

# Final Report



## Town of Raymond

### Transportation Master Plan

March 2009



#### **CONFIDENTIALITY AND © COPYRIGHT**

This document is for the sole use of the addressee and Associated Engineering Alberta Ltd. The document contains proprietary and confidential information that shall not be reproduced in any manner or disclosed to or discussed with any other parties without the express written permission of Associated Engineering Alberta Ltd. Information in this document is to be considered the intellectual property of Associated Engineering Alberta Ltd. in accordance with Canadian copyright law.

This report was prepared by Associated Engineering Alberta Ltd. for the account of Town of Raymond. The material in it reflects Associated Engineering Alberta Ltd.'s best judgement, in light of the information available to it, at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Associated Engineering Alberta Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

# Certification Page

Town of Raymond

Transportation Master Plan  
March 2009



## PERMIT TO PRACTICE

ASSOCIATED ENGINEERING ALBERTA LTD.

Signature *Rohit Vij*

Date March 24, 2009

**PERMIT NUMBER: P 3979**

The Association of Professional Engineers,  
Geologists and Geophysicists of Alberta



Associated  
Engineering

GLOBAL PERSPECTIVE.  
LOCAL FOCUS.



## Executive Summary

### 1 INTRODUCTION

The Town of Raymond is located approximately 34 km south of Alberta's fourth largest city, Lethbridge, in the County of Warner. Over the past couple of years, the Town has experienced a large population growth, from 3200 residents in 2005 to 3363 residents in 2007. As a result of the growth, the Town has some immediate and future transportation needs that are required to address urgent development concerns.

Associated Engineering (AE) was retained by the Town of Raymond to develop the Transportation Master Plan (TMP) for the Town. The plan will address immediate and long term transportation issues indicated by the Town and establish a transportation road network plan for the future expansion of Raymond. These immediate and long term issues are listed below.

#### 1.1 Immediate Concerns

- Definition of road network where new development is occurring within the existing Town boundary
- Signalization requirements at the intersections of Highway 52 (200 N) and 200 W, Highway 52 and Highway 845 (Broadway), Broadway and 100 N, Broadway and Church Avenue, and 100 N and 200 W
- Establish a unit cost estimate for construction of newly proposed roadways within the existing Town boundary
- Pedestrian safety at the school site located along Highway 52.

#### 1.2 Long Term Concerns

- Definition of road network for future expansion of the Town boundary
- Future requirement for extending 400 W from Highway 52 to 400 S
- Future requirement for extending 300 S from 100 W to Broadway.

The TMP was completed using the following methodology:

- Data collection and review
- Establish time horizons for completing the capacity analysis
- Develop the functional classification (Road Network Plan) for the existing and future road networks
- Determine the study intersections for completing the capacity analysis
- Generate background, site and total traffic forecasts for the established time horizons

- Distribute and assign traffic forecasts to the study intersections on the existing/future road network for the established time horizons
- Analyze the capacity of the study intersections within the Town boundaries for the established time horizons
- Complete a traffic signal warrant for the intersection of Highway 52 and Broadway
- Develop a unit cost estimate for construction of new roadway
- Report documentation.

The capacity analyses were completed using the afternoon (pm) peak hour traffic volumes and was completed for three different time horizons, which include:

- Existing (2008) horizon
- Future short-term (2018) horizon
- Future long-term (2028) horizon.

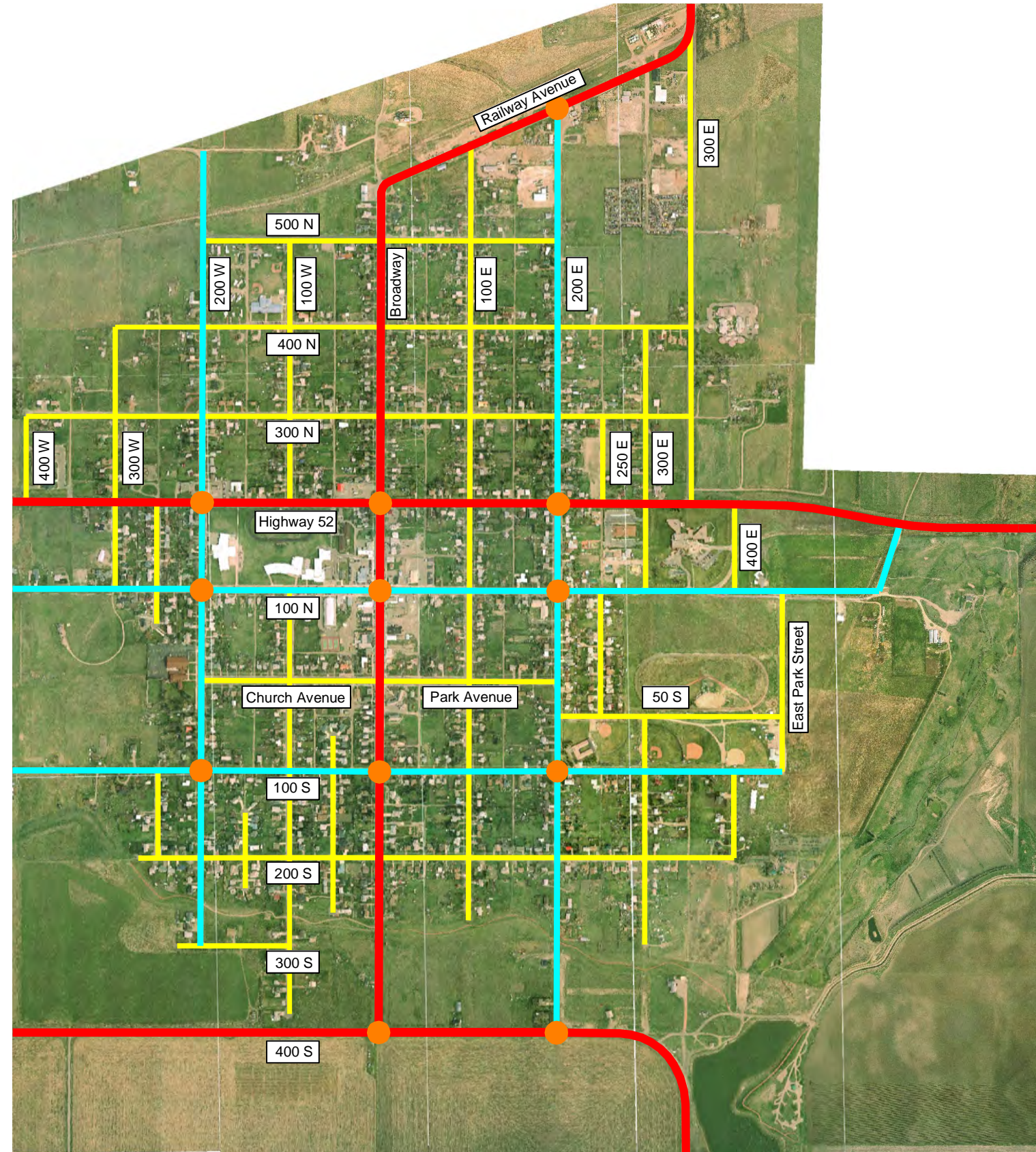
## 2 ANALYSIS

With consideration for the existing land use and the proposed developments indicated by the Town, AE established the road network for all the time horizons. The roadway networks were then classified into the following road classifications with consideration for function and connectivity: public lanes (alleys), local streets, collector streets and arterial streets. Figure E-1, E-2 and E-3 present the road network plan and road classifications for the 2008, 2018 and 2028 horizons respectively.

The road network plans show the study intersections that were assessed in the capacity analysis for each time horizon. For the purpose of the traffic assessment a minimum overall intersection LOS C and a minimum LOS D for each movement at an intersection was required. The level of service definitions for an unsignalized intersection is included in Appendix C.

Existing traffic volumes for the 2008 horizon were derived by applying a calculated growth rate of 1.6% to traffic data obtained from either Alberta Transportation (AT) or from traffic counts conducted by the Town. Traffic volumes for the future 2018 and 2028 horizon were obtained by applying the 1.6% growth rate to the 2008 volumes and combining with anticipated development traffic. The development traffic was estimated using a three-step process which involved trip generation, trip distribution and trip assignment.

Table E-1 presents an overview of the capacity analysis results completed on the existing 2008 traffic volumes and the 2018 and 2028 background and development traffic volumes, for the pm peak hour. A detailed summary has been included in Appendix D of the report.



LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009
	INITIAL S.L.

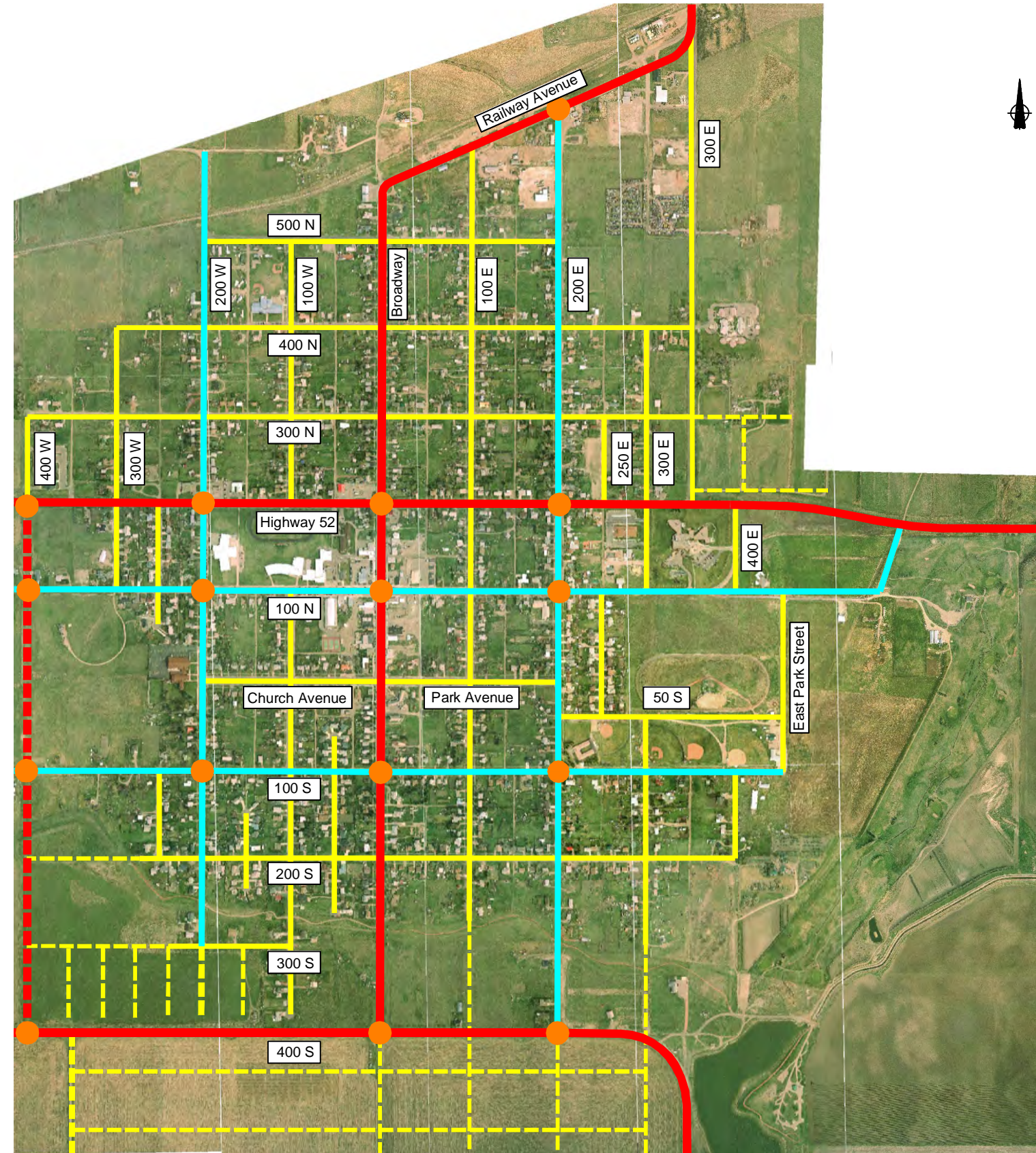
FIGURE E-1  
2008 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET

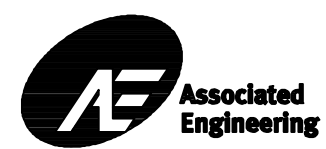






LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



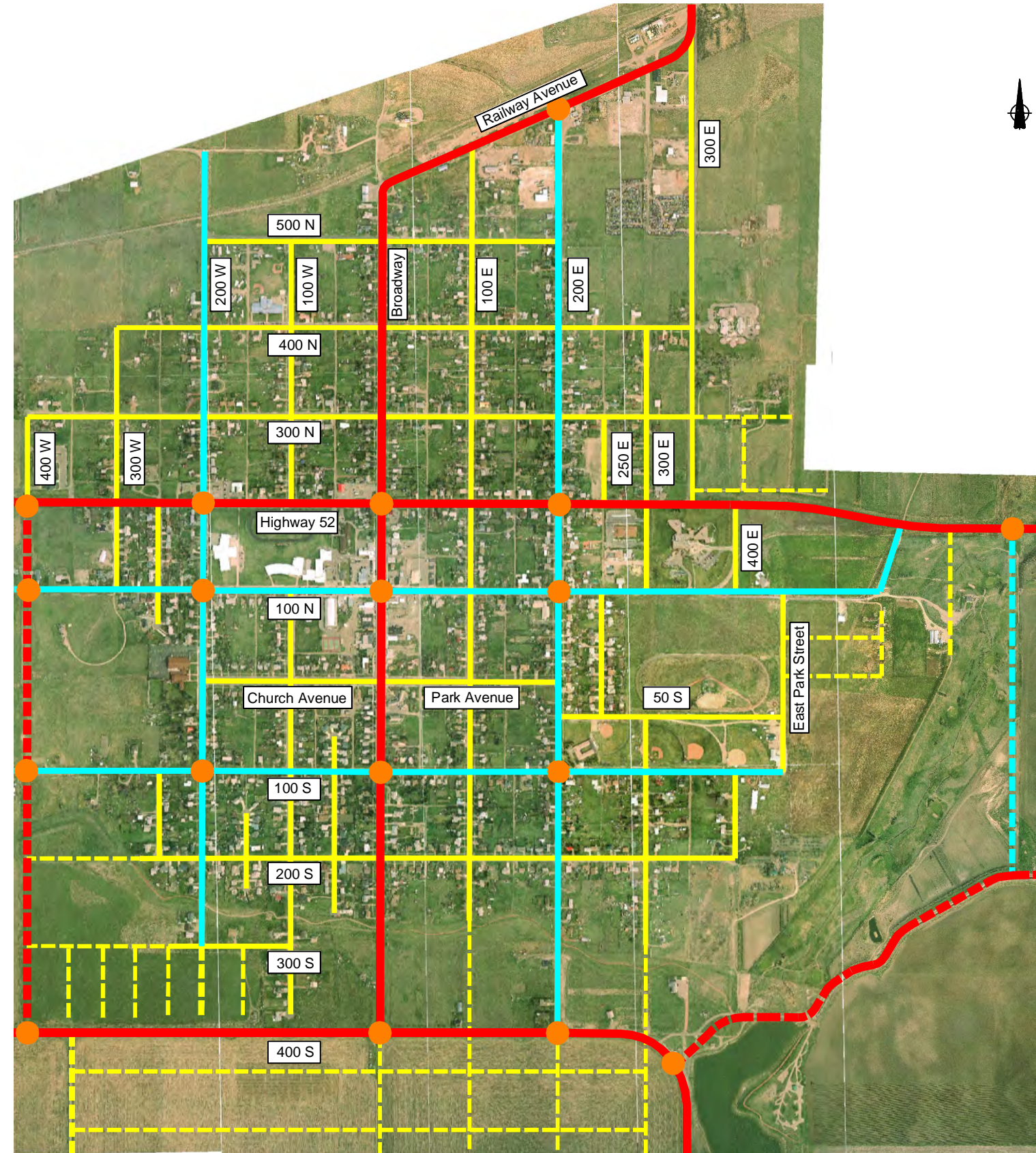
PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009 INITIAL

FIGURE E-2  
2018 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

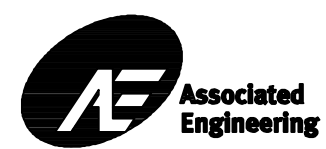
DRAWING NUMBER	REV. NO.	SHEET





LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009 INITIAL

FIGURE E-3  
2028 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



**Table E-1  
Capacity Analysis Results – All Horizons, PM Peak Hour**

Intersection	2008 Existing Traffic			2018 (Background & Development Traffic)			2028 (Background & Development Traffic)		
	LOS	Max V/C Ratio	Delay (s)	LOS	Max V/C Ratio	Delay (s)	LOS	Max V/C Ratio	Delay (s)
Railway Avenue & 200 E	A	0.04	3.6	A	0.11	4.1	A	0.20	4.5
Highway 52 & 400 W	n/a			A	0.03	1.5	A	0.05	1.4
Highway 52 & 200 W	A	0.18	6.0	A	0.36	7.0	A	0.70	13.0
Highway 52 & Broadway	A	0.20	6.3	A	0.41	8.7	D	1.37	81.0
Highway 52 & 200 E	A	0.10	6.0	A	0.23	7.0	A	0.52	8.5
Highway 52 & Development #10 Access	n/a			n/a			A	0.09	1.9
100 N & 400 W	n/a			A	0.02	1.9	A	0.02	1.9
100 N & 200 W	A	0.09	7.6	A	0.15	8.0	A	0.22	8.6
100 N & Broadway	A	0.09	3.7	A	0.16	3.6	B	0.28	4.3
100 N & 200 E	A	0.07	7.4	A	0.16	7.9	A	0.23	8.5
100 S & 400 W	n/a			A	0.07	6.0	A	0.09	6.0
100 S & 200 W	A	0.05	7.1	A	0.08	7.4	A	0.13	7.7

Intersection	2008 Existing Traffic			2018 (Background & Development Traffic)			2028 (Background & Development Traffic)		
	LOS	Max V/C Ratio	Delay (s)	LOS	Max V/C Ratio	Delay (s)	LOS	Max V/C Ratio	Delay (s)
100 S & Broadway	A	0.06	4.7	A	0.10	3.7	A	0.16	4.0
100 S & 200 E	A	0.05	7.2	A	0.13	7.5	A	0.19	8.0
400 S & 400 W	n/a			A	0.02	1.8	A	0.03	1.3
400 S & Broadway	A	0.02	4.6	A	0.08	4.4	A	0.15	3.9
400 S & 200 E	A	0.01	5.3	A	0.02	6.0	A	0.07	3.1
400 S & Development #10 Access	n/a			n/a			A	0.00	-

**2.1 Existing 2008 Traffic**

All the 2008 study intersections operate well above the minimum LOS threshold required. Every intersection operates at an overall intersection LOS A and all movements across the entire road network operate at LOS B or higher.

**2.2 2018 Background and Development Traffic**

Even with additional traffic on the 2018 road network, all the study intersections operate well above the minimum LOS required with an overall intersection LOS A and all movements across the 2018 road network operate at LOS C or higher.

### 2.3 2028 Background and Development Traffic

With the exception of Highway 52 and Broadway, all the study intersections continue to operate above the minimum LOS required despite the additional traffic. Highway 52 and Broadway operates at an overall intersection LOS D. This exceeds the minimum LOS threshold and indicates that improvements are required at the intersection.

Most intersection movements operate at LOS D or higher, except at Highway 52 and 200 W, and Highway 52 and Broadway. Movements at these intersections experience LOS E and LOS F respectively.

## 3 RECOMMENDED IMPROVEMENTS

The 2018 road network indicated in Figure E-2 is sufficient to accommodate the traffic volumes anticipated for that horizon. Therefore, no roadway improvements are required above and beyond the road network presented.

During the 2028 horizon, a separate northbound right turn lane is required at Highway 52 and 200 W, and a change in traffic control to a four-way stop-control is required at Highway 52 and Broadway. The provision of a northbound right-turn lane at Highway 52 and 200 W will improve the LOS on the northbound approach to LOS D from LOS E and changing the traffic control to a four-way stop control at Highway 52 and 200 W will improve the intersection so that all movements operate at LOS D or higher.

One of the immediate transportation issues identified by the Town was the need for signalization at the intersections of Highway 52 and 200 W, Highway 52 and Broadway, Broadway and 100 N, Broadway and Church Avenue, and 100 N and 200 W. To evaluate the need to provide signalization at the intersections, the traffic signal warrant from the Manual on Uniform Traffic Control Devices (MUTCD) was completed. Table E-1 presents the results of the signal warrant for the different time horizons.

**Table E-2  
Traffic Signal Warrant Results**

<b>Intersection</b>	<b>Existing 2008 Traffic</b>	<b>2018 (Background &amp; Development Traffic)</b>	<b>2028 (Background &amp; Development Traffic)</b>
Highway 52 and 200 W	-4.69 (Not warranted)	6.62 (Not warranted)	23.68 (Not warranted)
Highway 52 and Broadway	0.59 (Not warranted)	14.39 (Not warranted)	36.15 (Not warranted)
Broadway and 100 N	-6.51 (Not warranted)	5.23 (Not warranted)	14.80 (Not warranted)
Broadway and Church Avenue	-4.72 (Not warranted)	n/a	n/a
100 N and 200 W	-10.81 (Not warranted)	-5.55 (Not warranted)	0.82 (Not warranted)

The results of the signal warrants indicate that the traffic volumes at the above intersections do not warrant signalization in the 2008, 2018 or 2028 time horizons.

AE recommends that the extension of 400 W, as shown in Figure E-2 and E-3, be implemented. 400 W is located at the Town's west end and would serve as an important link to the future developments planned within the Town. Many of the proposed developments are located in the south end, near 400 S. The extension of 400 W to connect with 400 S would provide an alternative north-south route to these developments, reducing the trips that must pass through the Town and through the residential communities. Inherently, the 400 S extension could become a vital link by providing a more direct, quicker route for commuters heading to the new developments.

AE does not recommend the extension of 300 S between 100 W and Broadway. The results for the capacity analysis indicate that the surrounding intersections continue to operate well even without the extension; therefore, AE does not recommend that the Town implement the 300 S extension. The extension of 300 S should be evaluated again in the future should the traffic patterns within the area change.

#### **4 SCHOOL SAFETY**

To improve the pedestrian safety at the study intersections within the school zone, regular communications between school zones officials, City officials, parents, law enforcement officials and school transportation personnel are required.



## 5 COST ESTIMATE

Table E-3 presents the cost estimate for the new road construction in the 2018 and 2028 horizons. These prices reflect 2008 costs.

**Table E-3  
Cost Estimate**

<b>Construction Item</b>	<b>2018 Horizon</b>	<b>2028 Horizon</b>
Arterial Roadway	\$ 1,316,929.58	\$1,098,223.53
Collector Roadway	\$ 0.00	\$ 856,989.81
Local Roadway	\$ 6,331,514.97	\$ 865,287.15
Contingency	\$ 1,147,266.68	\$ 423,075.07
Engineering Cost	\$ 1,319,356.69	\$ 486,536.34
GST	\$ 505,753.40	\$ 186,505.60
<b>Total</b>	<b>\$10,620,821.32</b>	<b>\$3,916,617.51</b>

# Table of Contents

<b>SECTION</b>	<b>PAGE NO.</b>
<b>Executive Summary</b>	<b>i</b>
<b>Table of Contents</b>	<b>xii</b>
<b>List of Tables</b>	<b>xiv</b>
<b>List of Figures</b>	<b>xv</b>
<b>1 Introduction</b>	<b>1-1</b>
1.1 Background	1-1
1.2 Study Objective	1-1
1.3 Study Methodology	1-2
1.4 Analysis Horizons	1-2
<b>2 Existing Conditions</b>	<b>2-1</b>
2.1 Land Use	2-1
2.2 Road Network	2-1
<b>3 Future Conditions</b>	<b>3-1</b>
3.1 Land Use	3-1
3.2 Road Network	3-5
<b>4 Background Traffic</b>	<b>4-1</b>
4.1 2008 Horizon	4-1
4.2 2018 Horizon	4-3
4.3 2028 Horizon	4-3
<b>5 Development Traffic</b>	<b>5-1</b>
5.1 Trip Generation	5-1
5.2 Trip Distribution	5-1
5.3 Trip Assignment	5-1
<b>6 Total Traffic</b>	<b>6-1</b>

<b>7</b>	<b>Traffic Analysis</b>	<b>7-1</b>
7.1	Existing 2008 Traffic	7-1
7.2	2018 Background and Development Traffic	7-5
7.3	2028 Background and Development Traffic	7-9
<b>8</b>	<b>Recommended Improvements</b>	<b>8-1</b>
8.1	2018 Horizon	8-1
8.2	2028 Horizon	8-1
<b>9</b>	<b>Transportation Issues</b>	<b>9-1</b>
9.1	Traffic Signalization	9-1
9.2	Extension of 400 W and 300 S	9-2
<b>10</b>	<b>Cost Estimate</b>	<b>10-1</b>
<b>11</b>	<b>School Safety</b>	<b>11-1</b>
<b>12</b>	<b>Recommendations and Conclusions</b>	<b>12-1</b>
	<b>Appendix A - Traffic Counts</b>	
	<b>Appendix B - Existing Traffic Controls</b>	
	<b>Appendix C - Level of Service Definitions for Unsignalized Intersections</b>	
	<b>Appendix D - Synchro Capacity Analysis Results</b>	
	<b>Appendix E - Traffic Signal Warrants</b>	
	<b>Appendix F - Cost Estimate</b>	

## List of Tables

	<b>PAGE NO.</b>	
<b>Table E-1</b>	<b>Capacity Analysis Results – All Horizons, PM Peak Hour</b>	<b>vii</b>
<b>Table E-2</b>	<b>Traffic Signal Warrant Results</b>	<b>x</b>
<b>Table E-3</b>	<b>Cost Estimate</b>	<b>xi</b>
<b>Table 2-1</b>	<b>Raymond Municipal Standards – Street Classification</b>	<b>2-1</b>
<b>Table 2-2</b>	<b>TAC Urban Road Classifications</b>	<b>2-4</b>
<b>Table 4-1</b>	<b>Annual Growth Rate Calculation along Highway 52</b>	<b>4-2</b>
<b>Table 5-1</b>	<b>Trip Generation for Proposed Developments – 2018 Horizon</b>	<b>5-2</b>
<b>Table 5-2</b>	<b>Trip Generation for Proposed Developments - 2028 Horizon</b>	<b>5-3</b>
<b>Table 7-1</b>	<b>Existing 2008 Traffic Volumes – PM Peak Hour</b>	<b>7-4</b>
<b>Table 7-2</b>	<b>2018 Background and Development Traffic Volumes – PM Peak Hour</b>	<b>7-8</b>
<b>Table 7-3</b>	<b>2028 Background and Development Traffic Volumes – PM Peak Hour</b>	<b>7-12</b>
<b>Table 9-1</b>	<b>Traffic Signal Warrant Results</b>	<b>9-2</b>
<b>Table 10-1</b>	<b>AIT Unit Price – Southern Region – December 2008</b>	<b>10-1</b>
<b>Table 10-2</b>	<b>Cost Estimate</b>	<b>10-2</b>

## List of Figures

	<b>PAGE NO.</b>	
Figure E-1	Road Network Plan – 2008 Horizon	iii
Figure E-2	Road Network Plan – 2018 Horizon	iv
Figure E-3	Road Network Plan – 2028 Horizon	v
Figure 2-1	Land Use Plan	2-2
Figure 2-2	2008 Road Network Plan	2-6
Figure 3-1	Future Land Annexation	3-2
Figure 3-2	Proposed Developments - 2018 Horizon	3-3
Figure 3-3	Proposed Developments - 2028 Horizon	3-4
Figure 3-4	2018 Road Network and Classification	3-7
Figure 3-5	2028 Road Network and Classification	3-8
Figure 4-1	2008 Traffic Volumes - PM Peak	4-4
Figure 4-2	2018 Background Traffic Volumes - PM Peak	4-5
Figure 4-3	2028 Background Traffic Volumes - PM Peak	4-6
Figure 5-1	Development Traffic Volumes - 2018 Horizon	5-4
Figure 5-2	Development Traffic Volumes - 2028 Horizon	5-5
Figure 6-1	Total Traffic Volumes - 2018 Horizon	6-2
Figure 6-2	Total Traffic Volumes - 2028 Horizon	6-3



# 1 Introduction

## 1.1 BACKGROUND

The Town of Raymond is located approximately 34 km south of Alberta's fourth largest city, Lethbridge, in the County of Warner. Over the past couple of years, the Town has experienced a large population growth, from 3200 residents in 2005 to 3363 residents in 2007. The Town's growth has identified the need to update the existing Municipal Development Plan (MDP). The MDP establishes a framework and direction for a Town's future land development and redevelopment decisions. The updated MDP will account for a future population horizon of approximately 15000. A Transportation Master Plan (TMP) is typically completed to complement the MDP by addressing the transportation needs of the proposed developments discussed in the MDP.

Associated Engineering (AE) was retained to develop the Transportation Master Plan (TMP) for the Town. The updated MDP was not available to complete the TMP study; therefore, the Town provided AE with an explicit list of the future developments anticipated within the existing and future Town boundaries. The TMP was limited to immediate and long term transportation issues indicated by the Town and does not represent a comprehensive analysis of transportation issues and future development directions.

## 1.2 STUDY OBJECTIVE

The main objective for the study was to develop a TMP which clearly defines the Town's transportation road network within the existing and future Town boundaries. The TMP will act as a coordination tool for the Town to ensure that new developments within the Town will not compromise the functionality of the road network.

As part of the study, AE will address the immediate and long term transportation issues indicated by the Town. These immediate and long term issues are listed below:

### 1.2.1 Immediate Concerns

- Definition of road network where new development is occurring within the existing Town boundary
- Signalization requirements at the intersections of Highway 52 (200 N) and 200 W, Highway 52 and Highway 845 (Broadway), Broadway and 100 N, Broadway and Church Avenue, and 100 N and 200 W
- Establish a unit cost estimate for construction of newly proposed roadways within the existing Town boundary
- Pedestrian safety at the school site located along Highway 52.

### 1.2.2 Long Term Concerns

- Definition of road network for future expansion of the Town boundary
- Future requirement for extending 400 W from Highway 52 to 400 S
- Future requirement for extending 300 S from 100 W to Broadway.

### **1.3 STUDY METHODOLOGY**

The TMP was completed using the following methodology:

- Data collection and review
- Establish time horizons for completing the capacity analysis
- Develop the functional classification (road network plan) for the existing and future road networks
- Determine the study intersections for completing the capacity analysis
- Generate background, site and total traffic forecasts for the established time horizons
- Distribute and assign traffic forecasts to the study intersections on the existing/future road network for the established time horizons
- Analyze the capacity of the study intersections within the Town boundaries for the established time horizons
- Complete a traffic signal warrant for the intersection of Highway 52 and Broadway
- Develop a unit cost estimate for construction of new roadway
- Report documentation.

### **1.4 ANALYSIS HORIZONS**

At the project initiation meeting, it was established that the afternoon (pm) peak hour traffic volumes would be used for completing the capacity analyses. The pm peak hour volumes represent the worst-case traffic scenario within the Town. The capacity analysis was completed for three different time horizons, which include:

- Existing (2008) horizon
- Future short-term (2018) horizon
- Future long-term (2028) horizon.



## 2 Existing Conditions

### 2.1 LAND USE

Figure 2-1 presents the existing land use zones for the Town of Raymond, obtained from the Oldman River Region Urban GIS project. The existing zoning does not account for future growth objectives and development potential. The major land use characteristics of Raymond are listed below.

- Predominantly residential land use
- Central business district, with commercial land use, located along Broadway between Highway 52 and Church/Park Avenue
- General industrial land use located in the north around the railway track and in the Town's northeast corner
- Public and institutional land use located throughout the Town, with a large area located south of Highway 52 between 200 W and Broadway
- Large park located in the west bounded to the north by 100 N, to the south by 100 S, to the west by 200 E and to the east by East Park Street E. Additional park space provided along the south edge of Town in the form of a pathway along the canal right-of-way.

### 2.2 ROAD NETWORK

The Town of Raymond does not currently have a road network plan which indicates the classification of the Town's roadways; however, there are established street classification categories. Table 2-1 presents the Town's street classification categories obtained from the Municipal Standards.

**Table 2-1  
Raymond Municipal Standards – Street Classification**

Street Classification
Local Residential
Minor Collector – Residential
Major Collector – Residential
Industrial
Lane

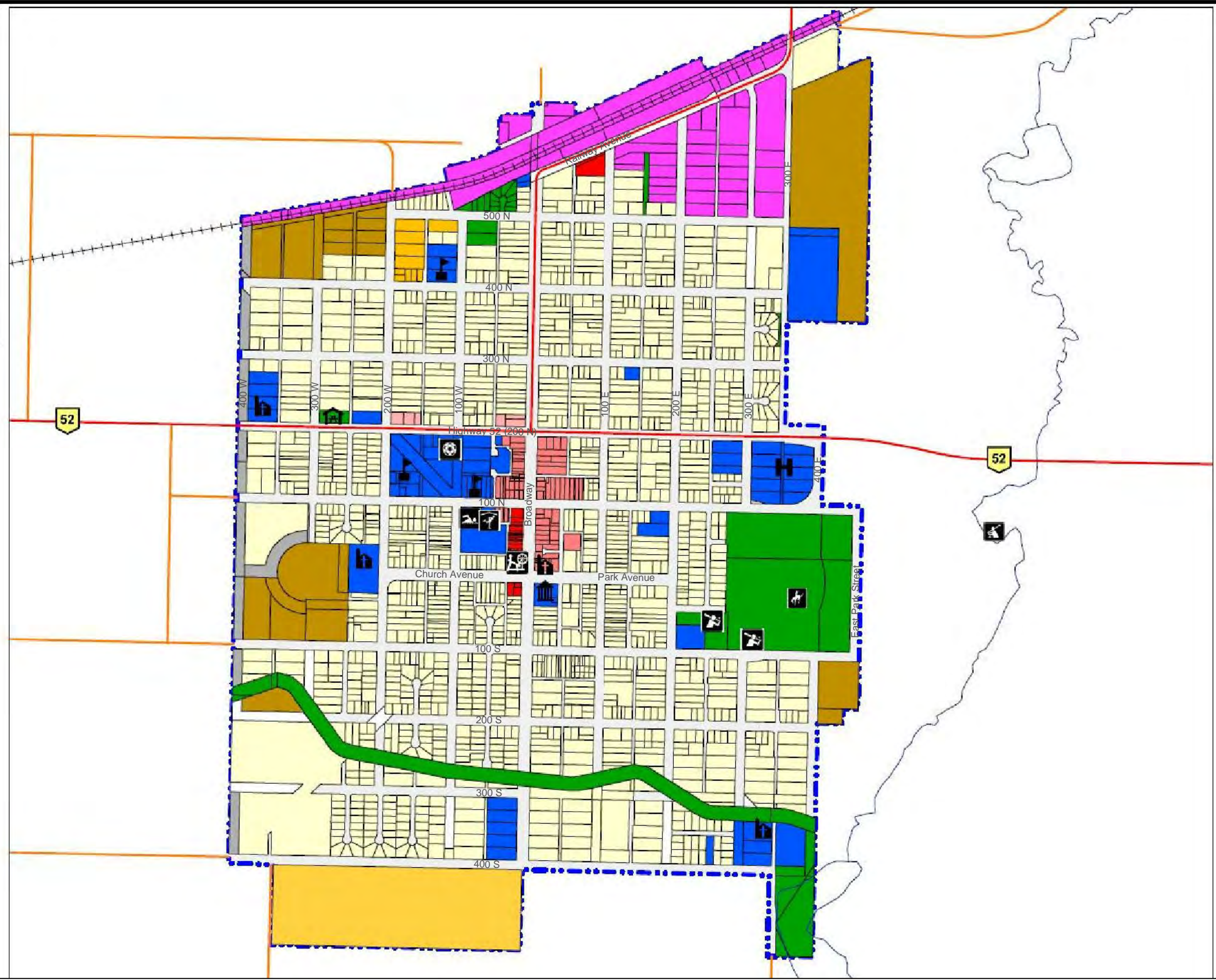


No Representations Of Any Kind Are Made To Other Parties

— Adjacent Roads  
 +++ Railway

**Land Use Districts**

□	Land Use Districts
□	General Residential R-1
□	Mobile Home Residential ...
□	Retail Commercial C-1
□	General Commercial C-2
□	Highway Commercial C-3
□	General Industrial & Ware...
□	Parks & Open Space POS-1
□	Public & Institutional PI-1
□	Urban Reserve UR-1
□	Direct Control DC-1
□	County of Warner - Urban ...
□	NO LANDUSE



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	NTS
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009
	INITIAL

FIGURE 2-1  
 EXISTING LAND USE PLAN

TOWN OF RAYMOND  
 TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



The Transportation Association of Canada (TAC) Urban Supplement to the Geometric Design Guide for Canadian Roads has six roadway classifications for urban streets. These road classifications, ranked in order from lowest to highest capacity, are described further below as per the TAC.

### 2.2.1 Public Lanes (Alleys)

Provide lane access typically at the rear of abutting properties. Direct access is normally allowed to all properties. Public lanes are not intended to carry any through traffic.

### 2.2.2 Local Streets

Provide land access and occur in most developed areas, giving rise to local residential streets, local commercial streets and local industrial streets.

### 2.2.3 Collector Streets

Provide both land access and mobility within residential, commercial and industrial areas.

### 2.2.4 Arterial Streets

Separated into major and minor arterials. Major arterial streets typically interconnect the major development areas in the urban setting including the central business district, large industrial centres, major residential communities, large shopping centres and other major activity centres. Minor arterials typically interconnect residential, shopping, employment and recreational activity areas at the community level.

### 2.2.5 Expressways

Carry large volumes of all types of vehicles at medium to high speeds, at a slightly higher level of service than major arterials. Some intersections with major streets are grade separated to provide free flow conditions.

### 2.2.6 Freeway

Carry large volumes of all types of vehicles at high speed with higher level of service than major arterial. Most intersections are grade separated to provide free-flow conditions.

To facilitate planning for future roadway expansion, AE deemed it necessary to update the Town's street classifications to more closely reflect the TAC guidelines. With consideration for the Town context, AE determined that the applicable road classifications within the Town of Raymond include public lanes, local streets, collector streets and arterial streets. The arterial road classification was introduced to reflect the important function of Highway 52 and Broadway (Highway 845) in connecting the Central Business District with other parts of the Town and in connecting the Town

with adjacent municipalities. The expressway and freeway road classifications were not included since the Town's traffic volumes would not warrant the provision of these facilities.

The characteristics of each road classification are detailed in Table 2-2 below.

