Kalispell Courthouse Couplet

Preliminary Traffic Engineering Report

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1.0. INTRODUCTION

The Kalispell Courthouse Couplet is located on US Highway 93 (US 93) in downtown Kalispell. The couplet consist of one northbound lane to the east and one southbound lane to the west of the historic Flathead County Courthouse. A project to reconstruct the couplet was nominated by the Montana Department of Transportation (MDT).

The *U.S. Highway 93 Somers to Whitefish West Final EIS/Section 4(f) Evaluation*[1] completed in 1994 identified the preferred alternative of two northbound through lanes and two southbound through lanes. However, due to the presence of historically significant properties, perceived right-of-way impacts, and lack of funding, limited pre-design activity has occurred since 1994.

Prior to development of the reconstruction project for the Kalispell Courthouse Couplet, preliminary traffic engineering and coordination services were conducted. The intent of this preliminary phase is to determine the preferred roadway configuration, identify traffic operational and safety issues, and collaborate with the local governments and the public. This preliminary phase will establish existing and projected conditions and identify the needs of the corridor.

Development of this *Traffic Engineering Report* is intended to provide a detailed analysis of various alternative design scenarios. Included is a description of the existing conditions including traffic and safety, land use projections, descriptions of multiple alternative configuration scenarios, and an extensive analysis of the alternatives. Field visits and meetings with local governments and the public were held to ensure that any recommendations are consistent with the desires of the surrounding community.

1.1. STUDY AREA

The study area for this traffic report consists of US 93 along the southern end of downtown Kalispell. Limits for the study area are from the intersection with 13th Street East / Airport Road (reference post [RP] 111.5) to the intersection with 6th Street East (RP 112.1). Within the study area US 93 is named Main Street. The land use adjacent to Main Street consists of commercial, medical, government, and park lands. Saint Matthew's School is situated just to the west of Main Street between 7th and 6th Streets. A map of the study area is shown in **Figure 1.1**.

[1] *US Highway 93 – Somers to Whitefish West; Environmental Impact Statement and FINAL Section 4(f) Statement*, Federal Highway Administration, September 1994.

