 2045. However, as the southbound movement operates below capacity with low vehicle volumes, no improvements are recommended at + 20 future horizon.

All other study intersections within Group 4 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.53: + 20 Future Horizon (2045) Traffic Operations – Group 4**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 34 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *C* | - | - |
| | EBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | EBTR | A | 0.33 | <5 | A | 0.24 | <5 |
| | WBLT | A | 0.02 | <5 | A | 0.05 | <5 |
| | WBTR | A | 0.27 | <5 | A | 0.35 | <5 |
| | NBLTR | E | 0.28 | 10 | D | 0.24 | 5 |
| | SBLTR | F | 0.27 | 10 | F | 0.31 | 10 |
| 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBL | A | 0.04 | <5 | B | 0.17 | 5 |
| | EBT | A | 0.37 | <5 | A | 0.27 | <5 |
| | EBTR | A | 0.19 | <5 | A | 0.14 | <5 |
| | WBT | A | 0.21 | <5 | A | 0.37 | <5 |
| | WBTR | A | 0.13 | <5 | A | 0.30 | <5 |
| | NBR | B | <0.02 | <5 | B | <0.02 | <5 |
| | SBR | B | 0.05 | <5 | D | 0.63 | 35 |
| 25 Street & 43 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | 0.06 | <5 | A | 0.04 | <5 |
| | WBLTR | A | 0.05 | <5 | A | 0.03 | <5 |
| | NBLTR | D | 0.45 | 15 | C | 0.30 | 10 |
| | SBLTR | D | 0.53 | 25 | C | 0.39 | 15 |




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**Exhibit 3.24**

# +20 Future Horizon (2045) – Group 4 Traffic Volumes

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### 3.6.5 + 20 Future Horizon (2045) Traffic Operations for Group 5 Intersections

+ 20 Future Horizon (2045) analysis results for Group 5 intersections are summarized in **Table 3.54** based on the traffic volumes in **Exhibit 3.25**.

*33 Street & 39 Avenue*

The intersection of 33 Street & 39 Avenue is projected to operate acceptably during both the AM and PM peak hours, with an overall LOS B. To accommodate vehicle queues within the lane's capacity, it is necessary to increase the westbound left-turn storage lane to 45 meters. However, there is no available space within the existing road layout to extend the lane. **Table 3.55** outlines the intersection's performance under the potential roundabout upgrade. It is anticipated that the intersection would operate efficiently with an overall LOS A during both peak hours, with the 95th percentile queue expected to remain within the westbound road capacity.

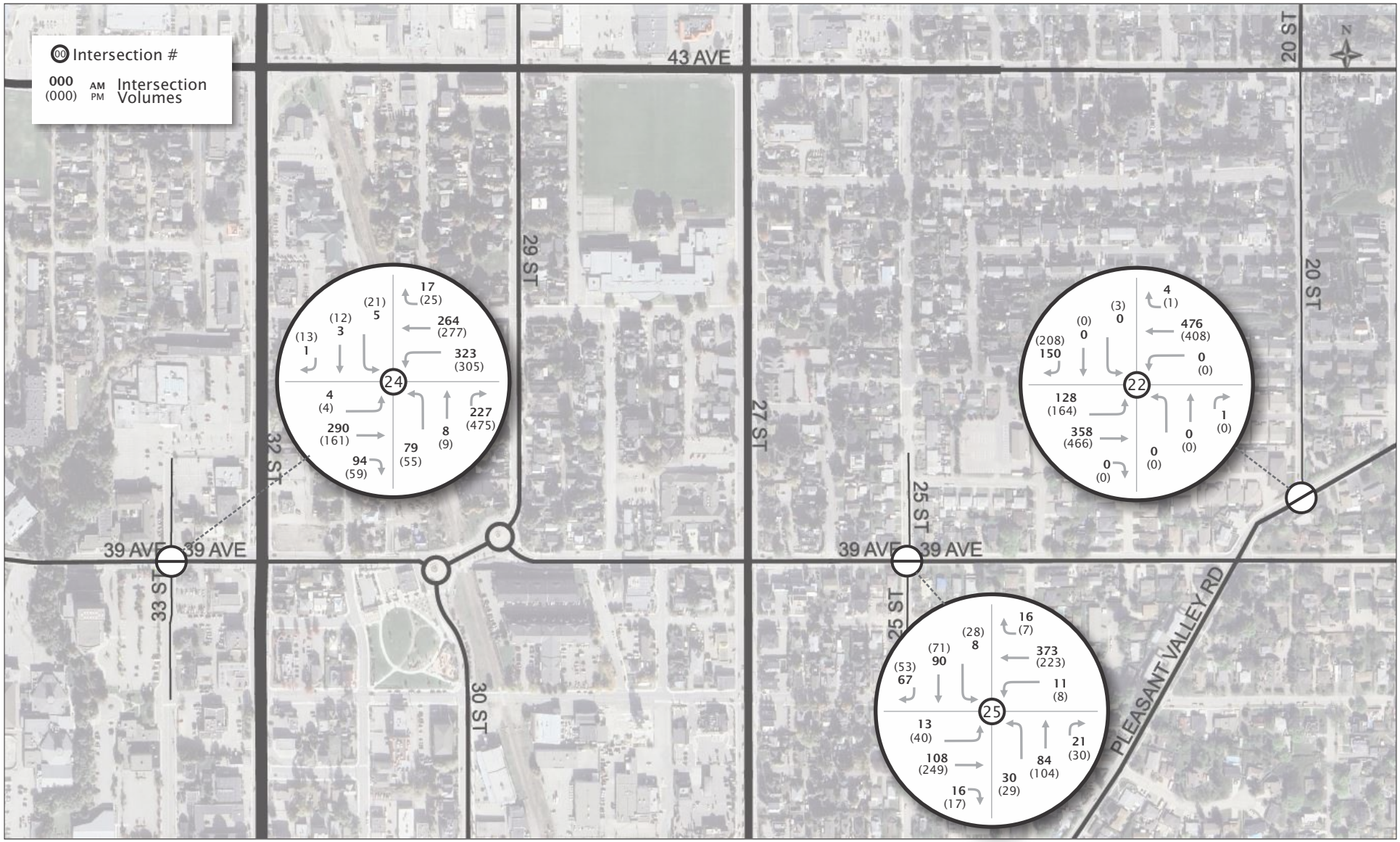
All other study intersections within Group 5 are expected to continue operating acceptably with an overall LOS D or better by the 2045 future year.

**Table 3.54: + 20 Future Horizon (2045) Traffic Operations – Group 5**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 20 Street *(SB Stop)* | *OVERALL* | *D* | - | - | *D* | - | - |
| | EBLT | A | 0.13 | 5 | A | 0.15 | 5 |
| | WBTR | A | 0.30 | <5 | A | 0.25 | <5 |
| | SBLR | C | 0.32 | 10 | B | 0.37 | 15 |
| 33 Street & 39 Avenue *(Signal)* | *OVERALL* | *B* | *0.75* | - | *B* | *0.57* | - |
| | EBL | B | 0.02 | <5 | B | 0.02 | <5 |
| | EBTR | C | 0.77 | 90 | B | 0.47 | 35 |
| | WBL | B | 0.71 | 45 | A | 0.51 | 35 |
| | WBTR | A | 0.29 | 30 | A | 0.30 | 35 |
| | NBLTR | C | 0.69 | 45 | B | 0.51 | 30 |
| | SBLTR | B | 0.04 | 5 | B | 0.15 | 10 |
| 25 Street & 39 Avenue *(NB/SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | A | <0.02 | <5 | A | 0.03 | <5 |
| | WBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLTR | D | 0.50 | 20 | C | 0.45 | 20 |
| | SBLTR | C | 0.49 | 20 | C | 0.40 | 15 |

**Table 3.55: + 20 Future Horizon (2045) Traffic Operations – Group 5 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 33 Street & 39 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.53* | - | *A* | *0.46* | - |
| | EBLTR | A | 0.47 | 25 | A | 0.23 | 10 |
| | WBLTR | A | 0.53 | 35 | A | 0.44 | 25 |
| | NBLTR | A | 0.38 | 20 | A | 0.46 | 25 |
| | SBLTR | B | 0.03 | <5 | A | 0.06 | <5 |
| | | | | | | | |




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**Exhibit 3.25**

## +20 Future Horizon (2045) – Group 5 Traffic Volumes

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### 3.6.6 + 20 Future Horizon (2045) Traffic Operations for Group 6 Intersections

+ 20 Future Horizon (2045) analysis results for Group 6 intersections are summarized in **Table 3.56** based on the traffic volumes in **Exhibit 3.26**.

#### *Pleasant Valley Road & 46 Avenue*

The intersection of Pleasant Valley Road & 46 Avenue is projected to experience LOS F for the westbound approach during both the AM and PM peak hours by 2045. To improve traffic operations, it is recommended to either:

1. Upgrade the intersection with a single-lane roundabout.
2. Upgrade the intersection to a full traffic signal. A traffic signal intersection control is preferred due to reduced land acquisition and overall costs.

**Table 3.57** summarizes the intersection's performance under the roundabout upgrade. It is expected that the proposed roundabout operates efficiently, with all individual movements achieving LOS A during both peak hours.

All other study intersections within Group 6 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.58** outlines the performance of the 24 Street/Driveway & 48 Avenue intersection under the alternative single-lane roundabout configuration. As indicated, the intersection is expected to perform well, achieving an overall LOS A during both the AM and PM peak hours.

**Table 3.56: + 20 Future Horizon (2045) Traffic Operations – Group 6**

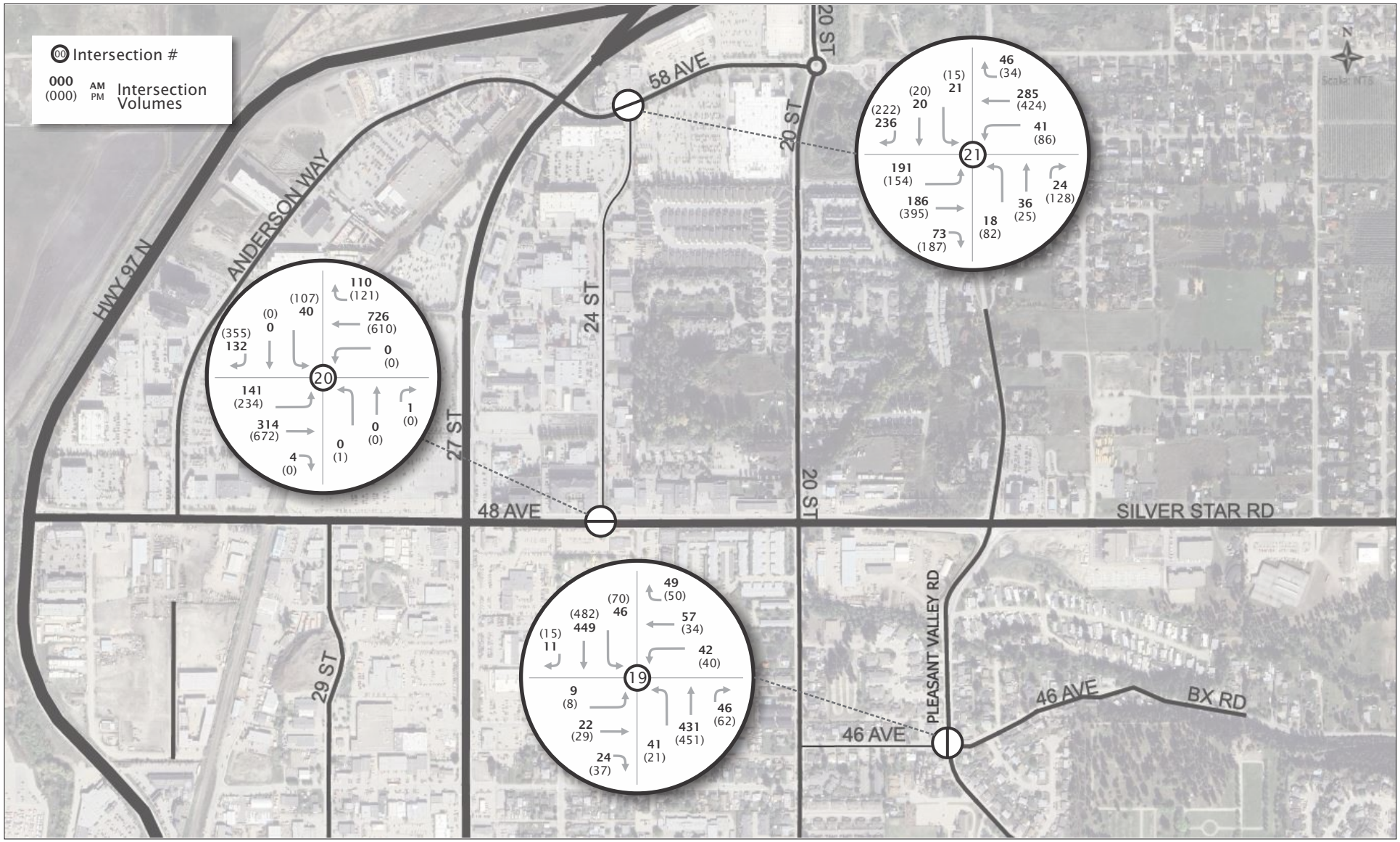
| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | *OVERALL* | *B* | - | - | *D* | - | - |
| | EBLTR | D | 0.26 | 10 | D | 0.37 | 15 |
| | WBLTR | F | 0.73 | 40 | F | 0.74 | 40 |
| | NBLTR | A | 0.04 | <5 | A | 0.02 | <5 |
| | SBLTR | A | 0.04 | <5 | A | 0.07 | <5 |
| 24 Street/Driveway & 48 Avenue *(Signal)* | *OVERALL* | *A* | *0.41* | - | *B* | *0.56* | - |
| | EBL | A | 0.45 | 15 | A | 0.51 | 20 |
| | EBTR | A | 0.17 | 10 | A | 0.32 | 25 |
| | WBLTR | A | 0.45 | 25 | B | 0.67 | 45 |
| | NBLTR | B | 0.05 | 5 | B | 0.03 | 5 |
| | SBLT | B | 0.25 | 10 | B | 0.41 | 20 |
| | SBR | B | 0.09 | 10 | B | 0.23 | 15 |
| 24 Street/Driveway & 58 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.37* | - | *A* | *0.60* | - |
| | EBLTR | A | 0.36 | 20 | A | 0.60 | 40 |
| | WBLTR | A | 0.37 | 15 | A | 0.53 | 30 |
| | NBLTR | A | 0.09 | 5 | A | 0.32 | 15 |
| | SBLTR | A | 0.30 | 15 | A | 0.36 | 20 |