**Table 2-2  
TAC Urban Road Classifications**

	<b>Locals</b>	<b>Collectors</b>	<b>Arterials</b>
<b>Traffic Service Function</b>	Traffic movement secondary consideration	Traffic movement and land use access of equal importance	Traffic movement major/primary consideration
<b>Land Service/Access</b>	Land access primary function	Traffic movement and land use access of equal importance	Some/rigid access control
<b>Traffic Volume (Vehicle per day)</b>	<1000 (residential) <3000 (indust./comm.)	<8000 (residential) 1000 - 12000 (indust./comm.)	5000 - 20000 (minor) 10000 - 30000 (major)
<b>Flow Characteristics</b>	Interrupted flow	Interrupted flow	Uninterrupted flow except at signals and crosswalks
<b>Design Speed (km/h)</b>	30 - 50	50 - 80	50 - 70 (minor) 60 - 100 (major)
<b>Average Running Speed (km/h, Offpeak)</b>	20 - 40	30 - 70	40 - 60 (minor) 50 - 90 (major)
<b>Vehicle Type</b>	Passenger and all service vehicles (residential) All types (indust./comm.)	Passenger and all service vehicles (residential) All types (indust./comm.)	All types
<b>Desirable Connections</b>	Public lanes, locals, collectors	Locals, collectors, arterials	Collectors, arterials, expressways, freeways
<b>Transit Service</b>	Generally avoided	Permitted	Express and local buses permitted

	<b>Locals</b>	<b>Collectors</b>	<b>Arterials</b>
<b>Accommodation of Cyclists</b>	No restrictions or special facilities	No restrictions or special facilities	Lane widening or separate facilities desirable
<b>Accommodations of Pedestrians</b>	Sidewalks normally on one side or both sides	Sidewalks provided both sides	Sidewalks may be provided, separation from traffic lanes preferred
<b>Parking</b>	No restrictions or restrictions one side only	Few restrictions other than peak hour	Peak hour restrictions
<b>Minimum Intersection Spacing (m)</b>	60	60	200 (minor) 400 (major)
<b>Right-of-way Width (m)</b>	15 - 22	20 - 24	20 - 45

The posted speed limit for each road classification is typically set at or below the design speed.

AE reviewed the existing road network with primary consideration for function and connectivity. Figure 2-2 presents the road network plan with the road classification for the existing road network within Raymond. The intersections between the collector and arterial roads were identified in the figure and will be analyzed to assess the intersection capacity for completion of the Master Plan. The major roadways identified in the road network plan are listed below.

Arterial Roadways:

- Highway 52 (200 N)
- Broadway (Highway 845)
- 400 S.

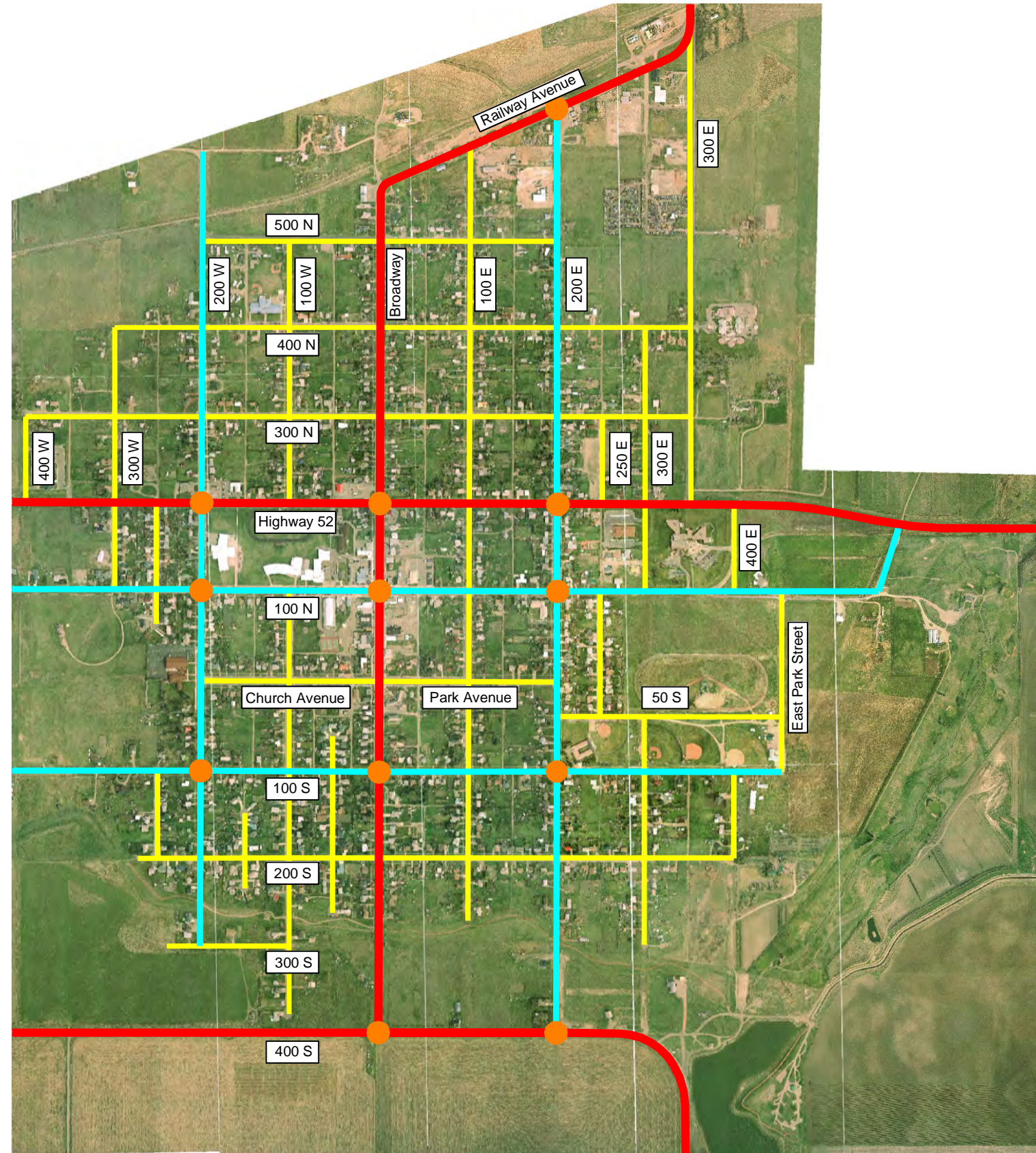
Collector Roadways:

- 100 N
- 100 S
- 200 W
- 200 E.

The remaining roadways in the existing road network were classified as local roadways.







LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN			
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	S.L.

FIGURE 2-2  
2008 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



## 3 Future Conditions

### 3.1 LAND USE

Figure 3-1 presents the future land annexation planned by the Town of Raymond in the 2018 and 2028 horizons. The Town plans to annex two land parcels by 2018; one 52 acre parcel located south of 400 S at SE 8-6-60-4 and one 21 acre parcel located east of 400 E and north of Highway 52. An additional 580 acre parcel will be annexed east of the Town by 2028 at NW 9-6-20-4, NE 9-6-20-4, SW 9 6 20-4 and SE 9-6-20-4. In November 2008, the annexation application for these lands was submitted by the Town of Raymond to the Municipal Government Board.

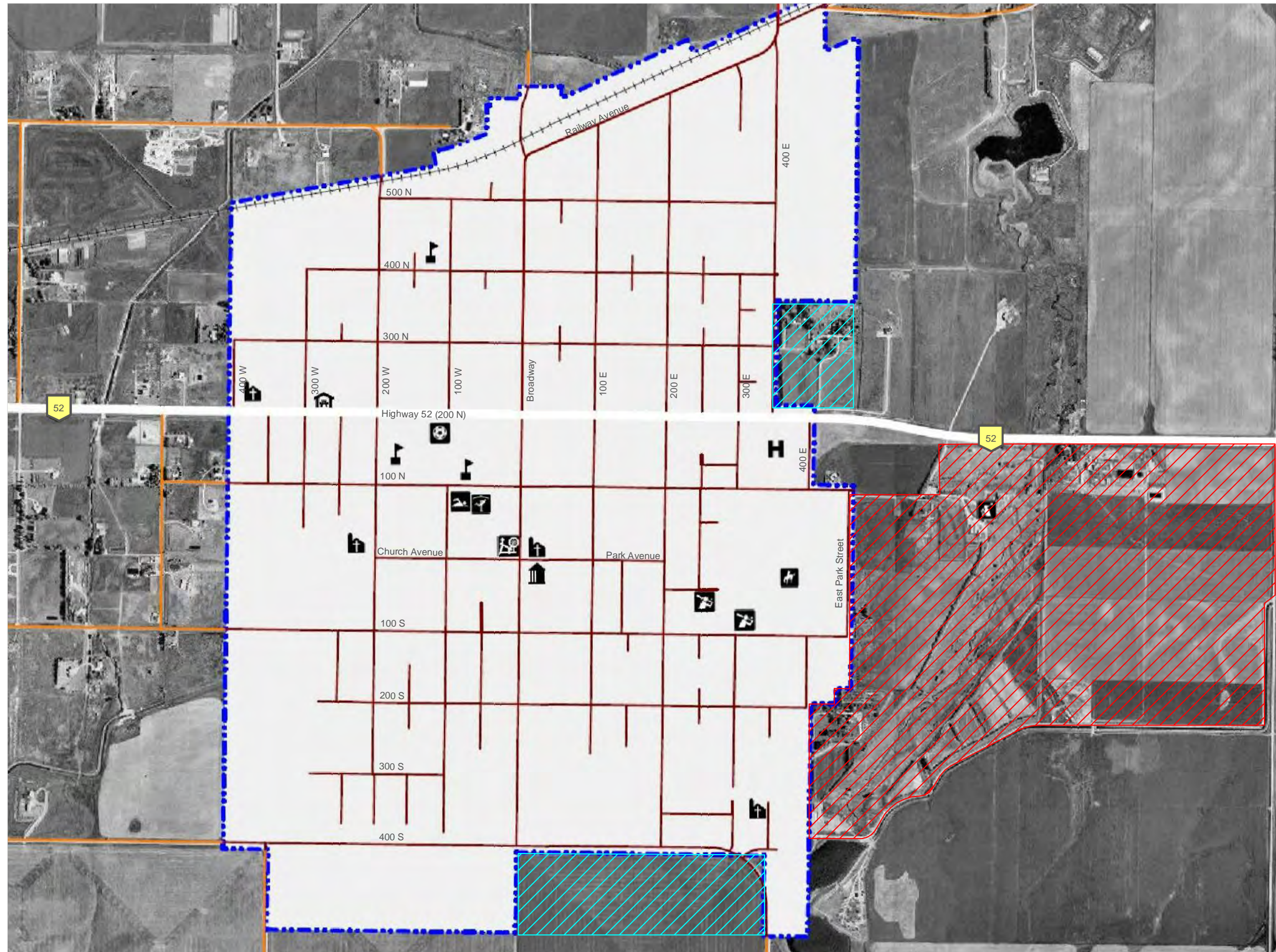
Figures 3-2 and 3-3 present the anticipated developments indicated by the Town for the 2018 and 2028 horizons respectively. These developments are discussed in detail below. It should be noted that the developments discussed in the following sections do not represent the actual development potential of the land area. Subsequently this could affect the road network recommendations presented in this report. As part of the Town's development application process, it is recommended that a traffic impact assessment be required for all future developments within the Town boundaries in order to determine the traffic impacts on the road network.

#### 3.1.1 2018 Developments

Eight major developments are anticipated by the 2018 horizon. The developments have been numbered arbitrarily and discussed below.

- **Development #1:** 60-lot, single-family residential development located east of 400 W between 200 S and 300 S
- **Development #2:** 66-lot, single-family residential development located east of 400 W between 300 S and 400 S
- **Development #3:** 16-home, single-family residential development located south of 400 S and east of Range Road 205
- **Development #4:** 85-bed institutional facility for senior citizens located west of Broadway between 300 S and 400 S
- **Development #5:** 60-unit, single-family residential development located east of Broadway between 300 S and 400 S
- **Development #6:** 114-lot, single-family residential development located south of 400 S and west of Development #3
- **Development #7:** ball park and soccer field in the existing park space located south of 100 S between 200 E and East Park Street
- **Development #8:** 47-lot, single-family residential development located east of 400 E and north of Highway 52.





- - - Existing Town Boundary
- ▨ Proposed 2018 Annexed Land
- ▨ Proposed 2028 Annexed Land

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



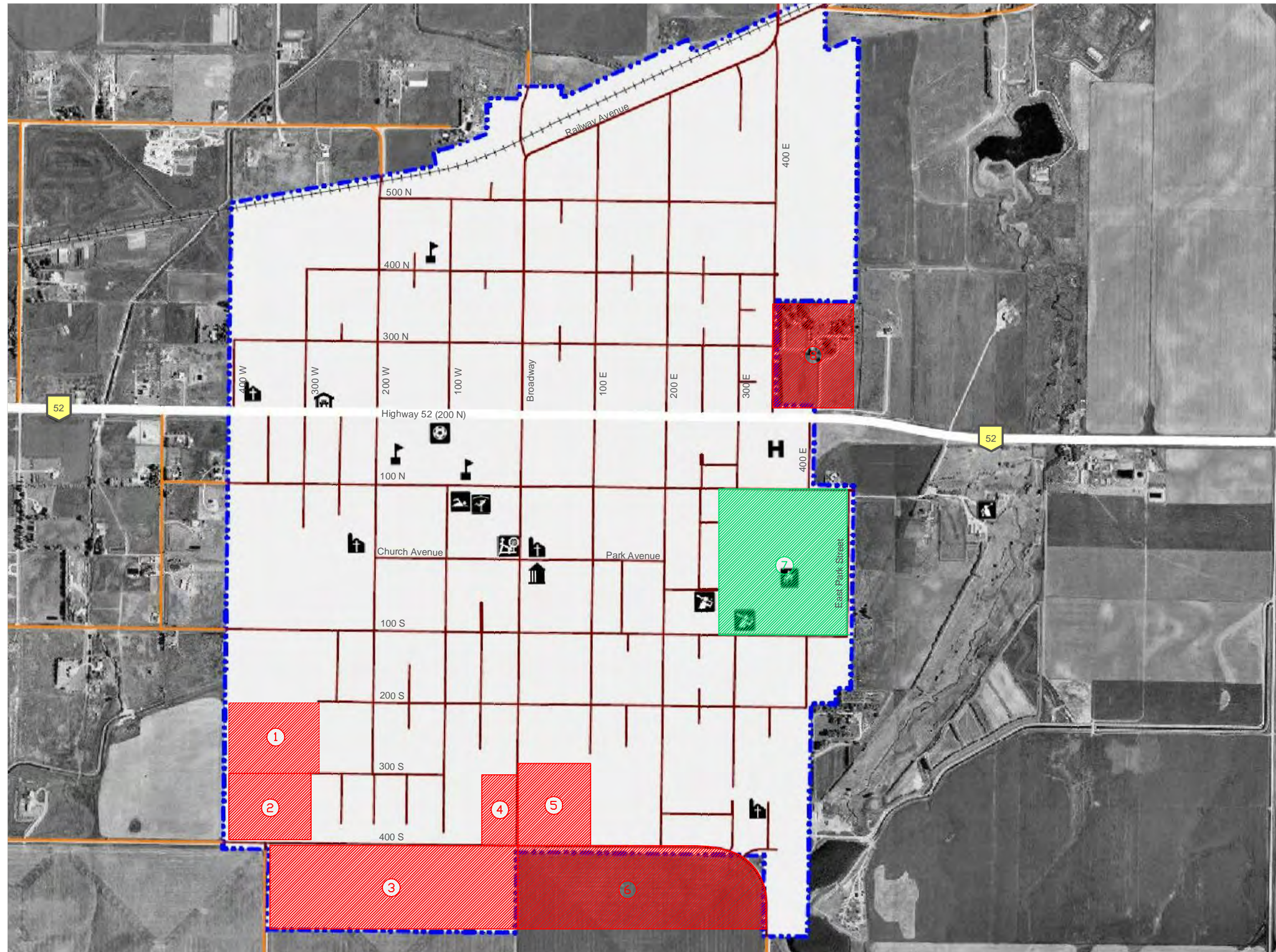
PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 3-1  
PROPOSED LAND ANNEXATION PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





- - - - Existing Town Boundary
- ▨ Residential Land Use
- ▨ Parks & Open Space

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009 INITIAL

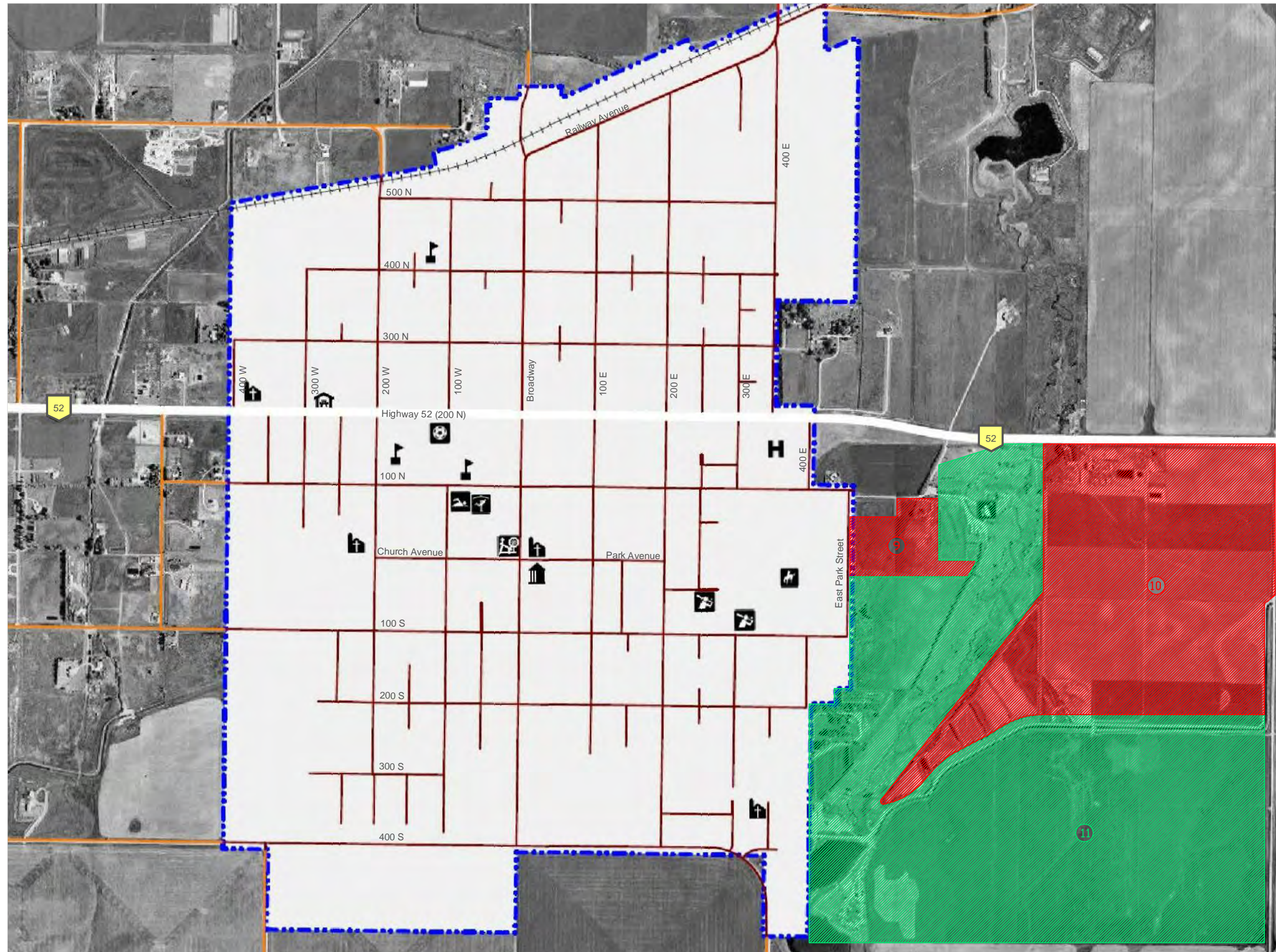
FIGURE 3-2  
PROPOSED 2018 DEVELOPMENTS

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET

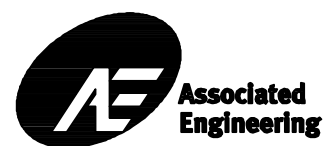






- - - - Existing Town Boundary
- ▨ Residential Land Use
- ▨ Parks & Open Space

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 3-3  
PROPOSED 2028 DEVELOPMENTS

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



### 3.1.2 2028 Developments

Three additional developments are anticipated by the 2028 horizon, which include:

- **Development #9:** 51-lot, single family residential development located east of East Park Street between 100 S and Park Avenue
- **Development #10:** 265-lot, single family residential development located south of Highway 52 and west of Range Road 203
- **Development #11:** 100-acre golf course located south of Highway 52 between Development #9 and #10.

## 3.2 ROAD NETWORK

To accommodate the anticipated developments discussed in Section 3.1, additional links to the existing road network were assumed. The following links were assumed for the 2018 and 2028 time horizons.

### 3.2.1 2018 Horizon

- Extension of 400 W from Highway 52 to 400 S
- Extension of 200 and 300 S to connect with the proposed 400 W
- Construction of local roadways into the proposed Development #3
- Extension of Broadway, 100 E, 200 E, and 300 E, south of 400 S into the proposed Development #6
- Construction of local roadways into the proposed Development #8.

### 3.2.2 2028 Horizon

- Two accesses onto East Park Street from the proposed Development #9
- One access onto Highway 52 from Development #10, to be located approximately midway between 400 E and Range Road 203
- One access onto Highway 52 from Development #11, to be located west of the access to Development #10.

The future 2018 and 2028 road networks were reviewed with primary consideration for function and connectivity and classified according to the road classifications established in Section 2.2. Similar to the existing road network, the intersections between the collector and arterial roads were identified. These intersections will be assessed to determine the intersection capacity during the future time horizons.

Figures 3-4 and 3-5 present the future road network plan and classification for the 2018 and 2028 time horizons. These road networks were used for completing the capacity analysis in the 2018 and 2028 time horizons. The major roadways remain the same between the two future horizons;

however, in 2028 two additional roadways are added. The following summarizes the major roadways in the two horizons.

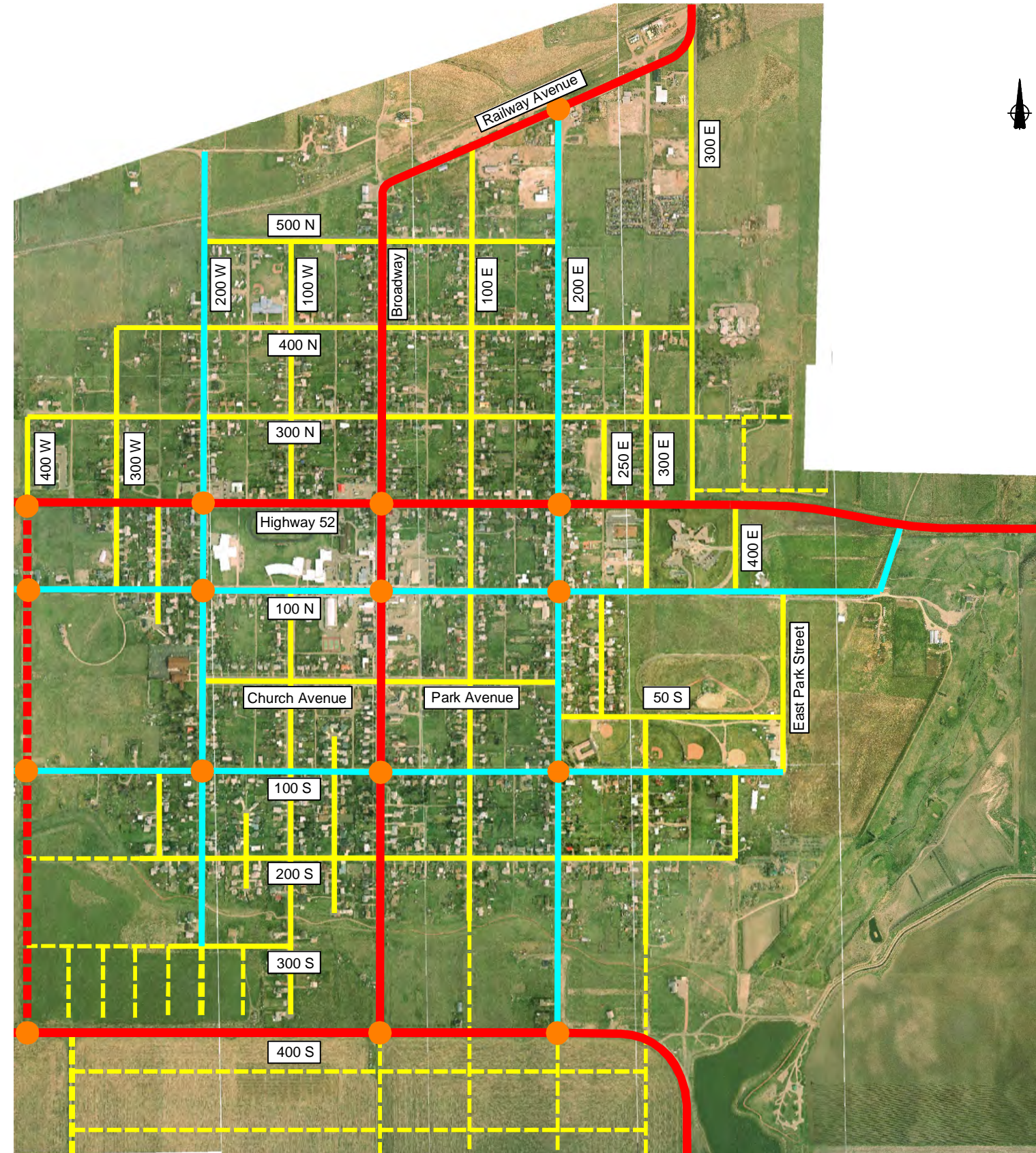
Arterial Roadways:

- Highway 52 (200 N)
- Broadway (Highway 845)
- 400 S
- 400 W
- South access to Development #10 via extension of 400 S.

Collector Roadways:

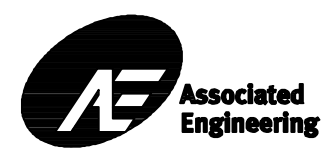
- 100 N
- 100 S
- 200 W
- 200 E
- Access to Development #10 off Highway 52.

The remaining roadways in the existing road network were classified as local roadways.



LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



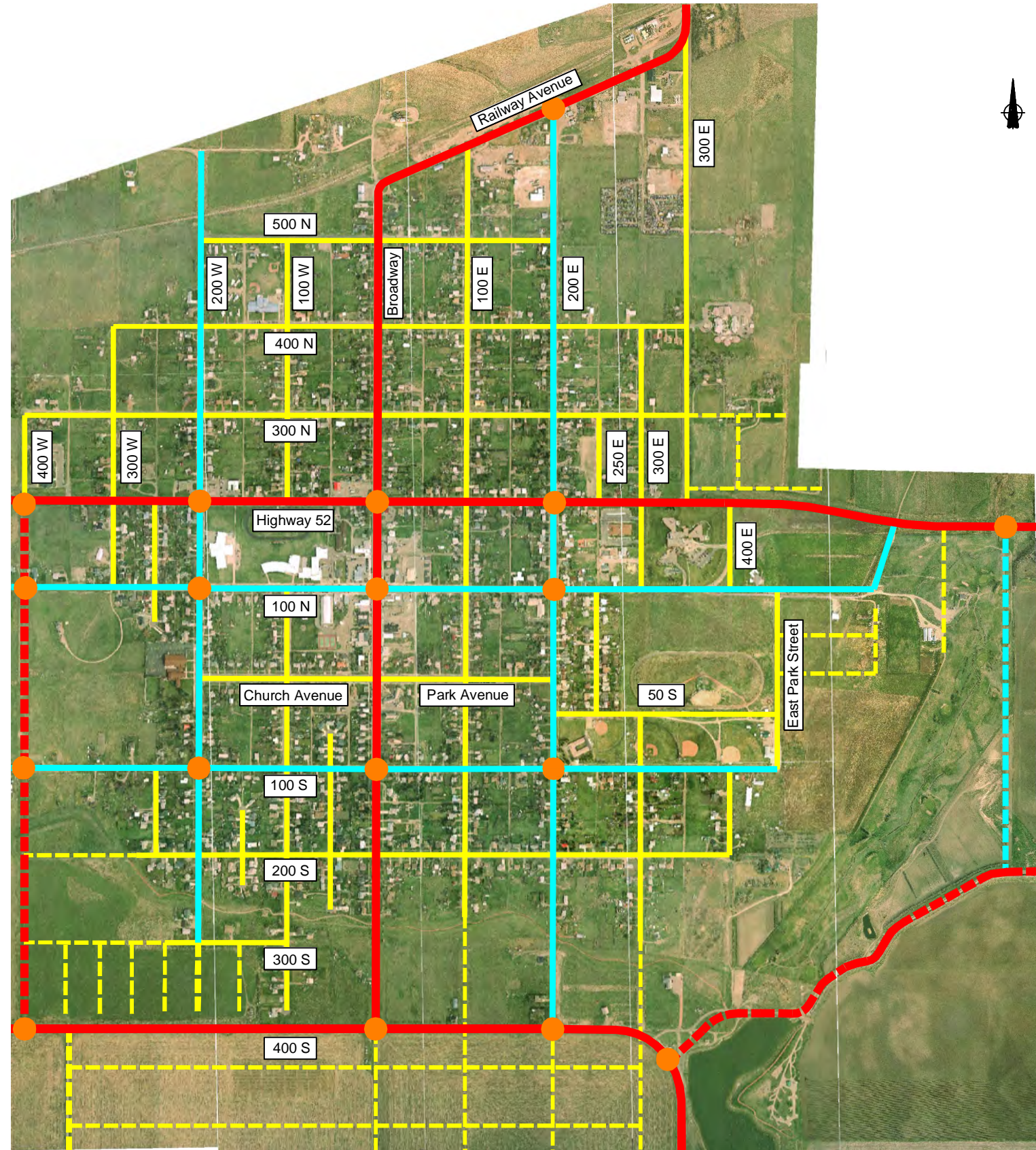
PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009 INITIAL

FIGURE 3-4  
2018 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





LEGEND	
	Arterial
	Collector
	Local
	Proposed Arterial
	Proposed Collector
	Proposed Local
	Study Intersection

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 3-5  
2028 ROAD NETWORK PLAN

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





## 4 Background Traffic

### 4.1 2008 HORIZON

Traffic data for the Town of Raymond was obtained from two sources, Alberta Transportation and traffic counts conducted by the Town. Both sets of traffic data have been included in Appendix A. The information obtained from Alberta Transportation included:

- 2006 turning movement volumes for Highway 52 and Highway 5
- 2006 turning movement volumes for Highway 52 and Highway 844
- 2006 turning movement volumes for Highway 52 and Highway 845
- 2006 turning movement volumes for Highway 52 and Highway 846
- 2006 turning movement volumes for Highway 845 and Local Road 32
- Traffic volume history (1997 – 2006) for Highway 52.

Traffic counts were conducted by the Town at several intersections along Highway 52, 100 N and Church Avenue in April 2008. The counts were completed to obtain traffic information near the school site for the pedestrian safety study. Traffic counts were completed for the following intersections:

- Highway 52 and 200 W
- Highway 52 and 100 W
- 100 N and 200 W
- 100 N and 100 W
- 100 N and Broadway
- Church Avenue and 200 W
- Church Avenue and 100 W
- Church Avenue and Broadway.

Traffic count data was compiled onto a spreadsheet and the highest hourly volumes in the afternoon was used to represent the afternoon (pm) peak hour volumes.

2008 turning movement volumes at the study intersections were obtained in the following manner:

- Compile 2006 AT turning movement volumes for the applicable study intersections
- Determine and apply an annual growth rate to the applicable study intersections to grow traffic volumes to the 2008 horizon
- Include traffic data obtained from the traffic counts for the applicable study intersections
- At intersections where traffic information was not available from either source, existing travel patterns at the other intersections were used to estimate the turning movements.

The traffic volume history along Highway 52 was analyzed to determine the annual growth rate and applied to the 2006 turning movement counts obtained from Alberta Transportation. Table 4-1 presents the growth rate calculations performed on the data provided for the intersection.

**Table 4-1  
Annual Growth Rate Calculation along Highway 52**

<b>Year/ AADT</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>Average</b>
East of Hwy 5	1830	1750	1640	1870	1570	1540	1560	1530	1490	1600	
Growth Rate		-4.37%	-6.29%	14.02%	-16.04%	-1.91%	1.30%	-1.92%	-2.61%	7.38%	-1.2%
West of Hwy 844	2010	1930	1440	1650	1390	1350	1390	1660	1600	1710	
Growth Rate		-3.98%	-25.39%	14.58%	-15.76%	-2.88%	2.96%	19.42%	-3.61%	6.88%	-0.9%
East of Hwy 844	2000	1920	1490	1710	1440	1400	1440	1690	1630	1740	
Growth Rate		-4.00%	-22.40%	14.77%	-15.79%	-2.78%	2.86%	17.36%	-3.55%	6.75%	-0.8%
West of Hwy 845		2290	2160	2470	2080	2590	2670	2670	2560	2740	
Growth Rate			-5.68%	14.35%	-15.79%	24.52%	3.09%	0.00%	-4.12%	7.03%	2.9%
East of Hwy 845		1660	1550	1760	1490	1560	1600	1600	1540	1660	
Growth Rate			-6.63%	13.55%	-15.34%	4.70%	2.56%	0.00%	-3.75%	7.79%	0.4%
West of Hwy 846	650	650	660	700	650	630	640	640	640	680	
Growth Rate		0.00%	1.54%	6.06%	-7.14%	-3.08%	1.59%	0.00%	0.00%	6.25%	0.6%

A negative growth rate was observed west of the Town of Raymond and a positive growth rate was observed east of the Town. To capture the worst-case scenario, the growth rates outside the Town were not considered and the average growth rate west and east of Highway 845 was used. This resulted in a rate of 1.6%. The 1.6% was applied to the turning movement counts obtained from Alberta Transportation.

Figure 4-1 presents the traffic volumes for the 2008 pm peak hour derived using the methodology detailed above.

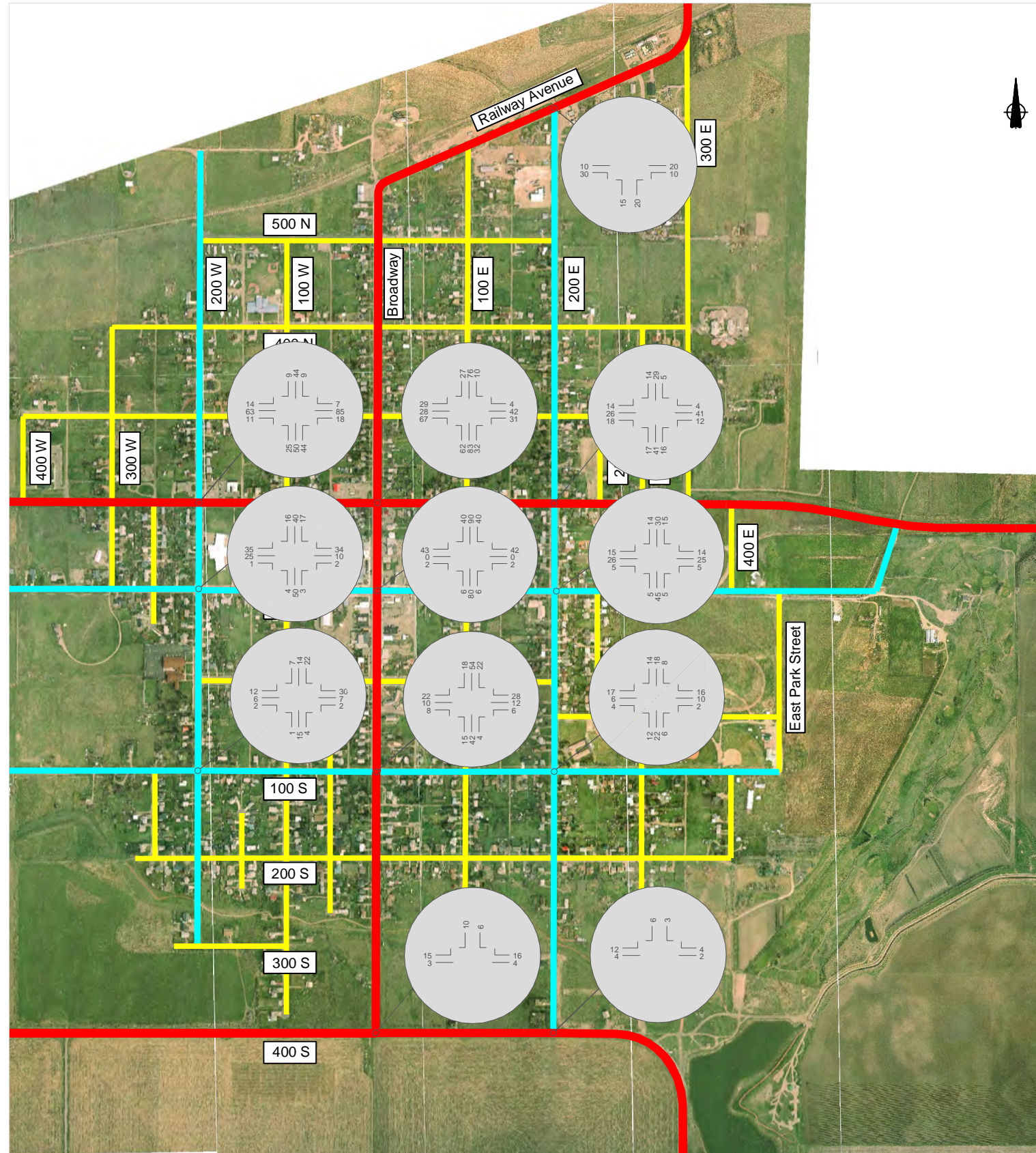
### 4.2 2018 HORIZON

To obtain the 2018 background traffic volumes, the 2008 traffic presented in Figure 4-1 was grown using the 1.6% growth rate. The growth rate was applied over a 10 year period, assuming non-compounded growth. Figure 4-2 presents the background traffic volumes for the 2018 pm peak hour at the study intersections indicated in Figure 3-4.

### 4.3 2028 HORIZON

To obtain the 2028 background traffic volumes, the 2018 background traffic volume was combined with the anticipated traffic volumes generated by the 2018 developments and grown using the 1.6% growth rate. The traffic volumes generated by the future developments are discussed in detail in Section 5. Similar to the 2018 horizon, the 1.6% growth rate was applied over a 10 year period assuming non-compounded growth. Figure 4-3 presents the background traffic volumes for the 2028 pm peak hour at the study intersections indicated in Figure 3-5.





NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009 INITIAL

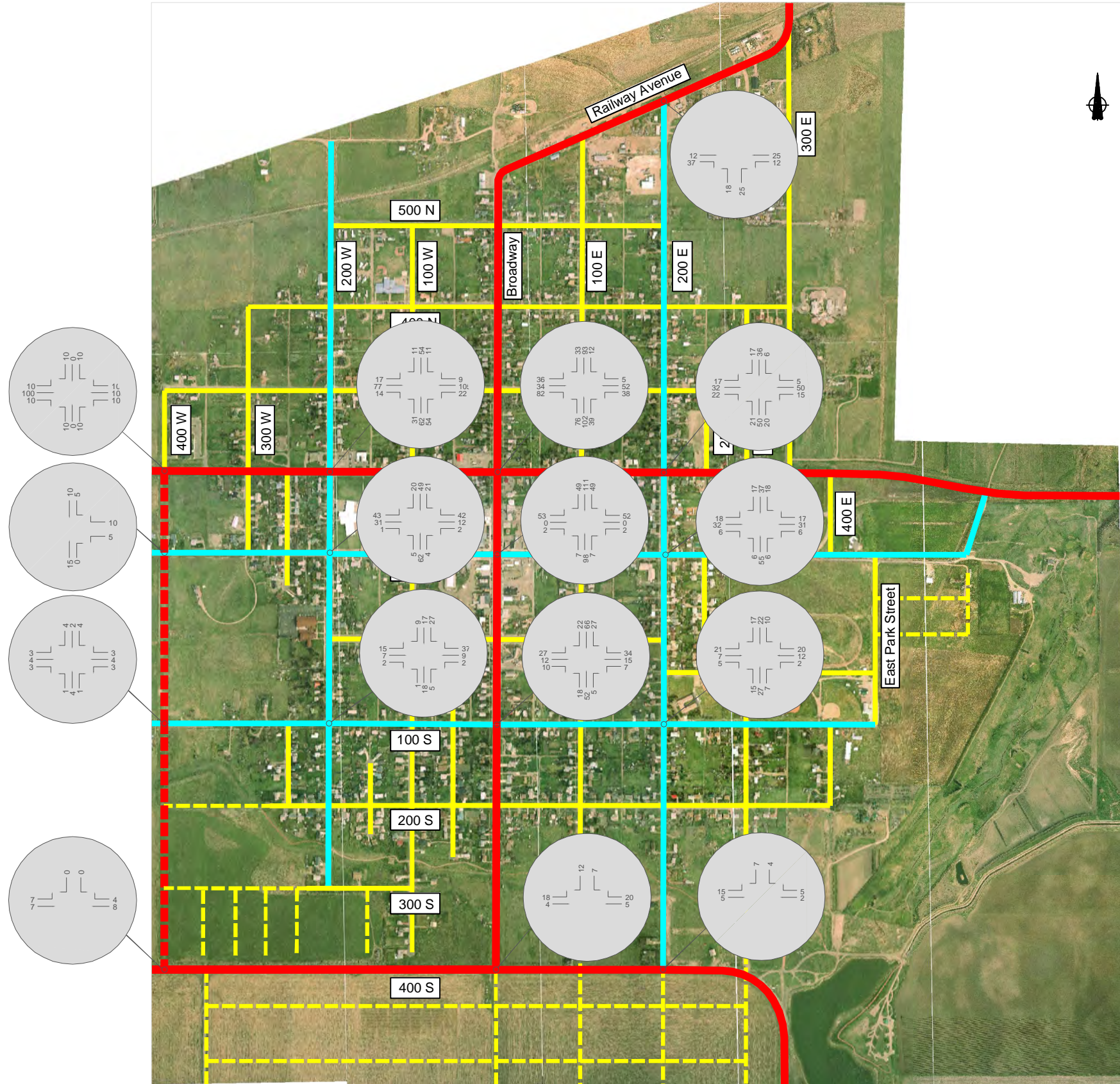
FIGURE 4-1  
EXISTING TRAFFIC VOLUMES  
2008 PM PEAK HOUR

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



This Drawing is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 4-2  
BACKGROUND TRAFFIC VOLUMES  
2018 PM PEAK HOUR

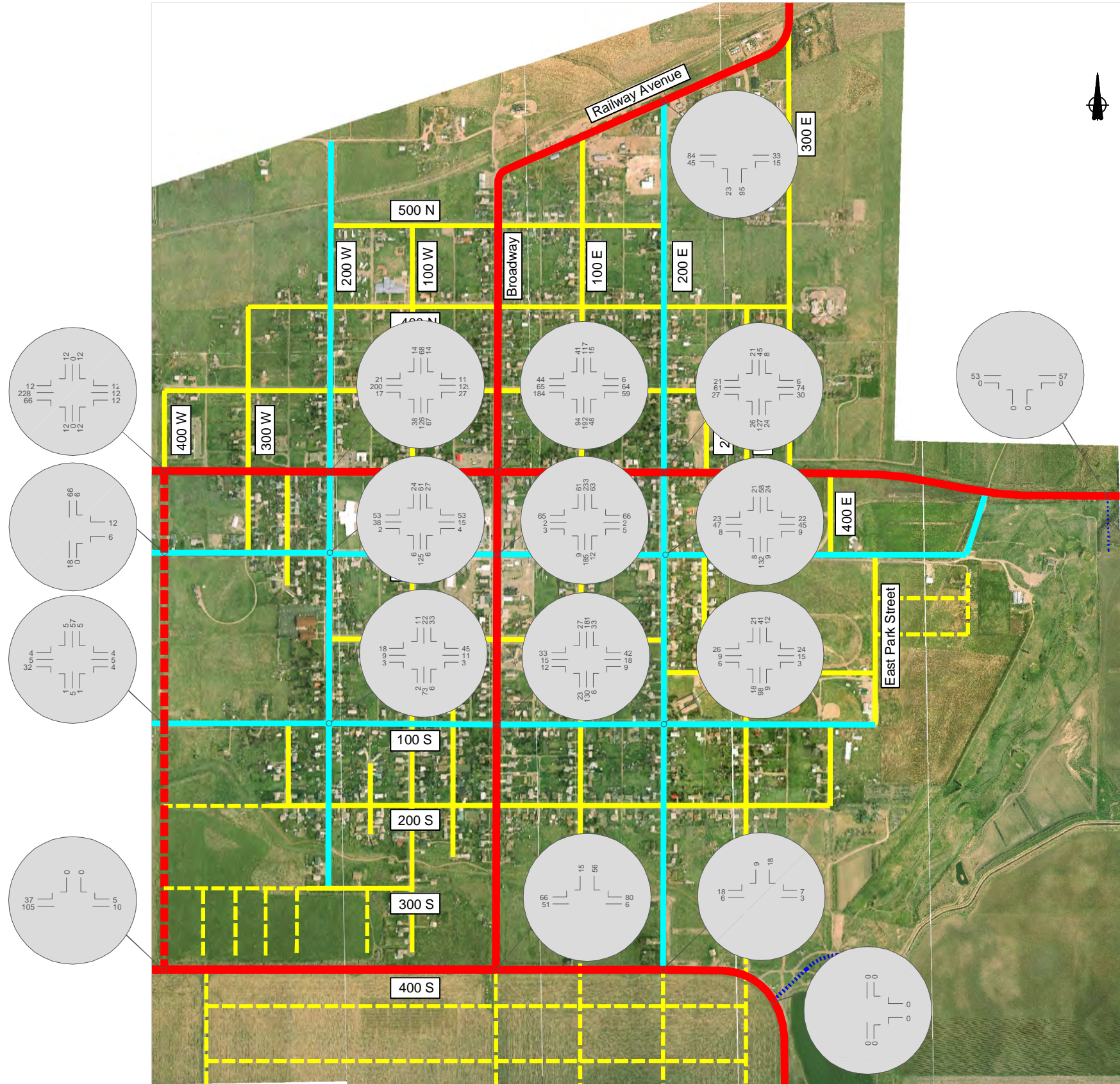
TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





This Drawing is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 4-3  
BACKGROUND TRAFFIC VOLUMES  
2028 PM PEAK HOUR

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



## 5 Development Traffic

A three-step process was undertaken to determine the traffic volumes generated by the future developments proposed in the 2018 and 2028 horizons. The steps included:

- Trip Generation: Estimate of the number of trips generated to/from the development sites during the pm peak hour.
- Trip Distribution: Estimate of the origin of trips to the development sites and destinations of the trips from the development sites.
- Trip Assignment: Selecting the routes used by trips to/from the development sites and assignment of the traffic volumes to the study intersections identified in Figure 3-4 and 3-5.

### 5.1 TRIP GENERATION

The ITE Trip Generation (7th Edition) handbook was referenced to determine the appropriate trip rates to apply in order to estimate the trips generated to/from the proposed developments. Tables 5-1 and 5-2 summarize the trip generation procedure undertaken to estimate the site trips in the 2018 and 2028 time horizon respectively.

### 5.2 TRIP DISTRIBUTION

Assumptions were made to establish the origin for trips ending at the proposed developments and the destination for trips starting at the proposed developments. Discussions with the Town served as the basis for the trip distribution assumptions. The following trip distribution assumptions were used in both the 2018 and 2028 horizons.

- Trips to residential developments (except for the institutional facility): origin for trips to the development sites from outside of Town, consisting of commuter trips returning home from Lethbridge in the afternoon peak. Destination for trips from the development sites assumed to be throughout Raymond.
- Trips to the institutional facility, ball diamond/soccer field and golf course: both the origin and destination was assumed to be throughout Raymond.

### 5.3 TRIP ASSIGNMENT

The development trips were assigned onto the 2018 and 2028 road network with consideration for the logical routes, on the basis of convenience and travel time, which would be taken by commuters between the origin and destinations. To capture worst-case traffic scenarios at the study intersections, the development trips were primarily assigned to the major roadways indicated on Figures 3-4 and 3-5.

Figures 5-1 and 5-2 present the traffic volumes generated by the development sites for the 2018 and 2028 time horizons.

**Table 5-1  
Trip Generation for Proposed Developments – 2018 Horizon**

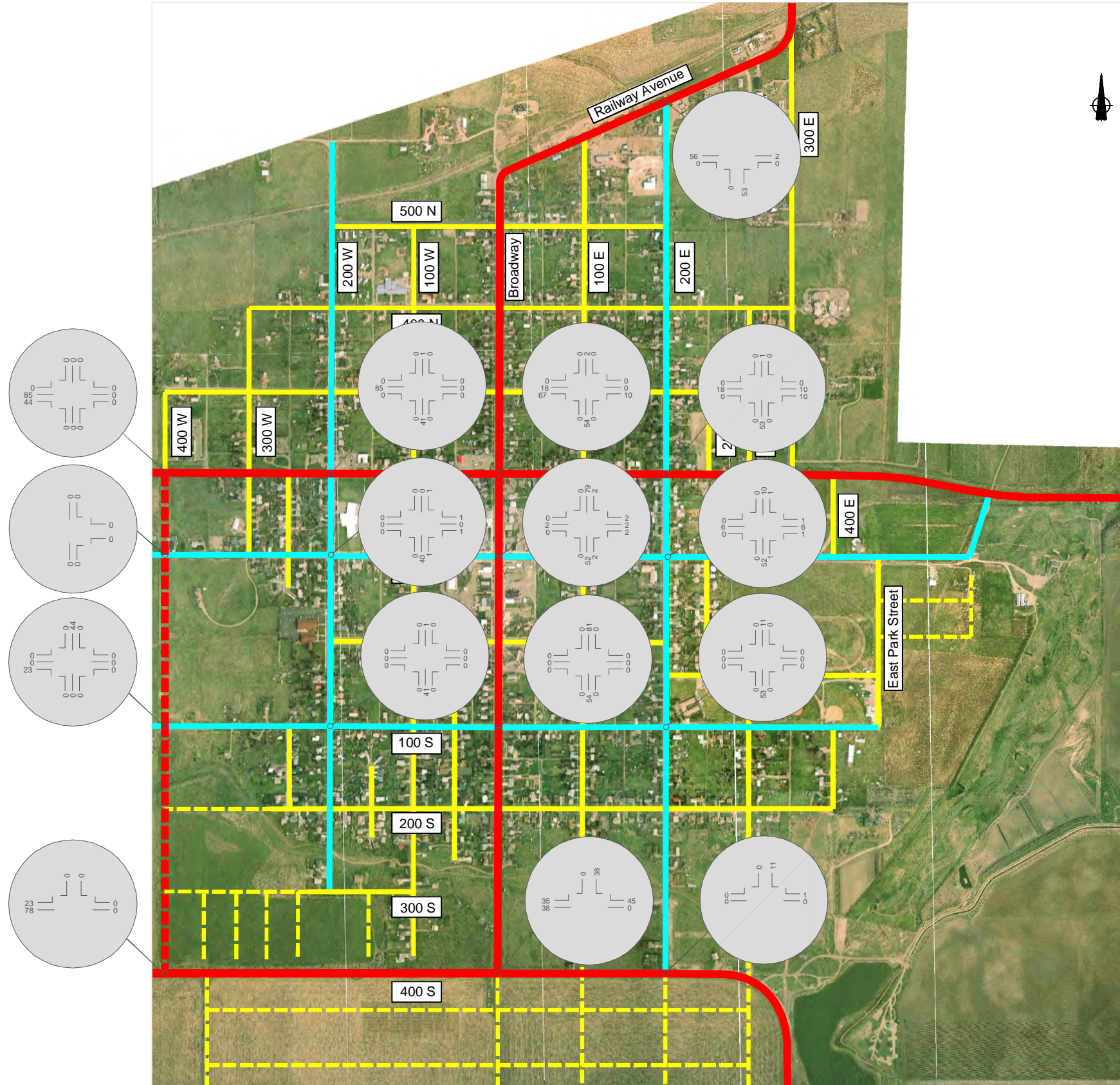
Development #	Description	Land Use Description	Independent Variable		Assumption	ITE % Entering/ % Exiting	Trips		
			Unit	# of Units			Total	Enter	Exit
1	60 lot residential (400 E and 200 S)	Single-Family Detached Housing (210)	Dwelling Unit	60	One dwelling unit/lot	63/37	68	43	25
2	66 lot residential (400 E and 300 S)	Single-Family Detached Housing (210)	Dwelling Unit	66	One dwelling unit/lot	63/37	74	47	27
3	16 Houses on 15 Acres (S of 400 S)	Single-Family Detached Housing (210)	Dwelling Unit	16	-	63/37	21	13	8
4	85 bed institutional facility (Broadway)	Assisted Living (254)	Occupied Beds	85	Assume all bed occupied	36/64	36	13	23
5	60 unit residential (Between Broadway and 100 E)	Single-Family Detached Housing (210)	Dwelling Unit	60	-	63/37	68	43	25
6	Residential Subdivision (114 lots)	Single-Family Detached Housing (210)	Dwelling Unit	114	One dwelling unit/lot	63/37	121	76	45
7	Ball Diamond/Soccer Field	City Park	Acres	11.1	Average rate used	50/50	15	8	8
8	Residential – 47 lots (400 E)	Single-Family Detached Housing (210)	Dwelling Unit	47	-	63/37	55	35	20

**Table 5-2**  
**Trip Generation for Proposed Developments - 2028 Horizon**

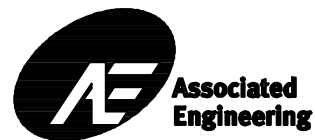
Development #	Description	Land Use Description	Independent Variable		Assumption	ITE % Entering/ % Exiting	Trips		
			Unit	# of Units			Total	Enter	Exit
9	Residential subdivision - Residential	Single-Family Detached Housing (210)	Dwelling Unit	51	One dwelling unit/lot	63/37	59	37	22
10	Residential subdivision - Residential	Single-Family Detached Housing (210)	Dwelling Unit	265	One dwelling unit/lot	63/37	258	163	95
11	Golf course	Golf Course (430)	Acres	100	-	34/66	108	37	71



This Drawing is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 5-1  
DEVELOPMENT TRAFFIC VOLUMES  
2018 PM PEAK HOUR

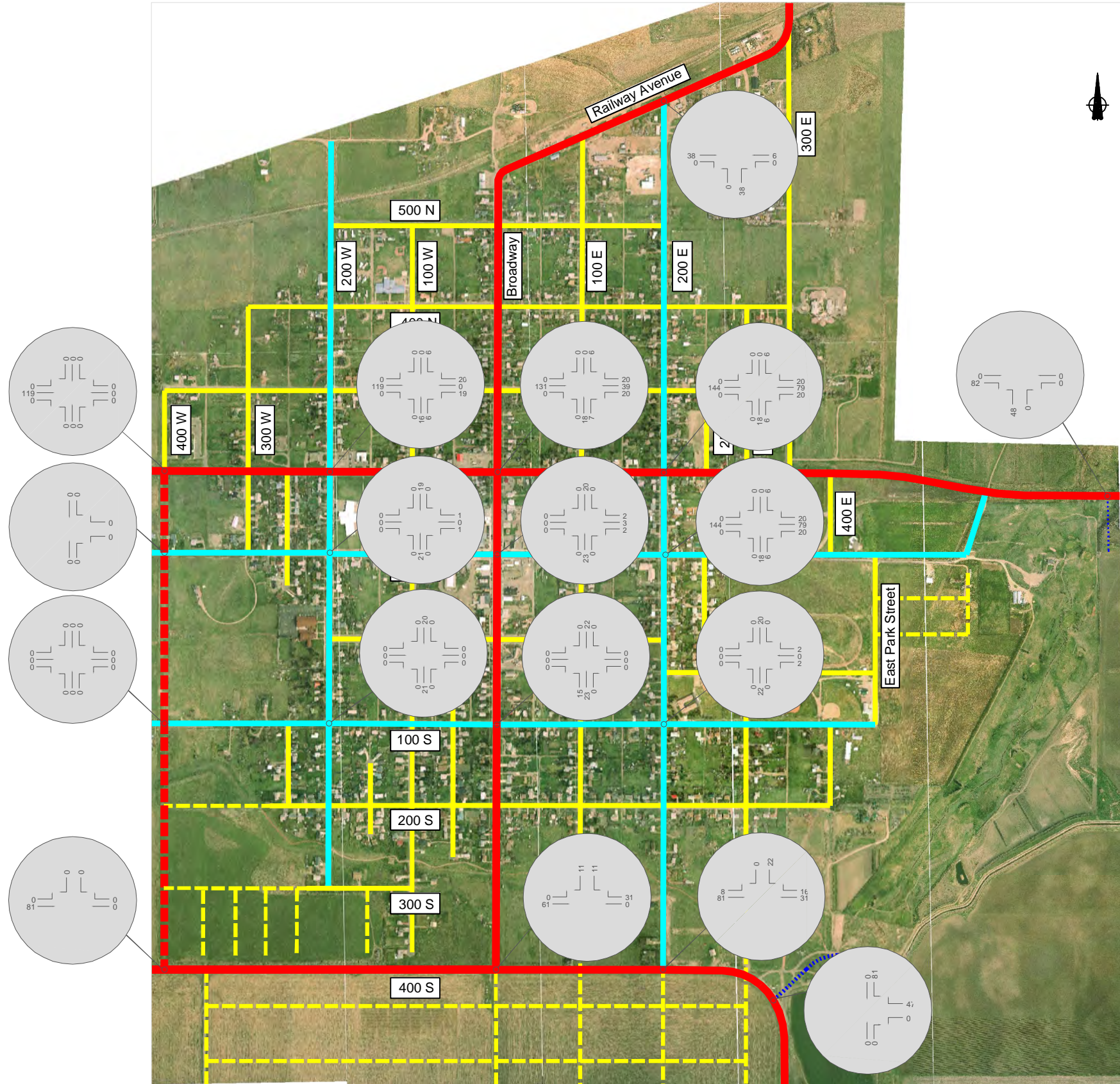
TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





This Drawing Is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 5-2  
DEVELOPMENT TRAFFIC VOLUMES  
2028 PM PEAK HOUR

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET



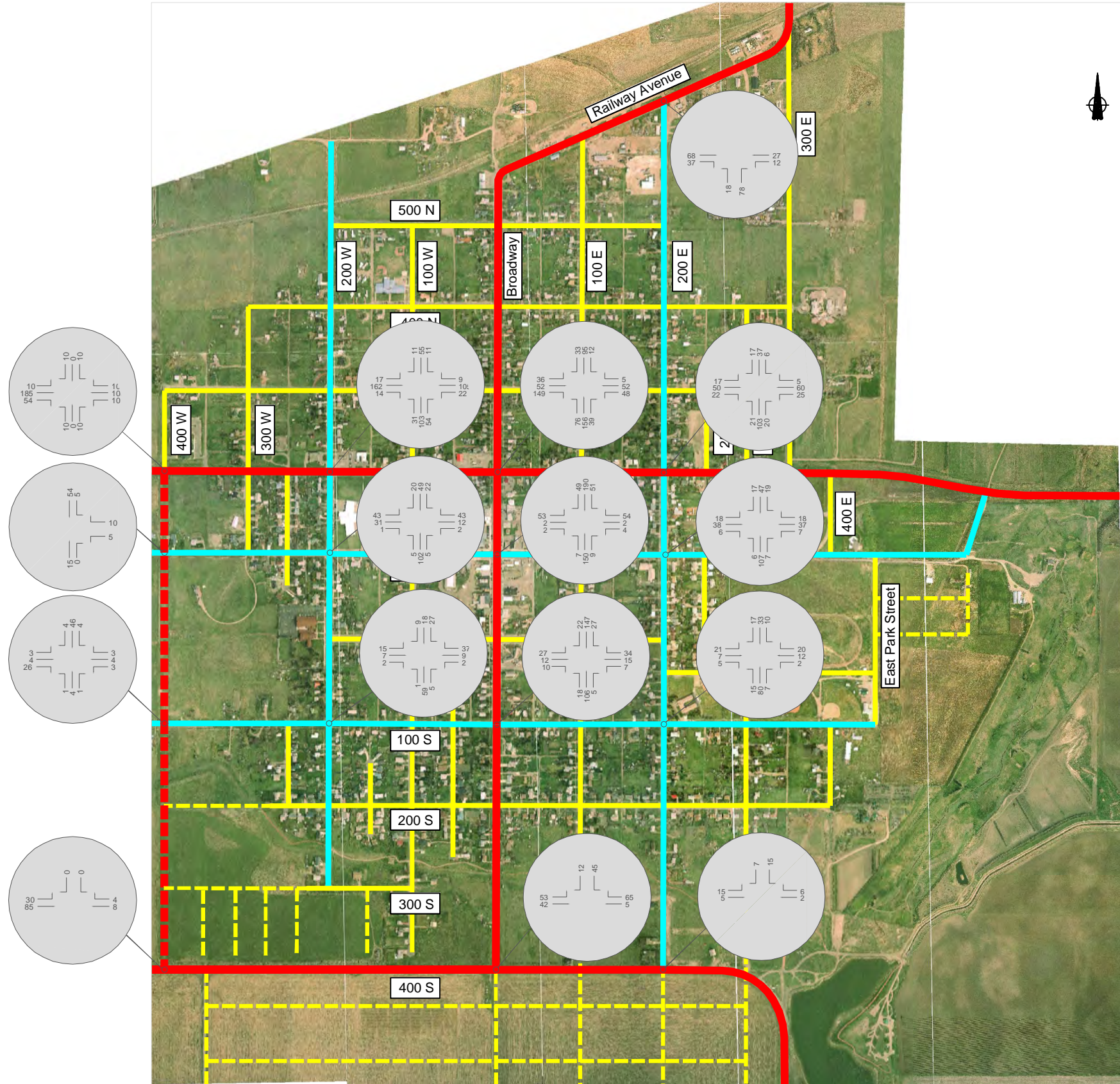
## 6 Total Traffic

The total traffic was generated by combining the background traffic volumes with the site generated traffic volumes from the developments for common time horizons.

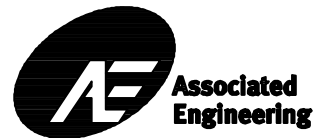
Figures 6-1 and 6-2 present the pm total traffic volumes for the 2018 and 2028 time horizons respectively.



This Drawing Is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491
SCALE	N.T.S.
DRAWN	S.L.
DESIGNED	
CHECKED	
APPROVED	
DATE	JANUARY 2009

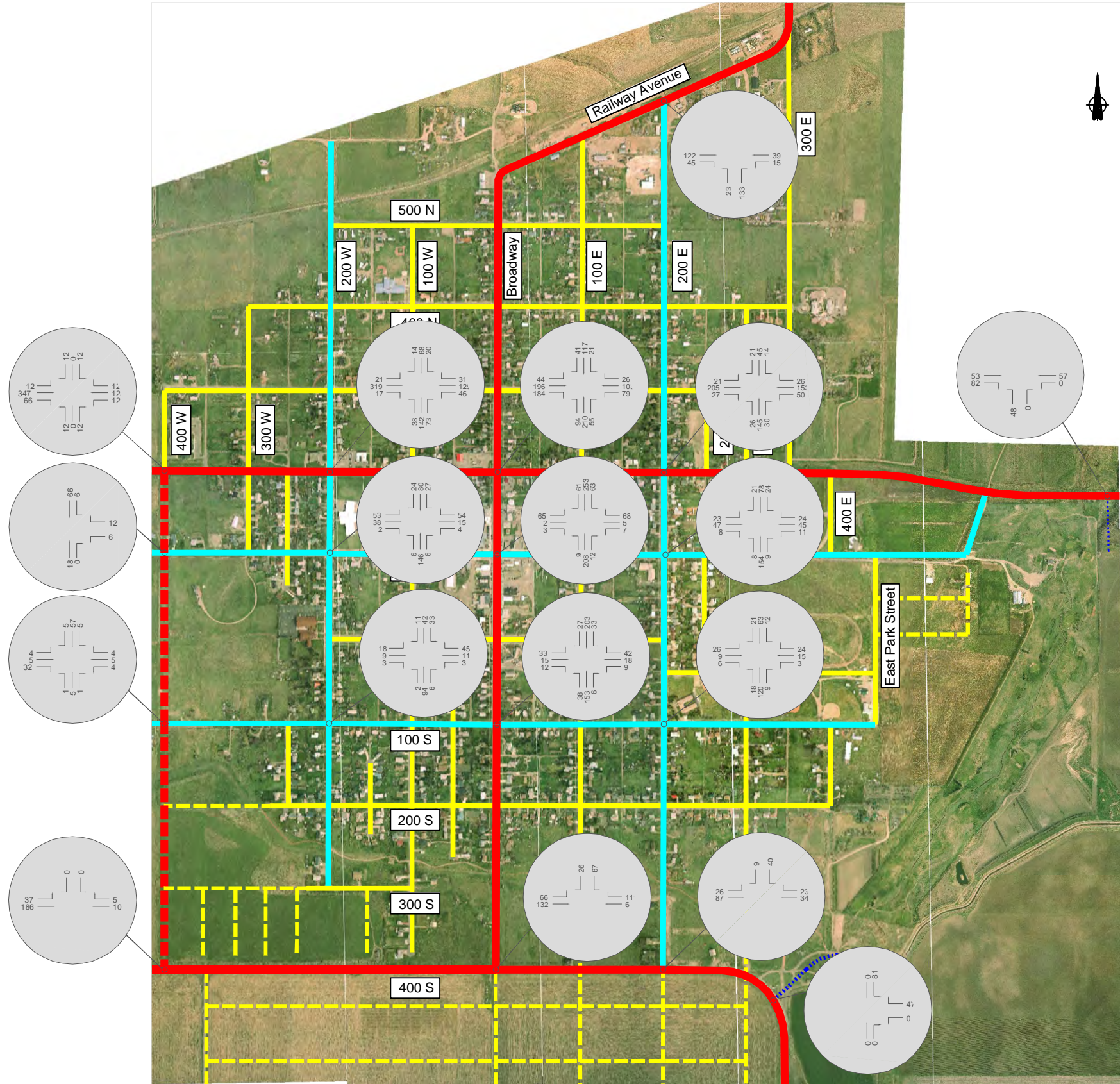
FIGURE 6-1  
TOTAL TRAFFIC VOLUMES  
2018 PM PEAK HOUR

TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET
----------------	----------	-------



This Drawing is For The Use Of The Client And Project Indicated  
No Representations Of Any Kind Are Made To Other Parties



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	2007-3491		
SCALE	N.T.S.		
DRAWN	S.L.		
DESIGNED			
CHECKED			
APPROVED			
DATE	JANUARY 2009	INITIAL	

FIGURE 6-2  
TOTAL TRAFFIC VOLUMES  
2028 PM PEAK HOUR  
  
TOWN OF RAYMOND  
TRANSPORTATION MASTER PLAN

DRAWING NUMBER	REV. NO.	SHEET





## 7 Traffic Analysis

The Synchro 7.0 traffic analysis program based on the Highway Capacity Manual (HCM) was used to complete the capacity analysis of the study intersections during the pm peak hour. Synchro 7.0 applies the methodology established by the HCM to output a level of service for a study intersection, given the lane configuration, vehicular volumes, heavy vehicle percentages, etc. For the capacity analysis the following assumptions were made:

- Posted speed limit: 50 km/h throughout Town, 30 km/h near school sites
- Heavy vehicle percentage: heavy vehicle percentage were derived from Alberta Transportation turning movements and from Town of Raymond traffic counts where applicable, otherwise 2% was assumed
- Traffic control: existing traffic control provided from Town in Appendix B
- Lane width: 4.8 m assumed (maximum allowed by Synchro)
- Default values from Synchro were used for the remaining parameters.

The operational capability of the study intersections were assessed using capacity, which is a measure of the sustainable flow rate at which vehicles can be expected to transverse a point. The critical measures used in the assessment were:

- Volume to capacity (v/c) ratio provides the amount of congestion for each turning movement and for each lane group for signalized intersections. A v/c value over 1 indicates that the movement or lane group is over capacity.
- Control delay is the amount of delay a vehicle experiences in seconds.
- Level of service (LOS) is a qualitative measure describing operational conditions within a traffic stream and is based on service measures such as delay and congestion.

For the purpose of the traffic assessment a minimum overall intersection LOS C and a minimum LOS D for each movement at an intersection was required. The level of service definitions for an unsignalized intersection is included in Appendix C.

The detailed results of the Synchro capacity analysis for the Transportation Master Plan is provided in Appendix D and discussed below.

### 7.1 EXISTING 2008 TRAFFIC

The study intersections were assessed under the existing (2008) horizon to determine how the intersections currently operate. The results of the 2008 analysis will serve as a benchmark for future horizons and assist in pinpointing the timeframe for when intersection improvements are required.

All the 2008 study intersections operate well above the minimum LOS threshold required. Every intersection operates at an overall intersection LOS A and all movements across the entire road network operate at LOS B or higher. The results of the individual intersections are detailed below.

#### **7.1.1 Railway Avenue and 200 E**

Railway Avenue and 200 E operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.04, delays = 3.6 seconds). All movements at the intersection operate at LOS A with a v/c ratio of 0.04 or less and delays of 8.8 seconds or less.

#### **7.1.2 Highway 52 and 200 W**

Highway 52 and 200 W operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.18, delays = 6.0 seconds). Movements on the eastbound and westbound movements operate under free-flow conditions at LOS A and with low delays (v/c ratios = 0.01, delays = 1.3 seconds or less). The northbound and southbound movements are stop controlled and operate at LOS B with longer delays than the eastbound and westbound movements (v/c ratios = 0.18 or less, delays = 11.2 seconds or less).

#### **7.1.3 Highway 52 and Broadway**

Highway 52 and Broadway operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.20, delays = 6.3 seconds). Movements on the eastbound and westbound movements are stop controlled and operate at LOS B with low delays (v/c ratios = 0.20 or less, delays = 13.7 seconds or less). Movements on the northbound and southbound approaches are free-flow and operate at LOS A with low delays (v/c ratios = 0.05 or less, delays = 2.9 seconds or less).

#### **7.1.4 Highway 52 and 200 E**

Highway 52 and 200 E operates well at an overall intersection LOS A and with delays (max v/c ratio = 0.10, delays = 6.0 seconds). The eastbound, westbound and southbound movements all operate with LOS A while the northbound movements operate at LOS B. All movements operate with v/c ratios of 0.10 or less and delays of 10.1 seconds or less.

#### **7.1.5 100 N and 200 W**

100 N and 200 W operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.09, delays = 7.6 seconds). All movements operate at LOS A and with low delays (v/c ratios = 0.09 or less, delays = 7.7 seconds or less).

#### **7.1.6 100 N and Broadway**

100 N and Broadway operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.09, delays = 3.7 seconds). The westbound, northbound and southbound movements operate at

LOS A while the eastbound movements operate at LOS B. All movements operate with a v/c ratio of 0.09 or less and delays of 12.0 seconds or less.

#### 7.1.7 100 N and 200 E

100 N and 200 E operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.07, delays = 7.4 seconds). All movements at the intersection operate at LOS A and with a v/c ratio of 0.07 or less and delays of 7.5 seconds or less.

#### 7.1.8 100 S and 200 W

100 S and 200 W operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.05, delay = 7.1 seconds). All movements at the intersection operate at LOS A with low delays (v/c ratios = 0.05 or less, delays = 7.3 seconds or less).

#### 7.1.9 100 S and Broadway

100 S and Broadway operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.06, delays = 4.7 seconds). Movements on the westbound, northbound and southbound approaches operate at LOS A with v/c ratios of 0.06 or less and delays of 9.5 seconds or less. Movements on the eastbound approach operate at LOS B with a v/c ratio of 0.06 and delays of 10.3 seconds.

#### 7.1.10 100 S and 200 E

100 S and 200 E operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.05, delays = 7.2 seconds). All movements at the intersection operate at LOS A and with v/c ratios of 0.05 or less and delays of 7.3 seconds or less.

#### 7.1.11 400 S and Broadway

400 S and Broadway operates at with an overall intersection LOS A with low delays (max v/c ratio = 0.02, delays = 4.6 seconds). All movements at the intersection operate at LOS A with extremely low delays (v/c ratios = 0.02 or less, delays = 8.6 seconds or less).

#### 7.1.12 400 S and 200 E

400 S and 200 E operates well at an overall intersection LOS A with low delays (max v/c ratio = 0.01, delays = 5.3 seconds). All movements at the intersection operate at LOS A with extremely low delays (v/c ratios = 0.01 or less, delays = 8.5 seconds or less).

Table 7-1 summarizes the Synchro capacity results for the existing 2008 traffic volumes, during the pm peak hour. The table only captures the overall intersection results; results for the individual intersection movements can be found in Appendix D.

**Table 7-1  
Existing 2008 Traffic Volumes – PM Peak Hour**

Intersection	LOS	Max V/C Ratio	Delay (s)
Railway Ave & 200 E	A	0.04	3.6
Highway 52 & 400 W	n/a		
Highway 52 & 200 W	A	0.18	6.0
Highway 52 & Broadway	A	0.20	6.3
Highway 52 & 200 E	A	0.10	6.0
Highway 52 & Development #10 Access	n/a		
100 N & 400 W	n/a		
100 N & 200 W	A	0.09	7.6
100 N & Broadway	A	0.09	3.7
100 N & 200 E	A	0.07	7.4
100 S & 400 W	n/a		
100 S & 200 W	A	0.05	7.1
100 S & Broadway	A	0.06	4.7
100 S & 200 E	A	0.05	7.2
400 S & 400 W	n/a		
400 S & Broadway	A	0.02	4.6
400 S & 200 E	A	0.01	5.3
400 S & Development #10 Access	n/a		

## 7.2 2018 BACKGROUND AND DEVELOPMENT TRAFFIC

An assessment of the study intersections with the 2018 background and development traffic volumes was completed to evaluate how the intersections would operate under the 2018 time horizon.

Even with additional traffic on the 2018 road network, all the study intersections operate well above the minimum LOS required with an overall intersection LOS C and all movements across the 2018 road network operate at LOS D or higher. Two intersections operate with movements at LOS C; this includes Highway 52 at Broadway and 100 N at Broadway, which are both located in the central business district. The results of the individual intersections are detailed below.

### 7.2.1 Railway Avenue and 200 E

Railway Avenue and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.11, delays = 4.1 seconds). All movements at the intersection is expected to operate at LOS A and with v/c ratios of 0.11 or less and delays of 9.3 seconds or less.

### 7.2.2 Highway 52 and 400 W

In 2018, Highway 52 and 400 W is upgraded from a T-intersection to a four-legged intersection. Highway 52 and 400 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.03, delays = 1.5 seconds). The northbound and southbound movements are expected to operate at LOS B with v/c ratios of 0.03 and delays of 10.7 seconds or less. The eastbound and westbound movements are expected to operate at LOS A with v/c ratios of 0.01 and delays of 0.7 seconds or less.

### 7.2.3 Highway 52 and 200 W

Highway 52 and 200 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.36, delays = 7.0 seconds). The movement LOS remain unchanged from the 2008 horizon despite the additional traffic in the 2018 horizon. However, the v/c ratios and delays experience a slight increase and are at 0.36 or less and 14.9 seconds or less, respectively.

### 7.2.4 Highway 52 and Broadway

Highway 52 and Broadway is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.41, delays = 8.7 seconds). The westbound movement is expected to experiences a decrease in LOS from LOS B in the 2008 horizon to LOS C in the 2018 horizon. For the remaining intersection movements, the movement LOS remain unchanged from the analysis completed for the 2008 horizon; however the v/c ratio and delays are expected to increase slightly to 0.41 or less and 14.7 or less, respectively.

### **7.2.5 Highway 52 and 200 E**

Highway 52 and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.23, delays = 7.0 seconds). The southbound movement is expected to experience a slight decrease in LOS from LOS A in 2008 to LOS B in 2018. The v/c ratio is 0.09 and the delay is 10.7 seconds for this approach. The eastbound, westbound and northbound movements continue to operate at the same LOS as in 2008, but with slight increases in the v/c ratios and delays.

### **7.2.6 100 N and 400 W**

100 N and 400 W is a new intersection in the 2018 horizon. 100 N and 400 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.02, delays = 1.9 seconds). All movements at the intersection are expected to operate at LOS A and with v/c ratios of 0.02 or less and delays of 8.6 seconds or less.

### **7.2.7 100 N and 200 W**

100 N and 200 W is expected to operate well at an overall intersection LOS A and low delays (max v/c ratio = 0.15, delays = 8.0 seconds). All movement LOS remain unchanged from the 2008 horizon. The intersection movements are expected to experience slight increase in the v/c ratio and delays.

### **7.2.8 100 N and Broadway**

100 N and Broadway is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.16, delays = 3.6 seconds). The eastbound movement is expected to experience a decrease in LOS from LOS B in the 2008 horizon to LOS C in the 2018 horizon. The remaining movements continue to operate at the same LOS with only slight increases in the v/c ratios and delays.

### **7.2.9 100 N and 200 E**

100 N and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.16, delays = 7.9 seconds). All movements are expected to operate at LOS A with very slight increase in the v/c ratios and delays from the 2008 horizon.

### **7.2.10 100 S and 400 W**

100 S and 400 W is a new intersection in the 2018 horizon. 100 S and 400 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.07, delays = 6.0 seconds). All movements at the intersection are expected to operate at LOS A and with v/c ratios of 0.07 or less and delays of 9.5 seconds or less.

### 7.2.11 100 S and 200 W

100 S and 200 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.08, delay = 7.4 seconds). All movements at the intersection are expected to operate at LOS A and with low delays (v/c ratios = 0.08 or less, delays = 7.5 seconds or less).

### 7.2.12 100 S and Broadway

100 S and Broadway is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.10, delays = 3.7 seconds). The westbound movement is expected to experience a slight decrease in LOS from LOS A in the 2008 horizon to LOS B in the 2018 horizon. The LOS for other movements are expected to remain unchanged despite slight increase in the v/c ratio and delays.

### 7.2.13 100 S and 200 E

100 S and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.13, delays = 7.5 seconds). All movements at the intersection are expected to operate at LOS A and with v/c ratios of 0.13 or less and delays of 7.8 seconds or less.