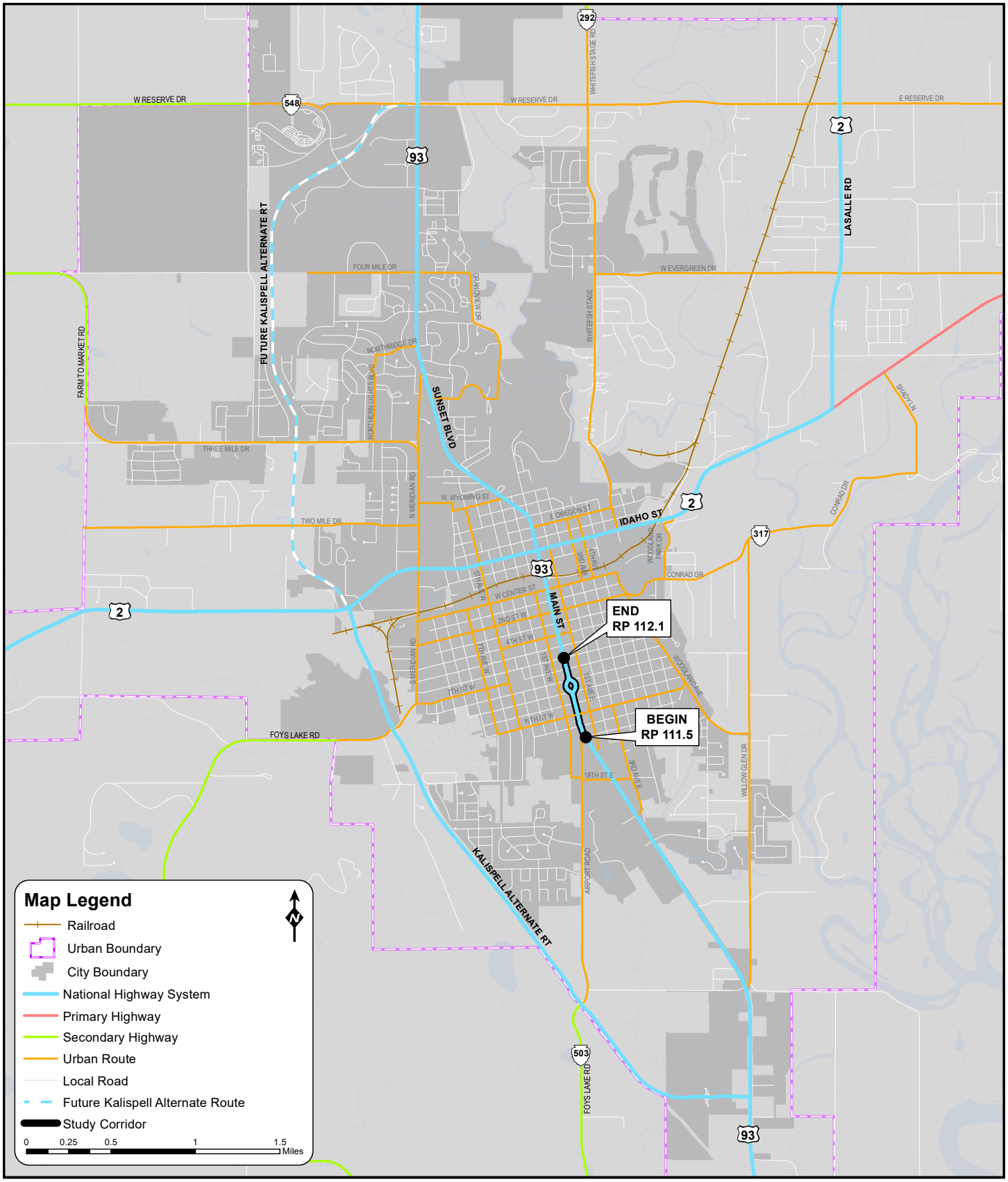

Figure 1.1: Vicinity Map

2.0. EXISTING CONDITIONS

The typical section of Main Street varies through the study area. At the southern end near 13th Street East, Main Street consists of five lanes – two through lanes in each direction and a center left-turn lane. At 12th Street, the northbound right lane transitions into a right-turn only lane. Between 12th Street and 10th Street, the roadway section consists of one travel lane in each direction and left-turn bays. North of 10th Street, the roadway splits around the Flathead County Courthouse with one northbound lane to the east and one southbound lane to the west. North of the couplet, the roadway transitions to a four-lane road with two lanes in each direction.

There are six major intersections along the study corridor. Two of the intersections (11th Street and 6th Street) are signalized. The other four have stop-control along the minor approach legs. Detailed analyses of existing conditions of the study area are presented in the following subsections.

2.1. TRAFFIC VOLUMES

The Montana Department of Transportation (MDT) Data and Statistics Bureau provided Average Annual Daily Traffic (AADT) counts within the vicinity of the study corridor. The counts are typically conducted annually and adjusted to represent average traffic conditions. Historic counts were also available at these locations and were used to determine historic growth trends (see **Section 3** for more detail). The existing AADT at locations near the study corridor are shown in **Table 2.1**. Commercial truck percentages at the count sites are also included in the table.

Table 2.1: Existing (2015) Average Annual Daily Traffic

Site ID	Location		2015 AADT	Commercial Truck %
15-7C-7	Main Street	South of 12th Street	19,090	3.5%
15-7C-8	Main Street	South of 7th Street	16,570	4.0%
15-7C-9	Main Street	North of 4th Street	16,650	4.0%

In order to supplement existing information, a detailed traffic data collection effort was conducted during multiple time periods in 2015. The data collection effort consisted of intersection turning movement counts, field observations, and vehicle classification counts. Turning movement counts were conducted using *Miovision* video collection units during the AM, noon, and PM peak hours in the months of April and August. The data was used to establish existing baseline conditions for the study corridor. Vehicle classification data was also collected with the turning movements. On average, the counts conducted in April showed that commercial trucks accounted for 4.3 percent of all intersection traffic within the study area. In August, commercial trucks accounted for 4.2 percent of intersection traffic.

Figure 2.2 at the end of this section shows the 2015 baseline traffic conditions for the study corridor and major intersections. More detailed data is provide in **Appendix B**.

2.2. TRAFFIC OPERATIONS

Turning movement count data was collected during the peak hours in both April and August of 2015. The data collected in April is representative of a typical traffic school day, with little influence from tourist and recreational traffic. The count in August is intended to represent a peak summer day during the height of the tourism season. A comparison of the total traffic volume through each of the six major intersections is presented in **Figure 2.1**.