**Table 3.57: + 20 Future Horizon (2045) Traffic Operations – Group 6 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Pleasant Valley Road & 46 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.41* | - | *A* | *0.44* | - |
| | EBLTR | A | 0.07 | <5 | A | 0.10 | 5 |
| | WBLTR | A | 0.17 | 5 | A | 0.15 | 5 |
| | NBLTR | A | 0.38 | 20 | A | 0.42 | 20 |
| | SBLTR | A | 0.41 | 20 | A | 0.44 | 25 |
| | | | | | | | |

**Table 3.58: + 20 Future Horizon (2045) Traffic Operations – Group 6 (Roundabout Option)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 24 Street/Driveway & 48 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.71* | - | *A* | *0.68* | - |
| | EBLTR | A | 0.36 | 20 | A | 0.68 | 60 |
| | WBLTR | A | 0.71 | 55 | A | 0.64 | 45 |
| | NBLTR | A | 0.02 | <5 | B | 0.03 | <5 |
| | SBLTR | B | 0.31 | 15 | B | 0.63 | 45 |
| | | | | | | | |




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**Exhibit 3.26**

## +20 Future Horizon (2045) – Group 6 Traffic Volumes

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### 3.6.7 + 20 Future Horizon (2045) Traffic Operations for Group 7 Intersections

+ 20 Future Horizon (2045) analysis results for Group 7 intersections are summarized in **Table 3.59** based on the traffic volumes in **Exhibit 3.27**.

#### *27 Street & 25 Avenue*

The westbound right-turn movement at the 27 Street & 25 Avenue intersection is projected to operate at LOS F during the AM peak hour. To improve safety and traffic flow, it is recommended that 25 Avenue be closed at this intersection and converted into a cul-de-sac. This modification is expected to reroute approximately 90 vehicles in the AM and 190 vehicles in the PM peak hour and redirect them to 28 Avenue for access to 27 Street. A traffic analysis was performed at this study horizon to redistribute traffic volumes following the proposed closure of 25 Avenue at the 27 Street intersection. This redistribution was conducted for both the AM and PM peak hours and the traffic was reassigned to the intersection of 27 Street and 28 Avenue.

#### *27 Street & 28 Avenue*

The 27 Street & 28 Avenue intersection is projected to operate above capacity during the AM peak hour, with an overall LOS F. To mitigate these traffic conditions, it is recommended that the intersection be upgraded with a full traffic signal by 2045. **Table 3.60** summarizes the improved performance of the intersection after the upgrade. As indicated, the intersection is expected to operate within capacity limits, achieving an overall LOS B and a V/C ratio of 0.80 or better during both peak hours.

All other study intersections within Group 7 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.




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**Exhibit 3.27**

## +20 Future Horizon (2045) – Group 7 Traffic Volumes

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**Table 3.59: + 20 Future Horizon (2045) Traffic Operations – Group 7**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 25 Avenue *(WB Stop)* | *OVERALL* | *C* | - | - | *C* | - | - |
| | WBR | F | 0.85 | 55 | D | 0.36 | 15 |
| | NBT | A | 0.67 | <5 | A | 0.65 | <5 |
| | SBT | A | 0.49 | <5 | A | 0.76 | <5 |
| 27 Street & 28 Avenue *(Ped Signal)* | *OVERALL* | *F* | *>1* | - | *B* | *0.68* | - |
| | EBLTR | B | 0.21 | 15 | C | 0.55 | 55 |
| | WBLTR | A | 0.04 | 5 | C | 0.03 | 5 |
| | NBLTR | F | >1 | 155 | B | 0.74 | 85 |
| | SBLTR | E | >1 | 100 | B | 0.75 | 110 |
| 30 Street & 31 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | C | 0.09 | <5 | D | 0.09 | <5 |
| | WBLTR | C | 0.10 | 5 | C | 0.16 | 5 |
| | NBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.02 | <5 | A | 0.02 | <5 |
| 30 Street & 28 Avenue *(EB/WB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLTR | B | 0.09 | <5 | C | 0.30 | 10 |
| | WBLTR | C | 0.21 | 5 | E | 0.47 | 20 |
| | NBLT | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.19 | <5 | A | 0.37 | <5 |
| | | | | | | | |

**Table 3.60: + 20 Future Horizon (2045) Traffic Operations – Group 7 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 27 Street & 28 Avenue *(Signal)* | *OVERALL* | *B* | *0.80* | - | *B* | *0.73* | - |
| | EBLTR | D | 0.72 | 45 | C | 0.60 | 40 |
| | WBLTR | C | 0.44 | 40 | B | 0.12 | 10 |
| | NBLTR | B | 0.83 | 125 | A | 0.67 | 70 |
| | SBLTR | A | 0.55 | 70 | B | 0.78 | 125 |
| | | | | | | | |

### 3.6.8 + 20 Future Horizon (2045) Traffic Operations for Group 8 Intersections

+ 20 Future Horizon (2045) analysis results for Group 8 intersections are summarized in **Table 3.61** based on the traffic volumes in **Exhibit 3.28**.

#### *41 Street & 25 Avenue*

It is recommended to extend the eastbound left-turn storage lane to 95 m at the intersection of 41 Street & 25 Avenue to ensure that traffic volumes remain within the lane's storage capacity by 2045.

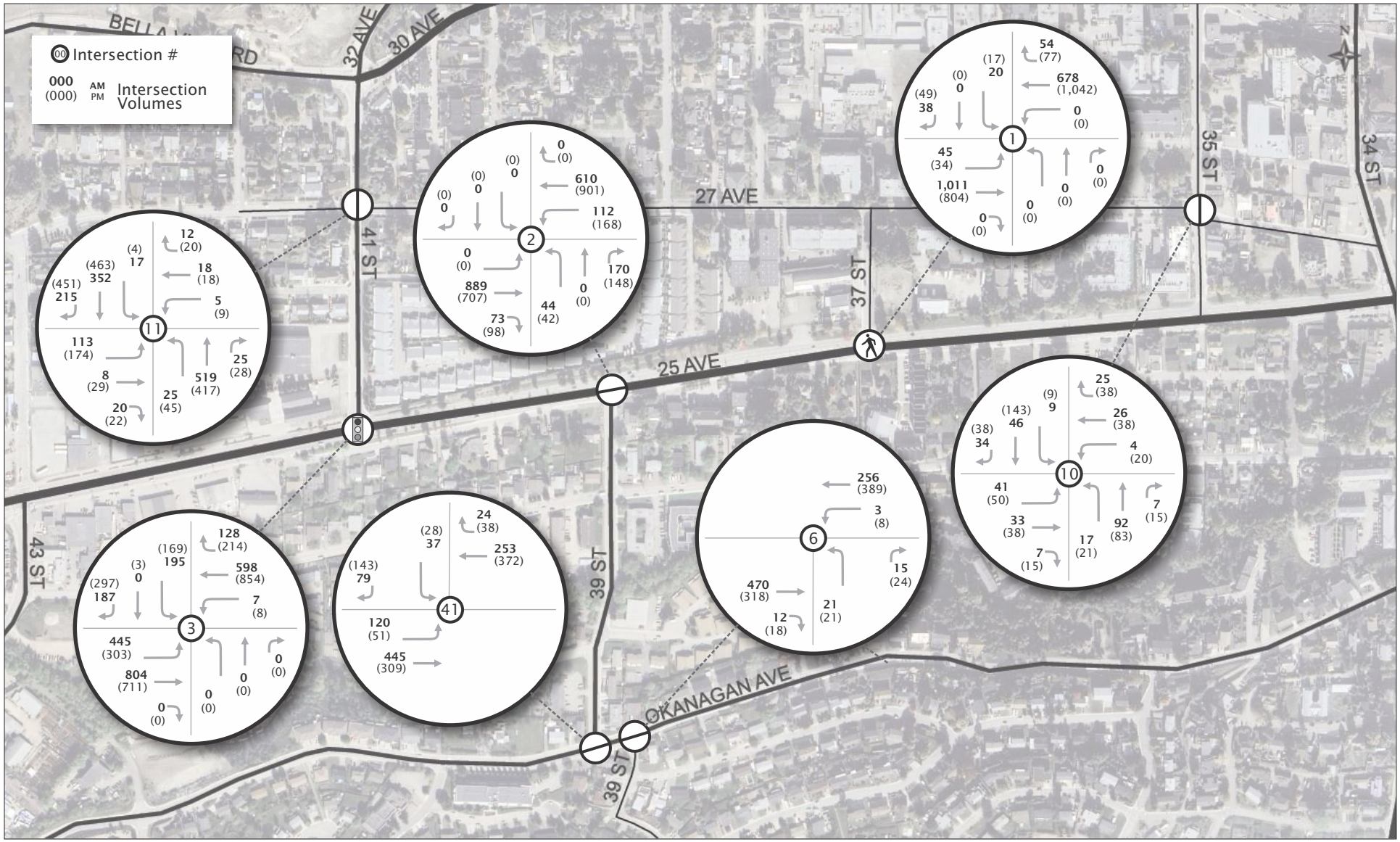
All other study intersections within Group 8 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.61: + 20 Future Horizon (2045) Traffic Operations – Group 8**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 25 Avenue & 37 Street *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBL | A | 0.06 | <5 | B | 0.06 | <5 |
| | EBT1 | A | 0.32 | <5 | A | 0.25 | <5 |
| | EBT2 | A | 0.32 | <5 | A | 0.25 | <5 |
| | WBT | A | 0.29 | <5 | A | 0.43 | <5 |
| | WBTR | A | 0.18 | <5 | A | 0.26 | <5 |
| | SBLR | D | 0.27 | 10 | D | 0.32 | 10 |
| 39 Street & 25 Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBT | A | 0.37 | <5 | A | 0.28 | <5 |
| | EBTR | A | 0.23 | <5 | A | 0.20 | <5 |
| | WBL | A | 0.17 | 20 | A | 0.21 | 25 |
| | WBT1 | A | 0.19 | <5 | A | 0.27 | 10 |
| | WBT2 | A | 0.19 | <5 | A | 0.27 | <5 |
| | NBL | C | 0.49 | 15 | C | 0.52 | 20 |
| | NBR | A | 0.28 | 20 | A | 0.24 | 20 |
| 41 Street & 25 Avenue *(Signal)* | *OVERALL* | *B* | *0.70* | - | *B* | *0.69* | - |
| | EBL | B | 0.70 | 95 | B | 0.63 | 70 |
| | EBTR | A | 0.36 | 50 | A | 0.30 | 40 |
| | WBL | B | 0.04 | 5 | B | 0.03 | 5 |
| | WBTR | C | 0.75 | 95 | C | 0.80 | 130 |
| | SBL | C | 0.58 | 60 | C | 0.52 | 50 |
| | SBTR | C | 0.14 | 20 | B | 0.21 | 20 |
| 39 Street S & Okanagan Avenue *(NB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBTR | A | 0.33 | <5 | A | 0.22 | <5 |
| | WBLT | A | <0.02 | <5 | A | <0.02 | <5 |
| | NBLR | C | 0.11 | 5 | B | 0.11 | 5 |
| 35 Street & 27 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | B | 0.14 | 5 | B | 0.21 | 5 |
| | WBLTR | B | 0.08 | <5 | B | 0.16 | 5 |
| | NBLTR | A | <0.02 | <5 | A | 0.02 | <5 |
| | SBLTR | A | <0.02 | <5 | A | <0.02 | <5 |
| | | | | | | | |

**Table 3.61: + 20 Future Horizon (2045) Traffic Operations – Group 8 (Cont.)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| 41 Street & 27 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.49* | - | *A* | *0.68* | - |
| | EBLTR | A | 0.16 | 5 | B | 0.27 | 15 |
| | WBLTR | A | 0.06 | 5 | A | 0.07 | 5 |
| | NBLTR | A | 0.49 | 30 | A | 0.46 | 25 |
| | SBLTR | A | 0.43 | 25 | A | 0.68 | 55 |
| Okanagan Avenue & 39 Street N *(SB Stop)* | *OVERALL* | *B* | - | - | *B* | - | - |
| | EBLT | A | 0.12 | 5 | A | 0.05 | <5 |
| | WBTR | A | 0.19 | <5 | A | 0.27 | <5 |
| | SBLR | C | 0.38 | 15 | C | 0.36 | 15 |
| | | | | | | | |




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**Exhibit 3.28**

## +20 Future Horizon (2045) – Group 8 Traffic Volumes

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### 3.6.9 + 20 Future Horizon (2045) Traffic Operations for Group 9 Intersections

+ 20 Future Horizon (2045) analysis results for Group 9 intersections are summarized in **Table 3.62** based on the traffic volumes in **Exhibit 3.29**.