### 7.2.14 400 S and 400 W

400 S and 400 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.02, delays = 1.8 seconds). All movements at the intersection are expected to operate at LOS A and with v/c ratios of 0.02 or less and delays 2.0 seconds or less.

### 7.2.15 100 S and Broadway

400 S and Broadway is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.08, delays = 4.4 seconds). All movements at the intersection are expected to operate at LOS A with low delays (v/c ratios = 0.08 or less, delays = 9.9 seconds or less).

### 7.2.16 400 S and 200 E

400 S and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.02, delays = 6.0 seconds). All movements at the intersection are expected to operate at LOS A and with v/c ratios of 0.02 or less and delays of 8.7 seconds or less.

Table 7-2 summarizes the Synchro capacity results for the 2018 background and development traffic volumes, during the pm peak hour. The table only captures the overall intersection results; results for the individual intersection movements can be found in Appendix D.

**Table 7-2  
2018 Background and Development Traffic Volumes – PM Peak Hour**

Intersection	LOS	Max V/C Ratio	Delay (s)
Railway Avenue & 200 E	A	0.11	4.1
Highway 52 & 400 W	A	0.03	1.5
Highway 52 & 400 W	A	0.36	7.0
Highway 52 & Broadway	A	0.41	8.7
Highway 52 & 200 E	A	0.23	7.0
Highway 52 & Development #10 Access	n/a		
100 N & 400 W	A	0.02	1.9
100 N & 200 W	A	0.15	8.0
100 N & Broadway	A	0.16	3.6
100 N & 200 E	A	0.16	7.9
100 S & 400 W	A	0.07	6.0
100 S & 200 W	A	0.08	7.4
100 S & Broadway	A	0.10	3.7
100 S & 200 E	A	0.13	7.5
400 S & 400 W	A	0.02	1.8
400 S & Broadway	A	0.08	4.4
400 S & 200 E	A	0.02	6.0
400 S & Development #10 Access	n/a		



### 7.3 2028 BACKGROUND AND DEVELOPMENT TRAFFIC

Similar to the 2018 horizon, an assessment of the study intersections with the background and development traffic volumes was completed to evaluate how the intersections would operate under the 2028 horizon.

With the exception of Highway 52 and Broadway, all the study intersections are expected to operate above the minimum LOS required despite the additional traffic. Highway 52 and Broadway is expected to operate at an overall intersection LOS D. This exceeds the minimum LOS threshold and indicates that improvements are required at the intersection.

Most intersection movements are expected to operate at LOS D or higher, except at Highway 52 and 200 W and Highway 52 and Broadway. Movements at these intersection are expected to experience LOS E and LOS F respectively.

#### 7.3.1 Railway Avenue and 200 E

Railway Avenue and 200 E is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.20, delays = 4.5 seconds). The LOS for the northbound movements is expected to decrease from LOS A in the 2018 horizon to LOS B in the 2028 horizon. Movements on the eastbound and westbound approaches continue to operate at LOS A with v/c ratios of 0.11 or less and delays of 2.2 seconds or less.

#### 7.3.2 Highway 52 and 400 W

Highway 52 and 400 W is expected to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.05, delays = 1.4 seconds). The movement LOS remain unchanged from the 2018 analysis; however the v/c ratio and delays do increase slightly.

#### 7.3.3 Highway 52 and 400 W

Highway 52 and 200 W is expected to operate at an overall intersection LOS A with low delays (max v/c ratio = 0.70, delays = 13.0 seconds). In 2028, the northbound movement is expected to deteriorate to LOS E with a v/c ratio of 0.72 and delay of 35.0 seconds, and the southbound movement is expected to deteriorate to LOS C with a v/c ratio of 0.37 and delays of 23.7 seconds. The poor LOS on the northbound movement can be linked to the high right-turn proportion and the delay experienced behind stopped vehicles waiting for gaps to execute a left-turn or through movement. The movement LOS remain unchanged for the remaining movements aside from slight increase in the v/c ratio and delays.

The provision of a separate right-turn lane for the northbound approach would reduce the delay experienced by the northbound movements.

#### **7.3.4 Highway 52 and Broadway**

In the 2028 horizon Highway 52 and Broadway is expected to operate at an overall intersection LOS D with a maximum v/c ratio of 1.37 and delays of 81.0 seconds. The intersection LOS is expected to exceed the minimum LOS required and the v/c ratio. The higher v/c ratio indicates that the intersection is expected to operate above capacity. The poor overall intersection LOS can be attributed to the eastbound and westbound movements. These movements are expected to operate at LOS F with v/c ratios exceeding 1.00 and delays as high as 252.2 seconds. The northbound and southbound movements continue to operate at LOS A, with v/c ratios of 0.07 or less and delays of 2.5 seconds or less.

As mentioned in Section 7.4, changing the traffic control at this intersection to a four-way stop control would improve the LOS for the eastbound and westbound approaches. A four way stop control would help to balance out the delay across all intersection approaches and improve the overall operation of the entire intersection. The results of the individual intersections are detailed below.

#### **7.3.5 Highway 52 and 200 E**

Highway 52 and 200 E is expected to operate at an overall intersection LOS A with low delays (max v/c ratio = 0.52, delays = 8.5 seconds). The northbound and southbound movements are expected to experience a slight decrease in LOS from LOS B in the 2018 horizon to LOS in the 2028 horizon. The eastbound and westbound movements continue to operate at LOS A, with v/c ratios of 0.04 or less and delays of 2.0 seconds or less.

#### **7.3.6 Highway 52 and Development #10 Access**

Highway 52 and the access to Development #10 is a new intersection in the 2028 horizon. The intersection is expected to operate at an overall intersection LOS A with a maximum v/c ratio of 0.09 and delay of 1.9 seconds. All the intersection movements are expected to operate at LOS A with v/c ratios of 0.09 or less and delays under 9.6 seconds.

#### **7.3.7 100 N and 400 W**

100 N and 400 W continues to operate at an overall intersection LOS A with a maximum v/c ratio of 0.02 and delay of 1.9 seconds. All movements at the intersection are expected to operate at LOS A with low delays (v/c ratios = 0.02 or less, delays = 8.7 seconds or less).

#### **7.3.8 100 N and 200 W**

100 N and 200 W continues to operate well with an overall intersection LOS A and low delays (max v/c ratio = 0.22, delays = 8.6 seconds). All movements at the intersection are expected to operate at LOS A with low delays (v/c ratios = 0.22 or less, delays = 8.8 seconds or less).

### 7.3.9 100 N and Broadway

100 N and Broadway is expected to operate at an overall intersection LOS B with low delays (max v/c ratio = 0.28, delays = 4.3 seconds). The eastbound and westbound movements are expected to operate at LOS C and LOS B respectively and with v/c ratios of 0.28 or less and delays of 22.9 seconds or less. Both the northbound and southbound movements are expected to operate at LOS A. The v/c ratios and delays for these approaches are at 0.05 or less and 1.7 seconds or less.

### 7.3.10 100 N and 200 E

100 N and 200 E continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.11, delays = 8.4 seconds). All movements continue to operate at LOS A with very slight increases in the v/c ratios and delays.

### 7.3.11 100 S and 400 W

100 S and 400 W continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.09, delays = 6.0 seconds). All the intersection movements are expected to operate at LOS A with v/c ratios of 0.09 or less and delays of 9.7 seconds or less.

### 7.3.12 100 S and 200 W

100 S and 200 W continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.13, delay = 7.7 seconds). All movements at the intersection continue to operate at LOS A with low delays (v/c ratios = 0.13 or less, delays = 7.8 seconds or less).

### 7.3.13 100 S and Broadway

100 S and Broadway continues to operate at an overall intersection LOS A with low delays (max v/c ratio = 0.16, delays = 4.0 seconds). In the 2028 horizon, the eastbound movement is expected to decrease to LOS C. The LOS for the other movements remains unchanged despite slight increases in the v/c ratio and delays.

### 7.3.14 100 S and 200 E

100 S and 200 E continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.19, delays = 8.0 seconds). All movements at the intersection continue to operate at LOS A and with v/c ratios of 0.19 or less and delays of 8.2 seconds or less.

#### **7.3.15 400 S and 400 W**

400 S and 400 W continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.03, delays = 1.3 seconds). All movements at the intersection continue to operate at LOS A and with v/c ratios of 0.03 or less and delays 1.4 seconds or less.

#### **7.3.16 400 S and Broadway**

400 S and Broadway continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.15, delays = 3.9 seconds). The eastbound and westbound movements are expected to operate at LOS A with v/c ratios of 0.07 and delays of 2.8 seconds or less. The southbound movement is expected to operate at LOS B with a v/c ratio of 0.15 and delays of 11.1 seconds..

#### **7.3.17 400 S and 200 E**

400 S and 200 E continues to operate well at an overall intersection LOS A with low delays (max v/c ratio = 0.07, delays = 3.1 seconds). All movements at the intersection continue to operate at LOS A and with v/c ratios of 0.07 or less and delays of 9.8 seconds or less.

#### **7.3.18 400 S and Development #10 Access**

400 S and the access to Development #10 continues to operate at an overall intersection LOS A with a maximum v/c ratio of 0.00 and delays of 0.0 seconds.

Table 7-3 summarizes the Synchro capacity results for the 2028 background and development traffic volumes, during the pm peak hour. The table only captures the overall intersection results; results for the individual intersection movements can be found in Appendix D.

**Table 7-3**  
**2028 Background and Development Traffic Volumes – PM Peak Hour**

Intersection	LOS	Max V/C Ratio	Delay (s)
Railway Ave & 200 E	A	0.20	4.5
Highway 52 & 400 W	A	0.05	1.4
Highway 52 & 200 W	A	0.70	13.0
Highway 52 & Broadway	D	1.37	81.0
Highway 52 & 200 E	A	0.52	8.5
Highway 52 & Development #10 Access	A	0.09	1.9
100 N & 400 W	A	0.02	1.9
100 N & 200 W	A	0.22	8.6
100 N & Broadway	B	0.28	4.3
100 N & 200 E	A	0.23	8.5
100 S & 400 W	A	0.09	6.0
100 S & 200 W	A	0.13	7.7
100 S & Broadway	A	0.16	4.0
100 S & 200 E	A	0.19	8.0
400 S & 400 W	A	0.03	1.3
400 S & Broadway	A	0.15	3.9
400 S & 200 E	A	0.07	3.1
400 S & Development #10 Access	A	0.00	-



## 8

## Recommended Improvements

### 8.1 2018 HORIZON

The results of the traffic analysis indicate that the road network assumed for the 2018 horizon is sufficient to accommodate the total traffic volumes anticipated for that horizon. Therefore, no roadway improvements are required above and beyond the provision of the links indicated in Section 3.2 for the 2018 horizon.

### 8.2 2028 HORIZON

The results of the traffic analysis indicate that two intersections are expected to operate poorly in the 2028 horizon and require intersection improvements.

Highway 52 and 200 W requires a separate northbound right-turn lane. When a northbound right-turn lane is provided, the northbound movement is expected to operate at LOS D with a v/c ratio of 0.59 and delays of 25.0 seconds. This is a significant improvement from the LOS E with v/c ratio of 0.79 and delays of 35.0 seconds experienced without the turn lane.

Highway 52 and Broadway requires a change in traffic control from a two-way stop-control to a four-way stop-control. With the provision of a four-way stop-control, all the intersection movements are expected to operate at LOS D or higher, and with v/c ratios of 0.82 or less and delays under 32.5 seconds or less. This is a significant improvement from the two-way stop control condition, where the eastbound and westbound movements were failing and operating above capacity (highest v/c ratio = 1.37 and longest delays = 252.2 seconds).

The detailed results of the capacity analyses with the intersection improvements have been included in Appendix D.





## 9 Transportation Issues

### 9.1 TRAFFIC SIGNALIZATION

One of the immediate transportation issue identified by the Town was the need for signalization at the intersections of Highway 52 and 200 W, Highway 52 and Broadway, Broadway and 100 N, Broadway and Church Avenue, and 100 N and 200 W. For the four major intersections identified in the road network plans, traffic signal warrants were completed for all three time horizons. Traffic signal warrants were only completed in the 2008 horizon for Broadway and Church Avenue since it was not identified as a major roadway. The traffic signal warrant calculation was completed to provide the Town with insight into whether the signal is warranted currently.

To evaluate the need to provide signalization at the intersection, the traffic signal warrant from the Manual on Uniform Traffic Control Devices (MUTCD) was completed. The MUTCD traffic signal warrant is a point based system that assigns priority points to an intersection based on factors such as its collision history, geometry and pedestrian and vehicle volumes. The total priority points assigned to an intersection indicate the priority to install a traffic signal. Typically, a traffic signal is warranted at an intersection when a total priority point equal or in excess of 100 is assigned.

The traffic signal warrants have been included in Appendix E. For the 2008 time frame, the traffic signal warrants were completed using the existing traffic. For the 2018 and 2028 horizons, traffic signal warrants were completed using background and development traffic. Collision data was obtained from AT for Highway 52 through the Town. The data indicated that there was one collision within the last five years at the study intersection.

The following data/assumptions were used for the signal warrant calculations:

- Traffic Volumes: volumes as per Figures 4-1, 4-2, 4-3, 6-1 and 6-2.
- Pedestrian volumes: As per the traffic counts provided by the Town. Pedestrian volumes were not available for Highway 52 and Broadway; therefore zero pedestrian volumes were assumed. No growth was assumed for the pedestrian volumes for the future horizons.

The results of the traffic signal warrants are summarized in Table 9-1 below for the different time horizons.

**Table 9-1  
Traffic Signal Warrant Results**

<b>Intersection</b>	<b>Existing 2008 Traffic</b>	<b>2018 (Background &amp; Development Traffic)</b>	<b>2028 (Background &amp; Development Traffic)</b>
Highway 52 and 200 W	-4.69 (Not warranted)	6.62 (Not warranted)	23.68 (Not warranted)
Highway 52 and Broadway	0.59 (Not warranted)	14.39 (Not warranted)	36.15 (Not warranted)
Broadway and 100 N	-6.51 (Not warranted)	5.23 (Not warranted)	14.80 (Not warranted)
Broadway and Church Avenue	-4.72 (Not warranted)	n/a	n/a
100 N and 200 W	-10.81 (Not warranted)	-5.55 (Not warranted)	0.82 (Not warranted)

The results of the signal warrants indicate that the traffic volumes at the above intersections do not warrant signalization in the 2008, 2018 or 2028 time horizons. As mentioned in Section 8.0, capacity issues with the intersection of Highway 52 and Broadway can be removed by changing the traffic control to a four-way stop control.

## 9.2 EXTENSION OF 400 W AND 300 S

Two long-term transportation issues identified by the Town were the extension of 400 W from Highway 52 to 400 S and the extension of 300 S from 100 W to Broadway.

AE recommends that the extension of 400 W, as shown in Figures 3-4 and 3-5, be implemented. 400 W is located at the Town's west end and would serve as an important link to the future developments planned within the Town. Many of the proposed developments are located in the south end, near 400 S. The extension of 400 W to connect with 400 S would provide an alternative north-south route to these developments, reducing the trips that must pass through the Town and through the residential communities. Inherently, the 400 S extension could become a vital link by providing a more direct, quicker route for commuters heading to the new developments.

The capacity analysis completed for the 2018 and 2028 horizons were completed under the assumption that the extension of 300 S was not implemented. The results indicate that the surrounding intersections continue to operate well even without the extension; therefore, AE does not recommend that the Town

implement the 300 S extension. The extension of 300 S should be evaluated again in the future should the traffic patterns within the area change.



## 10 Cost Estimate

A preliminary cost estimate of the new road construction required for the 2018 and 2028 horizons was completed using typical roadway cross-sections and pavement structures detailed in the Town of Raymond Engineering Standards (2006). The Major Collector Residential cross-section (Drawing TN-02) was assumed for both the new Arterial and Collector Road classifications and the Local Residential cross-section (Drawing TN-01) was assumed for the Local Road classification. The pavement structure for the residential roadway, comprising of 75 mm Asphaltic Concrete and 200 mm Crushed Granular Base, was assumed for all the roadways.

Unit pricing was obtained from the December 2008 AIT unit prices for Southern Alberta. Table 10-1 summarizes the unit prices used.

**Table 10-1  
AIT Unit Price – Southern Region – December 2008**

Construction Item	Unit Price
<b>Excavation:</b>	
Common Excavation	\$4.19/m <sup>3</sup>
Waste Excavation	\$10.88/m <sup>3</sup>
<b>Subgrade Preparation:</b>	
Subgrade Preparation	\$1.34/m <sup>2</sup>
<b>Pavement Structure:</b>	
ACP - 75 mm	\$110.90/t
GBC - 200 mm	\$23.84/t
Curb and Gutter	\$270.00/m
<b>Pavement Marking:</b>	
Centre Line Painting	\$1,041.35/m

The following assumptions regarding contingency, engineering costs and GST were assumed under both horizons:

- 15% contingency
- 15% Engineering Fee (includes contingency)
- 5% GST.

Table 10-2 presents the cost estimate for the new road construction in the 2018 and 2028 horizons. These prices reflect 2008 costs. A detailed breakdown of the cost estimate has been provided in Appendix F.

**Table 10-2  
Cost Estimate**

Construction Item	2018 Horizon	2028 Horizon
Arterial Roadway	\$ 1,316,929.58	\$1,098,223.53
Collector Roadway	\$ 0.00	\$ 856,989.81
Local Roadway	\$ 6,331,514.97	\$ 865,287.15
Contingency	\$ 1,147,266.68	\$ 423,075.07
Engineering Cost	\$ 1,319,356.69	\$ 486,536.34
GST	\$ 505,753.40	\$ 186,505.60
<b>Total</b>	<b>\$10,620,821.32</b>	<b>\$3,916,617.51</b>

## 11 School Safety

One of the immediate issues that the Town needs to address is the school zone pedestrian safety. The Town is concerned about the traffic operations along 100 N, specifically the section with all three schools. The block is comprised by Highway 52 to the north, Broadway to the east, 100 N to the south and 200 W to the west and contains an elementary and a junior high school. Between 8:00 am and 9:00 am and 2:00 pm and 3:00 pm, all boundary roads experience increased traffic and pedestrian volumes. The increased traffic and pedestrian volumes can be attributed to the student drop off/pick up and walking activities. The Town's immediate concern is to improve the school zone traffic operations and reduce the pedestrian/vehicular conflicts along the boundary road intersections.

In order to analyze the traffic operations along the boundary road intersections, turning movement counts and video surveillance at the following intersections were collected:

- Highway 52/200 W
- 100 S/200 W
- 100 S/Broadway
- Highway 52/Broadway.

Traffic analysis at the above noted intersections were conducted for the 2008, 2018 and 2028 horizon and the results are illustrated in Sections 7 through 7.5 of this report. The capacity analysis results indicate that all boundary road intersections are expected to operate at excellent levels of service with low delays under the 2008, 2018 and 2028 horizon years.

Signal warrant analysis at the above noted intersections were conducted and are illustrated in Section 9 of this report. The warrant analysis indicates that traffic volumes including pedestrians at the above noted intersections do not warrant signalization in the 2008, 2018 or 2028 time horizons.

Video surveillance provided by the Town was reviewed and following points were observed:

- The beginning of the school zone was clearly indicated, according to the MUTCDC.
- The school zone was marked with the School Area sign (WC-1), according to the MUTCDC.
- In addition to the appropriate area warning signs, the school zone was marked with a sign denoting reduced speed limit and a sign denoting the end of the school zone, according to the MUTCDC.
- A RB-1 (Maximum Speed sign) below the WC-1 (Fluorescent yellow in colour), displaying the reduced speed limit was provided at the school zone, in accordance with the MUTCDC.

- RB-1 (Maximum Speed sign) at the end of the zone, reinstating the original speed limit was provided, in accordance with the MUTCDC.
- End school zone sign, yellow in colour was used on local roads in residential areas, in accordance with the MUTCDC.
- Pavement markings were not used to supplement the traffic signs with in the School area, in accordance with the MUTCDC guidelines.
- No speed transition zone is required and provided further upstream of the existing school zone, as the posted speed limit is less than 70 km/h.
- Although crossing guards were operational at 100 S/Broadway intersection during the am peak hour of the school zone, they were not effective. It was observed that the crossing guards were standing at the northwest corner of 100 S/Broadway intersection, while pedestrians were crossing the intersection without their guidance.
- Driver behaviour at 100 S/Broadway intersection was unacceptable. During the video surveillance review it was found that many drivers didn't stop at all or come to a complete stop at the stop control while clearing the intersection. Moreover it was observed that many drivers did not wait at the stop controlled intersection for the pedestrians to clear the intersection.

In order to improve the pedestrian safety and reduce the potential pedestrian/vehicular conflict points at the study intersections mentioned above, the following recommendations have been proposed:

- The study intersections are currently operating at excellent levels of service as far as the traffic operations are concerned.
- The intersections are not warranted for signalization in the 2008, 2018 or 2028 time horizons.
- Zebra pavement markings should be used to supplement the traffic signs and add emphasis to the crosswalk. The details of the pavement markings through the school zone should be implemented in accordance with the pavement marking schemes described in the MUTCDC.
- Promote driver awareness of the school zones by providing traffic signs and pavement markings.
- Educate students on pedestrian safety at the school zone crossing.
- Appoint adult crossing guards at the study intersections and/or at roadway segments to monitor young children crossing the intersections during the peak hours of the school zone.



- Alternatively retrain the school safety patrol. School safety patrol members should be selected from the upper grade levels. Patrol members can be trained in traffic operations and pedestrian safety by RCMP.
- Encourage parents to be involved in discussing hazards, obstacles and crossing behaviours.
- Encourage teachers to help children to be aware of the vehicle/pedestrian conflicts and practice the correct crossing behaviours as a school activity.
- Educate the area drivers about the school zones and traffic operations.
- Enforce the study intersections with the help of RCMP officers during the peak hours of the school zone to stop erratic manoeuvres and/or to punish aggressive drivers.

Regular communications between school officials, law enforcement, parents, City Officials and school transportation personnel are critical to promote safe operations with in the school zones.



# 12 Recommendations and Conclusions

This report documents the analysis undertaken to complete the Transportation Master Plan for the Town of Raymond. At the project initiation meeting, the Town provided AE with a list of immediate and long-term transportation issues that need to be addressed along with plans for the future expansion of the Town in terms of land annexation and developments. AE's main objective for the study was to develop a TMP which clearly defines the Town's transportation road network within the existing and future Town boundaries.

Figures 2-2, 3-4 and 3-5 present the Road Network Plans developed by AE for the Town of Raymond in the existing (2008) and future (2018 and 2028) time horizons. The road network plans outline the major roadways and their classifications in each time horizon and were developed with consideration for the land use, the function and connectivity of the roadways.

The road network plans also identify the major intersections within the Town. These intersections were assessed in terms of operational capacity for the different horizons. The results of the capacity analysis indicate that the existing road network, with the extension of 400 W from Highway 52 to 400 S, can accommodate the total traffic (background traffic and development traffic) in the 2008 and 2018 time horizons. During the 2028 horizon intersection improvements are required; in the form of a separate northbound right turn lane at Highway 52 and 200 W and a four-way stop control at Highway 52 and Broadway. The capacity analysis also revealed that the road network operates well without the extension of 300 S, confirming that this extension is not required.

Traffic signal warrants were undertaken to determine the need for traffic signals at the intersections of Highway 52 and 200 W, Highway 52 and Broadway, Broadway and 100 N, Broadway and Church Avenue, and 100 N and 200 W. The traffic signal warrants indicate that traffic signals are not warranted at the intersections in the existing or future horizons.

To improve the pedestrian safety at the study intersections within the school zone, regular communications between school zones officials, City officials, parents, law enforcement officials and school transportation personnel are required.

The cost estimate for the new road construction is \$11 million (approx.) in the 2018 horizon year and \$4 million (approx.) in the 2028 horizon year, respectively.



# A Appendix A - Traffic Counts



### Town of Raymond: Summary of Traffic Counts

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: January 2009

Location: Church Ave & 200 W  
 Date: Thursday, April 10, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
7:00 - 7:15 am				0	0	0	0	0	0	0	0	0
7:15 - 7:30 am				0	0	0	0	0	0	0	0	0
7:30 - 7:45 am				0	0	0	0	0	0	0	0	0
7:45 - 8:00 am				0	0	0	0	0	0	0	0	0
8:00 - 8:15 am				0	0	0	0	0	0	0	0	0
8:15 - 8:30 am				0	0	0	0	0	0	0	0	0
8:30 - 8:45 am				0	0	0	0	0	0	0	0	0
8:45 - 9:00 am				0	0	0	0	0	0	0	0	0
9:00 - 9:15 am				0	0	0	0	0	0	0	0	0
9:15 - 9:30 am				0	0	0	0	0	0	0	0	0
9:30 - 9:45 am				0	0	0	0	0	0	0	0	0
9:45 - 10:00 am				0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Peak</b>	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Total	0			17			49			47		
Peak Hour (Truck)	0			1			1			0		
Truck Percentage	#####			5.89%			2.04%			0.00%		

Date: Wednesday, April 9, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
2:00 - 2:15 pm				0	0	0	0	0	0	0	0	0
2:15 - 2:30 pm				0	0	0	0	0	0	0	0	0
2:30 - 2:45 pm				0	0	0	0	0	0	0	0	0
2:45 - 3:00 pm				0	0	0	0	0	0	0	0	0
3:00 - 3:15 pm				0	0	0	0	0	0	0	0	0
3:15 - 3:30 pm				0	0	0	0	0	0	0	0	0
3:30 - 3:45 pm				0	0	0	0	0	0	0	0	0
3:45 - 4:00 pm				0	0	0	0	0	0	0	0	0
4:00 - 4:15 pm				0	0	0	0	0	0	0	0	0
4:15 - 4:30 pm				0	0	0	0	0	0	0	0	0
4:30 - 4:45 pm				0	0	0	0	0	0	0	0	0
4:45 - 5:00 pm				0	0	0	0	0	0	0	0	0
5:00 - 5:15 pm				0	0	0	0	0	0	0	0	0
5:15 - 5:30 pm				0	0	0	0	0	0	0	0	0
5:30 - 5:45 pm				0	0	0	0	0	0	0	0	0
5:45 - 6:00 pm				0	0	0	0	0	0	0	0	0
6:00 - 6:15 pm				0	0	0	0	0	0	0	0	0
6:15 - 6:30 pm				0	0	0	0	0	0	0	0	0
6:30 - 6:45 pm				0	0	0	0	0	0	0	0	0
6:45 - 7:00 pm				0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Peak</b>	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Total	0			28			38			77		
Peak Hour (Truck)	0			0			2			2		
Truck Percentage	#####			0.00%			5.26%			2.60%		

**Town of Raymond: Summary of Traffic Counts**

Project No: 2007-2491  
 Date Created: April 24, 2008  
 Date Revised: January 2009

Location: Church Avenue & 100 W  
 Date: Thursday, April 10, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian
7:00 - 7:15 am	0	0	0	0	0	0	0	0	0	0	0	0
7:15 - 7:30 am	0	0	0	0	0	0	0	0	0	0	0	0
7:30 - 7:45 am	0	0	0	0	0	0	0	0	0	0	0	0
7:45 - 8:00 am	0	0	0	0	0	0	0	0	0	0	0	0
8:00 - 8:15 am	0	0	0	0	0	0	0	0	0	0	0	0
8:15 - 8:30 am	5	0	4	0	0	0	0	0	0	0	0	0
8:30 - 8:45 am	2	0	0	0	0	0	0	0	0	0	0	0
8:45 - 9:00 am	0	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15 am	0	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30 am	0	0	0	0	0	0	0	0	0	0	0	0
9:30 - 9:45 am	0	0	0	0	0	0	0	0	0	0	0	0
9:45 - 10:00 am	2	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>9</b>	<b>0</b>	<b>37</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>13</b>	<b>3</b>	<b>0</b>	<b>27</b>	<b>1</b>	<b>8</b>
<b>Peak</b>	<b>7</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>3</b>
Peak Hour Total	28			18			26			18		
Peak Hour (Truck)	1			1			4			4		
Truck Percentage	3.57%			5.65%			15.36%			22.22%		

Date: Wednesday, April 9, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian
2:00 - 2:15 pm	1	0	4	0	0	0	0	0	0	0	0	0
2:15 - 2:30 pm	0	0	5	0	0	0	0	0	0	0	0	0
2:30 - 2:45 pm	0	0	2	0	0	0	0	0	0	0	0	0
2:45 - 3:00 pm	1	0	2	0	0	0	0	0	0	0	0	0
3:00 - 3:15 pm	0	0	4	0	0	0	0	0	0	0	0	0
3:15 - 3:30 pm	0	0	6	0	0	0	0	0	0	0	0	0
3:30 - 3:45 pm	0	0	11	0	0	0	0	0	0	0	0	0
3:45 - 4:00 pm	0	0	1	0	0	0	0	0	0	0	0	0
4:00 - 4:15 pm	0	0	7	0	0	0	0	0	0	0	0	0
4:15 - 4:30 pm	0	0	2	0	0	0	0	0	0	0	0	0
4:30 - 4:45 pm	0	0	3	0	0	0	0	0	0	0	0	0
4:45 - 5:00 pm	0	0	3	0	0	0	0	0	0	0	0	0
5:00 - 5:15 pm	0	0	5	0	0	0	0	0	0	0	0	0
5:15 - 5:30 pm	0	0	2	0	0	0	0	0	0	0	0	0
5:30 - 5:45 pm	0	0	3	0	0	0	0	0	0	0	0	0
5:45 - 6:00 pm	1	0	2	0	0	0	0	0	0	0	0	0
6:00 - 6:15 pm	0	0	3	0	0	0	0	0	0	0	0	0
6:15 - 6:30 pm	0	0	2	0	0	0	0	0	0	0	0	0
6:30 - 6:45 pm	0	0	3	0	0	0	0	0	0	0	0	0
6:45 - 7:00 pm	0	0	3	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>78</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>37</b>	<b>12</b>	<b>7</b>	<b>88</b>	<b>0</b>	<b>26</b>
<b>Peak</b>	<b>1</b>	<b>1</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>2</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>7</b>
Peak Hour Total	29			15			29			29		
Peak Hour (Truck)	1			0			0			0		
Truck Percentage	3.45%			0.00%			0.00%			0.06%		



**Town of Raymond: Summary of Traffic Counts**

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: January 2009

Location: Church Avenue & Broadway  
 Date: Tuesday, April 8, 2008

Period	Eastbound			Westbound			Northbound			Southbound								
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right						
7:00 - 7:15 am	1	0	0	1	0	0	0	15	2	0	0	0						
7:15 - 7:30 am	2	0	0	0	0	0	0	21	2	0	0	0						
7:30 - 7:45 am	1	0	0	0	0	0	1	13	0	0	0	0						
7:45 - 8:00 am	2	0	0	0	2	0	1	18	0	0	0	0						
8:00 - 8:15 am	4	0	0	0	0	0	0	2	19	2	0	0						
8:15 - 8:30 am	9	0	0	0	0	0	3	1	27	1	0	0						
8:30 - 8:45 am	3	0	0	0	0	0	0	0	17	0	2	0						
8:45 - 9:00 am	0	0	0	0	0	0	0	1	12	2	2	0						
9:00 - 9:15 am	1	0	0	0	0	0	0	1	16	1	0	0						
9:15 - 9:30 am	1	0	0	0	0	0	0	1	14	0	0	0						
9:30 - 9:45 am	1	0	0	0	0	0	0	1	7	1	0	0						
9:45 - 10:00 am	5	0	0	0	0	0	0	1	20	2	1	0						
Total	31	0	0	0	0	0	0	5	199	13	6	0						
Peak	16	0	0	0	0	0	0	3	75	5	4	0						
Peak Hour Total	29						91						80					
Peak Hour (Truck)	0						9						13					
Truck Percentage	0.00%						0.00%						16.25%					

Date: Thursday, April 3, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
2:00 - 2:15 pm	7	1	0	1	0	0	0	0	0	0	0	0
2:15 - 2:30 pm	5	1	0	0	0	0	0	0	12	1	0	0
2:30 - 2:45 pm	1	0	0	0	0	0	0	0	3	0	0	0
2:45 - 3:00 pm	7	0	0	0	0	0	0	0	14	0	0	0
3:00 - 3:15 pm	3	0	0	0	0	0	0	0	14	0	0	0
3:15 - 3:30 pm	10	0	0	0	0	0	0	0	21	1	0	0
3:30 - 3:45 pm	7	0	0	0	0	0	0	0	15	0	0	0
3:45 - 4:00 pm	9	0	0	0	0	0	0	0	18	0	0	0
4:00 - 4:15 pm	7	1	0	0	0	0	0	0	18	0	0	0
4:15 - 4:30 pm	10	0	0	0	0	0	0	0	19	1	0	0
4:30 - 4:45 pm	2	0	0	0	0	0	0	0	25	1	0	0
4:45 - 5:00 pm	7	0	0	0	0	0	0	0	35	0	0	0
5:00 - 5:15 pm	6	1	0	0	0	0	0	0	18	0	0	0
5:15 - 5:30 pm	4	0	0	0	0	0	0	0	20	1	0	0
5:30 - 5:45 pm	2	0	0	0	0	0	0	0	22	0	0	0
5:45 - 6:00 pm	2	0	0	0	0	0	0	0	19	0	0	0
6:00 - 6:15 pm	4	0	0	0	0	0	0	0	9	2	0	0
6:15 - 6:30 pm	2	0	0	0	0	0	0	0	12	0	0	0
6:30 - 6:45 pm	4	0	0	0	0	0	0	0	13	0	0	0
6:45 - 7:00 pm	5	0	0	0	0	0	0	0	13	0	0	0
Total	104	4	0	0	0	0	0	0	339	7	23	0
Peak	33	1	0	0	0	0	0	0	75	1	8	0
Peak Hour Total	28			92			176			153		
Peak Hour (Truck)	0			1			4			9		
Truck Percentage	0.00%			1.09%			2.27%			6.47%		

**Town of Raymond: Summary of Traffic Counts**

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: April 25, 2008

Location: 100 N & 200 W  
 Date: Wednesday, April 9, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck
7:00 - 7:15 am	0	0	0	0	0	0	0	0	0	0	0	0
7:15 - 7:30 am	0	0	0	0	0	0	0	0	0	0	0	0
7:30 - 7:45 am	0	0	0	0	0	0	0	0	0	0	0	0
7:45 - 8:00 am	0	0	0	0	0	0	0	0	0	0	0	0
8:00 - 8:15 am	0	0	0	0	0	0	0	0	0	0	0	0
8:15 - 8:30 am	2	1	3	1	2	1	16	0	1	0	10	2
8:30 - 8:45 am	0	0	0	0	0	0	3	0	0	0	15	0
8:45 - 9:00 am	0	0	0	0	0	0	1	0	0	2	0	0
9:00 - 9:15 am	0	0	0	0	0	0	1	0	0	3	0	0
9:15 - 9:30 am	1	0	0	0	0	0	2	0	0	3	0	0
9:30 - 9:45 am	0	0	0	0	0	0	0	0	0	3	0	0
9:45 - 10:00 am	0	0	0	0	0	0	1	0	0	2	1	0
Total	4	1	8	2	9	1	27	0	10	0	70	9
Peak	2	1	4	2	6	1	8	22	0	2	58	6
Peak Hour Total	16			88			52			71		
Peak Hour (Truck)	4			6			0			7		
Truck Percentage	25.00%			6.82%			0.00%			9.86%		

Date: Tuesday April 8, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck
2:00 - 2:15 pm	0	0	0	0	0	0	0	0	0	0	0	0
2:15 - 2:30 pm	0	1	2	0	0	0	0	0	0	0	0	0
2:30 - 2:45 pm	1	0	1	0	0	0	2	0	2	0	0	0
2:45 - 3:00 pm	0	1	2	0	0	0	1	0	1	0	0	0
3:00 - 3:15 pm	0	0	1	0	0	0	3	0	2	0	0	0
3:15 - 3:30 pm	0	0	0	0	0	0	13	0	2	0	5	0
3:30 - 3:45 pm	2	0	2	0	0	0	3	0	4	0	4	0
3:45 - 4:00 pm	0	0	0	0	0	0	4	0	4	0	1	0
4:00 - 4:15 pm	2	0	3	0	0	0	1	0	6	0	2	0
4:15 - 4:30 pm	0	0	0	0	0	0	1	0	3	0	1	0
4:30 - 4:45 pm	2	0	2	0	0	0	2	0	4	0	3	0
4:45 - 5:00 pm	2	0	1	0	0	0	1	0	8	0	1	0
5:00 - 5:15 pm	0	0	0	0	0	0	3	0	2	0	0	0
5:15 - 5:30 pm	1	0	3	0	0	0	0	0	3	0	0	0
5:30 - 5:45 pm	1	0	2	0	0	0	0	0	4	0	0	0
5:45 - 6:00 pm	1	0	4	0	0	0	0	0	4	0	5	0
6:00 - 6:15 pm	0	0	1	0	0	0	2	0	0	0	5	0
6:15 - 6:30 pm	0	0	0	0	0	0	1	0	1	0	5	0
6:30 - 6:45 pm	0	0	0	0	0	0	1	0	4	0	2	0
6:45 - 7:00 pm	0	0	0	0	0	0	6	0	2	0	6	0
Total	12	2	35	0	0	0	48	0	54	0	97	9
Peak	4	0	7	0	0	0	6	21	0	14	0	25
Peak Hour Total	20			66			54			82		
Peak Hour (Truck)	0			1			4			4		
Truck Percentage	0.00%			1.52%			1.85%			4.88%		

**Town of Raymond: Summary of Traffic Counts**

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: April 25, 2008

Location: 100 N & 100 W  
 Date: Wednesday, April 9, 2008

Period	Eastbound			Westbound			Northbound			Southbound			
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	
7:00 - 7:15 am	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 - 7:30 am	0	1	0	0	0	0	0	0	0	0	0	0	
7:30 - 7:45 am	0	2	0	0	0	0	0	0	0	0	0	0	
7:45 - 8:00 am	0	5	1	0	0	0	0	0	0	0	0	0	
8:00 - 8:15 am	0	6	1	0	17	4	0	0	2	0	0	0	
8:15 - 8:30 am	0	17	0	0	36	1	0	45	14	0	3	0	
8:30 - 8:45 am	0	4	1	0	13	1	0	10	3	0	0	0	
8:45 - 9:00 am	0	0	0	0	1	0	0	0	0	0	0	0	
9:00 - 9:15 am	0	4	0	0	12	0	0	0	3	0	0	0	
9:15 - 9:30 am	0	4	0	0	4	0	0	0	0	0	0	0	
9:30 - 9:45 am	0	3	0	0	6	0	0	0	4	0	0	0	
9:45 - 10:00 am	0	5	0	0	2	0	0	0	0	0	0	0	
Total	0	52	3	4	117	5	2	90	23	0	20	0	
Peak	0	0	32	3	12	8	0	66	5	2	0	77	
Peak Hour Total	39			81			28			0			Peak Hour Total
Peak Hour (Truck)	4			5			0			0			Peak Hour (Truck)
Truck Percentage	10.25%			6.17%			0.00%			0.00%			Truck Percentage