As shown in the figure, traffic was higher in April than in August during the AM peak hour. Average intersection volumes are shown to be approximately nine percent lower in August than in April during

the AM peak hour. This is likely the result of school-related traffic along the corridor. During the noon and PM peak hours, however, traffic is higher during peak the peak tourist season. The noon peak hour experienced an average increase in traffic of over 16 percent in August while the PM peak hour traffic increased by just under 5 percent in August.

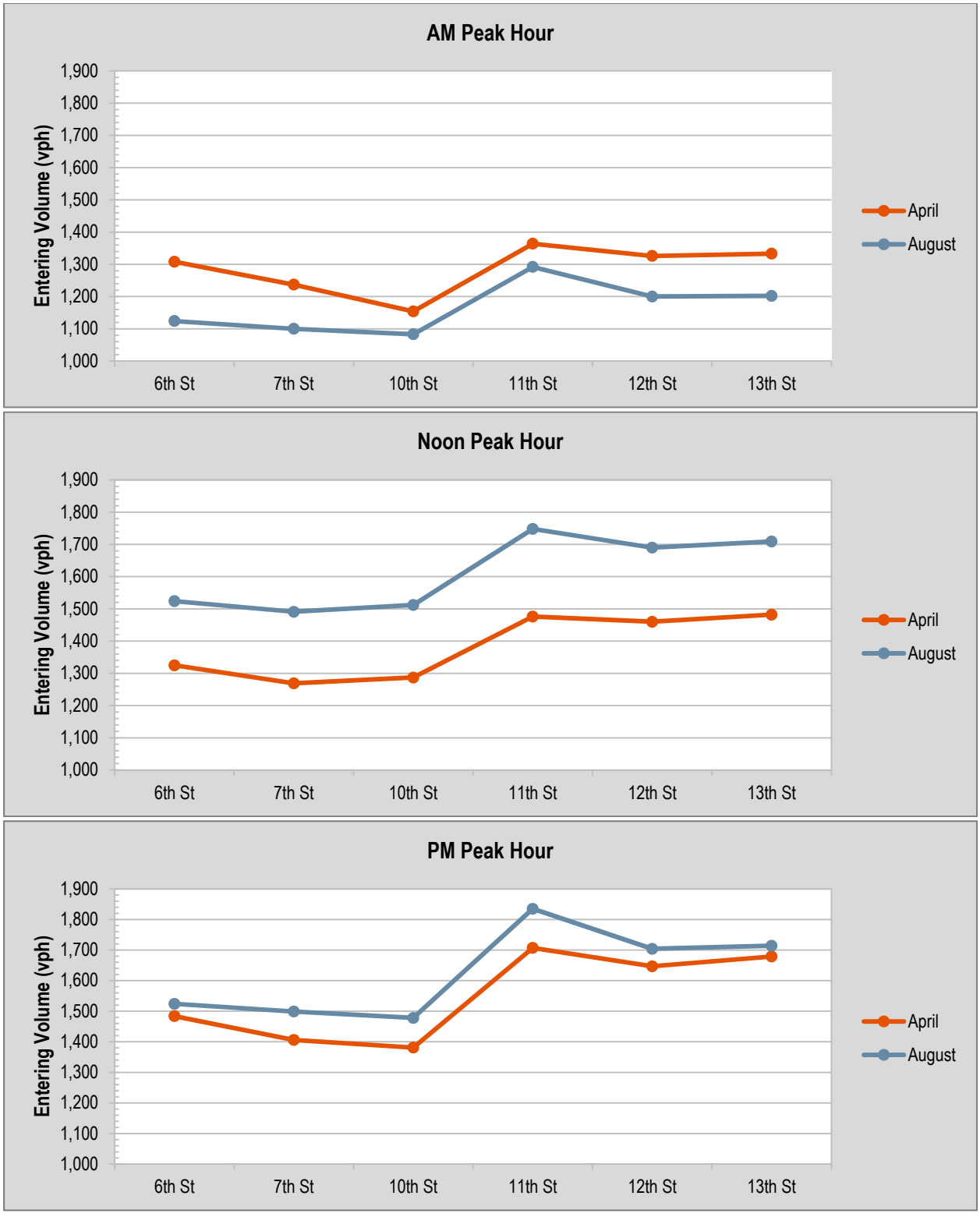

Figure 2.1: Seasonal Intersection Traffic Volume Comparison

2.2.1. Intersection Operational Analysis

A level of service (LOS) analysis of existing data was performed for all six major intersections along the study corridor. The LOS analysis was performed using *PTV Vistro 4* software. For the operational analysis, the worst case scenario traffic volumes were used as a conservative estimate. As such, April intersection volumes were used to represent the AM peak hour while volumes collected in August were used for the noon and PM peak hours. The results of the existing conditions intersection operational analysis are shown **Table 2.2** and summarized in **Figure 2.2**.