#### *Middleton Way & Kosmina Road*

The eastbound approach at the Middleton Way & Kosmina Road intersection is projected to experience a LOS F during the PM peak hour. A potential mitigation measure is to upgrade the intersection with a full traffic signal by 2045. **Table 3.63** presents the operational results after the proposed upgrade. With signalization, the intersection is expected to achieve an overall LOS A during both peak hours, with all individual movements operating at LOS B or better.

#### *Middleton Way & 11 Avenue*

The intersection of Middleton Way & 11 Avenue is projected to operate over capacity for the eastbound approach, with a LOS F during the PM peak hour. Two potential mitigation measures are proposed to improve traffic operations: upgrading the intersection with a traffic signal or implementing a single-lane roundabout. **Table 3.63** presents the operational results for both scenarios. In either case, the intersection is expected to operate at an overall LOS A, with all individual movements achieving LOS B or better during both the AM and PM peak hours.

All other study intersections within Group 9 are expected to continue operating acceptably with an overall LOS A by the 2045 future year.

**Table 3.62: + 20 Future Horizon (2045) Traffic Operations – Group 9**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & Kosmina Road *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLTR | D | 0.31 | 10 | F | 0.78 | 45 |
| | WBLTR | C | 0.06 | <5 | C | 0.09 | <5 |
| | NBL | A | 0.02 | <5 | A | 0.03 | <5 |
| | NBTR | A | 0.37 | <5 | A | 0.28 | <5 |
| | SBL | A | <0.02 | <5 | A | <0.02 | <5 |
| | SBTR | A | 0.23 | <5 | A | 0.33 | <5 |
| Middleton Way & 11 Avenue *(EB/WB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBLTR | E | 0.56 | 25 | F | >1 | 125 |
| | WBLTR | D | 0.12 | 5 | D | 0.14 | 5 |
| | NBL | A | 0.15 | 5 | A | 0.10 | 5 |
| | NBT | A | 0.23 | <5 | A | 0.14 | <5 |
| | NBTR | A | 0.12 | <5 | A | 0.07 | <5 |
| | SBL | A | <0.02 | <5 | A | 0.02 | <5 |
| | SBT | A | 0.09 | <5 | A | 0.19 | <5 |
| | SBTR | A | 0.10 | <5 | A | 0.14 | <5 |
| Kalamalka Lake Road & 11 Avenue *(Signal)* | *OVERALL* | *A* | *0.61* | - | *A* | *0.63* | - |
| | WBL | B | 0.20 | 15 | C | 0.22 | 15 |
| | WBR | B | 0.24 | 15 | C | 0.13 | 20 |
| | NBTR | A | 0.72 | 90 | A | 0.61 | 80 |
| | SBL | A | 0.37 | 15 | A | 0.69 | 65 |
| | SBT | A | 0.37 | 35 | A | 0.70 | 105 |
| | | | | | | | |

**Table 3.63: + 20 Future Horizon (2045) Traffic Operations – Group 9 (Improved)**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Middleton Way & Kosmina Road *(Signal)* | *OVERALL* | *A* | *0.50* | - | *A* | *0.52* | - |
| | EBLTR | B | 0.45 | 10 | B | 0.47 | 15 |
| | WBLTR | B | 0.08 | 5 | B | 0.04 | 5 |
| | NBL | A | 0.04 | 5 | A | 0.07 | 5 |
| | NBTR | A | 0.50 | 50 | A | 0.46 | 45 |
| | SBL | A | 0.02 | <5 | A | 0.02 | <5 |
| | SBTR | A | 0.30 | 25 | A | 0.53 | 50 |
| Middleton Way & 11 Avenue *(Signal)* | *OVERALL* | *A* | *0.33* | - | *A* | *0.47* | - |
| | EBLTR | B | 0.45 | 10 | A | 0.54 | 30 |
| | WBLTR | B | 0.07 | 5 | A | 0.03 | 5 |
| | NBL | A | 0.31 | 15 | A | 0.32 | 15 |
| | NBTR | A | 0.29 | 20 | A | 0.27 | 15 |
| | SBL | A | <0.02 | <5 | A | 0.05 | 5 |
| | SBTR | A | 0.15 | 10 | A | 0.41 | 25 |
| Middleton Way & 11 Avenue *(Roundabout)* | *OVERALL* | *A* | *0.55* | - | *A* | *0.46* | - |
| | EBLTR | A | 0.12 | 5 | A | 0.46 | 25 |
| | WBLTR | B | 0.03 | <5 | A | 0.03 | <5 |
| | NBLTR | A | 0.55 | 35 | A | 0.37 | 20 |
| | SBLTR | A | 0.29 | 15 | A | 0.43 | 25 |
| | | | | | | | |




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**Exhibit 3.29**

## +20 Future Horizon (2045) – Group 9 Traffic Volumes

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### 3.6.10 + 20 Future Horizon (2045) Traffic Operations for Group 10 Intersections

+ 20 Future Horizon (2045) analysis results for Group 10 intersections are summarized in **Table 3.64** based on the traffic volumes in **Exhibit 3.30**.

All study intersections within Group 10 are expected to continue operating acceptably with an overall LOS B or better by the 2045 future year.

**Table 3.64: + 20 Future Horizon (2045) Traffic Operations – Group 10**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Apollo Road & Okanagan Landing *(NB Stop)* | *OVERALL* | *A* | - | - | *B* | - | - |
| | EBTR | A | 0.25 | <5 | A | 0.23 | <5 |
| | WBLT | A | 0.02 | <5 | A | 0.06 | <5 |
| | NBLR | B | 0.12 | 5 | B | 0.14 | 5 |
| Okanagan Avenue & S Vernon Drive *(EB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLR | B | 0.14 | 5 | A | 0.06 | <5 |
| | NBLT | A | 0.05 | <5 | A | 0.03 | <5 |
| | SBTR | A | 0.16 | <5 | A | 0.09 | <5 |
| Tronson Road & Bella Vista Road *(SB Stop)* | *OVERALL* | *A* | - | - | *A* | - | - |
| | EBLT | A | 0.04 | <5 | A | 0.02 | <5 |
| | WBTR | A | 0.05 | <5 | A | 0.09 | <5 |
| | SBLR | B | 0.11 | 5 | A | 0.15 | 5 |
| | | | | | | | |




**Exhibit 3.30**

## +20 Future Horizon (2045) – Group 10 Traffic Volumes

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### 3.6.11 Total Traffic Operations at Apollo Road & Okanagan Landing Road intersection

*Background*

The City of Vernon is anticipating a proposal for the construction of approximately 4,000 residential units on a portion of a 421-hectare (1,040-acre) property known as the 580 Commonage, located south of Apollo Road and Bench Row Road. This large-scale development is expected to occur in multiple phases over the coming decades. Given the anticipated growth in the area, Apollo Road may be designated as a collector road. In light of this, the City has requested Bunt to conduct a traffic operation analysis for the Apollo Road & Okanagan Landing Road intersection considering the potential future growth.

*Development Statistics*

The projected density for the proposed development has not yet been finalized; however, it is expected to consist primarily of residential units, including a mix of single-family homes, townhouses, and condos, along with some supporting commercial retail and services. For the purpose of this study, it is assumed that the project will consist of 45% single-family detached homes, 35% single-family attached homes, and 20% multifamily units. Other potential future developments in the area are assumed to be accounted for within the 1.5% growth rate used in the background scenario. It is assumed that the full buildout of the project will be completed by 2045.

*Trip Generation*

The ITE trip rates were obtained assuming a general urban/suburban setting not close to rail transit for the residential land uses. The weekday peak hour of adjacent street traffic was used to estimate the site trip generation for AM and PM peak hours. **Table 3.65** outlines the trip rates applied to the development.

**Table 3.65: Peak Hour Vehicle Trip Rates**

| LAND USE | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|
| | RATE | IN | OUT | RATE | IN | OUT |
| Single Family Detached Housing - ITE 210 | 0.70 trips/ unit | 25% | 75% | 0.94 trips/ unit | 63% | 37% |
| Single Family Attached Housing - ITE 215 | 0.48 trips/ unit | 25% | 75% | 0.57 trips/ unit | 59% | 41% |
| Multi Family Mid-Rise Housing - ITE 221 | 0.37 trips/ unit | 23% | 77% | 0.39 trips/ unit | 61% | 39% |
| | | | | | | |

**Table 3.66** summarizes the anticipated future site-generated vehicle trips for the proposed development at full buildout based on the above rates.

**Table 3.66: Vehicle Trip Generation**

| LAND USE | DENSITY | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | TOTAL | IN | OUT | TOTAL | IN | OUT |
| Single Family Detached Housing - ITE 210 | 1,800 units | 1,260 | 315 | 945 | 1,692 | 1,066 | 626 |
| Single Family Attached Housing - ITE 215 | 1,400 units | 672 | 168 | 504 | 798 | 471 | 327 |
| Multi Family Mid-Rise Housing - ITE 221 | 800 units | 296 | 68 | 228 | 312 | 190 | 122 |
| **TOTAL** | **4,000 UNITS** | **2,228** | **551** | **1,677** | **2,802** | **1,727** | **1,075** |

The anticipated development is projected to generate approximately 2,228 vehicle trips during the AM peak hour and 2,802 vehicle trips during the PM peak hour.

### *Trip Distribution & Assignment*

The overall site trip distribution across the study network is presented in **Table 3.67**.

**Table 3.67: Site Trip Distribution**

| ORIGIN/DESTINATION | AM PEAK HOUR | | PM PEAK HOUR | |
|---|---|---|---|---|
| | IN (%) | OUT (%) | IN (%) | OUT (%) |
| East Okanagan Landing Road | 70% | 70% | 70% | 70% |
| West Okanagan Landing Road | 10% | 10% | 10% | 10% |
| South Apollo Road/Bench Row Rd | 20% | 20% | 20% | 20% |
| **TOTAL** | **100%** | **100%** | **100%** | **100%** |

### *Future Traffic Operations*

The intersection capacity analysis for Apollo Road & Okanagan Landing Road indicates that upgrades will be required to accommodate the proposed development traffic by the 2045 future horizon. Two potential mitigation measures have been identified: Traffic signal control, and double-lane roundabout. The intersection analysis results are summarized in **Table 3.68** for each scenario. Note, traffic signalization is preferred at this location as it is likely less costly overall and there is less property acquisition required.

**Signalized Intersection**: Upgrading the intersection's lane configuration to include dual-left turn lanes for westbound traffic and dual-right turn lanes for northbound traffic, along with the installation of a traffic signal, as illustrated in **Figure 3.2**. Under this scenario, the intersection is expected to operate at an overall LOS B during the AM peak hour and LOS C during the PM peak hour, with a v/c ratio of 0.80 or better. The 95th percentile queue for the westbound left-turn movement is estimated to extend up to 170 meters during the PM peak hour.

**Double-Lane Roundabout**: Introducing a double-lane roundabout with the lane configuration shown in **Figure 3.2**. The roundabout analysis indicates that the intersection will operate at an overall LOS A during both AM and PM peak hours, with all individual movements experiencing a LOS of B or better. No significant queuing issues are anticipated under this roundabout layout.

**Figure 3.2: Proposed Intersection Layout and Lane Configuration**

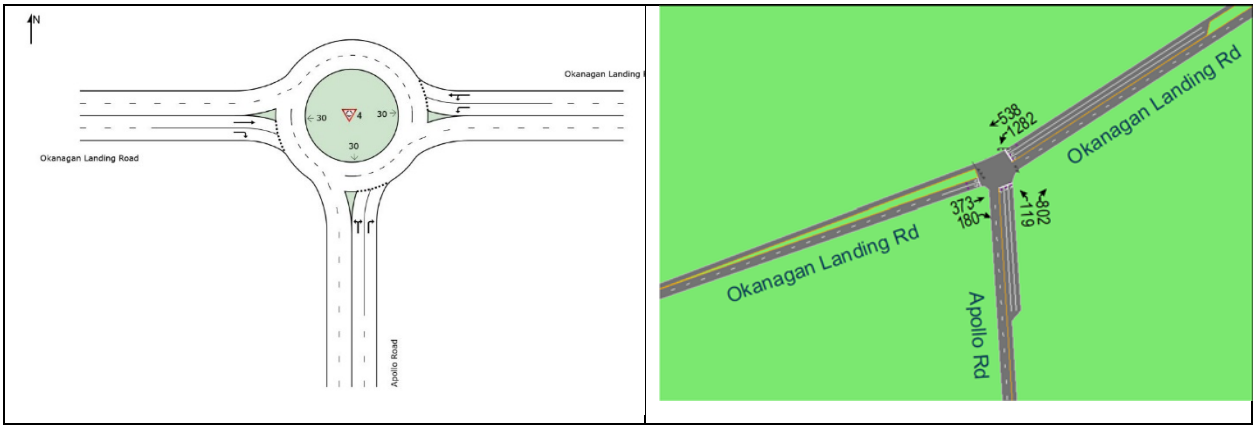



**Table 3.68: Opening Day (2045) Total Traffic Operations**

| INTERSECTION/ TRAFFIC CONTROL | MOVEMENT | AM | | | PM | | |
|---|---|---|---|---|---|---|---|
| | | LOS | V/C | 95TH Q (m) | LOS | V/C | 95TH Q (m) |
| Apollo Road & Okanagan Landing Road *(Roundabout)* | *OVERALL* | *A* | *0.75* | - | *A* | *0.72* | - |
| | EBT | A | 0.39 | 15 | B | 0.60 | 30 |
| | EBR | A | 0.10 | 5 | B | 0.40 | 15 |
| | WBL | B | 0.32 | 15 | B | 0.72 | 55 |
| | WBLT | A | 0.32 | 15 | A | 0.72 | 55 |
| | NBLR | B | 0.75 | 65 | A | 0.49 | 25 |
| | NBR | A | 0.75 | 65 | A | 0.49 | 25 |
| Apollo Road & Okanagan Landing Road *(Signal)* | *OVERALL* | *B* | *0.79* | - | *C* | *0.80* | - |
| | EBTR | B | 0.59 | 35 | D | 0.83 | 85 |
| | WBL | C | 0.71 | 45 | C | 0.89 | 170 |
| | WBT | A | 0.39 | 35 | A | 0.44 | 65 |
| | NBL | B | 0.32 | 30 | D | 0.42 | 40 |
| | NBR | B | 0.77 | 90 | A | 0.44 | 45 |
| | | | | | | | |

## 3.7 Traffic Signal Warrant Analyses

Traffic Signal warrant analysis was completed for the study intersections with reduced performance exceeding performance thresholds utilizing the Transportation Association of Canada (TAC) *Traffic Signal and Pedestrian Signal Head Warrant Handbook* (2014) methodology to evaluate appropriateness of signalization and potential capacity, delay, and queueing improvements.