Date: Tuesday April 8, 2008

Period	Eastbound			Westbound			Northbound			Southbound			
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	
2:00 - 2:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 - 2:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 - 2:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 - 3:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 - 3:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 - 3:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 - 3:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 - 4:00 pm	1	0	0	0	0	0	0	0	0	0	0	0	
4:00 - 4:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 - 4:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 - 4:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 - 5:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 - 5:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 - 5:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 - 5:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 - 6:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 - 6:15 pm	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 - 6:30 pm	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 - 6:45 pm	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 - 7:00 pm	0	0	0	0	0	0	0	0	0	0	0	0	
Total	1	0	0	0	0	0	0	0	0	0	0	0	
Peak	1	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour Total	40			76			30			0			Peak Hour Total
Peak Hour (Truck)	0			5			2			0			Peak Hour (Truck)
Truck Percentage	0.00%			6.58%			6.67%			0.00%			Truck Percentage

# Town of Raymond: Summary of Traffic Counts

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: January 2009

Location: 100 N & Broadway  
 Date: Thursday, April 3, 2008

Period	Eastbound						Westbound						Northbound						Southbound							
	Left		Straight		Right		Left		Straight		Right		Left		Straight		Right		Left		Straight		Right			
	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck		
7:00 - 7:15 am	0	0	2	0	0	0	2	0	2	0	2	0	0	0	23	0	0	0	0	2	0	4	1	3	0	0
7:15 - 7:30 am	0	0	1	0	2	0	0	0	0	0	0	0	0	0	18	1	4	0	0	3	0	13	0	2	0	0
7:30 - 7:45 am	2	0	0	0	0	1	0	3	0	1	0	3	0	0	19	0	1	0	0	3	0	7	0	1	0	0
7:45 - 8:00 am	4	0	0	0	0	1	0	0	3	0	4	1	0	2	17	1	3	0	1	2	1	15	0	6	2	0
8:00 - 8:15 am	4	1	4	0	3	0	3	0	6	0	7	0	3	7	22	0	3	0	4	4	0	27	0	18	4	17
8:15 - 8:30 am	7	1	2	0	3	0	1	5	0	9	0	3	0	14	0	23	0	1	0	2	0	21	0	27	1	15
8:30 - 8:45 am	3	0	1	0	2	0	2	1	0	1	1	6	0	2	0	23	0	2	0	9	1	13	1	12	2	2
8:45 - 9:00 am	3	0	0	1	2	0	0	1	0	5	1	0	0	8	0	17	1	1	0	0	0	19	0	7	0	0
9:00 - 9:15 am	1	1	2	0	2	0	2	0	2	0	4	1	0	3	0	14	0	3	0	0	1	15	1	10	0	0
9:15 - 9:30 am	1	2	0	0	1	2	1	4	0	2	0	1	0	3	0	15	1	0	0	0	2	0	12	2	3	2
9:30 - 9:45 am	4	0	0	0	2	0	2	3	0	1	0	5	1	1	3	0	17	1	4	0	5	0	19	1	4	1
9:45 - 10:00 am	2	0	1	0	1	0	3	9	0	2	1	5	0	1	0	18	2	1	0	0	4	0	18	1	7	0
Total	31	5	13	1	18	4	16	36	0	30	3	50	4	7	43	1	225	7	23	0	37	3	163	7	100	12
Peak	17	2	7	1	10	0	7	13	0	17	1	21	1	5	30	1	65	1	7	0	15	1	60	1	64	7
Peak Hour Total	37						53						124						168							
Peak Hour (Truck)	3						2						9						9							
Truck Percentage	8.11%						3.77%						1.61%						5.35%							

Date: Wednesday, April 2, 2008

Period	Eastbound						Westbound						Northbound						Southbound											
	Left		Straight		Right		Left		Straight		Right		Left		Straight		Right		Left		Straight		Right		Left		Straight		Right	
	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck	PC	Truck		
2:30 - 2:45 pm	7	0	0	0	3	0	3	0	5	0	6	0	11	6	0	24	1	4	0	0	3	0	8	0	7	1	1			
2:45 - 3:00 pm	5	0	2	0	6	0	4	7	0	2	0	7	0	10	2	0	20	0	4	0	7	0	23	0	5	0	4			
3:00 - 3:15 pm	5	0	3	0	8	0	3	11	0	1	0	9	0	7	6	0	28	0	5	0	1	8	0	30	0	5	0			
3:15 - 3:30 pm	10	0	2	0	13	0	16	7	0	9	0	12	0	18	6	0	23	0	9	0	1	5	0	29	0	3	0			
3:30 - 3:45 pm	4	0	4	0	3	0	6	7	0	3	0	9	0	2	11	0	33	0	2	0	2	6	0	25	0	5	1			
3:45 - 4:00 pm	9	0	4	0	6	0	1	8	0	3	0	17	0	8	4	0	34	0	7	0	2	10	0	31	1	5	0			
4:00 - 4:15 pm	8	0	2	0	4	0	2	11	0	4	0	8	0	4	2	0	27	0	6	0	2	7	0	33	0	4	0			
4:15 - 4:30 pm	8	0	2	0	4	0	2	11	0	4	0	8	0	4	2	0	35	0	5	0	0	5	0	23	0	5	0			
4:30 - 4:45 pm	4	1	1	0	2	0	2	9	0	3	0	7	0	2	1	0	26	1	4	0	4	10	0	33	0	5	0			
4:45 - 5:00 pm	7	0	7	0	4	0	5	7	0	4	0	10	0	2	3	0	28	0	7	0	0	9	0	31	0	3	1			
5:00 - 5:15 pm	13	2	3	0	3	0	1	13	0	6	0	6	0	1	4	0	41	0	6	0	0	12	0	32	0	10	0			
5:15 - 5:30 pm	2	0	5	0	5	0	1	6	0	4	0	13	0	2	4	0	29	1	7	0	2	7	0	40	0	6	0			
5:30 - 5:45 pm	3	0	1	0	4	0	6	9	0	3	0	5	0	1	4	0	21	0	1	0	0	8	0	25	0	2	0			
5:45 - 6:00 pm	4	0	3	0	3	0	3	5	0	7	0	5	0	2	5	0	35	0	5	0	0	10	0	26	0	4	1			
6:00 - 6:15 pm	4	0	0	0	3	0	1	1	0	0	0	3	0	0	0	0	21	0	4	0	2	7	0	21	0	1	0			
6:15 - 6:30 pm	1	0	1	0	3	0	0	2	0	2	0	3	0	1	1	0	28	0	1	0	2	7	0	21	0	1	0			
6:30 - 6:45 pm	4	0	0	0	2	0	5	3	0	1	0	5	0	5	2	0	16	0	4	0	0	6	0	25	0	5	0			
6:45 - 7:00 pm	3	0	3	0	3	0	2	3	0	3	0	6	0	2	2	0	23	0	2	0	2	5	0	20	0	3	1			
Total	96	4	41	0	79	0	64	115	0	62	0	140	0	84	70	0	492	3	65	0	24	132	0	476	1	79	5			
Peak	26	3	16	0	14	0	9	35	0	17	0	36	0	6	16	0	124	2	26	0	6	38	0	136	0	24	1			
Peak Hour Total	59						88						168						199											
Peak Hour (Truck)	3						0						2						1											
Truck Percentage	5.08%						0.00%						1.19%						0.50%											



**Town of Raymond: Summary of Traffic Counts**

Project No: 2007-3491  
 Date Created: April 24, 2008  
 Date Revised: January 2009

Location: 200 N & 100 W  
 Date: Tuesday, April 8, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian
7:00 - 7:15 am	0	0	0	0	0	0	0	0	0	0	0	0
7:15 - 7:30 am	0	0	0	0	0	0	0	0	0	0	0	0
7:30 - 7:45 am	0	0	0	0	0	0	0	0	0	0	0	0
7:45 - 8:00 am	0	0	0	0	0	0	0	0	0	0	0	0
8:00 - 8:15 am	1	0	0	0	0	0	0	0	0	0	0	0
8:15 - 8:30 am	3	0	0	0	0	0	0	0	0	0	0	0
8:30 - 8:45 am	1	0	0	0	0	0	0	0	0	0	0	0
8:45 - 9:00 am	0	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15 am	0	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30 am	1	0	0	0	0	0	0	0	0	0	0	0
9:30 - 9:45 am	0	0	0	0	0	0	0	0	0	0	0	0
9:45 - 10:00 am	1	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Peak</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Peak Hour Total	124			109			0			13		
Peak Hour (Truck)	12			16			0			1		
Truck Percentage	9.69%			16.51%			#DIV/0!			7.69%		

Date: Thursday, April 3, 2008

Period	Eastbound			Westbound			Northbound			Southbound		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian	PC	Truck	Pedestrian
2:00 - 2:15 pm	0	0	0	0	0	0	0	0	0	0	0	0
2:15 - 2:30 pm	1	0	0	0	0	0	0	0	0	0	0	0
2:30 - 2:45 pm	0	0	0	0	0	0	0	0	0	0	0	0
2:45 - 3:00 pm	0	0	0	0	0	0	0	0	0	0	0	0
3:00 - 3:15 pm	1	0	0	0	0	0	0	0	0	0	0	0
3:15 - 3:30 pm	3	0	0	0	0	0	0	0	0	0	0	0
3:30 - 3:45 pm	2	0	0	0	0	0	0	0	0	0	0	0
3:45 - 4:00 pm	2	0	0	0	0	0	0	0	0	0	0	0
4:00 - 4:15 pm	1	0	0	0	0	0	0	0	0	0	0	0
4:15 - 4:30 pm	0	0	0	0	0	0	0	0	0	0	0	0
4:30 - 4:45 pm	0	0	0	0	0	0	0	0	0	0	0	0
4:45 - 5:00 pm	4	0	0	0	0	0	0	0	0	0	0	0
5:00 - 5:15 pm	1	0	0	0	0	0	0	0	0	0	0	0
5:15 - 5:30 pm	0	0	0	0	0	0	0	0	0	0	0	0
5:30 - 5:45 pm	0	0	0	0	0	0	0	0	0	0	0	0
5:45 - 6:00 pm	0	0	0	0	0	0	0	0	0	0	0	0
6:00 - 6:15 pm	0	0	0	0	0	0	0	0	0	0	0	0
6:15 - 6:30 pm	0	0	0	0	0	0	0	0	0	0	0	0
6:30 - 6:45 pm	0	0	0	0	0	0	0	0	0	0	0	0
6:45 - 7:00 pm	3	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Peak</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Peak Hour Total	120			103			0			18		
Peak Hour (Truck)	6			3			0			0		
Truck Percentage	5.00%			2.91%			#DIV/0!			0.00%		

ALBERTA HIGHWAYS 1 TO 986  
TRAFFIC VOLUME HISTORY 1997 - 2006

Alberta Infrastructure and Transportation  
Program Management Branch  
Network Planning and Performance

Produced: 09-Mar-2007 By CornerStone Solutions Inc.

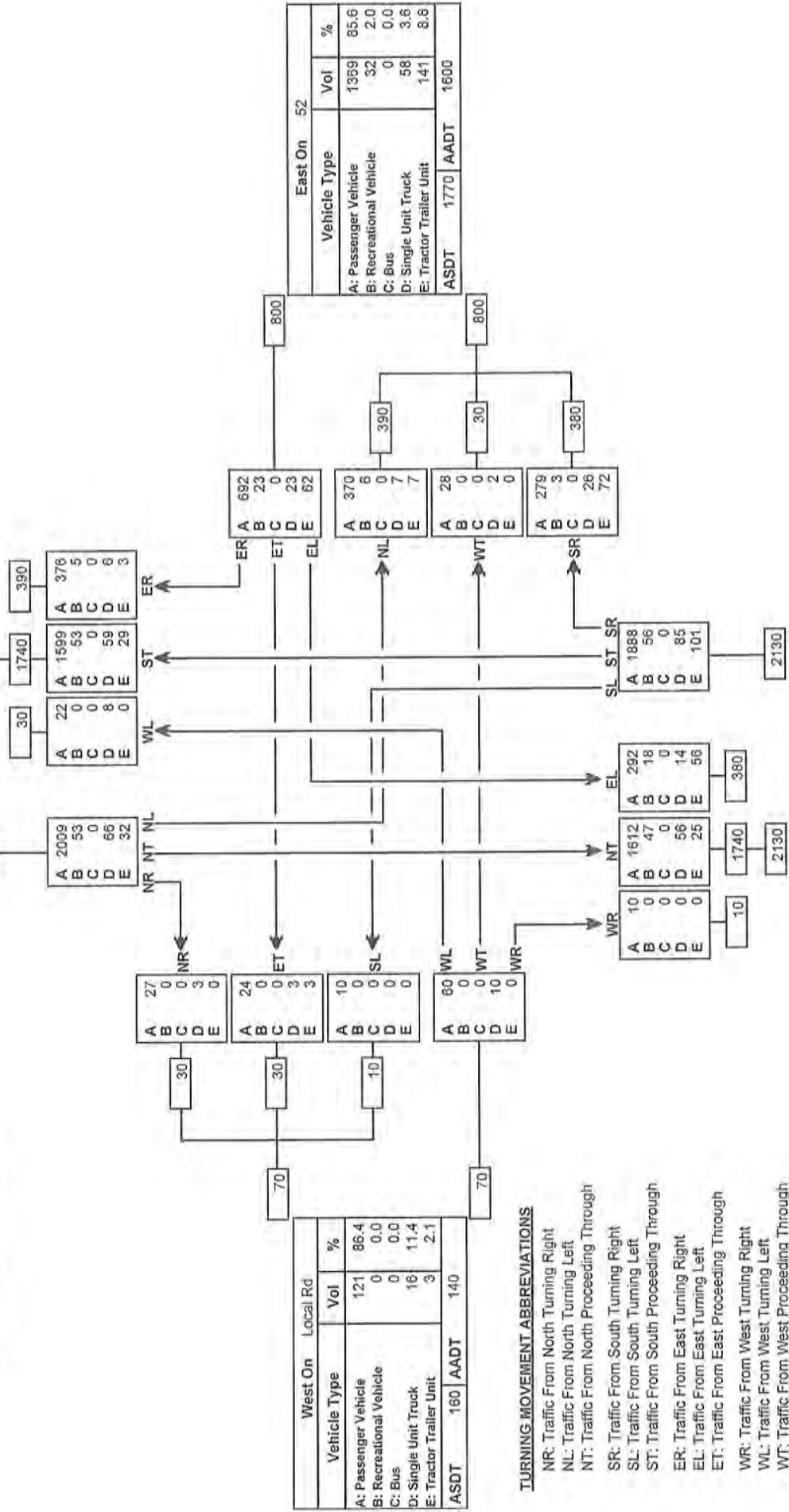
Hwy	CS	TCS	Muni	From	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		
					AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA	ADT	AA
49	10	8	Smkr	S OF GUY ACC RD 35-75-21-5000000000	1160	1210	1240	1250	1340	1410	1390	1420	1480	1610	1720										
49	10	8	Smkr	2.7 KM N OF 2A & 49 GUY	1180	1140	1110	1120	1240	1360	1360	1380	1430	1560	1670										
49	10	8	Smkr	N OF 2A S OF GUY	1080	1110	1080	1090	1200	1370	1350	1380	1430	1560	1670										
49	12	4	Smkr	S OF 2A S OF GUY	1060	1080	1060	1060	1200	1320	1340	1440	1460	1620	1690										
49	12	4	Smkr	N OF 676 S OF GUY	1080	1100	1080	1080	1200	1320	1340	1410	1430	1660	1730										
49	12	4	Smkr	S OF 676 S OF GUY	1660	1710	1680	1750	1890	1980	1980	2080	2100	2330	2430										
49	12	8	Grvw	1.1 KM N OF 49 & 669 VALLEYVIEW	1660	1720	1680	1810	1950	1950	2080	2080	2100	2330	2430										
49	12	8	Grvw	N OF 669 NE OF VALLEYVIEW	2380	2460	2400	2740	2850	2860	2860	2860	2730	3030	3160										
49	12	12	Grvw	S OF 669 NE OF VALLEYVIEW	3410	3520	3470	3480	3570	3680	3740	3930	4000	4240	4420										
49	12	12	Grvw	E OF 49 AT VALLEYVIEW	680	660	780	760	730	700	720	710	720	740	810										
50	2	4	Laco	N OF 12 SE OF TEES	710	720	760	740	700	660	680	700	710	730	800										
50	2	4	Laco	3.0 KM E OF 12 & 50 TEES	550	550	580	560	530	510	530	550	570	590	650										
50	2	4	Laco	W OF 21 E OF MIRROR	1850	1680	1590	1810	1520	1530	1560	1560	1490	1600	1770										
52	2	4	Card	E OF 5 S OF WELLING	1830	1750	1640	1870	1570	1540	1560	1530	1490	1600	1770										
52	2	4	Card	1.3 KM E OF 5 & 52 RAYMOND	2010	1930	1440	1650	1390	1350	1390	1660	1710	1890											
52	2	4	Warn	W OF 844 W OF RAYMOND	2000	1920	1490	1710	1440	1400	1440	1690	1630	1740	1930										
52	2	8	Warn	E OF 844 W OF RAYMOND	2290	1920	2160	2470	2080	2590	2670	2670	2560	2740	3030										
52	2	8	Warn	W OF 845 IN RAYMOND	1680	1550	1550	1760	1490	1560	1600	1600	1540	1660	1840										
52	2	12	Warn	E OF 845 IN RAYMOND	650	650	660	700	650	630	640	640	640	680	750										
52	2	12	Warn	W OF 846 S OF STIRLING	370	370	380	400	340	330	330	330	330	360	400										
52	2	16	Warn	E OF 846 S OF STIRLING	360	350	370	390	330	320	330	330	330	350	390										
52	2	16	Warn	W OF 4 SE OF STIRLING	360	370	370	370	370	380	380	390	420	420	480										
53	4	4	Chvw	E OF 22 N OF ROCKY MTN HOUSE			260	260	260	270	270	320	340	390											
53	4	4	Pnka	E OF LOCAL RD 29-42-5-500001100			260	260	260	270	270	320	340	390											
53	4	4	Pnka	E OF LOCAL RD 29-42-5-500001100			260	260	260	270	270	320	340	390											
53	4	4	Pnka	W OF 761 N OF CARLOS WJ	250	250	250	270	270	280	280	330	350	400											
53	4	4	Pnka	E OF 761 N OF CARLOS WJ	250	250	250	300	300	310	310	370	390	450											
53	4	8	Pnka	E OF 761 N OF CARLOS WJ		440	440	440	440	480	480	500	540	620											
53	4	8	Pnka	W OF 761 W OF RIMBEY EJ		560	560	560	560	580	580	600	650	740											
53	4	12	Pnka	E OF 761 W OF RIMBEY EJ	850	870	870	800	820	830	830	830	920	1050											
53	4	12	Pnka	W OF 766 W OF RIMBEY	1460	1500	1500	1360	1400	1410	1410	1410	1520	1740											
53	4	16	Pnka	E OF 766 W OF RIMBEY			2430	2430	2490	2490	2460	2450	2950	3200											
53	4	16	Pnka	W OF 52 ST IN RIMBEY 20-42-2-5017000000			2910	2910	2990	2890	2960	2950	3370	3680											
53	4	16	Pnka	E OF 52 ST IN RIMBEY 20-42-2-5017000000			4930	4930	5040	5030	4970	4940	5240	5730											
53	4	16	Pnka	W OF 20A IN RIMBEY	5070	5160	5220	5150	5270	5290	5120	5230	5430	5940											
53	4	16	Pnka	E OF 20A IN RIMBEY	2550	2610	2600	2560	2750	2740	2700	2680	2820	3100											
53	4	16	Pnka	W OF 20 S OF RIMBEY SJ	1330	1360	1360	1370	1450	1390	1470	1520	1590	1750											
53	6	4	Pnka	E OF 20 N OF RIMBEY NJ	1330	1360	1470	1440	1450	1380	1490	1550	1640	1750											
53	6	4	Pnka	0.5 KM E OF 20 & 53 RIMBEY NJ	1410	1430	1550	1370	1430	1370	1450	1500	1620	1730											
53	6	4	Pnka	W OF FORSHEE RD 36-42-2-5000000000	1440	1460	1580	1400	1430	1370	1450	1500	1600	1710											
53	6	4	Pnka	E OF FORSHEE RD 36-42-2-5000000000	1440	1460	1580	1400	1430	1370	1450	1500	1600	1710											
53	6	4	Pnka	W OF 771 S OF HOMEULEN WJ	1140	1160	1250	1080	1360	1370	1450	1500	1570	1600	1710										
53	6	8	Pnka	E OF 771 S OF HOMEULEN WJ	1140	1160	1250	1080	1250	1200	1260	1300	1370	1540	1640										

Turning Movement Summary Diagram

North On 5		
Vehicle Type	Vol	%
A: Passenger Vehicle	4006	92.7
B: Recreational Vehicle	111	2.6
C: Bus	0	0.0
D: Single Unit Truck	139	3.2
E: Tractor Trailer Unit	64	1.5
<b>ASDT</b>	<b>4310</b>	<b>AAADT 4320</b>

Reference No.: 105040  
 Intersection of:  
 5 & 52 S OF WELLING

2006 AADT / ASDT ESTIMATES



West On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	121	86.4
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	16	11.4
E: Tractor Trailer Unit	3	2.1
<b>ASDT</b>	<b>160</b>	<b>AAADT 140</b>

East On 52		
Vehicle Type	Vol	%
A: Passenger Vehicle	1369	85.6
B: Recreational Vehicle	32	2.0
C: Bus	0	0.0
D: Single Unit Truck	58	3.6
E: Tractor Trailer Unit	141	8.8
<b>ASDT</b>	<b>1770</b>	<b>AAADT 1600</b>

South On 5		
Vehicle Type	Vol	%
A: Passenger Vehicle	3802	89.2
B: Recreational Vehicle	121	2.8
C: Bus	0	0.0
D: Single Unit Truck	155	3.6
E: Tractor Trailer Unit	182	4.3
<b>ASDT</b>	<b>4740</b>	<b>AAADT 4260</b>

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

TURNING MOVEMENT ABBREVIATIONS

- AAADT: Average Annual Daily Traffic
- Average daily traffic expressed as vehicles per day to period of January 1 to December 31 (365 days)
- ASDT: Average Summer Daily Traffic
- Average daily traffic expressed as vehicles per day to period of May 1 to September 30 (153 days)

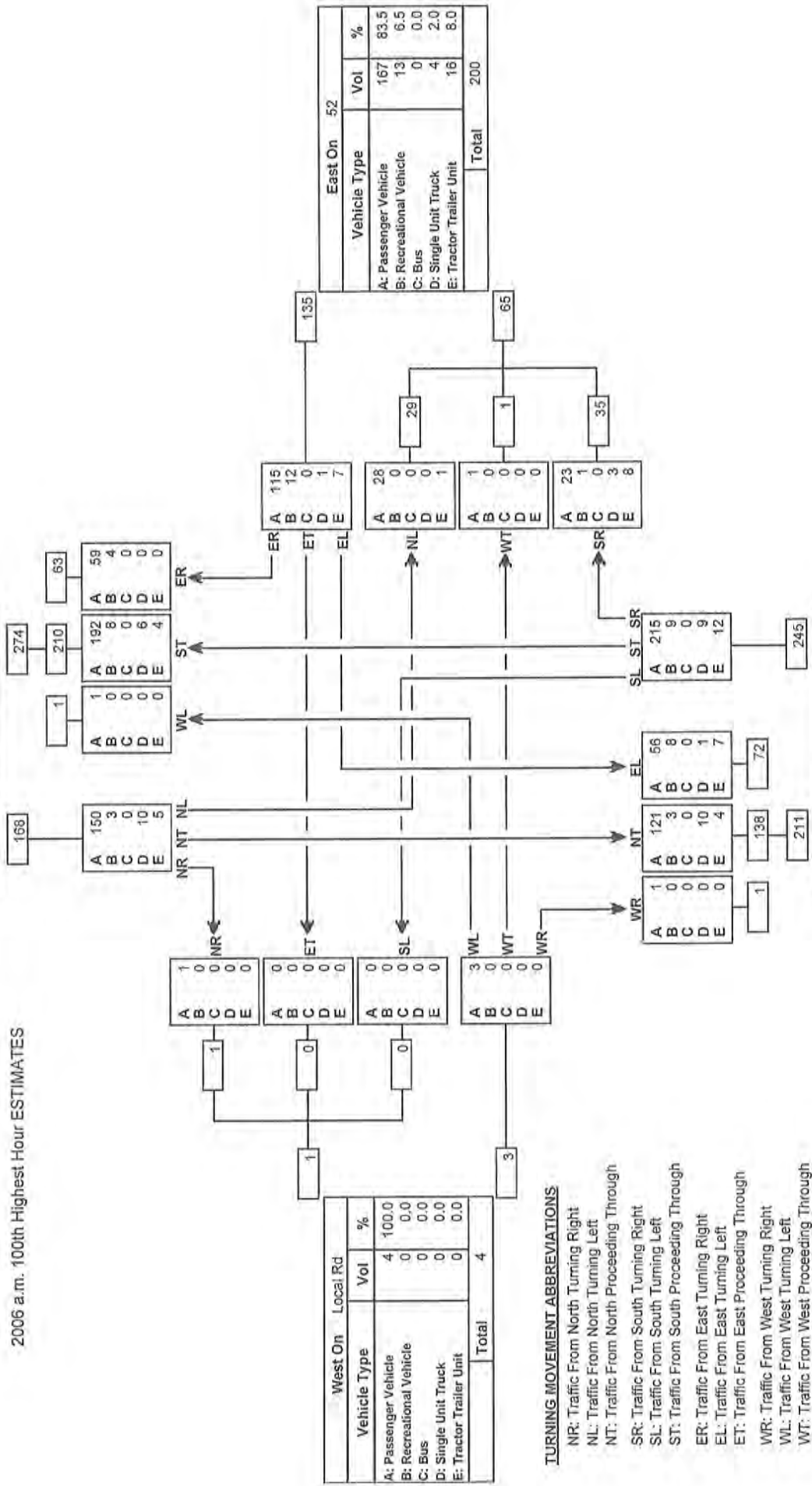


Turning Movement Summary Diagram

North On 5		
Vehicle Type	Vol	%
A: Passenger Vehicle	402	91.0
B: Recreational Vehicle	15	3.4
C: Bus	0	0.0
D: Single Unit Truck	16	3.6
E: Tractor Trailer Unit	9	2.0
<b>Total</b>	<b>442</b>	

Reference No.: 105040  
 Intersection of:  
 5 & 52 S OF WELLING

2006 a.m. 100th Highest Hour ESTIMATES



**TURNING MOVEMENT ABBREVIATIONS**

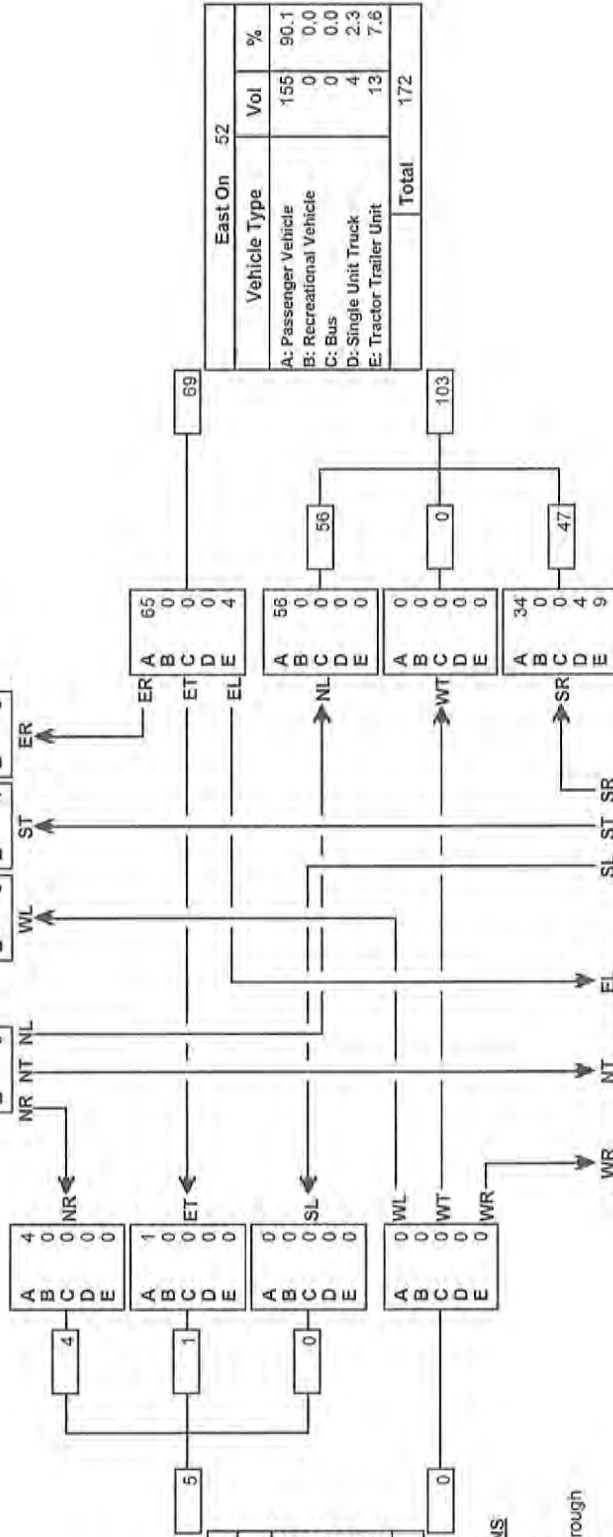
- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

Turning Movement Summary Diagram

Reference No.: 105040  
 Intersection of:  
 5 & 52 S OF WELLING

2006 p.m. 100th Highest Hour ESTIMATES

North On 5		
Vehicle Type	Vol	%
A: Passenger Vehicle	419	94.6
B: Recreational Vehicle	8	1.8
C: Bus	0	0.0
D: Single Unit Truck	12	2.7
E: Tractor Trailer Unit	4	0.9
<b>Total</b>	<b>443</b>	



TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through



Turning Movement Summary Diagram

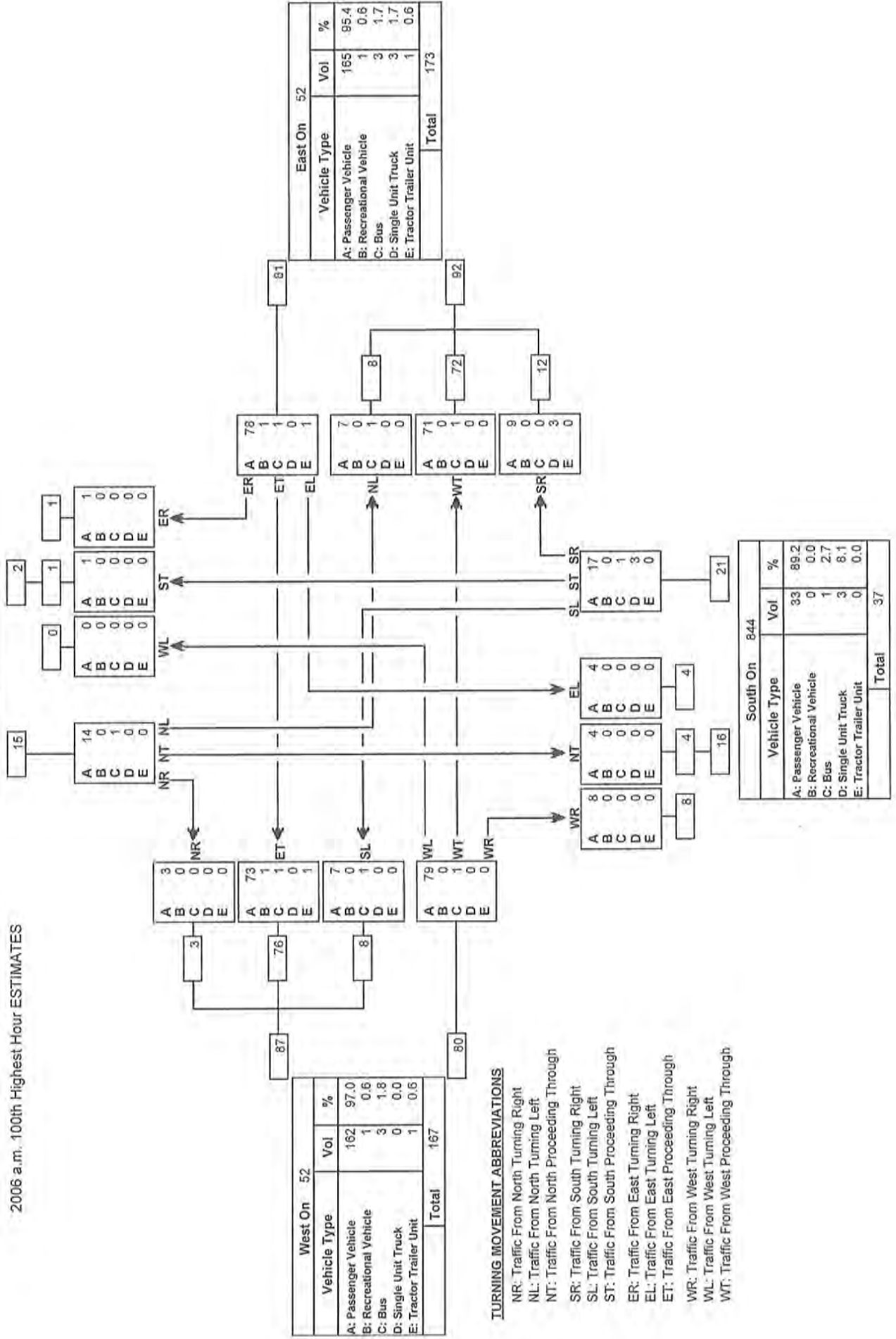
Vehicle Type	Vol	%
A: Passenger Vehicle	16	94.1
B: Recreational Vehicle	0	0.0
C: Bus	1	5.9
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>17</b>	

Reference No.: 106050

Intersection of:

52 & 844 W OF RAYMOND

2006 a.m., 100th Highest Hour ESTIMATES



Turning Movement Summary Diagram

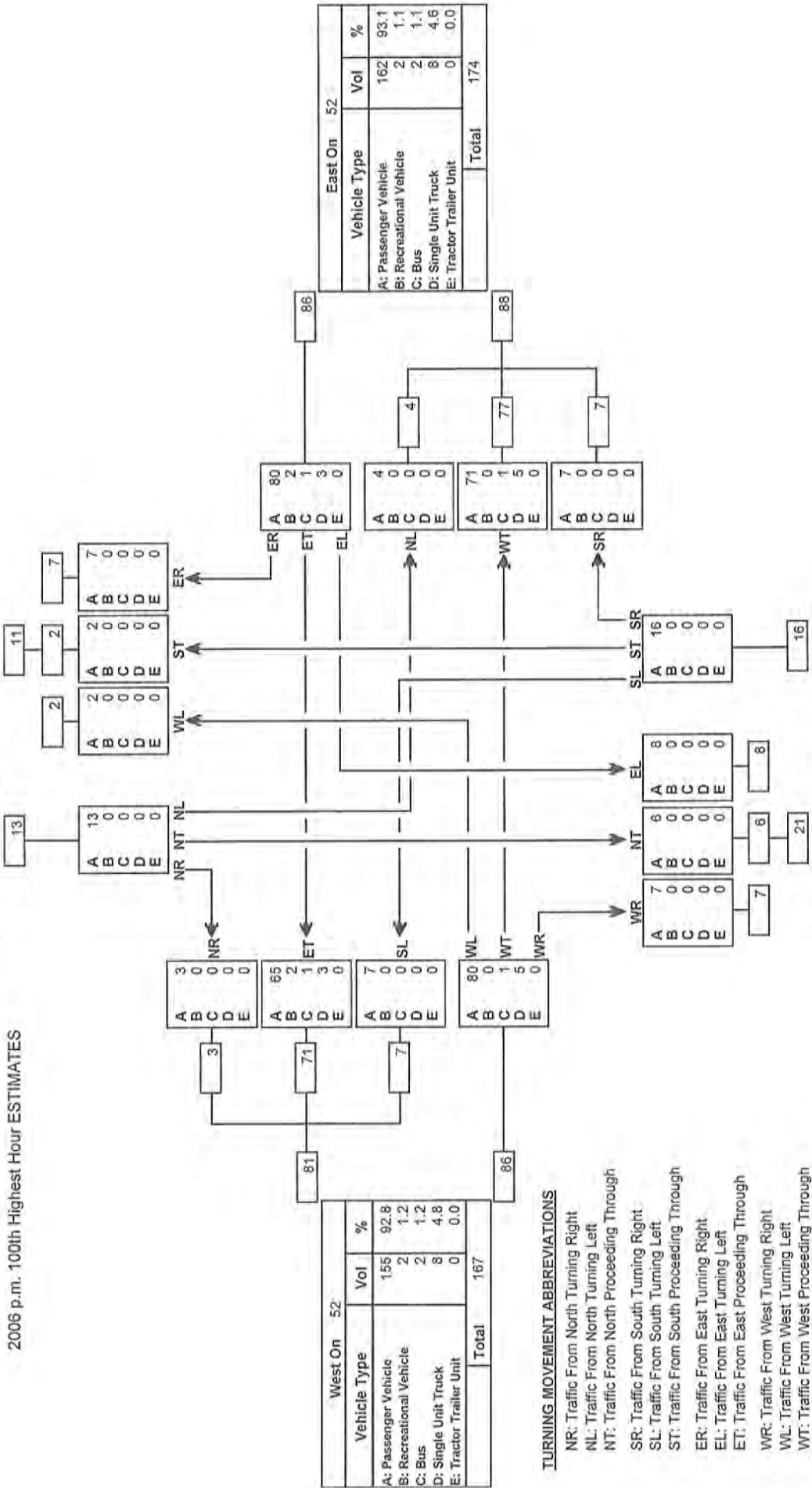
North On Rge Rd 210		
Vehicle Type	Vol	%
A: Passenger Vehicle	24	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>24</b>	

Reference No.: 106050

Intersection of:

52 & 844 W OF RAYMOND

2006 p.m. 100th Highest Hour ESTIMATES



West On 52		
Vehicle Type	Vol	%
A: Passenger Vehicle	155	92.8
B: Recreational Vehicle	2	1.2
C: Bus	2	1.2
D: Single Unit Truck	8	4.8
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>167</b>	

**TURNING MOVEMENT ABBREVIATIONS**

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

South On 844		
Vehicle Type	Vol	%
A: Passenger Vehicle	37	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>37</b>	

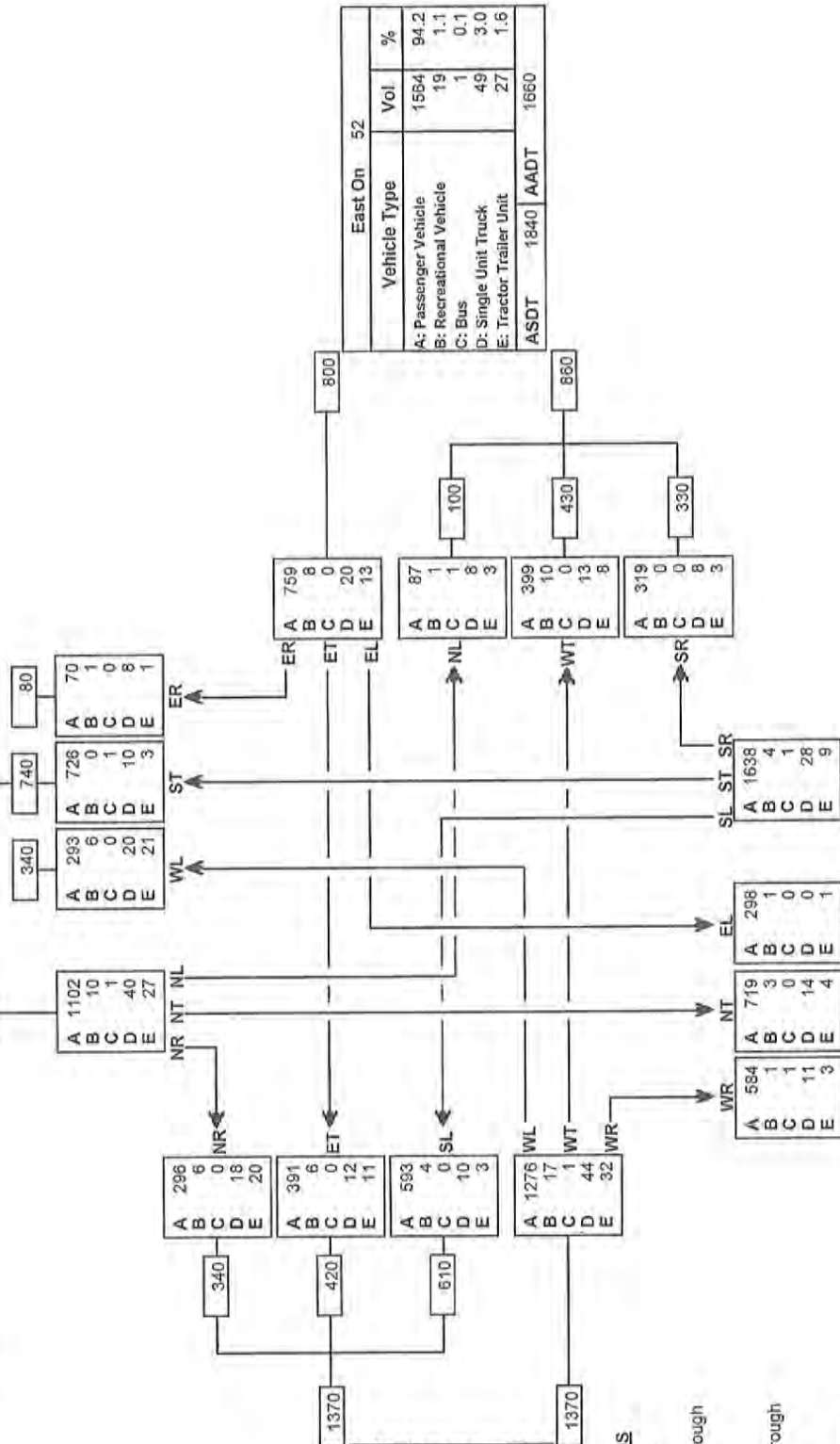
East On 52		
Vehicle Type	Vol	%
A: Passenger Vehicle	162	93.1
B: Recreational Vehicle	2	1.1
C: Bus	2	1.1
D: Single Unit Truck	8	4.6
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>174</b>	

Turning Movement Summary Diagram

Reference No.: 997119  
 Intersection of:  
 52 & 845 IN RAYMOND

2006 AADT / ASDT ESTIMATES

North On 845		Vol	%
Vehicle Type		2191	93.6
A: Passenger Vehicle		17	0.7
B: Recreational Vehicle		2	0.1
C: Bus		78	3.3
D: Single Unit Truck		52	2.2
E: Tractor Trailer Unit		2340	
ASDT		2590	AAADT



West On 52		Vol	%
Vehicle Type		2556	93.3
A: Passenger Vehicle		33	1.2
B: Recreational Vehicle		1	0.0
C: Bus		84	3.1
D: Single Unit Truck		66	2.4
E: Tractor Trailer Unit		2740	
ASDT		3030	AAADT

South On Local Rd		Vol	%
Vehicle Type		3238	97.6
A: Passenger Vehicle		9	0.3
B: Recreational Vehicle		2	0.1
C: Bus		53	1.6
D: Single Unit Truck		17	0.5
E: Tractor Trailer Unit		3320	
ASDT		3670	AAADT

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

TURNING MOVEMENT ABBREVIATIONS

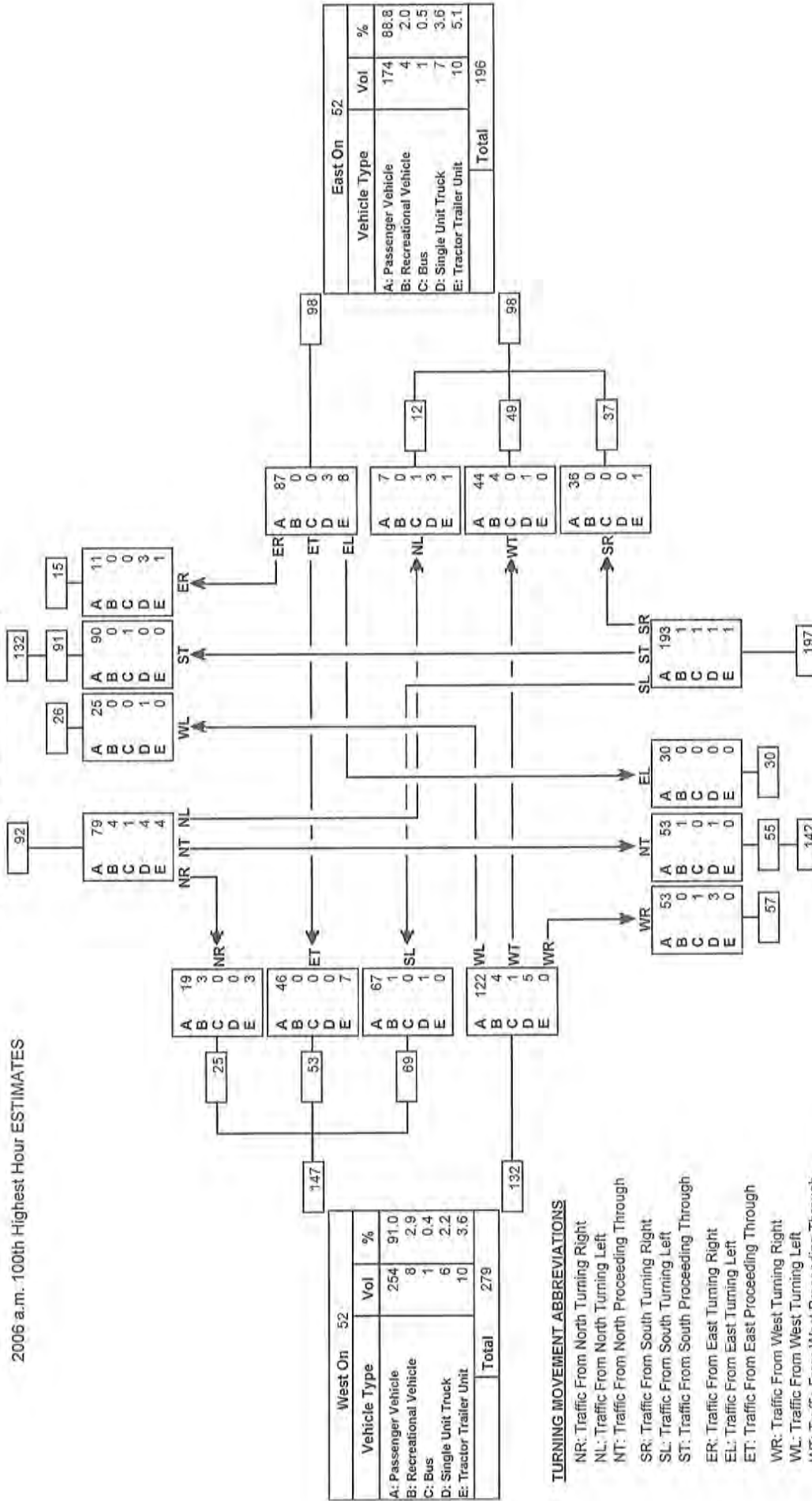
- AAADT: Average Annual Daily Traffic  
Average daily traffic expressed as vehicles per day to period of January 1 to December 31 (365 days)
- ASDT: Average Summer Daily Traffic  
Average daily traffic expressed as vehicles per day to period of May 1 to September 30 (153 days)

Turning Movement Summary Diagram

North On 845	
Vehicle Type	Vol
A: Passenger Vehicle	205
B: Recreational Vehicle	4
C: Bus	2
D: Single Unit Truck	8
E: Tractor Trailer Unit	5
<b>Total</b>	<b>224</b>

Reference No.: 997119  
 Intersection of:  
 52 & 845 IN RAYMOND

2005 a.m. 100th Highest Hour ESTIMATES



West On 52	
Vehicle Type	Vol
A: Passenger Vehicle	254
B: Recreational Vehicle	8
C: Bus	1
D: Single Unit Truck	6
E: Tractor Trailer Unit	10
<b>Total</b>	<b>279</b>

East On 52	
Vehicle Type	Vol
A: Passenger Vehicle	174
B: Recreational Vehicle	4
C: Bus	1
D: Single Unit Truck	7
E: Tractor Trailer Unit	10
<b>Total</b>	<b>196</b>

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

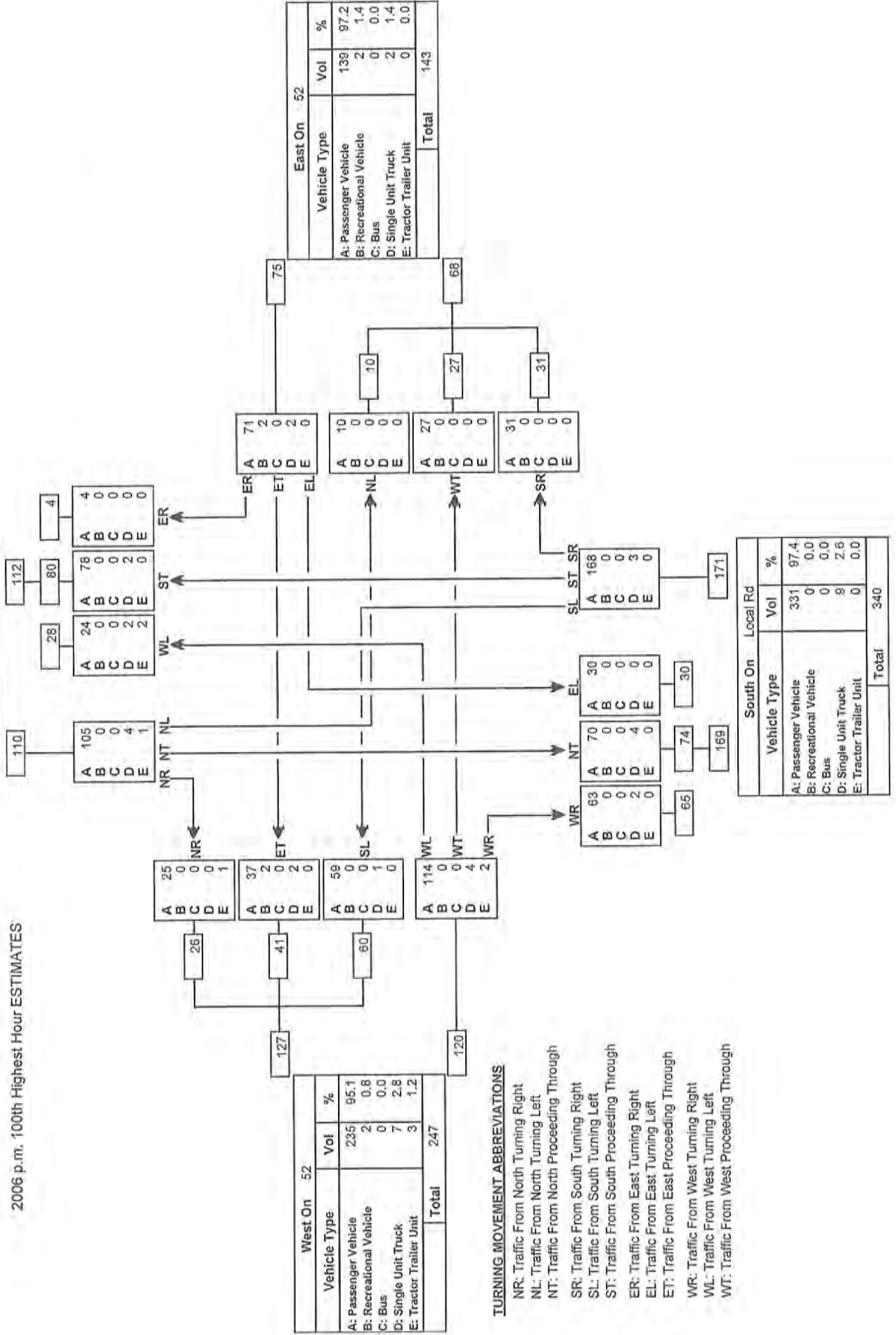
South On Local Rd	
Vehicle Type	Vol
A: Passenger Vehicle	329
B: Recreational Vehicle	2
C: Bus	2
D: Single Unit Truck	5
E: Tractor Trailer Unit	1
<b>Total</b>	<b>339</b>

Turning Movement Summary Diagram

Reference No.: 997119  
 Intersection of:  
 52 & 845 IN RAYMOND

2006 p.m. 100th Highest Hour ESTIMATES

North On 845	
Vehicle Type	Vol
A: Passenger Vehicle	211
B: Recreational Vehicle	0
C: Bus	0
D: Single Unit Truck	8
E: Tractor Trailer Unit	3
<b>Total</b>	<b>222</b>





Turning Movement Summary Diagram

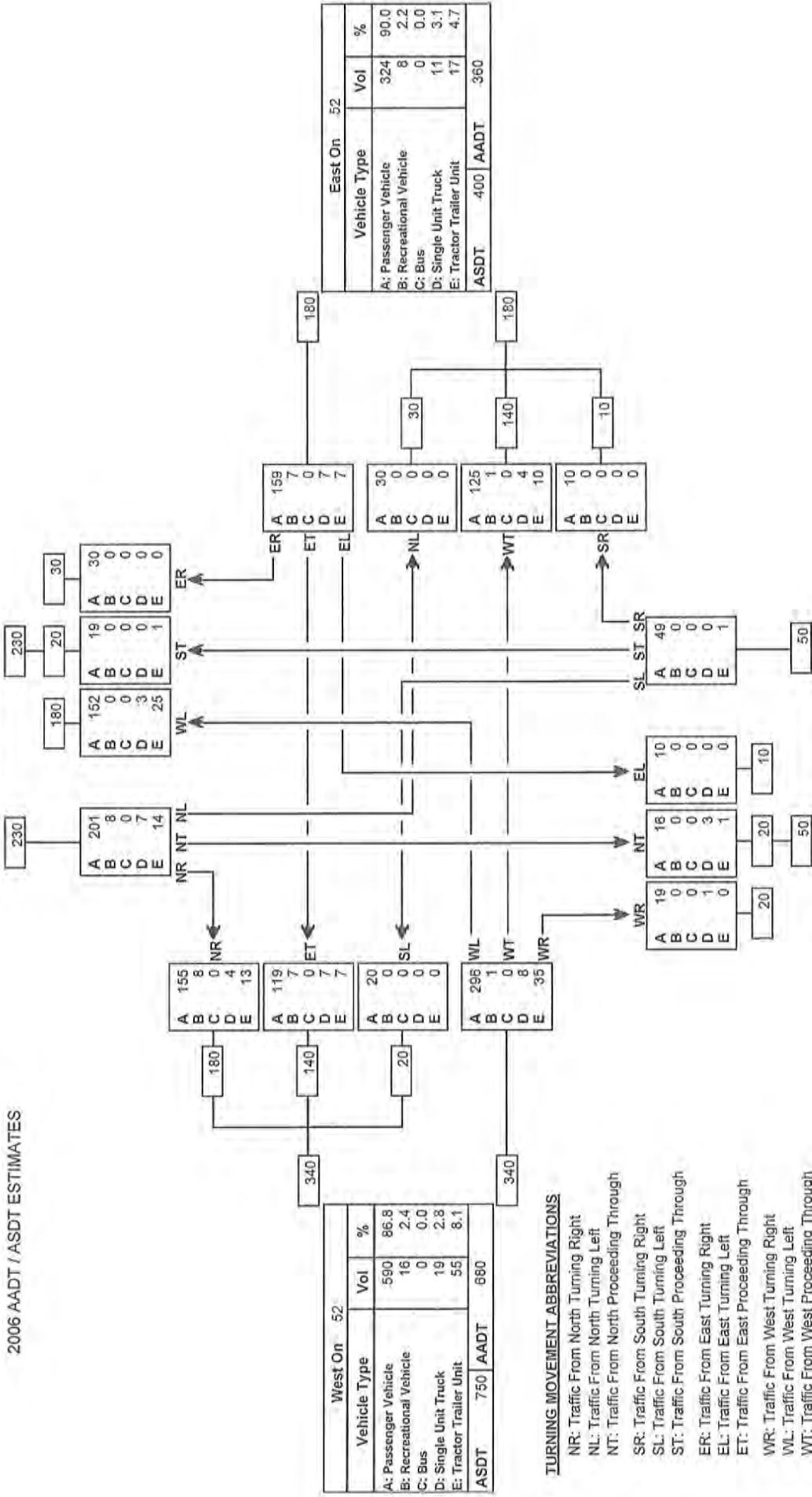
North On 846	
Vehicle Type	Vol
A: Passenger Vehicle	402
B: Recreational Vehicle	8
C: Bus	0
D: Single Unit Truck	10
E: Tractor Trailer Unit	40
<b>ASDT</b>	<b>500</b>

Reference No.: 109030

Intersection of:

52 & 846 S OF STIRLING

2006 AADT / ASDT ESTIMATES



West On 52	
Vehicle Type	Vol
A: Passenger Vehicle	590
B: Recreational Vehicle	16
C: Bus	0
D: Single Unit Truck	19
E: Tractor Trailer Unit	55
<b>ASDT</b>	<b>750</b>

**TURNING MOVEMENT ABBREVIATIONS**

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

**TURNING MOVEMENT ABBREVIATIONS**

- AAADT: Average Annual Daily Traffic  
Average daily traffic expressed as vehicles per day to period of January 1 to December 31 (365 days)
- ASDT: Average Summer Daily Traffic  
Average daily traffic expressed as vehicles per day to period of May 1 to September 30 (153 days)

South On Local Rd	
Vehicle Type	Vol
A: Passenger Vehicle	94
B: Recreational Vehicle	0
C: Bus	0
D: Single Unit Truck	4
E: Tractor Trailer Unit	2
<b>ASDT</b>	<b>100</b>

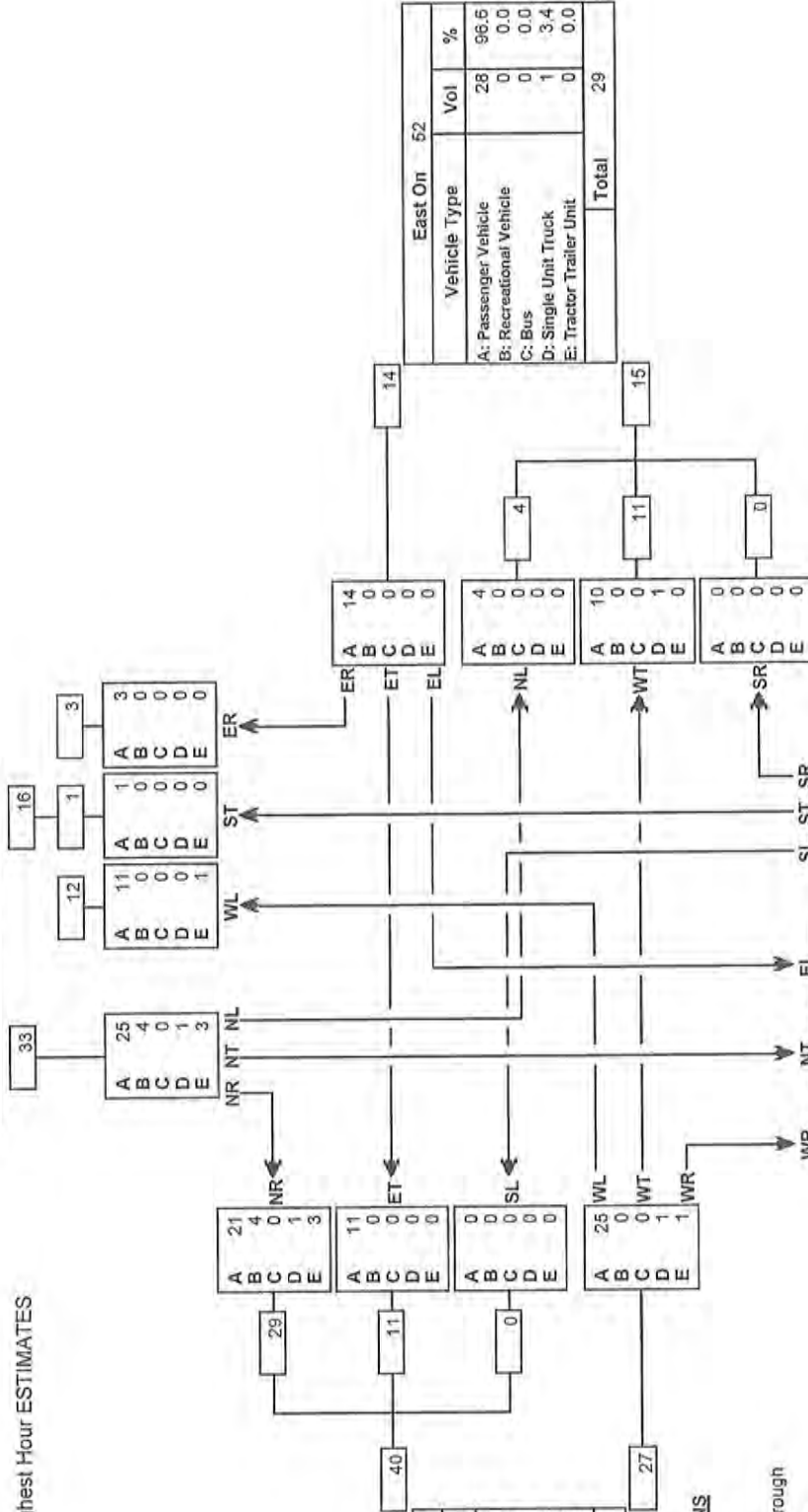
Turning Movement Summary Diagram

Reference No.: 109030

Intersection of:  
52 & 846 S OF STIRLING

2006 a.m. 100th Highest Hour ESTIMATES

North On 846		
Vehicle Type	Vol	%
A: Passenger Vehicle	40	81.6
B: Recreational Vehicle	4	8.2
C: Bus	0	0.0
D: Single Unit Truck	1	2.0
E: Tractor Trailer Unit	4	8.2
<b>Total</b>	<b>49</b>	



West On 52		
Vehicle Type	Vol	%
A: Passenger Vehicle	57	85.1
B: Recreational Vehicle	4	6.0
C: Bus	0	0.0
D: Single Unit Truck	2	3.0
E: Tractor Trailer Unit	4	6.0
<b>Total</b>	<b>67</b>	

East On 52		
Vehicle Type	Vol	%
A: Passenger Vehicle	28	96.6
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	1	3.4
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>29</b>	

South On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	5	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>5</b>	

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

Turning Movement Summary Diagram

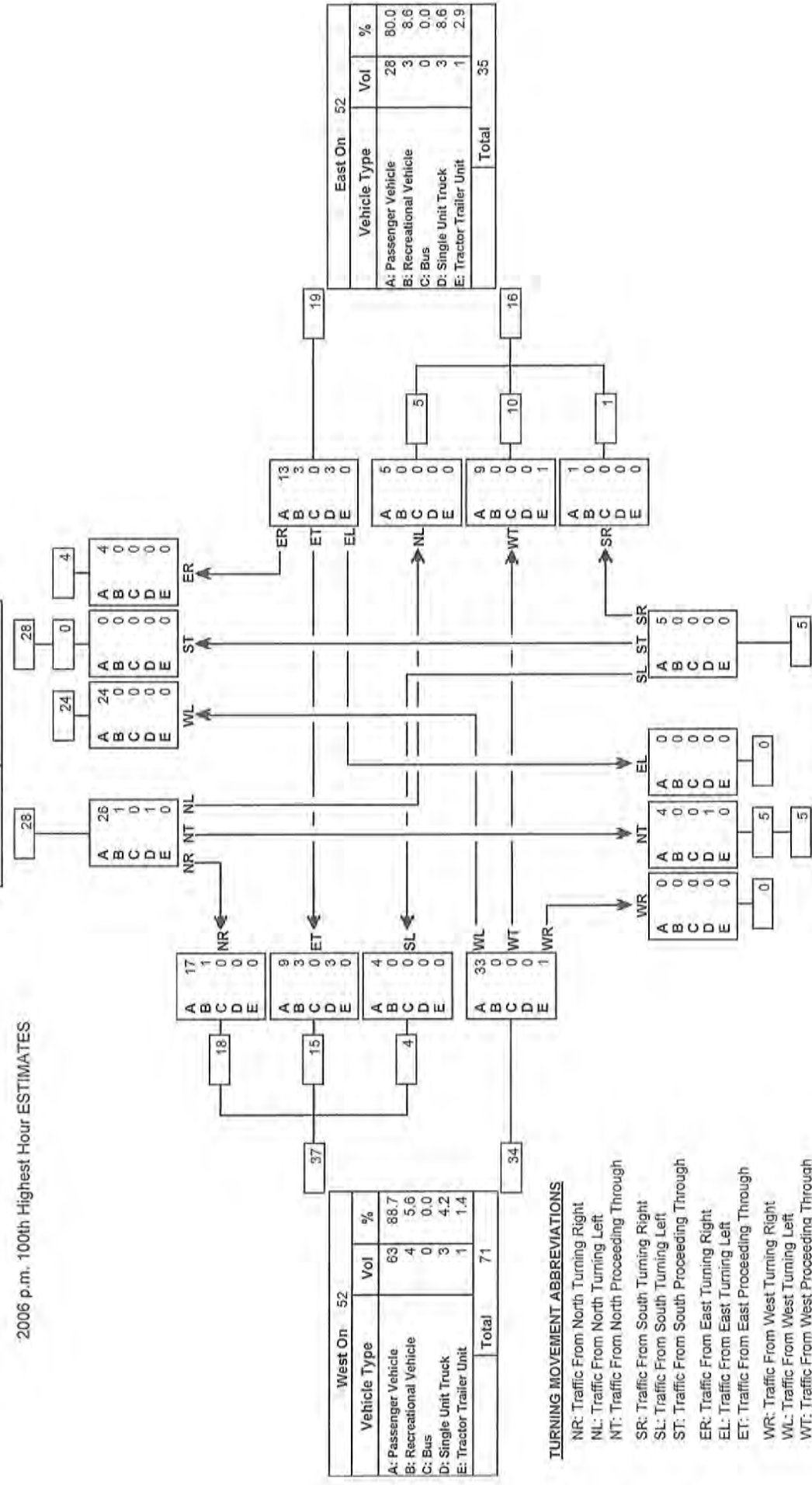
North On 846		
Vehicle Type	Vol	%
A: Passenger Vehicle	54	96.4
B: Recreational Vehicle	1	1.8
C: Bus	0	0.0
D: Single Unit Truck	1	1.8
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>56</b>	

2006 p.m. 100th Highest Hour ESTIMATES

Reference No.: 109030

Intersection of:

52 & 846 S OF STIRLING



TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

Turning Movement Summary Diagram

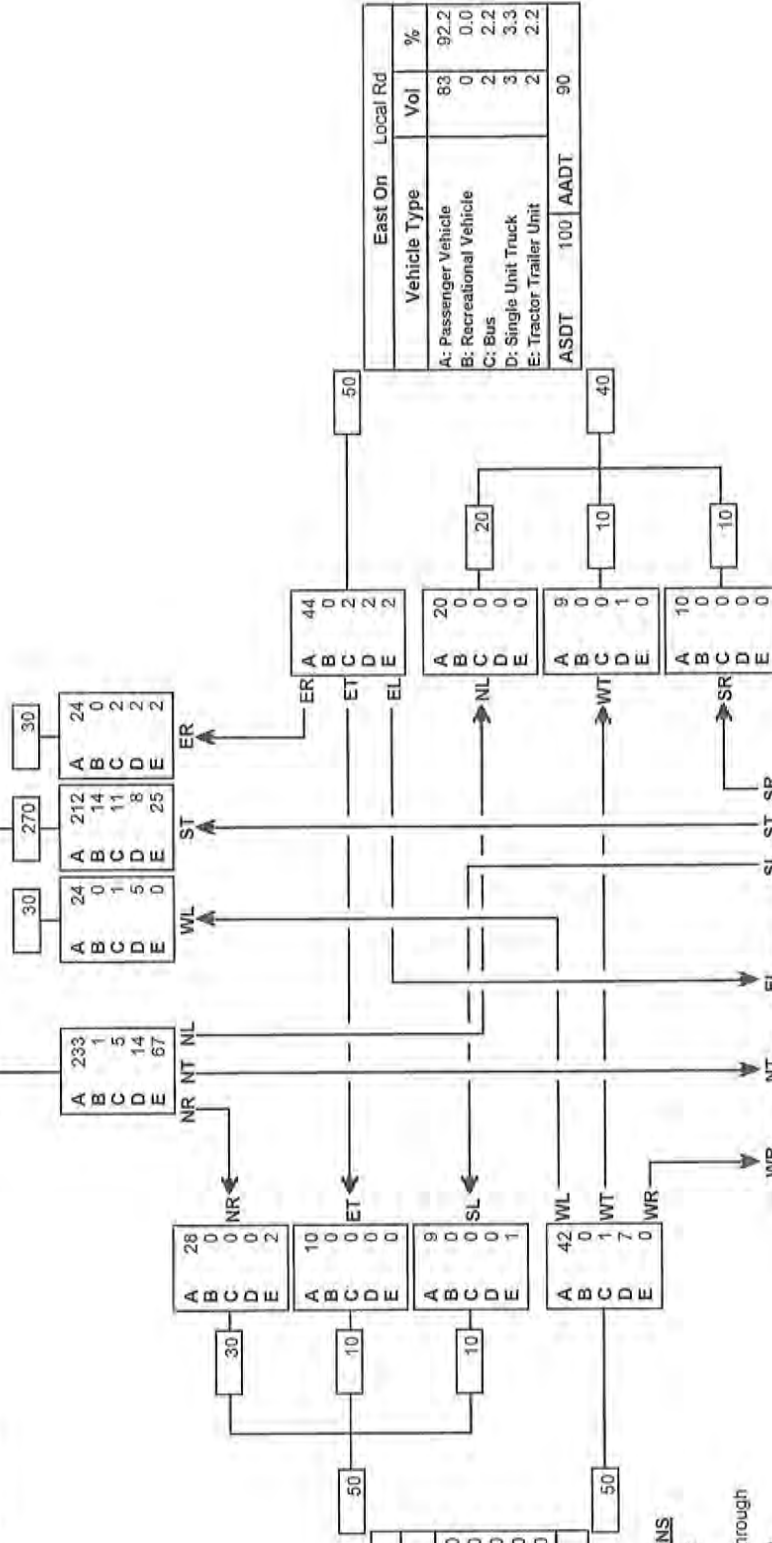
North On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	493	75.8
B: Recreational Vehicle	15	2.3
C: Bus	19	2.9
D: Single Unit Truck	29	4.5
E: Tractor Trailer Unit	94	14.5
<b>ASDT</b>	<b>650</b>	

Reference No.: 997153

Intersection of:

845 & LOCAL RD 32-06-20-400000000

2006 AADT / ASDT ESTIMATES



West On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	89	89.0
B: Recreational Vehicle	0	0.0
C: Bus	1	1.0
D: Single Unit Truck	7	7.0
E: Tractor Trailer Unit	3	3.0
<b>ASDT</b>	<b>110</b>	

East On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	83	92.2
B: Recreational Vehicle	0	0.0
C: Bus	2	2.2
D: Single Unit Truck	3	3.3
E: Tractor Trailer Unit	2	2.2
<b>ASDT</b>	<b>100</b>	

South On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	435	75.0
B: Recreational Vehicle	15	2.6
C: Bus	16	2.8
D: Single Unit Truck	23	4.0
E: Tractor Trailer Unit	91	15.7
<b>ASDT</b>	<b>580</b>	

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

TURNING MOVEMENT ABBREVIATIONS

- AADT: Average Annual Daily Traffic  
Average daily traffic expressed as vehicles per day to period of January 1 to December 31 (365 days)
- ASDT: Average Summer Daily Traffic  
Average daily traffic expressed as vehicles per day to period of May 1 to September 30 (153 days)

Turning Movement Summary Diagram

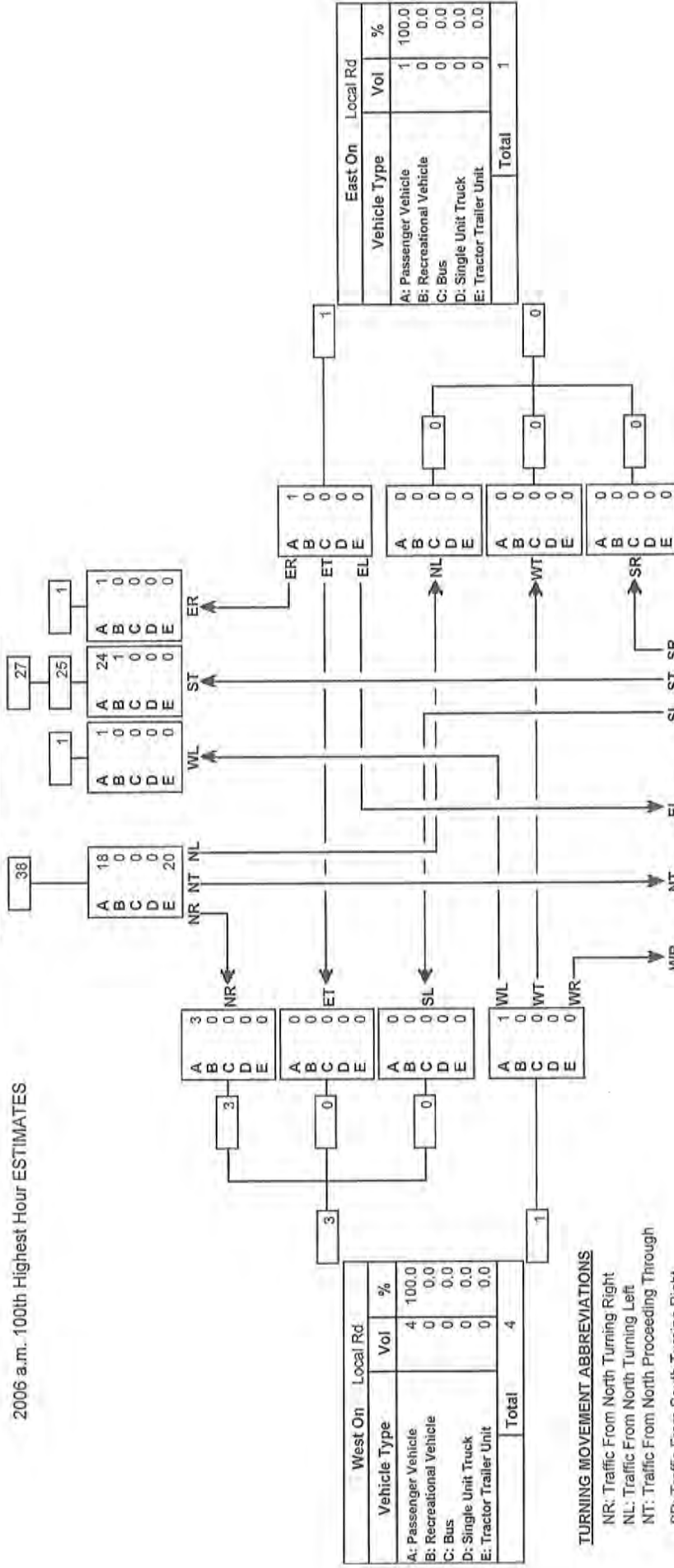
North On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	44	67.7
B: Recreational Vehicle	1	1.5
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	20	30.8
<b>Total</b>	<b>65</b>	

Reference No.: 997153

Intersection of:

845 & LOCAL RD 32-06-20-400000000

2006 a.m. 100th Highest Hour ESTIMATES



West On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	4	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>4</b>	

East On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	1	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
<b>Total</b>	<b>1</b>	

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

South On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	39	65.0
B: Recreational Vehicle	1	1.7
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	20	33.3
<b>Total</b>	<b>60</b>	

Turning Movement Summary Diagram

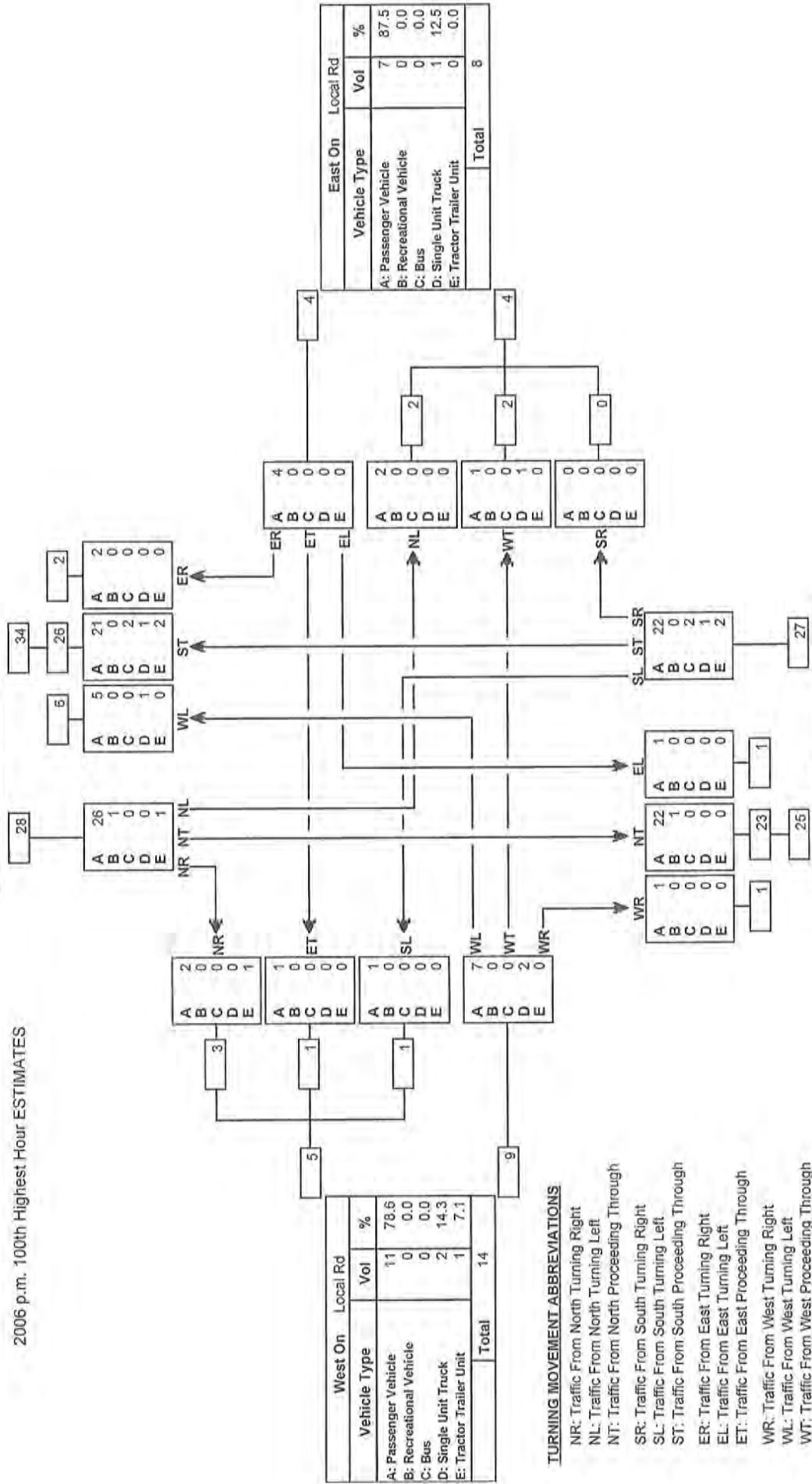
Reference No.: 997153

Intersection of:

845 & LOCAL RD 32-06-20-400000000

2006 p.m. 100th Highest Hour ESTIMATES

North On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	54	87.1
B: Recreational Vehicle	1	1.6
C: Bus	2	3.2
D: Single Unit Truck	2	3.2
E: Tractor Trailer Unit	3	4.8
<b>Total</b>	<b>62</b>	



West On Local Rd		
Vehicle Type	Vol	%
A: Passenger Vehicle	11	78.6
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	2	14.3
E: Tractor Trailer Unit	1	7.1
<b>Total</b>	<b>14</b>	

South On 845		
Vehicle Type	Vol	%
A: Passenger Vehicle	48	88.5
B: Recreational Vehicle	1	1.9
C: Bus	2	3.8
D: Single Unit Truck	1	1.9
E: Tractor Trailer Unit	2	3.8
<b>Total</b>	<b>52</b>	

TURNING MOVEMENT ABBREVIATIONS

- NR: Traffic From North Turning Right
- NL: Traffic From North Turning Left
- NT: Traffic From North Proceeding Through
- SR: Traffic From South Turning Right
- SL: Traffic From South Turning Left
- ST: Traffic From South Proceeding Through
- ER: Traffic From East Turning Right
- EL: Traffic From East Turning Left
- ET: Traffic From East Proceeding Through
- WR: Traffic From West Turning Right
- WL: Traffic From West Turning Left
- WT: Traffic From West Proceeding Through

# B Appendix B - Existing Traffic Controls





Town of Raymond  
 Project No: 2007-3491  
 Date Revised: March 28, 2008

N-S Street	E-W Street	Traffic Control	Controlled Direction
Hwy 5	Hwy 52 (200N)	n/a	n/a
Hwy 844	Hwy 52 (200N)	-	-
	1 Ave S (100 S)	-	-
	4 Ave S (400 S)	Stop	e-w (WB only)
4 St W (400 W)	1 Ave S (100 S)	n/a	n/a
	2 Ave S (200 S)	n/a	n/a
	3 Ave S (300 S)	n/a	n/a
	4 Ave S (400 S)	n/a	n/a
RR 205	4 Ave S (400 S)	-	-
3 St W (300 W)	Hwy 52 (200N)	Stop	e-w
	1 Ave N (100 N)	Yield	n-s (SB only)
2 St W (200 W)	4 Ave N (400 N)	Yield	e-w
	3 Ave N (300 N)	Yield	e-w
	Hwy 52 (200N)	Stop	n-s
	1 Ave N (100 N)	Stop	all
	Church Ave	Yield	e-w (WB only)
	1 Ave S (100 S)	Stop	all
	2 Ave S (200 S)	Stop	n-s
	3 Ave S (300 S)	-	-
	4 Ave S (400 S)	-	-
1 St W (100 W)	Hwy 52 (200N)	Stop	n-s (SB only)
	1 Ave N (100 N)	Stop	n-s (NB only)
	Church Ave	Stop	n-s
	1 Ave S (100 S)	Yield	n-s
	2 Ave S (200 S)	Yield	n-s
	3 Ave S (300 S)	Yield	e-w (EB only)
Broadway	Hwy 845 (Railway Avenue)	Stop	n-s (SB only)
	4 Ave N (400 N)	Stop	e-w
	3 Ave N (300 N)	Stop	e-w
	Hwy 52 (200N)	Stop	e-w
	1 Ave N (100 N)	Stop	e-w
	Park Ave	Stop	e-w (EB only)
	1 Ave S (100 S)	Stop	e-w
	2 Ave S (200 S)	Stop	e-w
	4 Ave S (400 S)	Yield	n-s (SB only)
1 St E (100 E)	4 Ave N (400 N)	Yield	e-w
	3 Ave N (300 N)	Yield	e-w
	Hwy 52 (200N)	Stop	n-s
	1 Ave N (100 N)	Yield	n-s
	Park Ave	Yield	n-s
	1 Ave S (100 S)	Yield	n-s
	2 Ave S (200 S)	Yield	n-s
2 St E (200 E)	Hwy 845	Stop	n-s (NB only)
	4 Ave N (400 N)	Stop	all
	3 Ave N (300 N)	Yield	e-w
	Hwy 52 (200N)	Stop	n-s
	1 Ave N (100 N)	Stop	all
	Park Ave	Stop	e-w (EB only)
	1 Ave S (100 S)	Stop	all
	2 Ave S (200 S)	Stop	all
	4 Ave S (400 S)	Stop	n-s (SB only)
3 St E (300 E)	Township Rd. 70	-	-
	Hwy 845	Stop	n-s (NB only)
	4 Ave N (400 N)	-	-
	3 Ave N (300 N)	Yield	e-w (EB only)
	Hwy 52 (200N)	Stop	n-s
	1 Ave N (100 N)	Yield	n-s (SB only)
	1 Ave S (100 S)	Stop	n-s (NB only)
	2 Ave S (200 S)	-	-
4 St E (400 E)	2 Ave S (200 S)	Stop	n-s (NB only)
Range Road 194	Hwy 52 (200N)	-	-



# C Appendix C - Level of Service Definitions for Unsignalized Intersections



## LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS<sup>(2)</sup>

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	$\leq 10$
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	$> 10$ and $\leq 15$
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	$> 15$ and $\leq 25$
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	$> 25$ and $\leq 35$
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	$> 35$ and $\leq 50$
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	$> 50$

(1) Highway Capacity Manual 2000.



# D Appendix D - Synchro Capacity Analysis Results





Town of Raymond  
 Project No: 2007-3491  
 Date Created: 6/17/2008  
 Date Revised: 1/14/2009

- ASSUMED NETWORK -

Intersection	Intersection Approach	Movement	Configuration	Traffic Control	2008 Background				2018 Background				2018 Total				2028 Background				2028 Total			
					Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)
Railway Ave & 200 E	Overall	-	-	-	-	A	0.04	3.6	-	A	0.05	3.6	-	A	0.11	4.1	-	A	0.14	4.2	-	A	0.20	4.5
	Eastbound	Left	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Through	TR	Free	10	A	0.03	0.0	12	A	0.03	0.0	68	A	0.07	0.0	84	A	0.08	0.0	122	A	0.11	0.0
		Right	-	-	30	A	0.03	0.0	37	A	0.03	0.0	37	A	0.07	0.0	45	A	0.08	0.0	45	A	0.11	0.0
	Westbound	Left	-	-	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	15	A	0.01	0.1	15	A	0.01	0.1
		Through	LT	Free	20	A	0.01	2.5	25	A	0.01	2.4	27	A	0.01	2.3	33	A	0.01	2.4	39	A	0.01	2.2
		Right	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northbound	Left	-	-	15	A	0.04	8.8	18	A	0.05	8.9	18	A	0.11	9.3	23	A	0.14	9.6	23	B	0.20	10.2	
	Through	LR	Stop	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Right	-	-	20	A	0.04	8.8	25	A	0.05	8.9	78	A	0.11	9.3	95	A	0.14	9.6	133	B	0.20	10.2	
Highway 52 & 400 W	Overall	-	-	-	-	A	0.03	2.0	-	A	0.03	1.5	-	A	0.04	1.5	-	A	0.04	1.5	-	A	0.05	1.4
	Eastbound	Left	-	-	10	A	0.01	0.1	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1
		Through	LTR	Free	100	A	0.01	0.7	185	A	0.01	0.4	228	A	0.01	0.4	347	A	0.01	0.4	347	A	0.01	0.3
		Right	-	-	10	A	0.01	0.7	54	A	0.01	0.4	66	A	0.01	0.4	66	A	0.01	0.4	66	A	0.01	0.3
	Westbound	Left	-	-	10	A	0.01	0.1	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1
		Through	LTR	Free	100	A	0.01	0.7	100	A	0.01	0.7	123	A	0.01	0.7	123	A	0.01	0.7	123	A	0.01	0.8
		Right	-	-	10	A	0.01	0.7	10	A	0.01	0.7	12	A	0.01	0.7	12	A	0.01	0.7	12	A	0.01	0.8
	Northbound	Left	-	-	10	A	0.03	9.8	10	B	0.03	10.7	12	B	0.04	11.5	12	B	0.04	11.5	12	B	0.05	12.9
		Through	LTR	Stop	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-
		Right	-	-	10	A	0.03	9.8	10	B	0.03	10.7	12	B	0.04	11.5	12	B	0.04	11.5	12	B	0.05	12.9
	Southbound	Left	-	-	10	A	0.03	9.8	10	B	0.03	10.4	12	B	0.04	11.0	12	B	0.04	11.0	12	B	0.05	12.0
		Through	LTR	Stop	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-
		Right	-	-	10	A	0.03	9.8	10	B	0.03	10.7	12	B	0.04	11.5	12	B	0.04	11.5	12	B	0.05	12.9
	Highway 52 & 200 W	Overall	-	-	-	A	0.18	6.0	-	A	0.24	6.5	-	A	0.36	7.0	-	A	0.50	8.7	-	A	0.70	13.0
		Eastbound	Left	-	-	14	A	0.01	0.1	17	A	0.01	0.1	17	A	0.01	0.1	21	A	0.02	0.1	21	A	0.02
Through			LTR	Free	63	A	0.01	1.3	77	A	0.01	1.3	162	A	0.01	0.8	200	A	0.02	0.8	319	A	0.02	0.6
Right			-	-	11	A	0.01	1.3	14	A	0.01	1.3	14	A	0.01	0.8	17	A	0.02	0.8	17	A	0.02	0.6
Westbound		Left	-	-	18	A	0.01	0.1	22	A	0.02	0.1	23	A	0.02	0.2	27	A	0.02	0.2	46	A	0.04	0.4
		Through	LTR	Free	85	A	0.01	1.3	105	A	0.02	1.3	105	A	0.02	1.4	129	A	0.02	1.4	129	A	0.04	2.1
		Right	-	-	7	A	0.01	1.3	9	A	0.02	1.3	9	A	0.02	1.4	11	A	0.02	1.4	31	A	0.04	2.1
Northbound		Left	-	-	25	B	0.18	11.1	31	B	0.24	12.1	31	B	0.36	14.9	38	C	0.50	19.2	38	E	0.72	35.0
		Through	LTR	Stop	50	B	0.18	11.1	62	B	0.24	12.1	103	B	0.36	14.9	126	C	0.50	19.2	142	E	0.72	35.0
		Right	-	-	44	B	0.18	11.1	54	B	0.24	12.1	54	B	0.36	14.9	67	C	0.50	19.2	73	E	0.72	35.0
Southbound		Left	-	-	9	B	0.10	11.2	11	B	0.14	12.1	11	B	0.16	13.4	14	C	0.24	15.8	20	C	0.37	23.7
		Through	LTR	Stop	44	B	0.10	11.2	54	B	0.14	12.1	55	B	0.16	13.4	68	C	0.24	15.8	68	C	0.37	23.7
		Right	-	-	9	B	0.10	11.2	11	B	0.14	12.1	11	B	0.16	13.4	14	C	0.24	15.8	14	C	0.37	23.7
Highway 52 & Broadway		Overall	-	-	-	A	0.20	6.3	-	A	0.27	7.1	-	A	0.41	8.7	-	B	0.59	12.6	-	D	1.37	81.0
		Eastbound	Left	-	-	29	B	0.20	11.6	36	B	0.27	13.1	36	B	0.41	14.7	44	C	0.59	13.4	44	F	1.08
	Through		LTR	Stop	28	B	0.20	11.6	34	B	0.27	13.1	52	B	0.41	14.7	65	C	0.59	13.4	196	F	1.08	97.2
	Right		-	-	67	B	0.20	11.6	82	B	0.27	13.1	149	B	0.41	14.7	184	C	0.59	13.4	184	F	1.08	97.2
	Westbound	Left	-	-	31	B	0.17	13.7	38	C	0.24	16.1	48	C	0.34	21.5	56	E	0.56	11.1	79	F	1.37	252.2
		Through	LTR	Stop	42	B	0.17	13.7	52	C	0.24	16.1	52	C	0.34	21.5	64	E	0.56	11.1	103	F	1.37	252.2
		Right	-	-	4	B	0.17	13.7	5	C	0.24	16.1	5	C	0.34	21.5	6	E	0.56	11.1	26	F	1.37	252.2
	Northbound	Left	-	-	62	A	0.05	0.4	76	A	0.06	0.5	76	A	0.06	0.5	94	A	0.07	15.5	94	A	0.07	0.7
		Through	LTR	Free	83	A	0.05	2.9	102	A	0.06	3.0	156	A	0.06	2.5	192	A	0.07	15.5	210	A	0.07	2.5
		Right	-	-	32	A	0.05	2.9	39	A	0.06	3.0	39	A	0.06	2.5	48	A	0.07	15.5	55	A	0.07	2.5
	Southbound	Left	-	-	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	15	A	0.01	11.3	21	A	0.02	0.2
		Through	LTR	Free	76	A	0.01	0.7	93	A	0.01	0.7	95	A	0.01	0.7	117	A	0.01	11.3	117	A	0.02	1.1
		Right	-	-	27	A	0.01	0.7	33	A	0.01	0.7	33	A	0.01	0.7	41	A	0.01	11.3	41	A	0.02	1.1
	Highway 52 & 200 E	Overall	-	-	-	A	0.10	6.0	-	A	0.13	6.2	-	A	0.23	7.0	-	A	0.30	7.6	-	A	0.52	8.5
		Eastbound	Left	-	-	14	A	0.01	0.1	17	A	0.01	0.1	17	A	0.01	0.1	21	A	0.02	0.1	21	A	0.02
Through			LTR	Free	26	A	0.01	1.8	32	A	0.01	1.8	50	A	0.01	1.5	61	A	0.02	1.5	201	A	0.02	0.8
Right			-	-	18	A	0.01	1.8	22	A	0.01	1.8	22	A	0.01	1.5	27	A	0.02	1.5	27	A	0.02	0.8
Westbound		Left	-	-	12	A	0.01	0.1	15	A	0.01	0.1	25	A	0.02	0.1	30	A	0.02	0.2	50	A	0.04	0.4
		Through	LTR	Free	41	A	0.01	1.6	50	A	0.01	1.6	60	A	0.02	2.2	74	A	0.02	2.2	153	A	0.04	2.0
		Right	-	-	4	A	0.01	1.6	5	A	0.01	1.6	5	A	0.02	2.2	6	A	0.02	2.2	26	A	0.04	2.0
Northbound		Left	-	-	17	B	0.10	10.1	21	B	0.13	10.5	21	B	0.23	11.9	26	B	0.30	13.2	26	C	0.52	22.3
		Through	LTR	Stop	41	B	0.10	10.1	50	B	0.13	10.5	103	B	0.23	11.9	127	B	0.30	13.2	145	C	0.52	22.3
		Right	-	-	16	B	0.10	10.1	20	B	0.13	10.5	20	B	0.23	11.9	24	B	0.30	13.2	30	C	0.52	22.3
Southbound		Left	-	-	5	A	0.07	9.9	6	B	0.08	10.2	6	B	0.09	10.7	8	B	0.12	11.3	14	C	0.21	16.3
		Through	LTR	Stop	29	A	0.07	9.9	36	B	0.08	10.2	37	B	0.09	10.7	45	B	0.12	11.3	45	C	0.21	16.3
		Right	-	-																				



Town of Raymond  
 Project No: 2007-3491  
 Date Created: 6/17/2008  
 Date Revised: 1/14/2009

- ASSUMED NETWORK -

Intersection	Intersection Approach	Movement	Configuration	Traffic Control	2008 Background				2018 Background				2018 Total				2028 Background				2028 Total			
					Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)
100 S & 200 W	Overall	-	-	-	-	A	0.05	7.1	-	A	0.07	7.2	-	A	0.08	7.4	-	A	0.10	7.5	-	A	0.13	7.7
	Eastbound	Left	-	-	12	A	0.03	7.3	15	A	0.03	7.4	15	A	0.03	7.5	18	A	0.04	7.6	18	A	0.04	7.7
		Through	LTR	Stop	6	A	0.03	7.3	7	A	0.03	7.4	7	A	0.03	7.5	9	A	0.04	7.6	9	A	0.04	7.7
		Right	-	-	2	A	0.03	7.3	2	A	0.03	7.4	2	A	0.03	7.5	3	A	0.04	7.6	3	A	0.04	7.7
	Westbound	Left	-	-	2	A	0.04	6.8	2	A	0.05	6.9	2	A	0.05	7.0	3	A	0.07	7.2	3	A	0.07	7.3
		Through	LTR	Stop	7	A	0.04	6.8	9	A	0.05	6.9	9	A	0.05	7.0	11	A	0.07	7.2	11	A	0.07	7.3
		Right	-	-	30	A	0.04	6.8	37	A	0.05	6.9	37	A	0.05	7.0	45	A	0.07	7.2	45	A	0.07	7.3
	Northbound	Left	-	-	1	A	0.02	7.1	1	A	0.03	7.2	1	A	0.08	7.5	2	A	0.10	7.6	2	A	0.13	7.8
		Through	LTR	Stop	15	A	0.02	7.1	18	A	0.03	7.2	18	A	0.08	7.5	23	A	0.10	7.6	28	A	0.13	7.8
		Right	-	-	4	A	0.02	7.1	5	A	0.03	7.2	5	A	0.08	7.5	6	A	0.10	7.6	6	A	0.13	7.8
	Southbound	Left	-	-	22	A	0.05	7.3	27	A	0.07	7.4	27	A	0.07	7.5	33	A	0.08	7.6	33	A	0.11	7.8
		Through	LTR	Stop	14	A	0.05	7.3	17	A	0.07	7.4	18	A	0.07	7.5	22	A	0.08	7.6	22	A	0.11	7.8
Right		-	-	7	A	0.05	7.3	9	A	0.07	7.4	9	A	0.07	7.5	11	A	0.08	7.6	11	A	0.11	7.8	
100 S & Broadway	Overall	-	-	-	B	0.06	4.7	-	A	0.08	4.8	-	A	0.10	3.7	-	A	0.14	4.0	-	A	0.16	4.0	
	Eastbound	Left	-	-	22	B	0.06	10.3	27	B	0.08	10.8	27	B	0.10	12.3	33	B	0.14	13.9	33	C	0.16	15.3
		Through	LTR	Stop	10	B	0.06	10.3	12	B	0.08	10.8	12	B	0.10	12.3	15	B	0.14	13.9	15	C	0.16	15.3
		Right	-	-	8	B	0.06	10.3	10	B	0.08	10.8	10	B	0.10	12.3	12	B	0.14	13.9	12	C	0.16	15.3
	Westbound	Left	-	-	6	A	0.06	9.5	7	A	0.07	9.7	7	B	0.09	10.5	9	B	0.12	11.3	9	B	0.13	11.9
		Through	LTR	Stop	12	A	0.06	9.5	15	A	0.07	9.7	15	B	0.09	10.5	18	B	0.12	11.3	18	B	0.13	11.9
		Right	-	-	28	A	0.06	9.5	34	A	0.07	9.7	34	B	0.09	10.5	42	B	0.12	11.3	42	B	0.13	11.9
	Northbound	Left	-	-	15	A	0.01	0.1	18	A	0.01	0.1	18	A	0.01	0.1	23	A	0.02	0.2	28	A	0.03	0.3
		Through	LTR	Free	42	A	0.01	1.9	52	A	0.01	1.9	106	A	0.01	1.2	130	A	0.02	1.3	153	A	0.03	1.7
		Right	-	-	4	A	0.01	1.9	5	A	0.01	1.9	5	A	0.01	1.2	6	A	0.02	1.3	6	A	0.03	1.7
	Southbound	Left	-	-	22	A	0.02	0.1	27	A	0.02	0.1	27	A	0.02	0.2	33	A	0.03	0.2	33	A	0.03	0.2
		Through	LTR	Free	54	A	0.02	1.8	66	A	0.02	1.8	147	A	0.02	1.2	181	A	0.03	1.2	203	A	0.03	1.2
Right		-	-	18	A	0.02	1.8	22	A	0.02	1.8	22	A	0.02	1.2	27	A	0.03	1.2	27	A	0.03	1.2	
100 S & 200 E	Overall	-	-	-	A	0.05	7.2	-	A	0.06	7.3	-	A	0.13	7.5	-	A	0.16	7.8	-	A	0.19	8.0	
	Eastbound	Left	-	-	17	A	0.03	7.3	21	A	0.04	7.4	21	A	0.04	7.6	26	A	0.06	7.8	26	A	0.06	7.9
		Through	LTR	Stop	6	A	0.03	7.3	7	A	0.04	7.4	7	A	0.04	7.6	9	A	0.06	7.8	9	A	0.06	7.9
		Right	-	-	4	A	0.03	7.3	5	A	0.04	7.4	5	A	0.04	7.6	6	A	0.06	7.8	6	A	0.06	7.9
	Westbound	Left	-	-	2	A	0.03	6.9	2	A	0.04	7.0	2	A	0.04	7.2	3	A	0.05	7.4	3	A	0.05	7.5
		Through	LTR	Stop	10	A	0.03	6.9	12	A	0.04	7.0	12	A	0.04	7.2	15	A	0.05	7.4	15	A	0.05	7.5
		Right	-	-	16	A	0.03	6.9	20	A	0.04	7.0	20	A	0.04	7.2	24	A	0.05	7.4	24	A	0.05	7.5
	Northbound	Left	-	-	12	A	0.05	7.3	15	A	0.06	7.4	15	A	0.13	7.8	18	A	0.16	8.0	18	A	0.19	8.2
		Through	LTR	Stop	22	A	0.05	7.3	27	A	0.06	7.4	80	A	0.13	7.8	98	A	0.16	8.0	120	A	0.19	8.2
		Right	-	-	6	A	0.05	7.3	7	A	0.06	7.4	7	A	0.13	7.8	9	A	0.16	8.0	9	A	0.19	8.2
	Southbound	Left	-	-	8	A	0.05	7.1	10	A	0.06	7.2	10	A	0.07	7.4	12	A	0.09	7.6	12	A	0.12	7.8
		Through	LTR	Stop	18	A	0.05	7.1	22	A	0.06	7.2	33	A	0.07	7.4	41	A	0.09	7.6	63	A	0.12	7.8
Right		-	-	14	A	0.05	7.1	17	A	0.06	7.2	17	A	0.07	7.4	21	A	0.09	7.6	21	A	0.12	7.8	
400 S & 400 W	Overall	-	-	-	-	A	0.01	2.0	-	A	0.02	1.8	-	A	0.03	1.9	-	A	0.03	1.9	-	A	0.03	1.3
	Eastbound	Left	LT	Free	7	A	0.00	0.0	30	A	0.02	0.2	37	A	0.03	0.2	37	A	0.03	0.2	37	A	0.03	0.2
		Through	-	-	7	A	0.00	3.7	85	A	0.02	2.0	105	A	0.03	2.0	186	A	0.03	2.0	186	A	0.03	1.4
	Westbound	Through	TR	Free	8	A	0.01	0.0	8	A	0.01	0.0	10	A	0.01	0.0	10	A	0.01	0.0	10	A	0.01	0.0
		Right	-	-	4	A	0.01	0.0	4	A	0.01	0.0	5	A	0.01	0.0	5	A	0.01	0.0	5	A	0.01	0.0
	Southbound	Left	LR	Yield	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-
Right		-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	
400 S & Broadway	Overall	-	-	-	-	A	0.01	0.1	18	A	0.01	0.1	15	A	0.01	0.1	18	A	0.01	0.1	26	A	0.02	0.1
	Eastbound	Left	LT	Free	15	A	0.01	0.1	18	A	0.01	0.1	53	A	0.04	0.3	66	A	0.05	0.4	66	A	0.05	0.4
		Through	-	-	3	A	0.01	6.1	4	A	0.01	6.0	42	A	0.04	4.3	51	A	0.05	4.4	132	A	0.05	2.8
	Westbound	Through	TR	Free	4	A	0.01	0.0	5	A	0.02	0.0	5	A	0.04	0.0	6	A	0.05	0.0	6	A	0.07	0.0
		Right	-	-	16	A	0.01	0.0	20	A	0.02	0.0	65	A	0.04	0.0	80	A	0.05	0.0	111	A	0.07	0.0
	Southbound	Left	LR	Yield	6	A	0.02	8.6	7	A	0.02	8.6	45	A	0.08	9.9	56	B	0.10	10.3	67	B	0.15	11.1
Right		-	-	10	A	0.02	8.6	12	A	0.02	8.6	12	A	0.08	9.9	15	B	0.10	10.3	26	B	0.15	11.1	
400 S & 200 E	Overall	-	-	-	-	A	0.01	5.3	-	A	0.01	5.3	-	A	0.02	6.0	-	A	0.03	6.0	-	A	0.07	3.1
	Eastbound	Left	LT	Free	12	A	0.01	0.1	15	A	0.01	0.1	15	A	0.01	0.1	18	A	0.01	0.1	26	A	0.02	0.1
		Through	-	-	4	A	0.01	5.5	5	A	0.01	5.5	5	A	0.01	5.5	6	A	0.01	5.5	87	A	0.02	1.8
	Westbound	Through	TR	Free	2	A	0.00	0.0	2	A	0.00	0.0	2	A	0.01	0.0	3	A	0.01	0.0	34	A	0.04	0.0
		Right	-	-	4	A	0.00	0.0	5	A	0.00	0.0	6	A	0.01	0.0	7	A	0.01	0.0	23	A	0.04	0.0
	Southbound	Left	LR	Stop	3	A	0.01	8.5	4	A	0.01	8.5	15	A	0.02	8.7	18	A	0.03	8.8	40	A	0.07	9.8
Right		-	-	6	A	0.01	8.5	7	A	0.01	8.5	7	A	0.02	8.7	9	A	0.03	8.8	9	A	0.07	9.8	
400 S & Development #10 Access	Overall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Westbound	Left	LR	Stop	0	-	-																	

Town of Raymond  
 Project No: 2007-3491  
 Date Created: 6/17/2008  
 Date Revised: 1/14/2009

- IMPROVED NETWORK -

Intersection	Intersection Approach	Movement	Configuration	Traffic Control	2008 Background				2018 Background				2018 Total				2028 Background				2028 Total				
					Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	
Railway Ave & 200 E	Overall	-	-	-	-	A	0.04	3.6	-	A	0.05	3.6	-	A	0.11	4.1	-	A	0.14	4.2	-	A	0.20	4.5	
	Eastbound	Left	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Through	TR	Free	10	A	0.03	0.0	12	A	0.03	0.0	68	A	0.07	0.0	84	A	0.08	0.0	122	A	0.11	0.0	
	Westbound	Left	-	-	30	A	0.03	0.0	37	A	0.03	0.0	37	A	0.07	0.0	45	A	0.08	0.0	45	A	0.11	0.0	
		Through	LT	Free	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	15	A	0.01	0.1	15	A	0.01	0.1	
	Northbound	Left	-	-	20	A	0.01	2.5	25	A	0.01	2.4	27	A	0.01	2.3	33	A	0.01	2.4	39	A	0.01	2.2	
		Through	LR	Stop	15	A	0.04	8.8	18	A	0.05	8.9	18	A	0.11	9.3	23	A	0.14	9.6	23	B	0.20	10.2	
	Highway 52 & 400 W	Overall	-	-	-	-	A	0.04	8.8	25	A	0.05	8.9	78	A	0.11	9.3	95	A	0.14	9.6	133	B	0.20	10.2
		Eastbound	Left	-	-	10	A	0.01	0.1	10	A	0.01	0.1	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1
			Through	LTR	Free	100	A	0.01	0.7	185	A	0.01	0.4	228	A	0.01	0.4	347	A	0.01	0.4	477	A	0.01	0.3
Westbound		Left	-	-	10	A	0.01	0.7	54	A	0.01	0.4	66	A	0.01	0.4	66	A	0.01	0.4	66	A	0.01	0.3	
		Through	LTR	Free	10	A	0.01	0.1	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	
Northbound		Left	-	-	100	A	0.01	0.7	100	A	0.01	0.7	100	A	0.01	0.7	123	A	0.01	0.7	123	A	0.01	0.8	
		Through	LTR	Stop	10	A	0.01	0.7	10	A	0.01	0.7	12	A	0.01	0.7	12	A	0.01	0.7	12	A	0.01	0.8	
Southbound		Left	-	-	10	A	0.03	9.8	10	B	0.03	10.7	12	B	0.04	11.5	12	B	0.04	11.5	12	B	0.05	12.9	
		Through	LTR	Stop	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	
Highway 52 & 200 W		Overall	-	-	-	-	A	0.18	6.0	10	A	0.03	9.8	10	B	0.03	10.4	12	B	0.04	11.0	12	B	0.05	12.0
	Eastbound	Left	-	-	14	A	0.01	0.1	17	A	0.01	0.1	17	A	0.01	0.1	21	A	0.02	0.1	21	A	0.02	0.2	
		Through	LTR	Free	63	A	0.01	1.3	77	A	0.01	1.3	162	A	0.01	0.8	200	A	0.02	0.8	319	A	0.02	0.6	
	Westbound	Left	-	-	11	A	0.01	1.3	14	A	0.01	1.3	14	A	0.01	0.8	17	A	0.02	0.8	17	A	0.02	0.6	
		Through	LTR	Free	18	A	0.01	0.1	22	A	0.02	0.1	23	A	0.02	0.2	27	A	0.02	0.2	46	A	0.04	0.4	
	Northbound	Left	-	-	85	A	0.01	1.3	105	A	0.02	1.3	105	A	0.02	1.4	129	A	0.02	1.4	129	A	0.04	2.1	
		Through	LTR	Stop	7	A	0.01	1.3	9	A	0.02	1.3	9	A	0.02	1.4	11	A	0.02	1.4	31	A	0.04	2.1	
	Southbound	Left	-	-	25	B	0.18	11.1	31	B	0.24	12.1	31	B	0.36	14.9	38	C	0.50	19.2	38	D	0.59	25.0	
		Through	LTR	Stop	50	B	0.18	11.1	62	B	0.24	12.1	103	B	0.36	14.9	126	C	0.50	19.2	142	D	0.59	25.0	
	Highway 52 & Broadway	Overall	-	-	-	-	A	0.20	6.3	-	A	0.27	7.1	-	A	0.41	8.7	-	B	0.56	13.5	-	D	0.82	25.1
Eastbound		Left	-	-	29	B	0.20	11.6	36	B	0.27	13.1	36	B	0.41	14.7	44	B	0.49	13.6	44	D	0.82	32.5	
		Through	LTR	Stop	28	B	0.20	11.6	34	B	0.27	13.1	52	B	0.41	14.7	65	B	0.49	13.6	196	D	0.82	32.5	
Westbound		Left	-	-	67	B	0.20	11.6	82	B	0.27	13.1	149	B	0.41	14.7	184	B	0.49	13.6	184	D	0.82	32.5	
		Through	LTR	Stop	31	B	0.17	13.7	38	C	0.24	16.1	48	C	0.34	21.5	56	B	0.24	11.1	79	C	0.46	16.2	
Northbound		Left	-	-	42	B	0.17	13.7	52	C	0.24	16.1	52	C	0.34	21.5	64	B	0.24	11.1	103	C	0.46	16.2	
		Through	LTR	Stop	4	B	0.17	13.7	5	C	0.24	16.1	5	C	0.34	21.5	6	B	0.24	11.1	26	C	0.46	16.2	
Southbound		Left	-	-	62	A	0.05	0.4	76	A	0.06	0.5	76	A	0.06	0.5	94	C	0.56	15.5	94	D	0.74	26.5	
		Through	LTR	Stop	83	A	0.05	2.9	102	A	0.06	3.0	156	A	0.06	2.5	192	C	0.56	15.5	210	D	0.74	26.5	
Highway 52 & 200 E		Overall	-	-	-	-	A	0.05	2.9	39	A	0.06	3.0	39	A	0.06	2.5	48	C	0.56	15.5	55	D	0.74	26.5
	Eastbound	Left	-	-	10	A	0.01	0.1	12	A	0.01	0.1	12	A	0.01	0.1	15	B	0.31	11.4	21	C	0.40	15.1	
		Through	LTR	Stop	76	A	0.01	0.7	93	A	0.01	0.7	95	A	0.01	0.7	117	B	0.31	11.4	117	C	0.40	15.1	
	Westbound	Left	-	-	27	A	0.01	0.7	33	A	0.01	0.7	33	A	0.01	0.7	41	B	0.31	11.4	41	C	0.40	15.1	
		Through	LTR	Free	14	A	0.01	0.1	17	A	0.01	0.1	17	A	0.01	0.1	21	A	0.02	0.1	21	A	0.02	0.1	
	Northbound	Left	-	-	26	A	0.01	1.8	32	A	0.01	1.8	50	A	0.01	1.5	61	A	0.02	1.5	201	A	0.02	0.8	
		Through	LTR	Free	18	A	0.01	1.8	22	A	0.01	1.8	22	A	0.01	1.5	27	A	0.02	1.5	27	A	0.02	0.8	
	Southbound	Left	-	-	12	A	0.01	0.1	15	A	0.01	0.1	25	A	0.02	0.1	30	A	0.02	0.2	50	A	0.04	0.4	
		Through	LTR	Stop	41	A	0.01	1.6	50	A	0.01	1.6	60	A	0.02	2.2	74	A	0.02	2.2	153	A	0.04	2.0	
	Highway 52 & 200 E	Overall	-	-	-	-	A	0.01	1.6	5	A	0.01	1.6	5	A	0.02	2.2	6	A	0.02	2.2	26	A	0.04	2.0
Eastbound		Left	-	-	17	B	0.10	10.1	21	B	0.13	10.5	21	B	0.23	11.9	26	B	0.30	13.2	26	C	0.52	22.3	
		Through	LTR	Stop	41	B	0.10	10.1	50	B	0.13	10.5	103	B	0.23	11.9	127	B	0.30	13.2	145	C	0.52	22.3	
Westbound		Left	-	-	16	B	0.10	10.1	20	B	0.13	10.5	20	B	0.23	11.9	24	B	0.30	13.2	30	C	0.52	22.3	
		Through	LTR	Stop	5	A	0.07	9.9	6	B	0.08	10.2	6	B	0.09	10.7	8	B	0.12	11.3	14	C	0.21	16.3	
Southbound		Left	-	-	29	A	0.07	9.9	36	B	0.08	10.2	37	B	0.09	10.7	45	B	0.12	11.3	45	C	0.21	16.3	
		Through	LTR	Stop	14	A	0.07	9.9	17	B	0.08	10.2	17	B	0.09	10.7	21	B	0.12	11.3	21	C	0.21	16.3	



Town of Raymond  
 Project No: 2007-3491  
 Date Created: 6/17/2008  
 Date Revised: 1/14/2009