The warrant analysis is summarized in **Table 3.69** and included in **Appendix D**. A score higher than 100 indicates that a traffic signal is warranted. The analysis indicates that by 2030, a traffic signal will be warranted at the Kalamalka Lake Road & 11 Avenue intersection, scoring 115. By 2035, traffic signals will be needed at 24 Street & 48 Avenue and 24 Street & 58 Avenue, with scores of 110 and 103, respectively. Furthermore, by the 2045 horizon, signals will be required at 34 Street & Okanagan Avenue (score of 103), 41 Street & 27 Avenue (score of 114), and Pleasant Valley Road & 46 Avenue (score of 104). Traffic signals are not warranted at any other study intersections.

**Table 3.69: Signal Warrant Analysis**

| INT ID NUMBER | INTERSECTION | HORIZON | SIGNAL WARRANT SCORE | RESULT |
|---|---|---|---|---|
| 2 | 39 Street & 25 Avenue | 2045 | 86 | Not Warranted |
| 7 | 34 Street & 24 Avenue | 2045 | 54 | Not Warranted |
| 8 | 34 Street & Okanagan Avenue | 2045 | 103 | **Warranted** |
| 11 | 41 Street & 27 Avenue | 2045 | 114 | **Warranted** |
| 19 | Pleasant Valley Road & 46 Avenue | 2045 | 104 | **Warranted** |
| 20 | 24 Street & 48 Avenue | 2035 | 110 | **Warranted** |
| 21 | 24 Street & 58 Avenue | 2035 | 103 | **Warranted** |
| 24 | 33 Street & 39 Avenue | 2045 | 90 | Not Warranted |
| 31 | Middleton Way & Kosmina Road | 2045 | 36 | Not Warranted |
| 32 | Middleton Way & 11 Avenue | 2045 | 60 | Not Warranted |
| 33 | Kalamalka Lake Road & 11 Avenue | 2030 | 115 | **Warranted** |
| 36 | 35 Street & 30 Avenue | 2045 | 83 | Not Warranted |
| 37 | 33 Street & 30 Avenue | 2045 | 83 | Not Warranted |
| 39 | 34 Street & 28 Avenue | 2045 | 54 | Not Warranted |
| | | | | |

## 3.8 Traffic Operations and Upgrades Summary

Bunt conducted traffic modelling and operations analysis for the 40 City intersections utilizing the Highway Capacity Manual (2000 Edition) to evaluate performance. The operations assessment included key performance metrics for Level of Service (LOS), Volume-to-Capacity ratio (v/c), and 95$^{th}$ Percentile Queue Length. Furthermore, the intersections were analyzed for the AM and PM peak hours and for the Existing Conditions (2025), +5 Years Future Horizon (2030), +10 Years Future Horizon (2035), and +20 Years Future Horizon (2045). A graphical summary of the traffic performance and recommendations for each group is provided in **Exhibits 3.31** to **3.41.**

Bunt's recommended transportation upgrades are also tabulated in **Table 3.70**. Please note, no upgrades are required for the intersections that are not mentioned here. Higher-order intersection upgrades (i.e., those recommended in later horizon years) can be implemented at earlier horizon years if desired by the City to help optimize administrative and logistical efforts.

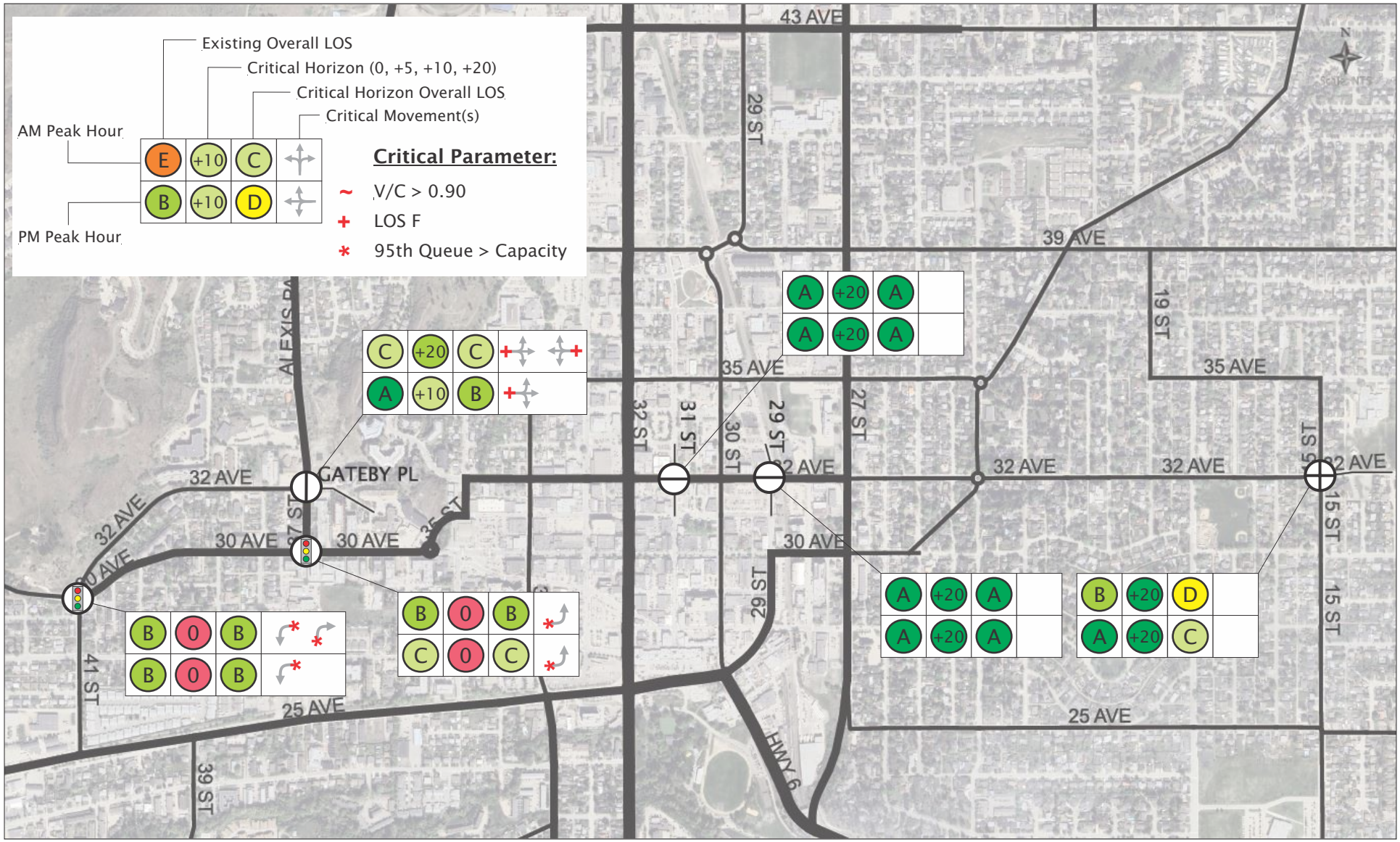
**Table 3.70: Summary of Recommended Transportation Upgrades**

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 3 | 41 Street & 25 Avenue *(Signal)* | Implement traffic signage and pavement markings to restrict the south leg's movements to inbound only | 2025 |
| | | Optimize signal timing plan | 2035 |
| | | Increase the eastbound left storage lane to 95 meters | 2045 |
| 7 | 34 Street & 24 Avenue *(EB/WB Stop)* | Implement turn controls and concrete median to restrict intersection to right-in/right-out.<br><br>Optional Addition: Install ladder pedestrian crosswalk markings for the north leg crosswalk.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons for the north leg crossing. | 2025 |
| 8 | 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2035 |
| 11 | 41 Street & 27 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2025 |
| 13 | 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | Optimize signal timing plan<br>Increase westbound left turn storage lane to 75 meters | 2025 |
| | | Increase westbound left turn storage lane to 105 meters | 2030 |
| | | Increase westbound left turn storage lane to 130 meters<br>Increase northbound right turn storage lane to 50 meters | 2035 |
| | | Upgrade to 95-meter dual-left turn westbound lanes<br>Increase northbound right turn storage lane to 85 meters | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 14 | 37 Street & 30 Avenue *(Signal)* | Install concrete median along 30 Avenue extending from 37 Street to just beyond 38 Street and implement turn controls such that 30 Avenue & 38 Street is restricted to right-in right-out movements only. | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 115 meters | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 140 meters | 2030 |
| | | Upgrade to roundabout | 2035 |
| 16 | 34 Street & 43 Avenue *(NB/SB Stop)* | Monitor intersection traffic operations as development in the area occurs and review applicability of signalization upgrades.<br><br>With future redevelopment potential of the Vernon Square Mall, consider providing bicycle facilities (bike lanes, protected bicycle tacks, etc.) along 34 Street north of 43 Avenue connecting to 32 Street/Highway 97. | 2035 |
| 17 | 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement | 2025 |
| 19 | Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | Option 1: Upgrade to traffic signal. Note, this option is preferred as there are less land acquisition and regrading requirements.<br><br>Option 2: Upgrade to roundabout | 2045 |
| 20 | 24 Street/Driveway & 48 Avenue *(NB/SB Stop)* | Upgrade to full traffic signal | 2030 |
| 21 | 24 Street/Driveway & 58 Avenue *(NB/SB Stop)* | Upgrade to roundabout | 2025 |
| 24 | 33 Street & 39 Avenue *(NB/SB Stop)* | Option 1: Upgrade to signal<br>Option 2: Upgrade to roundabout | 2025 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 30 meters | 2035 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 45 meters | 2045 |
| 25 | 25 Street & 39 Avenue *(NB Stop)* | Monitor traffic operations as delays are approaching acceptable thresholds. | 2030 |
| 26 | 31 Street & 32 Avenue *(NB/SB Stop)* | Install concrete median to restrict vehicle movements to right-in/right-out including a pedestrian refuge for the north-south crosswalks.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons (RRFBs) for the north-south crosswalks.<br><br>Optional Addition: Update zebra pedestrian crosswalk markings to ladder crosswalk marking pattern. | 2030 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 29 | 27 Street & 25 Avenue *(WB Stop)* | Close the east leg of the intersection on 25 Avenue and modify it to cul-de-sac | 2045 |
| 30 | 27 Street & 28 Avenue *(Ped Signal)* | Optimize signal timing plan | 2025 |
| | | Upgrade to a full traffic signal | 2045 |
| 31 | Middleton Way & Kosmina Road *(EB/WB Stop)* | Implement turn controls to restrict intersection to right-in/right-out with a concrete median on Middleton Way. | 2030 |
| | | Upgrade to traffic signal | 2045 |
| 32 | Middleton Way & 11 Avenue *(EB/WB Stop)* | Upgrade to traffic signal | 2045 |
| 33 | Kalamalka Lake Road & 11 Avenue *(WB Stop)* | Upgrade to traffic signal | 2035 |
| 34 | 34 Street & 31 Avenue *(EB/WB Stop)* | Install turn controls and concrete median along 34 Street at this intersection to restrict movements to right-in/right-out.<br><br>Optional Addition: Install concrete curb extensions at each intersection corner<br><br>Optional Addition: Install ladder pedestrian crosswalk markings<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacon pedestrian control for the north and south leg crosswalks. | 2030 |
| 35 | 30 Street & 31 Avenue *(NB/SB Stop)* | Continue monitoring this location for transit safety.<br><br>While traffic volumes may remain low, the primary vehicles exiting are buses and the intersection functions in a unique way.<br><br>Ongoing monitoring may should review potential for future transit station upgrades and ensure the design continues to meet operational and safety needs for transit vehicles and users. | - |
| 36 | 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement<br><br>Install a concrete median along 30 Avenue at this intersection to support the right-in/right-out turn controls that can also accommodate semi-truck vehicle access to the Safeway grocery store to the north. | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 37 | 33 Street & 30 Avenue *(NB/SB Stop)* | Option 1: Upgrade to full traffic signal.<br><br>Option 2: Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2045 |
| 38 | 31 Street & 30 Avenue *(NB/SB Stop)* | Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2030 |
| 39 | 34 Street & 28 Avenue *(EB/WB Stop)* | Implement turn controls prohibiting westbound left turn and through movement | 2045 |
| | | | |



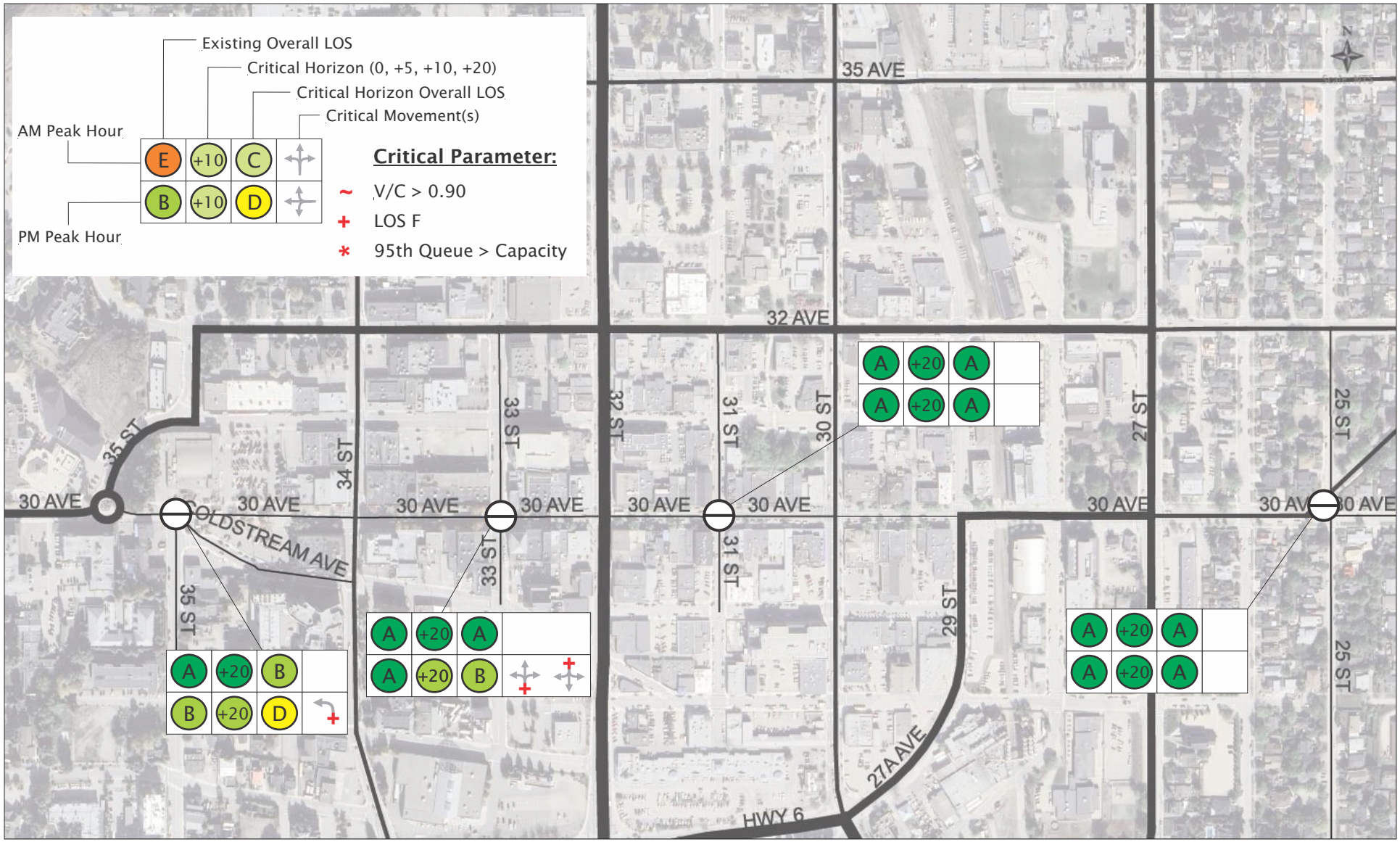

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**Exhibit 3.31**

## Traffic Operations Summary - Group 1

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates




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**Exhibit 3.32**

## Traffic Operations Summary - Group 2

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates

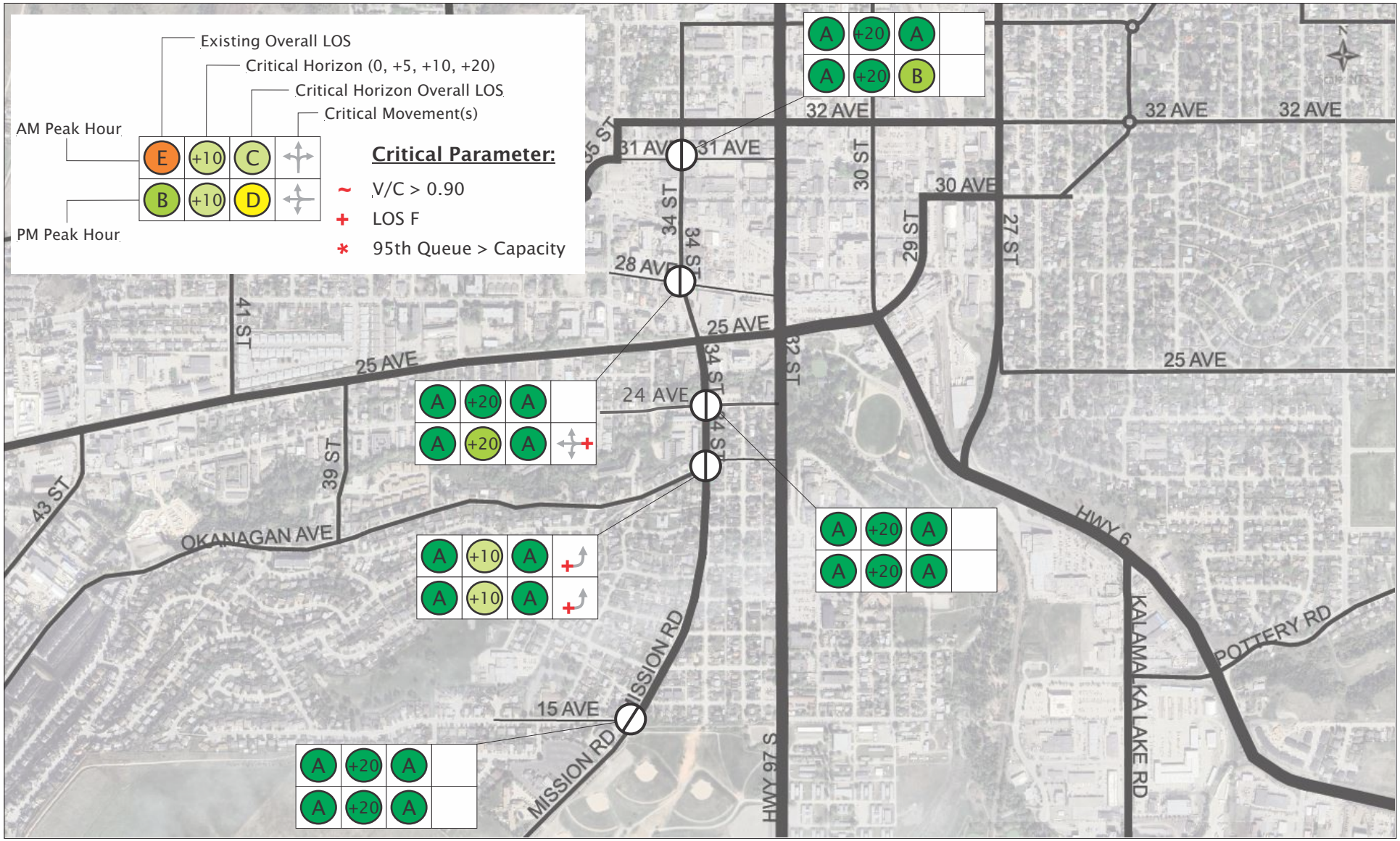


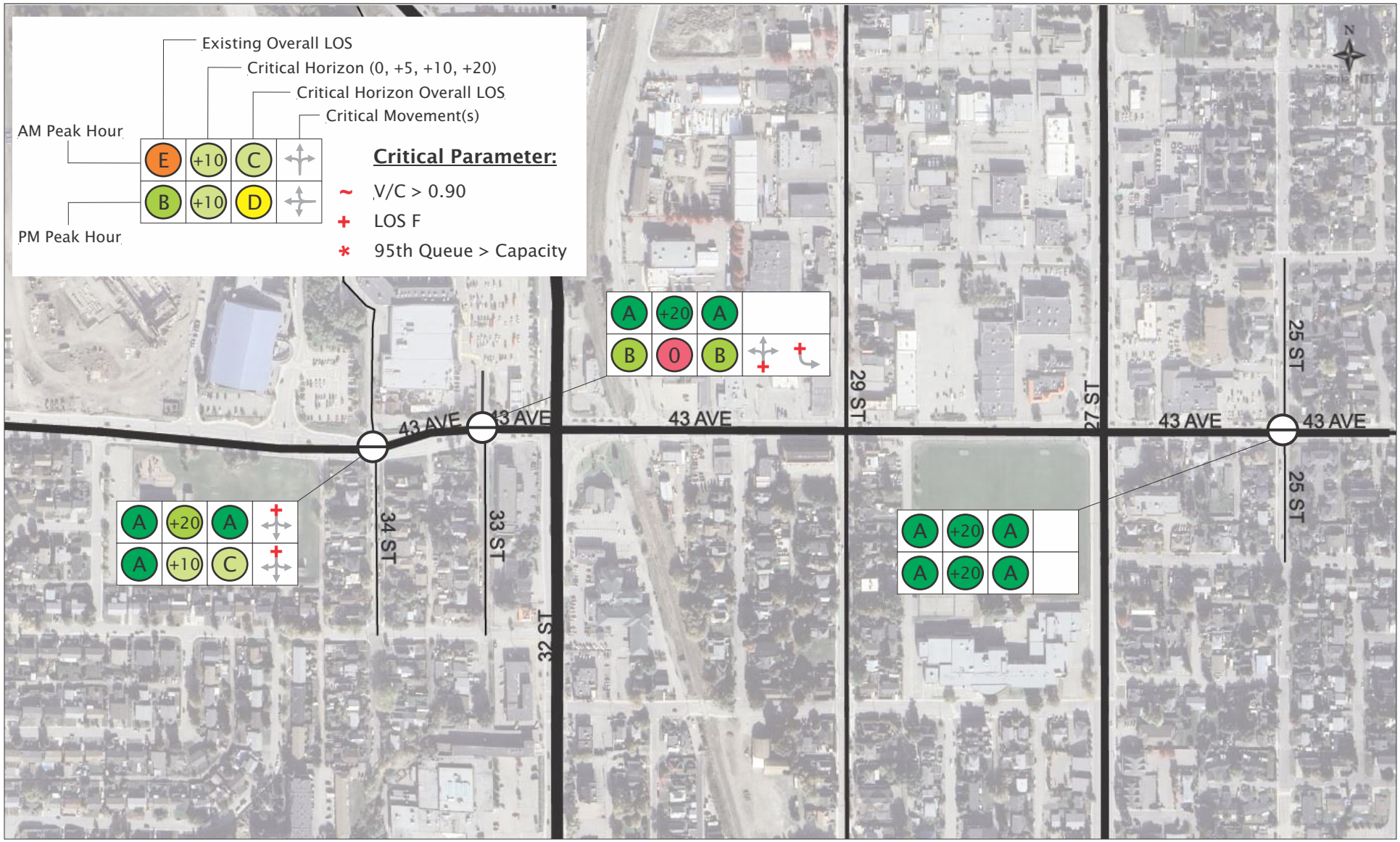

**Exhibit 3.33**

# Traffic Operations Summary - Group 3

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates

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**Exhibit 3.34**

# Traffic Operations Summary - Group 4

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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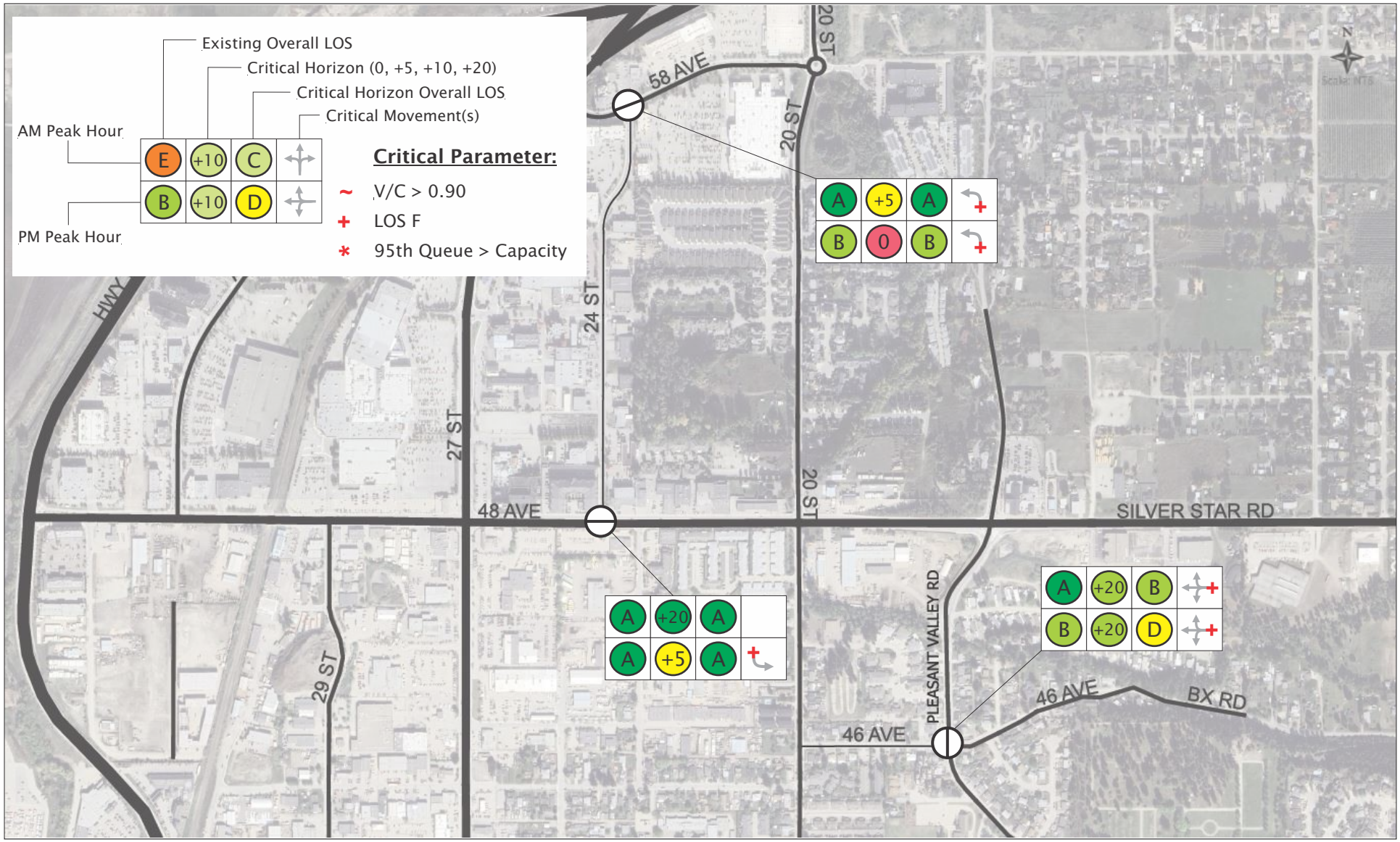