- IMPROVED NETWORK -

Intersection	Intersection Approach	Movement	Configuration	Traffic Control	2008 Background				2018 Background				2018 Total				2028 Background				2028 Total			
					Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)	Volume	LOS	Max V/C	Delay (s)
100 S & 200 W	Overall	-	-	-	-	A	0.05	7.1	-	A	0.07	7.2	-	A	0.08	7.4	-	A	0.10	7.5	-	A	0.13	7.7
	Eastbound	Left	-	-	12	A	0.03	7.3	15	A	0.03	7.4	15	A	0.03	7.5	18	A	0.04	7.6	18	A	0.04	7.7
		Through	LTR	Stop	6	A	0.03	7.3	7	A	0.03	7.4	7	A	0.03	7.5	9	A	0.04	7.6	9	A	0.04	7.7
		Right	-	-	2	A	0.03	7.3	2	A	0.03	7.4	2	A	0.03	7.5	3	A	0.04	7.6	3	A	0.04	7.7
	Westbound	Left	-	-	2	A	0.04	6.8	2	A	0.05	6.9	2	A	0.05	7.0	3	A	0.07	7.2	3	A	0.07	7.3
		Through	LTR	Stop	7	A	0.04	6.8	9	A	0.05	6.9	9	A	0.05	7.0	11	A	0.07	7.2	11	A	0.07	7.3
		Right	-	-	30	A	0.04	6.8	37	A	0.05	6.9	37	A	0.05	7.0	45	A	0.07	7.2	45	A	0.07	7.3
	Northbound	Left	-	-	1	A	0.02	7.1	1	A	0.03	7.2	1	A	0.08	7.5	2	A	0.10	7.6	2	A	0.13	7.8
		Through	LTR	Stop	15	A	0.02	7.1	18	A	0.03	7.2	59	A	0.08	7.5	73	A	0.10	7.6	94	A	0.13	7.8
		Right	-	-	4	A	0.02	7.1	5	A	0.03	7.2	5	A	0.08	7.5	6	A	0.10	7.6	6	A	0.13	7.8
	Southbound	Left	-	-	22	A	0.05	7.3	27	A	0.07	7.4	27	A	0.07	7.5	33	A	0.08	7.6	33	A	0.11	7.8
		Through	LTR	Stop	14	A	0.05	7.3	17	A	0.07	7.4	18	A	0.07	7.5	22	A	0.08	7.6	22	A	0.11	7.8
Right		-	-	7	A	0.05	7.3	9	A	0.07	7.4	9	A	0.07	7.5	11	A	0.08	7.6	11	A	0.11	7.8	
100 S & Broadway	Overall	-	-	-	A	0.06	4.7	-	A	0.08	4.8	-	A	0.10	3.7	-	A	0.14	4.0	-	A	0.16	4.0	
	Eastbound	Left	-	-	22	B	0.06	10.3	27	B	0.08	10.8	27	B	0.10	12.3	33	B	0.14	13.9	33	C	0.16	15.3
		Through	LTR	Stop	10	B	0.06	10.3	12	B	0.08	10.8	12	B	0.10	12.3	15	B	0.14	13.9	15	C	0.16	15.3
		Right	-	-	8	B	0.06	10.3	10	B	0.08	10.8	10	B	0.10	12.3	12	B	0.14	13.9	12	C	0.16	15.3
	Westbound	Left	-	-	6	A	0.06	9.5	7	A	0.07	9.7	7	B	0.09	10.5	9	B	0.12	11.3	9	B	0.13	11.9
		Through	LTR	Stop	12	A	0.06	9.5	15	A	0.07	9.7	15	B	0.09	10.5	18	B	0.12	11.3	18	B	0.13	11.9
		Right	-	-	28	A	0.06	9.5	34	A	0.07	9.7	34	B	0.09	10.5	42	B	0.12	11.3	42	B	0.13	11.9
	Northbound	Left	-	-	15	A	0.01	0.1	18	A	0.01	0.1	18	A	0.01	0.1	23	A	0.02	0.2	38	A	0.03	0.3
		Through	LTR	Free	42	A	0.01	1.9	52	A	0.01	1.9	106	A	0.01	1.2	130	A	0.02	1.3	153	A	0.03	1.7
		Right	-	-	4	A	0.01	1.9	5	A	0.01	1.9	5	A	0.02	1.3	6	A	0.02	1.3	6	A	0.03	1.7
	Southbound	Left	-	-	22	A	0.02	0.1	27	A	0.02	0.1	27	A	0.02	0.2	33	A	0.03	0.2	33	A	0.03	0.2
		Through	LTR	Free	54	A	0.02	1.8	66	A	0.02	1.8	147	A	0.02	1.2	181	A	0.03	1.2	203	A	0.03	1.2
Right		-	-	18	A	0.02	1.8	22	A	0.02	1.8	22	A	0.02	1.2	27	A	0.03	1.2	27	A	0.03	1.2	
100 S & 200 E	Overall	-	-	-	A	0.05	7.2	-	A	0.06	7.3	-	A	0.13	7.5	-	A	0.16	7.8	-	A	0.19	8.0	
	Eastbound	Left	-	-	17	A	0.03	7.3	21	A	0.04	7.4	21	A	0.04	7.6	26	A	0.06	7.8	26	A	0.06	7.9
		Through	LTR	Stop	6	A	0.03	7.3	7	A	0.04	7.4	7	A	0.04	7.6	9	A	0.06	7.8	9	A	0.06	7.9
		Right	-	-	4	A	0.03	7.3	5	A	0.04	7.4	5	A	0.04	7.6	6	A	0.06	7.8	6	A	0.06	7.9
	Westbound	Left	-	-	2	A	0.03	6.9	2	A	0.04	7.0	2	A	0.04	7.2	3	A	0.05	7.4	3	A	0.05	7.5
		Through	LTR	Stop	10	A	0.03	6.9	12	A	0.04	7.0	12	A	0.04	7.2	15	A	0.05	7.4	15	A	0.05	7.5
		Right	-	-	16	A	0.03	6.9	20	A	0.04	7.0	20	A	0.04	7.2	24	A	0.05	7.4	24	A	0.05	7.5
	Northbound	Left	-	-	12	A	0.05	7.3	15	A	0.06	7.4	15	A	0.13	7.8	18	A	0.16	8.0	18	A	0.19	8.2
		Through	LTR	Stop	22	A	0.05	7.3	27	A	0.06	7.4	80	A	0.13	7.8	98	A	0.16	8.0	120	A	0.19	8.2
		Right	-	-	6	A	0.05	7.3	7	A	0.06	7.4	7	A	0.13	7.8	9	A	0.16	8.0	9	A	0.19	8.2
	Southbound	Left	-	-	8	A	0.05	7.1	10	A	0.06	7.2	10	A	0.07	7.4	12	A	0.09	7.6	12	A	0.12	7.8
		Through	LTR	Stop	18	A	0.05	7.1	22	A	0.06	7.2	33	A	0.07	7.4	41	A	0.09	7.6	63	A	0.12	7.8
Right		-	-	14	A	0.05	7.1	17	A	0.06	7.2	17	A	0.07	7.4	21	A	0.09	7.6	21	A	0.12	7.8	
400 S & 400 W	Overall	-	-	-	-	-	-	-	A	0.01	2.0	-	A	0.02	1.8	-	A	0.03	1.9	-	A	0.03	1.3	
	Eastbound	Left	LT	Free	7	A	0.00	0.0	30	A	0.02	0.2	37	A	0.03	0.2	37	A	0.03	0.2	37	A	0.03	0.2
		Through	-	-	7	A	0.00	3.7	85	A	0.02	2.0	105	A	0.03	2.0	186	A	0.03	2.0	186	A	0.03	1.4
	Westbound	Through	TR	Free	8	A	0.01	0.0	8	A	0.01	0.0	10	A	0.01	0.0	10	A	0.01	0.0	10	A	0.01	0.0
		Right	-	-	4	A	0.01	0.0	4	A	0.01	0.0	5	A	0.01	0.0	5	A	0.01	0.0	5	A	0.01	0.0
	Southbound	Left	LR	Yield	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-
Right		-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	
400 S & Broadway	Overall	-	-	-	A	0.02	4.6	-	A	0.02	4.5	-	A	0.08	4.4	-	A	0.10	4.6	-	A	0.15	3.9	
	Eastbound	Left	LT	Free	15	A	0.01	0.1	18	A	0.01	0.1	53	A	0.04	0.3	66	A	0.05	0.4	66	A	0.05	0.4
		Through	-	-	3	A	0.01	6.1	4	A	0.01	6.0	42	A	0.04	4.3	51	A	0.05	4.4	152	A	0.05	2.8
	Westbound	Through	TR	Free	4	A	0.01	0.0	5	A	0.02	0.0	5	A	0.04	0.0	6	A	0.05	0.0	6	A	0.07	0.0
		Right	-	-	16	A	0.01	0.0	20	A	0.02	0.0	65	A	0.04	0.0	80	A	0.05	0.0	111	A	0.07	0.0
	Southbound	Left	LR	Yield	6	A	0.02	8.6	7	A	0.02	8.6	45	A	0.08	9.9	56	B	0.10	10.3	67	B	0.15	11.1
Right		-	-	10	A	0.02	8.6	12	A	0.02	8.6	12	A	0.08	9.9	15	B	0.10	10.3	26	B	0.15	11.1	
400 S & 200 E	Overall	-	-	-	A	0.01	5.3	-	A	0.01	5.3	-	A	0.02	6.0	-	A	0.03	6.0	-	A	0.07	3.1	
	Eastbound	Left	LT	Free	12	A	0.01	0.1	15	A	0.01	0.1	15	A	0.01	0.1	18	A	0.01	0.1	26	A	0.02	0.1
		Through	-	-	4	A	0.01	5.5	5	A	0.01	5.5	5	A	0.01	5.5	6	A	0.01	5.5	87	A	0.02	1.8
	Westbound	Through	TR	Free	2	A	0.00	0.0	2	A	0.00	0.0	2	A	0.01	0.0	3	A	0.01	0.0	34	A	0.04	0.0
		Right	-	-	4	A	0.00	0.0	5	A	0.00	0.0	6	A	0.01	0.0	7	A	0.01	0.0	23	A	0.04	0.0
	Southbound	Left	LR	Stop	3	A	0.01	8.5	4	A	0.01	8.5	15	A	0.02	8.7	18	A	0.03	8.8	40	A	0.07	9.8
Right		-	-	6	A	0.01	8.5	7	A	0.01	8.5	7	A	0.02	8.7	9	A	0.03	8.8	9	A	0.07	9.8	
400 S & Development #10 Access	Overall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Westbound	Left	LR	Stop	18	-	-	-	81	-	-	-												

# E Appendix E - Traffic Signal Warrants





**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Broadway & Church Avenue

Date of Count: 2008

I Collisions (Figure B2-1)											
Pa										<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops											
B. Two-Way Street											
	Approach		Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew} \text{ (or } V_{tns}) \times$	$P_2 \times$	$F_{eew} \text{ (or } F_{ens}) =$	Priority Points	
E-W Street - E. of int.	61	0.10	610	28	0.10	280	0.89	2	1.30	2.31	
E-W Street - W. of int.	44	0.10	440	62	0.10	620	1.06	2	1.30	2.76	
N-S Street - N. of int.	126	0.10	1,260	176	0.10	1,760	3.02	2	1.30	7.85	
N-S Street - S. of int.	127	0.10	1,270	92	0.10	920	2.19	2	1.30	5.69	
	<b>Total</b>									<b>18.62</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes											
B. Through Street Two-Way											
	Approach										
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew}) \times$	$(V_{ans} +$	$P_{ns}) \times$	$F_{ow} =$		Priority Points	
Approach East	61	1.00	61	0.06	0.49						
Approach West	44	1.00	44	0.04	0.49						
Approach North	126	1.00	126			0.13	0.64				
Approach South	127	1.00	127			0.13	0.64	1.00		1.66	
	<b>Total</b>									<b>1.66</b>	
<b>TOTAL PRIORITY POINTS</b>										<b>-4.72</b>	
<b>WARRANTED? (&gt;100)</b>										<b>NO</b>	

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Broadway & 100 N

Date of Count: 2008

I Collisions (Figure B2-1)												
Pa											<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
		Approach			Egress							
		2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{lew}$ (or $V_{tns}$ ) X	$P_2$ X	$F_{ew}$ (or $F_{ens}$ ) =		Priority Points
E-W Street - E. of int.		46	0.10	460	44	0.10	440	0.90	2	1.30		2.34
E-W Street - W. of int.		46	0.10	460	45	0.10	450	0.91	2	1.30		2.37
N-S Street - N. of int.		165	0.10	1,650	170	0.10	1,700	3.35	2	1.30		8.71
N-S Street - S. of int.		94	0.10	940	92	0.10	920	1.86	2	1.30		4.84
										<b>Total</b>		<b>18.25</b>
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
		Approach										
		2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} + P_{ew}) X$		$(V_{ans} + P_{ns}) X$		$F_{ow} =$			Priority Points
Approach East		46	1.00	46	0.05	0.15						
Approach West		46	1.00	46	0.05	0.15						
Approach North		165	1.00	165			0.17	0.18				
Approach South		94	1.00	94			0.09	0.18	1.00			0.24
									<b>Total</b>			<b>0.24</b>
<b>TOTAL PRIORITY POINTS</b>											<b>-6.51</b>	
<b>WARRANTED? (&gt;100)</b>											<b>NO</b>	

**Town of Raymond**

**Project No:** 2007-3491  
**Date Revised:** January 14, 2009  
**Interseccion:** Broadway & 100 N

Date of Count: 2018 Total

I Collisions (Figure B2-1)											
Pa										<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops											
B. Two-Way Street											
	Approach			Egress			2008 Pk Hr	$V_{lew}$ (or $V_{tns}$ ) X	$P_2$ X	$F_{eew}$ (or $F_{ens}$ ) =	Priority Points
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT						
E-W Street - E. of int.	63	0.10	626	60	0.10	601	1.23	2	1.30	3.19	
E-W Street - W. of int.	59	0.10	586	57	0.10	574	1.16	2	1.30	3.01	
N-S Street - N. of int.	257	0.10	2,570	290	0.10	2,901	5.47	2	1.30	14.22	
N-S Street - S. of int.	197	0.10	1,966	167	0.10	1,672	3.64	2	1.30	9.46	
<b>Total</b>										<b>29.89</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes											
B. Through Street Two-Way											
	Approach			2008 Pk Hr	$(V_{aew} + P_{ew}) X$	$(V_{ans} + P_{ns}) X$	$F_{ow} =$	Priority Points			
	2008 Pk Hr	pk to AADT									
Approach East	63	1.00	63	0.06	0.15						
Approach West	59	1.00	59	0.06	0.15						
Approach North	257	1.00	257			0.26	0.18				
Approach South	197	1.00	197			0.20	0.18	1.00			
<b>Total</b>								<b>0.34</b>			
<b>TOTAL PRIORITY POINTS</b>								<b>5.23</b>			
<b>WARRANTED? (&gt;100)</b>								<b>NO</b>			

**Town of Raymond**

**Project No:** 2007-3491  
**Date Revised:** January 14, 2009  
**Interseccion:** Broadway & 100 N

Date of Count: 2028 Total

I Collisions (Figure B2-1)											
Pa										<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops											
B. Two-Way Street											
	Approach			Egress							
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{lew}$ (or $V_{tns}$ ) X	$P_2$ X	$F_{eew}$ (or $F_{ens}$ ) =	Priority Points	
E-W Street - E. of int.	77	0.10	770	81	0.10	809	1.58	2	1.30	4.11	
E-W Street - W. of int.	75	0.10	751	71	0.10	705	1.46	2	1.30	3.79	
N-S Street - N. of int.	341	0.10	3,410	377	0.10	3,768	7.18	2	1.30	18.66	
N-S Street - S. of int.	264	0.10	2,638	229	0.10	2,286	4.92	2	1.30	12.80	
	<b>Total</b>									<b>39.36</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes											
B. Through Street Two-Way											
	Approach										
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew}) X$	$(V_{ans} +$	$P_{ns}) X$	$F_{ow} =$	Priority Points		
Approach East	77	1.00	77	0.08	0.15						
Approach West	75	1.00	75	0.08	0.15						
Approach North	341	1.00	341			0.34	0.18				
Approach South	264	1.00	264			0.26	0.18	1.00	0.44		
	<b>Total</b>									<b>0.44</b>	
<b>TOTAL PRIORITY POINTS</b>									<b>14.80</b>		
<b>WARRANTED? (&gt;100)</b>									<b>NO</b>		

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Highway 52 & Broadway

Date of Count: 2008

I Collisions (Figure B2-1)												
Pa											<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach			Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew}$ (or $V_{tns}$ ) x	$P_{2x}$	$F_{eew}$ (or $F_{ens}$ ) =	Priority Points		
E-W Street - E. of int.	70	0.10	700	77	0.10	770	1.47	2	1.30	3.82		
E-W Street - W. of int.	131	0.10	1,310	124	0.10	1,240	2.55	2	1.30	6.63		
N-S Street - N. of int.	116	0.10	1,160	113	0.10	1,130	2.29	2	1.30	5.95		
N-S Street - S. of int.	174	0.10	1,740	177	0.10	1,770	3.51	2	1.30	9.13		
	<b>Total</b>									<b>25.53</b>		
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach											
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} + P_{ew}) X$	$(V_{ans} + P_{ns}) X$	$F_{ow} =$	Priority Points					
Approach East	70	1.00	70	0.07	0.00							
Approach West	131	1.00	131	0.13	0.00							
Approach North	116	1.00	116		0.12	0.00						
Approach South	174	1.00	174		0.17	0.00	1.00					
	<b>Total</b>						<b>0.06</b>					
<b>TOTAL PRIORITY POINTS</b>										<b>0.59</b>		
<b>WARRANTED? (&gt;100)</b>										<b>NO</b>		

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Highway 52 & Broadway

Date of Count: 2018 Total

I Collisions (Figure B2-1)												
Pa											<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach			Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew}$ (or $V_{trns}$ ) x	$P_2$ x	$F_{eew}$ (or $F_{ens}$ ) =		Priority Points	
E-W Street - E. of int.	104	0.10	1,041	105	0.10	1,047	2.09	2	1.30		5.43	
E-W Street - W. of int.	161	0.10	1,611	238	0.10	2,375	3.99	2	1.30		10.36	
N-S Street - N. of int.	197	0.10	1,967	141	0.10	1,410	3.38	2	1.30		8.78	
N-S Street - S. of int.	293	0.10	2,930	272	0.10	2,717	5.65	2	1.30		14.68	
									<b>Total</b>		<b>39.26</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach											
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew}) X$	$(V_{ans} +$	$P_{ns}) X$	$F_{ow} =$			Priority Points	
Approach East	104	1.00	104	0.10	0.00							
Approach West	161	1.00	161	0.16	0.00							
Approach North	197	1.00	197			0.20	0.00					
Approach South	293	1.00	293			0.29	0.00	1.00			0.13	
								<b>Total</b>			<b>0.13</b>	
										<b>TOTAL PRIORITY POINTS</b>	<b>14.39</b>	
										<b>WARRANTED? (&gt;100)</b>	<b>NO</b>	

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Highway 52 & Broadway

Date of Count: 2028 Total

I Collisions (Figure B2-1)												
Pa											<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach		Egress									
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew}$ (or $V_{trns}$ ) x	$P_2$ x	$F_{eew}$ (or $F_{ens}$ ) =		Priority Points	
E-W Street - E. of int.	272	0.10	2,720	208	0.10	2,078	4.80	2	1.30		12.48	
E-W Street - W. of int.	237	0.10	2,372	423	0.10	4,231	6.60	2	1.30		17.17	
N-S Street - N. of int.	280	0.10	2,799	179	0.10	1,794	4.59	2	1.30		11.94	
N-S Street - S. of int.	380	0.10	3,804	359	0.10	3,592	7.40	2	1.30		19.23	
									<b>Total</b>		<b>60.82</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach											
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew})$ X	$(V_{ans} +$	$P_{ns})$ X	$F_{ow} =$			Priority Points	
Approach East	272	1.00	272	0.27	0.00							
Approach West	237	1.00	237	0.24	0.00							
Approach North	280	1.00	280			0.28	0.00					
Approach South	380	1.00	380			0.38	0.00	1.00			0.34	
								<b>Total</b>			<b>0.34</b>	
										<b>TOTAL PRIORITY POINTS</b>	<b>36.15</b>	
										<b>WARRANTED? (&gt;100)</b>	<b>NO</b>	

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection:**

Highway 52 & 200 W

Date of Count: 2008

I Collisions (Figure B2-1)											
Pa										<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops											
B. Two-Way Street											
	Approach		Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew}$ (or $V_{tns}$ ) x	$P_{2x}$	$F_{eew}$ (or $F_{ens}$ ) =	Priority Points	
E-W Street - E. of int.	116	0.10	1,160	110	0.10	1,100	2.26	2	1.30	5.88	
E-W Street - W. of int.	119	0.10	1,190	88	0.10	880	2.07	2	1.30	5.38	
N-S Street - N. of int.	71	0.10	710	62	0.10	620	1.33	2	1.30	3.46	
N-S Street - S. of int.	73	0.10	730	119	0.10	1,190	1.92	2	1.30	4.99	
	<b>Total</b>									<b>19.71</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes											
B. Through Street Two-Way											
	Approach										
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} + P_{ew}) X$	$(V_{ans} + P_{ns}) X$	$F_{ow} =$				Priority Points	
Approach East	116	1.00	116	0.12	0.59						
Approach West	119	1.00	119	0.12	0.59						
Approach North	71	1.00	71		0.07		0.14				
Approach South	73	1.00	73		0.07		0.14	1.00		0.60	
	<b>Total</b>									<b>0.60</b>	
<b>TOTAL PRIORITY POINTS</b>										<b>-4.69</b>	
<b>WARRANTED? (&gt;100)</b>										<b>NO</b>	





**Town of Raymond**

**Project No:** 2007-3491  
**Date Revised:** January 14, 2009  
**Intersection:** Highway 52 & 200 W

Date of Count: 2028 Total

I Collisions (Figure B2-1)												
Pa											<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach			Egress			$V_{tew}$ (or $V_{trns}$ ) x	$P_2$ x	$F_{eew}$ (or $F_{ens}$ ) =	Priority Points		
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr						
E-W Street - E. of int.	411	0.10	4,110	205	0.10	2,054	6.16	2	1.30	16.03		
E-W Street - W. of int.	180	0.10	1,800	357	0.10	3,567	5.37	2	1.30	13.95		
N-S Street - N. of int.	194	0.10	1,938	101	0.10	1,010	2.95	2	1.30	7.67		
N-S Street - S. of int.	131	0.10	1,307	252	0.10	2,525	3.83	2	1.30	9.96		
										<b>Total</b>	<b>47.61</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach			2008 Pk Hr	$(V_{aew} + P_{ew}) X$	$(V_{ans} + P_{ns}) X$	$F_{ow} =$	Priority Points				
	2008 Pk Hr	pk to AADT	2008 Pk Hr									
Approach East	411	1.00	411	0.41	0.59							
Approach West	180	1.00	180	0.18	0.59							
Approach North	194	1.00	194			0.19	0.14					
Approach South	131	1.00	131			0.13	0.14	1.00			1.07	
										<b>Total</b>	<b>1.07</b>	
										<b>TOTAL PRIORITY POINTS</b>	<b>23.68</b>	
										<b>WARRANTED? (&gt;100)</b>	<b>NO</b>	

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection**

100 N & 200 W

Date of Count: 2008

I Collisions (Figure B2-1)											
Pa										<b>Total</b>	<b>-25</b>
II Crossing Gaps, Progression, Delay and Vehicular Stops											
B. Two-Way Street											
	Approach		Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{tew} \text{ (or } V_{tns}) \times$	$P_2 \times$	$F_{eew} \text{ (or } F_{ens}) =$	Priority Points	
E-W Street - E. of int.	45	0.10	450	46	0.10	460	0.91	2	1.30	2.37	
E-W Street - W. of int.	30	0.10	300	61	0.10	610	0.91	2	1.30	2.37	
N-S Street - N. of int.	119	0.10	1,190	73	0.10	730	1.92	2	1.30	4.99	
N-S Street - S. of int.	43	0.10	430	57	0.10	570	1.00	2	1.30	2.60	
	<b>Total</b>									<b>12.32</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes											
B. Through Street Two-Way											
	Approach										
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew}) \times$	$(V_{ans} +$	$P_{ns}) \times$	$F_{ow} =$		Priority Points	
Approach East	45	1.00	45	0.05	0.70						
Approach West	30	1.00	30	0.03	0.70						
Approach North	119	1.00	119			0.12	0.55				
Approach South	43	1.00	43			0.04	0.55	1.00		1.86	
	<b>Total</b>									<b>1.86</b>	
<b>TOTAL PRIORITY POINTS</b>										<b>-10.81</b>	
<b>WARRANTED? (&gt;100)</b>										<b>NO</b>	

**Town of Raymond**

**Project No:** 2007-3491  
**Date Revised:** January 14, 2009  
**Intersection:** 100 N & 200 W

Date of Count: 2018 Total

I Collisions (Figure B2-1)											<b>Total</b>	<b>-25</b>
Pa												
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach			Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{lew} \text{ (or } V_{lms}) \times$	$P_2 \times$	$F_{eew} \text{ (or } F_{ens}) =$		Priority Points	
E-W Street - E. of int.	57	0.10	574	59	0.10	586	1.16	2	1.30		3.01	
E-W Street - W. of int.	37	0.10	369	75	0.10	750	1.12	2	1.30		2.91	
N-S Street - N. of int.	187	0.10	1,874	91	0.10	908	2.78	2	1.30		7.23	
N-S Street - S. of int.	54	0.10	539	111	0.10	1,111	1.65	2	1.30		4.29	
									<b>Total</b>		<b>17.45</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach											
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} +$	$P_{ew}) \times$	$(V_{ans} +$	$P_{ns}) \times$	$F_{ow} =$		Priority Points		
Approach East	57	1.00	57	0.06	0.70							
Approach West	37	1.00	37	0.04	0.70							
Approach North	187	1.00	187			0.19	0.55					
Approach South	54	1.00	54			0.05	0.55	1.00		2.00		
								<b>Total</b>		<b>2.00</b>		
										<b>TOTAL PRIORITY POINTS</b>	<b>-5.55</b>	
										<b>WARRANTED? (&gt;100)</b>	<b>NO</b>	

**Town of Raymond**

**Project No:**

2007-3491

**Date Revised:**

January 14, 2009

**Intersection**

100 N & 200 W

Date of Count: 2028 Total

I Collisions (Figure B2-1)											Total	-25
Pa												
II Crossing Gaps, Progression, Delay and Vehicular Stops												
B. Two-Way Street												
	Approach			Egress								
	2008 Pk Hr	pk to AADT	2008 Pk Hr	2008 Pk Hr	pk to AADT	2008 Pk Hr	$V_{lew}$ (or $V_{lms}$ ) x	$P_2x$	$F_{eew}$ (or $F_{ens}$ ) =		Priority Points	
E-W Street - E. of int.	71	0.10	705	74	0.10	741	1.45	2	1.30		3.76	
E-W Street - W. of int.	45	0.10	454	92	0.10	923	1.38	2	1.30		3.58	
N-S Street - N. of int.	252	0.10	2,525	131	0.10	1,307	3.83	2	1.30		9.96	
N-S Street - S. of int.	86	0.10	863	158	0.10	1,577	2.44	2	1.30		6.34	
									<b>Total</b>		<b>23.64</b>	
III Crossing Gaps, Intersecting Volumes, and Pedestrian Volumes												
B. Through Street Two-Way												
	Approach											
	2008 Pk Hr	pk to AADT	2008 Pk Hr	$(V_{aew} + P_{ew}) X$		$(V_{ans} + P_{ns}) X$		$F_{ow} =$		Priority Points		
Approach East	71	1.00	71	0.07	0.70							
Approach West	45	1.00	45	0.05	0.70							
Approach North	252	1.00	252			0.25	0.55					
Approach South	86	1.00	86			0.09	0.55	1.00		2.18		
								<b>Total</b>		<b>2.18</b>		
<b>TOTAL PRIORITY POINTS</b>										<b>0.82</b>		
<b>WARRANTED? (&gt;100)</b>										<b>NO</b>		



# F Appendix F - Cost Estimate





Cost Summary	Cost/	Unit
Excavation:		
Common Excavation	\$4.19	m <sup>3</sup>
Common Excavation Loaded to Trucks	\$10.88	m <sup>3</sup>
Subgrade preparation:		
Subgrade preparation:	\$1.34	m <sup>2</sup>
Pavement Structure:		
ACP - 70 mm	\$110.90	t
GBC - 200 mm	\$23.84	t
Curb & Gutter	\$270.00	m
Pavement Marking:		
Centre Line Painting	\$1,041.35	km

Summary	
Arterial Roadway	\$1,316,929.58
Collector Roadway	\$0.00
Local Roadway	\$6,331,514.97
Roadway Total	\$7,648,444.55
Contingency (15%)	\$1,147,266.68
Total (Roadway & Contingency)	\$8,795,711.24
Engineering Cost (15%, including Contingency)	\$1,319,356.69
Total (Roadway & Contingency & Engg. Cost)	\$10,115,067.92
GST	\$505,753.40
<b>TOTAL</b>	<b>\$10,620,821.32</b>

Assumption:  
 For ASP: 1 m<sup>3</sup> = 2.4 tonne  
 For GBC: 1 m<sup>2</sup> = 2.33 tonne

ARTERIAL			
400 S Access to Development #10 & #11	Quantity	Unit	Cost
Length of New Roadway	1.40	km	
	1,403.00	m	
Excavation:			
Common Excavation	4,545.72	m <sup>3</sup>	\$19,046.57
Waste Excavation	1,010.16	m <sup>3</sup>	\$10,990.54
Subgrade preparation:			
Subgrade preparation:	16,839.37	m <sup>2</sup>	\$22,564.75
Pavement Structure:			
ACP - 75 mm	2,904.88	t	\$322,151.57
GBC - 200 mm	7,680.17	t	\$183,095.14
Curb & Gutter	2,806.00	m	\$757,620.00
Pavement Marking:			
Centre Line Painting	1.40	km	\$1,461.01
<b>TOTAL</b>			<b>\$1,316,929.58</b>

COLLECTOR			
	Quantity	Unit	Cost
Excavation:			
Common Excavation	0.00	m <sup>3</sup>	\$0.00
Waste Excavation	0.00	m <sup>3</sup>	\$0.00
Subgrade preparation:			
Subgrade preparation:	0.00	m <sup>2</sup>	\$0.00
Pavement Structure:			
ACP - 75 mm	0.00	t	\$0.00
GBC - 200 mm	0.00	t	\$0.00
Curb & Gutter	0.00	m	\$0.00
Pavement Marking:			
Centre Line Painting	0.00	km	\$0.00
<b>TOTAL</b>			<b>\$0.00</b>

LOCAL			
200 S - Extension to 400 W	Quantity	Unit	Cost
Length of New Roadway	0.30	km	
	297.00	m	
Excavation:			
Common Excavation	691.36	m <sup>3</sup>	\$2,896.78
Waste Excavation	134.01	m <sup>3</sup>	\$1,457.99
Subgrade preparation:			
Subgrade preparation:	2,822.03	m <sup>2</sup>	\$3,781.53
Pavement Structure:			
ACP - 75 mm	481.21	t	\$53,366.33
GBC - 200 mm	1,300.36	t	\$31,000.49
Curb & Gutter	594.00	m	\$160,380.00
Pavement Marking:			
Centre Line Painting	0.30	km	\$309.28
<b>TOTAL</b>			<b>\$253,192.40</b>

TOTAL ARTERIAL ROADWAYS \$1,316,929.58

TOTAL COLLECTOR ROADWAYS \$0.00

LOCAL			
300 S - Extension to 400 W	Quantity	Unit	Cost
Length of New Roadway	0.37	km	
	372.00	m	
Excavation:			
Common Excavation	865.94	m <sup>3</sup>	\$3,628.30
Waste Excavation	167.85	m <sup>3</sup>	\$1,826.17
Subgrade preparation:			
Subgrade preparation:	3,534.67	m <sup>2</sup>	\$4,736.46
Pavement Structure:			
ACP - 75 mm	602.73	t	\$66,842.68
GBC - 200 mm	1,628.73	t	\$38,828.89
Curb & Gutter	744.00	m	\$200,880.00
Pavement Marking:			
Centre Line Painting	0.37	km	\$387.38
<b>TOTAL</b>			<b>\$317,129.87</b>

LOCAL			
Cul-de-sacs South of 300 S	Quantity	Unit	Cost
Length of New Roadway	1.05	km	
	1,050.00	m	
Excavation:			
Common Excavation	2,444.19	m <sup>3</sup>	\$10,241.16
Waste Excavation	473.76	m <sup>3</sup>	\$5,154.51
Subgrade preparation:			
Subgrade preparation:	9,976.89	m <sup>2</sup>	\$13,369.03
Pavement Structure:			
ACP - 75 mm	1,701.25	t	\$188,668.85
GBC - 200 mm	4,597.22	t	\$109,597.68
Curb & Gutter	2,100.00	m	\$567,000.00
Pavement Marking:			
Centre Line Painting	1.05	km	\$1,093.42
<b>TOTAL</b>			<b>\$895,124.64</b>

LOCAL			
Local Road along West Limit of Development #3	Quantity	Unit	Cost
Length of New Roadway	0.32	km	
	320.00	m	
Excavation:			
Common Excavation	744.90	m <sup>3</sup>	\$3,121.11
Waste Excavation	144.38	m <sup>3</sup>	\$1,570.90
Subgrade preparation:			
Subgrade preparation:	3,040.58	m <sup>2</sup>	\$4,074.37
Pavement Structure:			
ACP - 75 mm	518.48	t	\$57,499.08
GBC - 200 mm	1,401.06	t	\$33,401.20
Curb & Gutter	640.00	m	\$172,800.00
Pavement Marking:			
Centre Line Painting	0.32	km	\$333.23
<b>TOTAL</b>			<b>\$272,799.89</b>

LOCAL			
Broadway - Extension to Development #6	Quantity	Unit	Cost
Length of New Roadway	0.33	km	
	327.00	m	
Excavation:			
Common Excavation	761.19	m <sup>3</sup>	\$3,189.39
Waste Excavation	147.54	m <sup>3</sup>	\$1,605.26
Subgrade preparation:			
Subgrade preparation:	3,107.09	m <sup>2</sup>	\$4,163.50
Pavement Structure:			
ACP - 75 mm	529.82	t	\$58,756.87
GBC - 200 mm	1,431.71	t	\$34,131.85
Curb & Gutter	654.00	m	\$176,580.00
Pavement Marking:			
Centre Line Painting	0.33	km	\$340.52
<b>TOTAL</b>			<b>\$278,767.39</b>

LOCAL			
100 E - Extension to Development #6	Quantity	Unit	Cost
Length of New Roadway	0.64	km	
	641.00	m	
Excavation:			
Common Excavation	1,492.12	m <sup>3</sup>	\$6,251.98
Waste Excavation	289.22	m <sup>3</sup>	\$3,146.70
Subgrade preparation:			
Subgrade preparation:	6,090.65	m <sup>2</sup>	\$8,161.48
Pavement Structure:			
ACP - 75 mm	1,038.57	t	\$115,177.84
GBC - 200 mm	2,806.49	t	\$66,906.77
Curb & Gutter	1,282.00	m	\$346,140.00
Pavement Marking:			
Centre Line Painting	0.64	km	\$667.51
<b>TOTAL</b>			<b>\$546,452.28</b>

LOCAL			
300 E - Extension to Development #6	Quantity	Unit	Cost
Length of New Roadway	0.59	km	
	585.00	m	
Excavation:			
Common Excavation	1,361.76	m <sup>3</sup>	\$5,705.79
Waste Excavation	263.95	m <sup>3</sup>	\$2,871.80
Subgrade preparation:			
Subgrade preparation:	5,558.55	m <sup>2</sup>	\$7,448.46
Pavement Structure:			
ACP - 75 mm	947.84	t	\$105,115.50
GBC - 200 mm	2,561.31	t	\$61,061.56
Curb & Gutter	1,170.00	m	\$315,900.00
Pavement Marking:			
Centre Line Painting	0.59	km	\$609.19
<b>TOTAL</b>			<b>\$498,712.30</b>

LOCAL			
E-W Road within Development #6	Quantity	Unit	Cost
Length of New Roadway	3.02	km	
	3,024.00	m	
Excavation:			
Common Excavation	7,039.27	m <sup>3</sup>	\$29,494.53
Waste Excavation	1,364.43	m <sup>3</sup>	\$14,844.99
Subgrade preparation:			
Subgrade preparation:	28,733.44	m <sup>2</sup>	\$38,502.81
Pavement Structure:			
ACP - 75 mm	4,899.61	t	\$543,366.28
GBC - 200 mm	13,239.99	t	\$315,641.32
Curb & Gutter	6,048.00	m	\$1,632,960.00
Pavement Marking:			
Centre Line Painting	3.02	km	\$3,149.04
<b>TOTAL</b>			<b>\$2,577,958.97</b>

LOCAL			
Roads around Development #8	Quantity	Unit	Cost
Length of New Roadway	0.81	km	
	811.00	m	
Excavation:			
Common Excavation	1,887.85	m <sup>3</sup>	\$7,910.07
Waste Excavation	365.92	m <sup>3</sup>	\$3,981.24
Subgrade preparation:			
Subgrade preparation:	7,705.96	m <sup>2</sup>	\$10,325.99
Pavement Structure:			
ACP - 75 mm	1,314.01	t	\$145,724.22
GBC - 200 mm	3,550.80	t	\$84,651.16
Curb & Gutter	1,622.00	m	\$437,940.00
Pavement Marking:			
Centre Line Painting	0.81	km	\$844.53
<b>TOTAL</b>			<b>\$691,377.22</b>

TOTAL LOCAL ROADWAYS \$6,331,514.97

**Town of Raymond - Transportation Master Plan**

Project Number: 2007-3491

Date: January 15, 2009

Cost Estimate - 2028 Horizon

Cost Summary	Cost/	Unit
Excavation:		
Common Excavation	\$4.19	m <sup>3</sup>
Common Excavation Loaded to Trucks	\$10.88	m <sup>3</sup>
Subgrade preparation:		
Subgrade preparation:	\$1.34	m <sup>2</sup>
Pavement Structure:		
ACP - 75 mm	\$110.90	t
GBC - 200 mm	\$23.84	t
Curb & Gutter	\$270.00	m
Pavement Marking:		
Centre Line Painting	\$1,041.35	km

Summary	Quantity	Unit	Cost
Arterial Roadway	0.91	km	\$1,098,223.53
Collector Roadway	913.00	m	\$856,989.81
Local Roadway			\$865,287.15
Roadway Total			\$2,820,500.50
Contingency (15%)			\$423,075.07
Total (Roadway & Contingency)			\$3,243,575.57
Engineering Cost (15%, including Contingency)			\$486,536.34
Total (Roadway & Contingency & Engg. Cost)			\$3,730,111.91
GST			\$186,505.60
TOTAL			\$3,916,617.51

Assumption:  
For ASP: 1 m<sup>3</sup> = 2.4 tonne  
For GBC: 1 m<sup>3</sup> = 2.33 tonne

**ARTERIAL**

**400 S Access to Development #10 & #11**

**Length of New Roadway**

Excavation:	Quantity	Unit	Cost
Common Excavation	3,790.80	m <sup>3</sup>	\$15,883.45
Waste Excavation	842.40	m <sup>3</sup>	\$9,165.31
Subgrade preparation:			
Subgrade preparation:	14,042.81	m <sup>2</sup>	\$18,817.36
Pavement Structure:			
ACP - 75 mm	2,422.46	t	\$268,650.99
GBC - 200 mm	6,404.70	t	\$152,688.03
Curb & Gutter	2,340.00	m	\$631,800.00
Pavement Marking:			
Centre Line Painting	1.17	km	\$1,218.38
TOTAL			\$1,098,223.53

TOTAL ARTERIAL ROADWAYS

\$1,098,223.53

**COLLECTOR**

**Collector within Development #10**

**Length of New Roadway**

Excavation:	Quantity	Unit	Cost
Common Excavation	2,958.12	m <sup>3</sup>	\$12,394.52
Waste Excavation	657.36	m <sup>3</sup>	\$7,152.08
Subgrade preparation:			
Subgrade preparation:	10,958.19	m <sup>2</sup>	\$14,683.98
Pavement Structure:			
ACP - 75 mm	1,890.35	t	\$209,639.62
GBC - 200 mm	4,997.86	t	\$119,148.87
Curb & Gutter	1,826.00	m	\$493,020.00
Pavement Marking:			
Centre Line Painting	0.91	km	\$950.75
TOTAL			\$856,989.81

TOTAL COLLECTOR ROADWAYS

\$856,989.81

**LOCAL**

**Local Road in Development #9**

**Length of New Roadway**

Excavation:	Quantity	Unit	Cost
Common Excavation	1,589.89	m <sup>3</sup>	\$6,661.63
Waste Excavation	308.17	m <sup>3</sup>	\$3,352.89
Subgrade preparation:			
Subgrade preparation:	6,489.73	m <sup>2</sup>	\$8,696.24
Pavement Structure:			
ACP - 75 mm	1,106.62	t	\$122,724.59
GBC - 200 mm	2,990.38	t	\$71,290.68
Curb & Gutter	1,366.00	m	\$368,820.00
Pavement Marking:			
Centre Line Painting	0.68	km	\$711.24
TOTAL			\$582,257.27

**Access to Golf Course**

**Length of New Roadway**

Excavation:	Quantity	Unit	Cost
Common Excavation	772.83	m <sup>3</sup>	\$3,238.16
Waste Excavation	149.80	m <sup>3</sup>	\$1,629.81
Subgrade preparation:			
Subgrade preparation:	3,154.60	m <sup>2</sup>	\$4,227.16
Pavement Structure:			
ACP - 75 mm	537.92	t	\$59,655.29
GBC - 200 mm	1,453.60	t	\$34,653.74
Curb & Gutter	664.00	m	\$179,280.00
Pavement Marking:			
Centre Line Painting	0.33	km	\$345.73
TOTAL			\$283,029.89

TOTAL LOCAL ROADWAYS

\$865,287.15