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**Exhibit 3.35**

## Traffic Operations Summary - Group 5

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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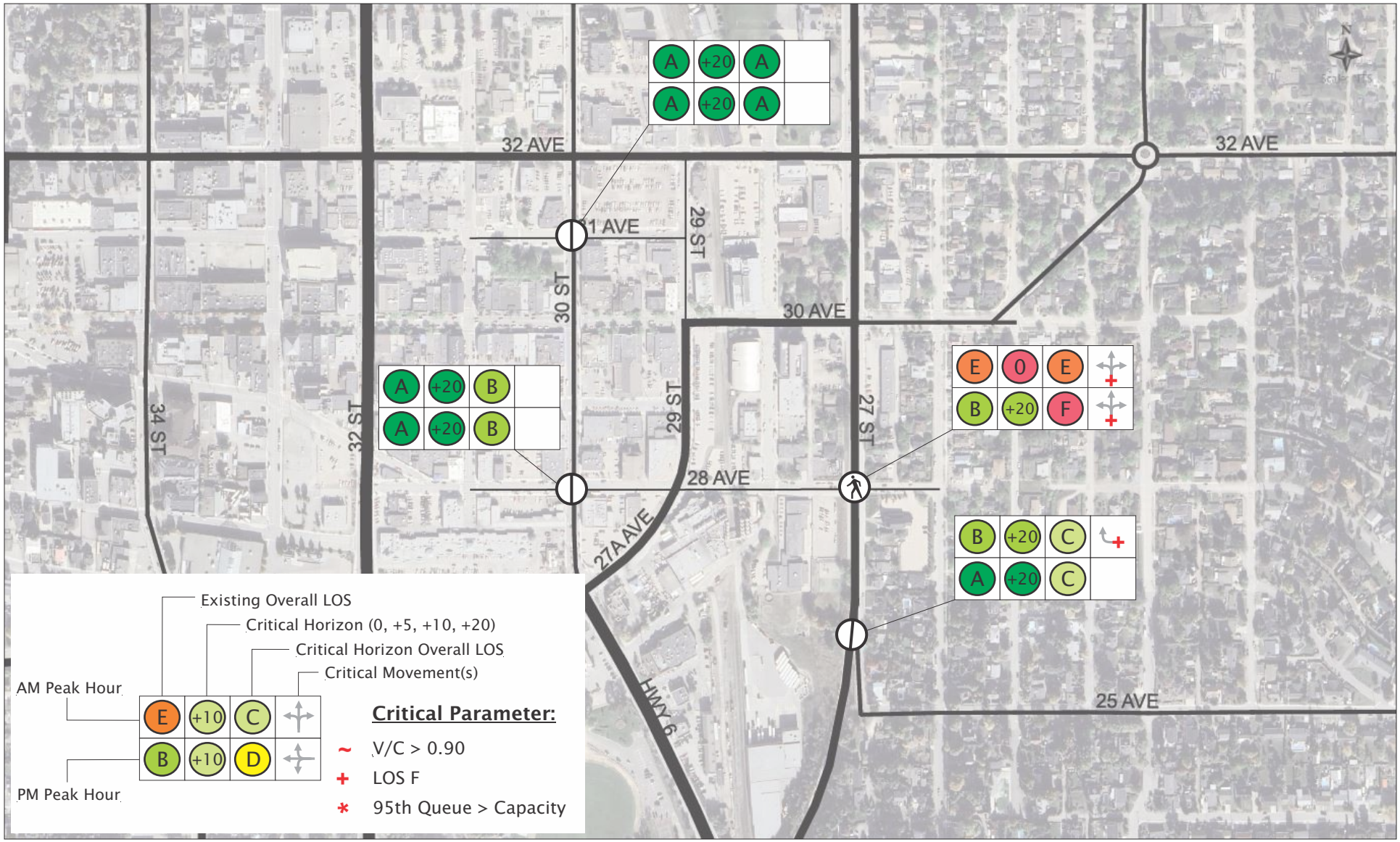

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**Exhibit 3.36**

## Traffic Operations Summary - Group 6

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates




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**Exhibit 3.37**

# Traffic Operations Summary - Group 7

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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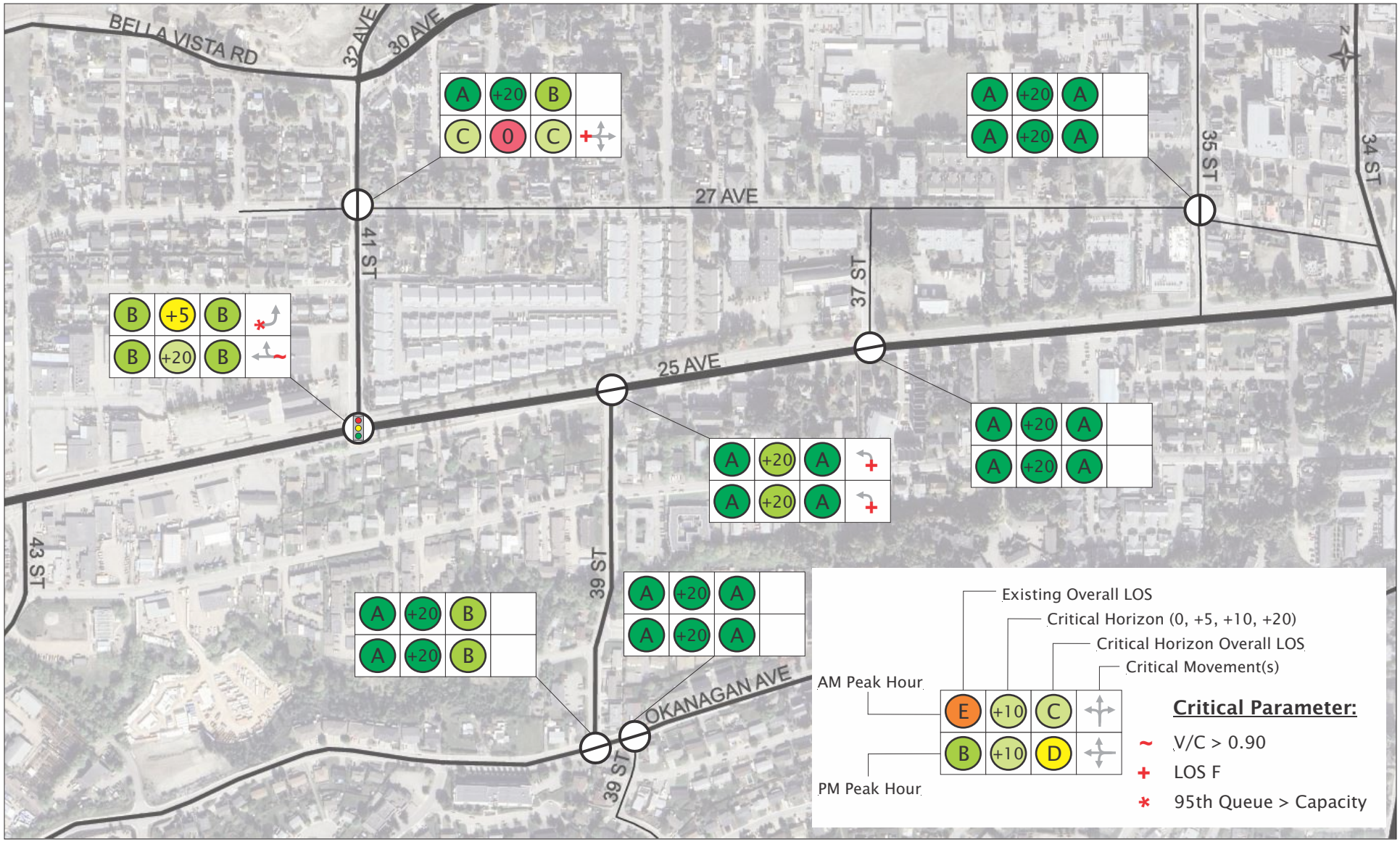


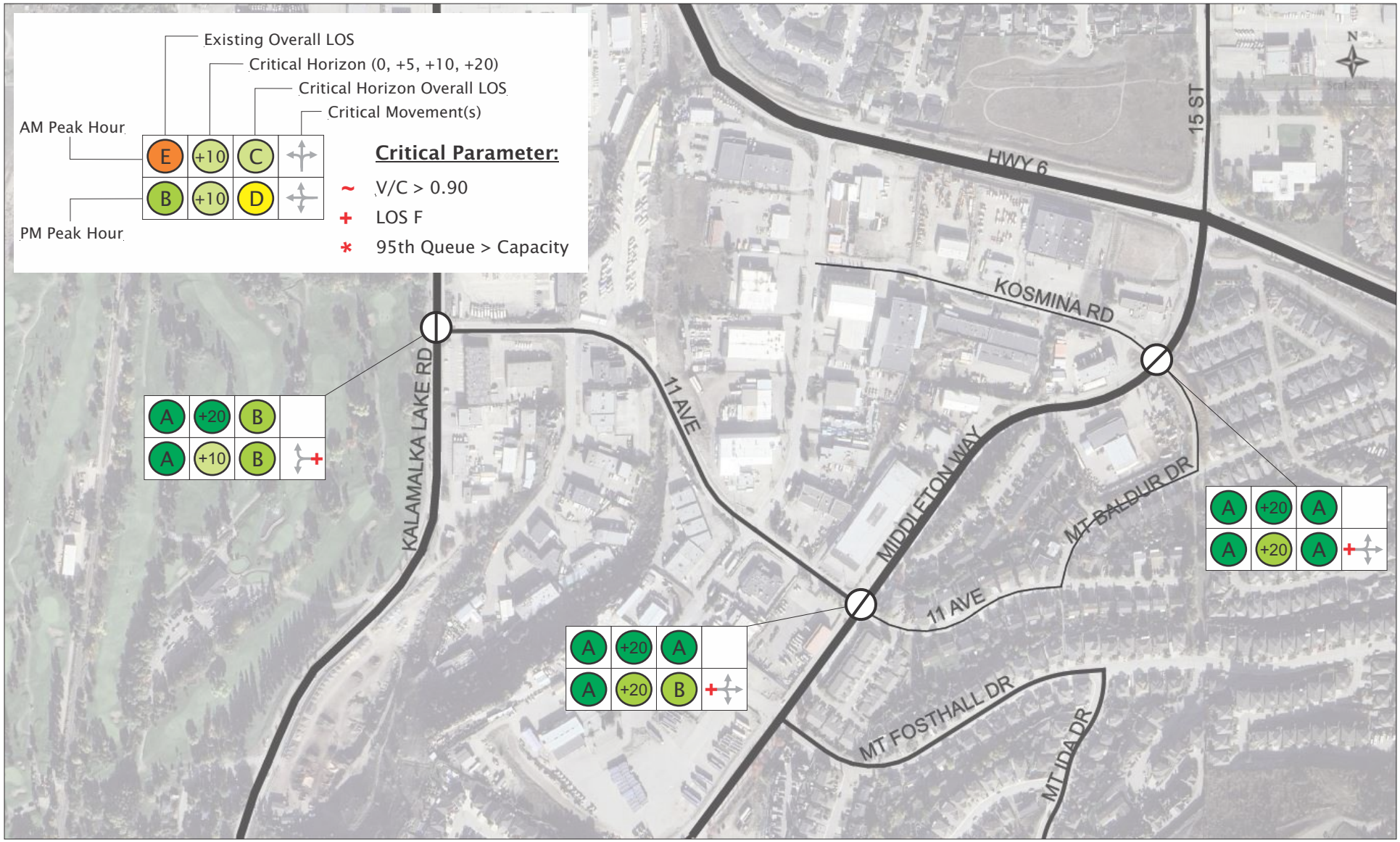

**Exhibit 3.38**

# Traffic Operations Summary - Group 8

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

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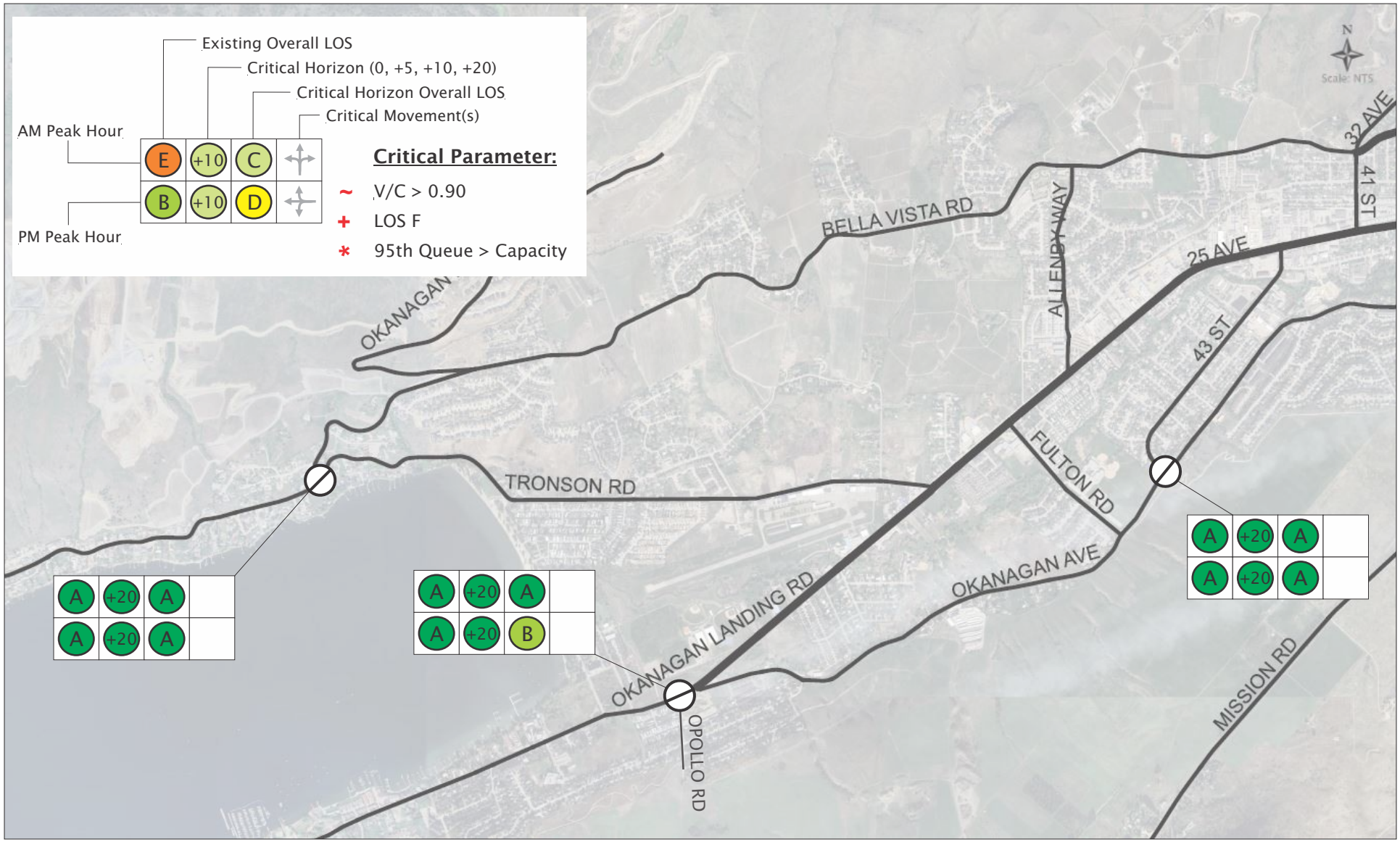

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**Exhibit 3.39**

## Traffic Operations Summary - Group 9

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates




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**Exhibit 3.40**

## Traffic Operations Summary - Group 10

City of Vernon Traffic Modelling Services
07-24-0038 March 2025

bunt & associates

# 4. SAFETY REVIEW

Bunt undertook a high-level safety review of the intersections modelled as part of the City-Wide Traffic Modelling. The safety review evaluated all study intersections to identify key trends and themes across all the intersections within this study.

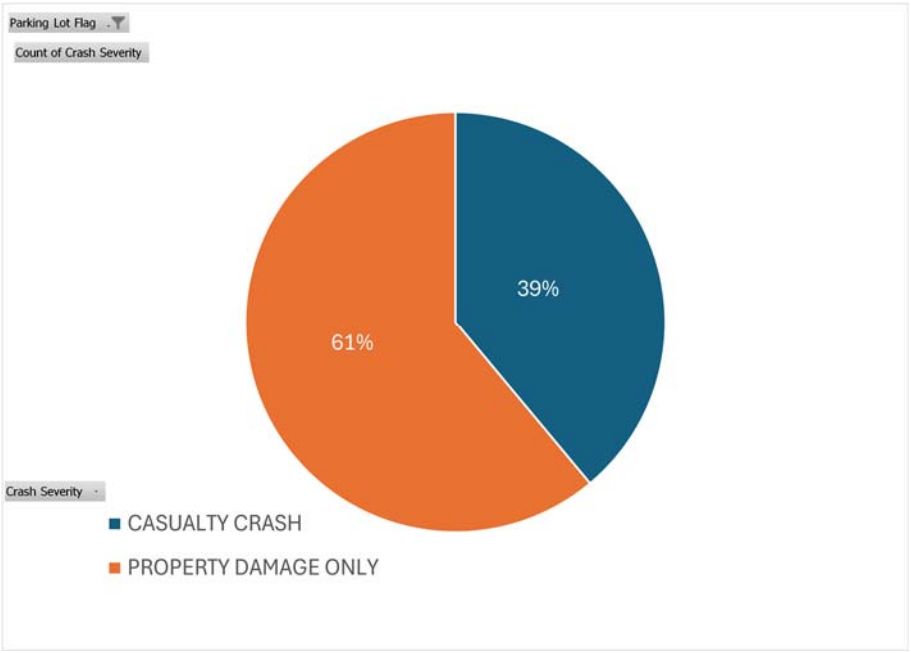
## 4.1 Crash Data

Bunt utilized ICBC crash data from 2019 – 2023 to undertake the safety review. Overall, there were a total of 411 crashes recorded during this time period at the study intersections.

The following figures present key findings in aggregation for all the study intersections:

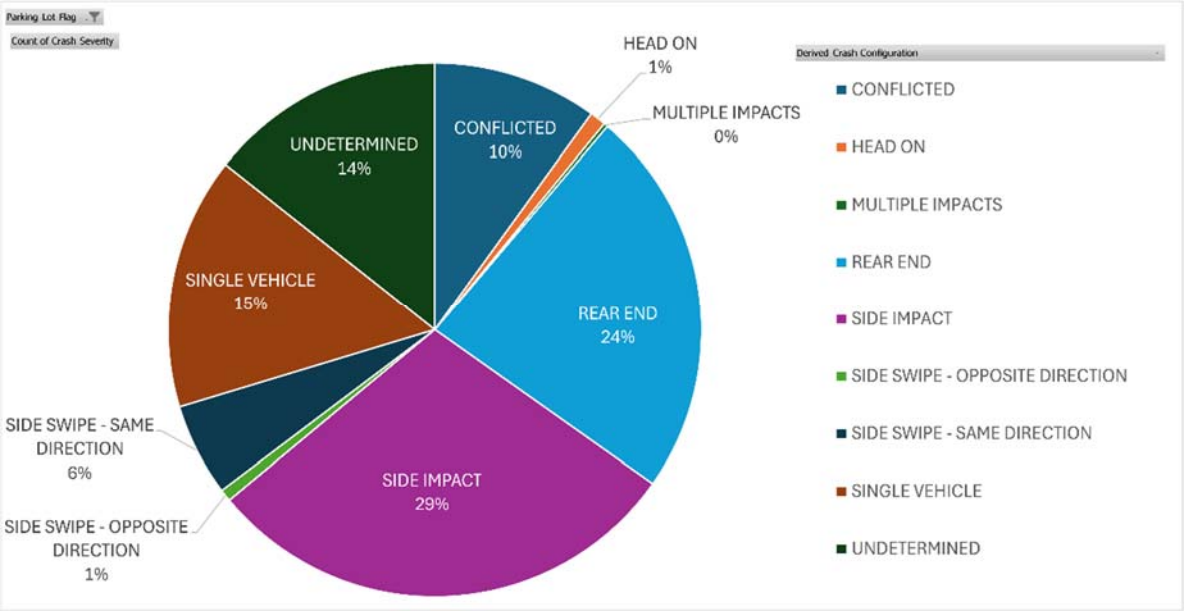
- **Figure 4.1** – Crash Severity
- **Figure 4.2** – Crash Type
- **Figure 4.3** – Month of the Year
- **Figure 4.4** – Day of the Week
- **Figure 4.5** – Time of Day

**Figure 4.1: Total Study Crashes by Crash Severity**




The chart indicates that more property damage crashes have occurred at the study intersections compared to casualty crashes.

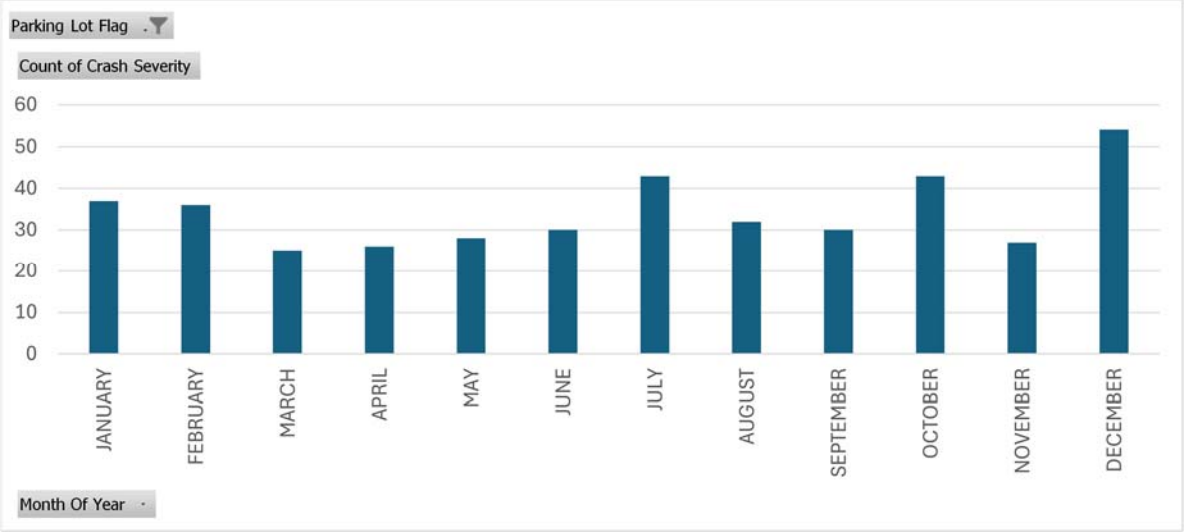
**Figure 4.2: Total Study Crashes by Crash Type**




The chart indicates that the largest type of recorded crash that occurred between 2019 and 2023 has side impact crashes, followed by rear-end crashes.

Side impact crashes indicate that vehicles may be making inappropriate gap selections at intersections. Rear-end crashes generally occur due to the changing of traffic signals, where vehicles stop, and the following vehicle does not realize or is following too closely to stop before hitting the vehicle in front.

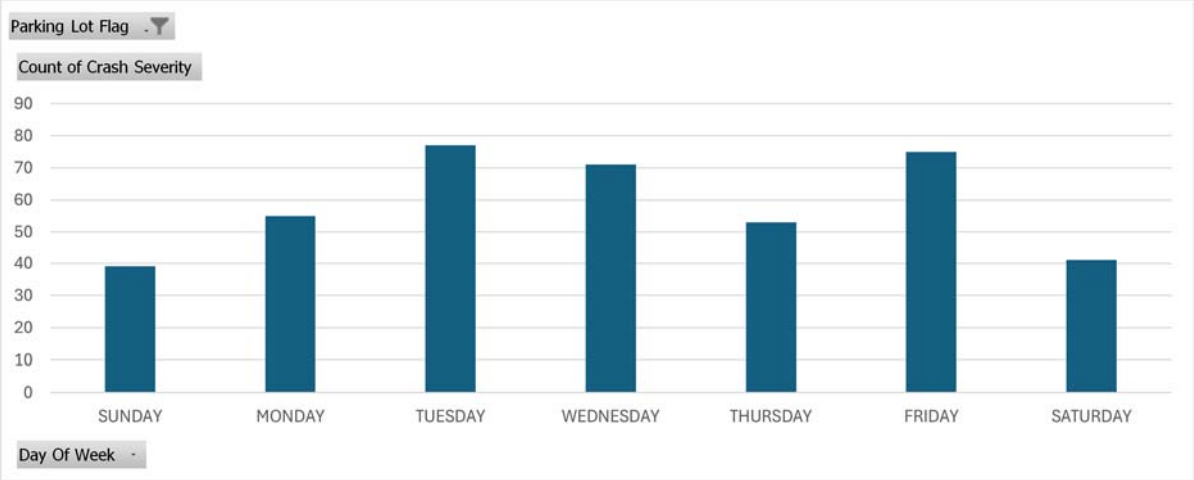
**Figure 4.3 Total Study Crashes by Month of the Year**



The graph presented indicates that there was a spike of crashes recorded during the month of December. This time of year, falls in the winter and is considered a 'holiday period'. It could be that winter road conditions caused an increase of crashes in this month, or that the 'holiday period' has more people driving on the road for shopping or visiting loved ones.

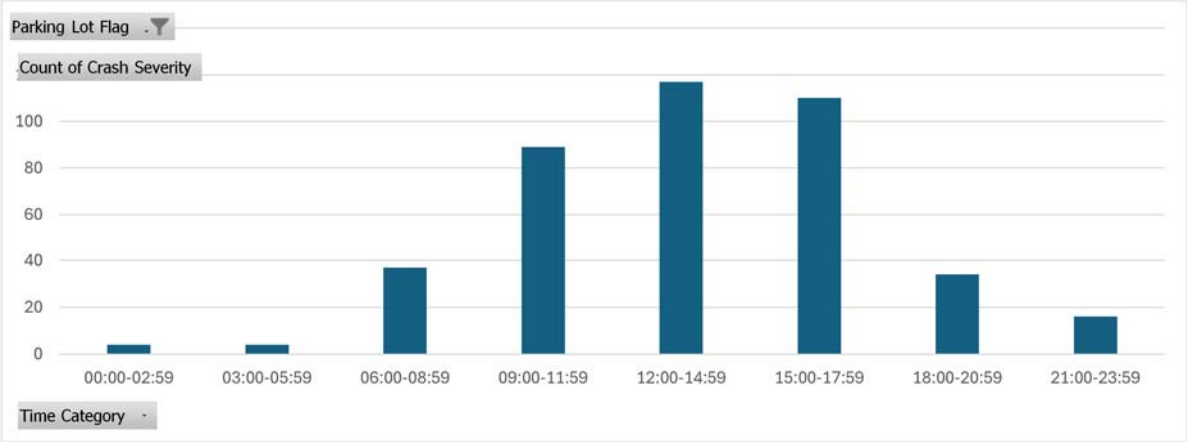
July and October also see a secondary spike. July may be attributed to increased summer traffic volumes, creating a high risk exposure to all road users.

**Figure 4.4 Total Study Crashes by Day of the Week**




The graph shows that most crashes occurred on a Tuesday.

**Figure 4.5 Total Study Crashes by Time of the Day**




The graph shows that most crashes occurred inside of 9am – 6pm, which are considered typical working hours.

In addition to the above findings, Bunt notes that over the 2019-2023 period there were 19 crashes that involved pedestrians and 16 which involved cyclists. The intersections that these vulnerable user crashes occurred at have been outlined in **Table 4.1**.

**Table 4.1: Vulnerable Road Users Crashes Locations**

| PEDESTRIAN CRASHES LOCATIONS | CYCLIST CRASH LOCATIONS |
|---|---|
| 24th Street & 48th Avenue | 24th Street & 48th Avenue (2 crashes) |
| 27th Avenue & 35th Street | 28th Avenue & 30th Street |
| 28th Avenue & 34th Street (2 crashes) | 31st Street & 32nd Avenue |
| 31st Street & 30th Avenue | 32nd Avenue & 29th Street |
| 31st Street & 32nd Avenue (2 crashes) | 32nd Avenue & Bella Vista Road |
| 32nd Avenue & Bella Vista Road | 34th Street & 24th Avenue (3 crashes) |
| 34th Street & 24th Avenue | 34th Street & 31st Avenue |
| 34th Street & 31st Avenue (2 crases) | 37th Street & 30th Avenue (2 crashes) |
| 37th Street &30th Avenue | 39th Avenue & 33rd Street |
| 39th Avenue & 33rd Street (3 crashes) | 43rd Avenue & 34th Street |
| 43rd Avenue &33rd Street | Kalamalka Lake Road & 11th Avenue |
| Middleton Road & Kosmina Road (2 crashes) | Okanagan Avenue & 34th Street |
| Okanagan Avenue & 34th Street | |

# 5. CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Conclusions

### 5.1.1 Study Overview

- The City of Vernon is updating their OCP and TP to support the vision for the community's long-term growth and identity.
- Within these publications, the City is planning to continue expanding their transportation networks for all travel modes (i.e., vehicle, public transit, active transportation, etc.) to support safe, sustainable, and transportation options for users of all ages and abilities.
- To help inform the OCP and TP updates, the City commissioned Bunt to undertake a comprehensive traffic modelling study for 40 select intersections to investigate upgrade requirements for supporting future transportation demands.

### 5.1.2 Methodology

- The traffic modelling and analysis was conducted for the AM and PM peak hours representing typical design conditions utilizing the HCM 2000 Edition analysis methodology.
- The modelling and analysis was conducted for the Existing Conditions, +5 Year Horizon (2030, +10 Year Horizon (2035), and +20 Year Horizon (2045).
- Traffic volumes were forecast for the future horizons utilizing a 1.5% linear traffic growth rate per annum following population growth metrics from the City's OCP.
- Traffic analysis was conducted in a stepwise manner identifying intersections exceeding performance thresholds at each horizon.
- Mitigation strategies were developed for the horizon year for which the intersection performance exceeded acceptable standards. The mitigations were then assumed to be implemented for any following horizon years.

### 5.1.3 Mitigation Measures

Mitigation strategies were developed for intersections exceeding performance thresholds. Multiple mitigation strategies were considered based on engineering judgement, the traffic modelling, and on-site field observations, including:

- Upgrading to a full traffic signal.
- Upgrading to a roundabout.

- Upgrading pedestrian crossing controls including Rectangular Rapid Flashing Beacons (RRFBs), Overhead of side-mounted flashers, of pedestrian actuated traffic signals.
- Turn controls (i.e., restrictions or prohibition of movements).
- Additional signage, pavement markings, and/or other traffic control devices.

In summary, the recommended mitigations strategies for the study intersections include:

- 1 Signal or roundabout upgrade
- 5 roundabout upgrades
- 6 traffic signal upgrades
- 4 signal optimization and left turn storage extensions
- 5 turn control or movement prohibitions
- Additional optional upgrades to support traffic flow and pedestrian safety.

### 5.1.4 Crash Data Review

ICBC crash data for 2019-2023 for the 40 study intersections was reviewed in aggregation to evaluate:

- Crash severity
- Crash Frequency
- Crash Type
- Active Transportation Related Crashes
- Crash Time of Day / Day of Week

Key findings included:

- 39% of crashes were casualty crashes
- Side impact and rear end crashes were the most prevalent types at 29% and 24% respectively.
- Crashes occurred most frequently on Tuesday and Friday.
- Crashes most frequently occurred in December, October, or July. This may be attributed to higher exposure (traffic volumes) during the summer months or winter conditions in December.
- 19 crashes occurred involving active transportation users. Of note:

- 34th Street & 24th Street which is a two-way stop controlled intersection with a signed and marked pedestrian crosswalk had the most cyclist crashes (3).
- 39th Street & 33rd Street which is a two-way stop controlled intersection with signed and marked pedestrian crosswalks had the most pedestrian crashes (3).

## 5.2 Recommended Upgrades Summary

Bunt's recommended transportation upgrades and corresponding horizon years are summarized in **Table 5.1**.

**Table 5.1: Summary of Recommended Transportation Upgrades**

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 3 | 41 Street & 25 Avenue *(Signal)* | Implement traffic signage and pavement markings to restrict the south leg's movements to inbound only | 2025 |
| | | Optimize signal timing plan | 2035 |
| | | Increase the eastbound left storage lane to 95 meters | 2045 |
| 7 | 34 Street & 24 Avenue *(EB/WB Stop)* | Implement turn controls and concrete median to restrict intersection to right-in/right-out.<br><br>Optional Addition: Install ladder pedestrian crosswalk markings for the north leg crosswalk.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons for the north leg crossing. | 2025 |
| 8 | 34 Street & Okanagan Avenue/23 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2035 |
| 11 | 41 Street & 27 Avenue *(EB/WB Stop)* | Upgrade to roundabout | 2025 |
| 13 | 41 Street/32 Avenue & Bella Vista Road/30 Avenue *(Signal)* | Optimize signal timing plan<br>Increase westbound left turn storage lane to 75 meters | 2025 |
| | | Increase westbound left turn storage lane to 105 meters | 2030 |
| | | Increase westbound left turn storage lane to 130 meters<br>Increase northbound right turn storage lane to 50 meters | 2035 |
| | | Upgrade to 95-meter dual-left turn westbound lanes<br>Increase northbound right turn storage lane to 85 meters | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 14 | 37 Street & 30 Avenue *(Signal)* | Install concrete median along 30 Avenue extending from 37 Street to just beyond 38 Street and implement turn controls such that 30 Avenue & 38 Street is restricted to right-in right-out movements only. | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 115 meters | 2025 |
| | | Optimize signal timing plan<br>Increase eastbound left turn storage lane to 140 meters | 2030 |
| | | Upgrade to roundabout | 2035 |
| 16 | 34 Street & 43 Avenue *(NB/SB Stop)* | Monitor intersection traffic operations as development in the area occurs and review applicability of signalization upgrades.<br><br>With future redevelopment potential of the Vernon Square Mall, consider providing bicycle facilities (bike lanes, protected bicycle tacks, etc.) along 34 Street north of 43 Avenue connecting to 32 Street/Highway 97. | 2035 |
| 17 | 33 Street/Driveway & 43 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement | 2025 |
| 19 | Pleasant Valley Road & 46 Avenue *(EB/WB Stop)* | Option 1: Upgrade to traffic signal. Note, this option is preferred as there are less land acquisition and regrading requirements.<br><br>Option 2: Upgrade to roundabout | 2045 |
| 20 | 24 Street/Driveway & 48 Avenue *(NB/SB Stop)* | Upgrade to full traffic signal | 2030 |
| 21 | 24 Street/Driveway & 58 Avenue *(NB/SB Stop)* | Upgrade to roundabout | 2025 |
| 24 | 33 Street & 39 Avenue *(NB/SB Stop)* | Option 1: Upgrade to signal<br>Option 2: Upgrade to roundabout | 2025 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 30 meters | 2035 |
| | | For Option 1: Optimize signal timing plan<br>Increase westbound left storage lane to 45 meters | 2045 |
| 25 | 25 Street & 39 Avenue *(NB Stop)* | Monitor traffic operations as delays are approaching acceptable thresholds. | 2030 |
| 26 | 31 Street & 32 Avenue *(NB/SB Stop)* | Install concrete median to restrict vehicle movements to right-in/right-out including a pedestrian refuge for the north-south crosswalks.<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacons (RRFBs) for the north-south crosswalks.<br><br>Optional Addition: Update zebra pedestrian crosswalk markings to ladder crosswalk marking pattern. | 2030 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 29 | 27 Street & 25 Avenue *(WB Stop)* | Close the east leg of the intersection on 25 Avenue and modify it to cul-de-sac | 2045 |
| 30 | 27 Street & 28 Avenue *(Ped Signal)* | Optimize signal timing plan | 2025 |
| | | Upgrade to a full traffic signal | 2045 |
| 31 | Middleton Way & Kosmina Road *(EB/WB Stop)* | Implement turn controls to restrict intersection to right-in/right-out with a concrete median on Middleton Way. | 2030 |
| | | Upgrade to traffic signal | 2045 |
| 32 | Middleton Way & 11 Avenue *(EB/WB Stop)* | Upgrade to traffic signal | 2045 |
| 33 | Kalamalka Lake Road & 11 Avenue *(WB Stop)* | Upgrade to traffic signal | 2035 |
| 34 | 34 Street & 31 Avenue *(EB/WB Stop)* | Install turn controls and concrete median along 34 Street at this intersection to restrict movements to right-in/right-out.<br><br>Optional Addition: Install concrete curb extensions at each intersection corner<br><br>Optional Addition: Install ladder pedestrian crosswalk markings<br><br>Optional Addition: Install Rectangular Rapid Flashing Beacon pedestrian control for the north and south leg crosswalks. | 2030 |
| 35 | 30 Street & 31 Avenue *(NB/SB Stop)* | Continue monitoring this location for transit safety.<br><br>While traffic volumes may remain low, the primary vehicles exiting are buses and the intersection functions in a unique way.<br><br>Ongoing monitoring may should review potential for future transit station upgrades and ensure the design continues to meet operational and safety needs for transit vehicles and users. | - |
| 36 | 35 Street/Driveway & 30 Avenue *(NB/SB Stop)* | Implement turn controls prohibiting northbound left turn and through movement and southbound left turn and through movement<br><br>Install a concrete median along 30 Avenue at this intersection to support the right-in/right-out turn controls that can also accommodate semi-truck vehicle access to the Safeway grocery store to the north. | 2045 |

| INT ID NUMBER | INTERSECTION (EXISTING CONTROL) | RECOMMENDED IMPROVEMENT | HORIZON YEAR IMPLEMENTATION |
|---|---|---|---|
| 37 | 33 Street & 30 Avenue *(NB/SB Stop)* | Option 1: Upgrade to full traffic signal.<br><br>Option 2: Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2045 |
| 38 | 31 Street & 30 Avenue *(NB/SB Stop)* | Implement turn controls and a concrete median along 30 Avenue to convert intersection to a right-in/right-out configuration. The concrete median should provide pedestrian refuge areas for the north-south crosswalks.<br><br>Optional Addition: Install ladder crosswalk markings and Rectangular Rapid Flashing Beacons (RRFBs) to promote enhanced visibility of the north-south crosswalks. | 2030 |
| 39 | 34 Street & 28 Avenue *(EB/WB Stop)* | Implement turn controls prohibiting westbound left turn and through movement | 2045 |
| | | | |

# APPENDIX A

## Traffic Data

*The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.*

# APPENDIX B

## Synchro Reports

*The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.*

# APPENDIX C

## Site Photos

*The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.*

# APPENDIX D

## TAC Signal Warrant Analysis

*The attached information is provided to support the agency's review process and shall not be distributed to other parties without written consent from Bunt & Associates Engineering Ltd.*

# APPENDIX E

## SIDRA Reports