The operational conditions of the intersections are characterized by the Level of Service (LOS). The LOS is based on an alphabetic scale which represents the full range of operating conditions. This scale is defined based on the vehicle delay experienced at the intersection. The scale ranges from “A” which indicates little, if any, vehicle delay, to “F” which indicates significant vehicle delay and traffic congestion.

The intersection LOS for a signalized intersection is based on the average delay for all vehicles traveling through the intersection. The intersection LOS for a two-way stop controlled intersection is based on the delay for the worst performing movement, often times a movement from the minor approach. More detailed information is contained in **Appendix C**.

The intersection operational analysis shows that the signalized intersections operate at a LOS C or better during the peak hours. All stop controlled intersections along the corridor operate at a poor LOS during the peak hours. The poor operations is a result of high amounts of vehicle delay due to the inability of traffic from the minor approach legs to make left-turn and/or through movements. Traffic congestion along Main Street leaves minimal available gaps for movements from minor approaches.

Table 2.2: Existing (2015) Intersection Operational Analysis

Intersection	AM Peak Hour (i)		Noon Peak Hour (ii)		PM Peak Hour (ii)	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
6th Street (Signal)	**19.1**	**B**	**18.3**	**B**	**18.0**	**B**
Northbound	*19.7*	*B*	*18.2*	*B*	*16.0*	*B*
Southbound	*19.2*	*B*	*18.5*	*B*	*19.4*	*B*
Eastbound	*17.2*	*B*	*17.4*	*B*	*17.4*	*B*
Westbound	*16.1*	*B*	*16.0*	*B*	*16.5*	*B*
7th Street (Stop)	**36.5**	**E**	**42.0**	**E**	**40.5**	**E**
Northbound	*9.1*	*A*	*9.4*	*A*	*9.8*	*A*
Southbound	*8.9*	*A*	*10.6*	*B*	*8.8*	*A*
Eastbound	*36.5*	*E*	*42.0*	*E*	*40.5*	*E*
10th Street (Stop)	**38.3**	**E**	**56.9**	**F**	**46.3**	**E**
Northbound	*8.6*	*A*	*9.2*	*A*	*9.4*	*A*
Southbound	*9.2*	*A*	*9.2*	*A*	*8.9*	*A*
Eastbound	*38.3*	*E*	*56.9*	*F*	*15.6*	*E*
Westbound	*37.4*	*E*	*48.9*	*E*	*46.3*	*E*
11th Street (Signal)	**19.1**	**B**	**17.8**	**B**	**21.1**	**C**
Northbound	*19.6*	*B*	*15.1*	*B*	*14.4*	*B*
Southbound	*12.2*	*B*	*13.2*	*B*	*21.5*	*C*
Eastbound	*27.2*	*C*	*32.8*	*C*	*30.6*	*C*
Westbound	*26.0*	*C*	*34.2*	*C*	*32.0*	*C*
12th Street (Stop)	**73.4**	**F**	**73.8**	**F**	**78.0**	**F**
Northbound	*9.2*	*A*	*10.0*	*A*	*10.6*	*B*
Southbound	*9.5*	*A*	*9.4*	*A*	*8.8*	*A*
Eastbound	*62.9*	*F*	*66.6*	*F*	*65.3*	*F*
Westbound	*73.4*	*F*	*73.8*	*F*	*78.0*	*F*
13th Street (Stop)	**35.9**	**E**	**46.7**	**E**	**42.0**	**E**
Northbound	*8.5*	*A*	*9.3*	*A*	*9.6*	*A*
Southbound	*9.9*	*A*	*9.8*	*A*	*9.0*	*A*
Eastbound	*35.9*	*E*	*45.0*	*E*	*42.0*	*E*
Westbound	*35.6*	*E*	*46.7*	*E*	*39.6*	*E*

(i) Data collected in April 2015
(ii) Data collected in August 2016

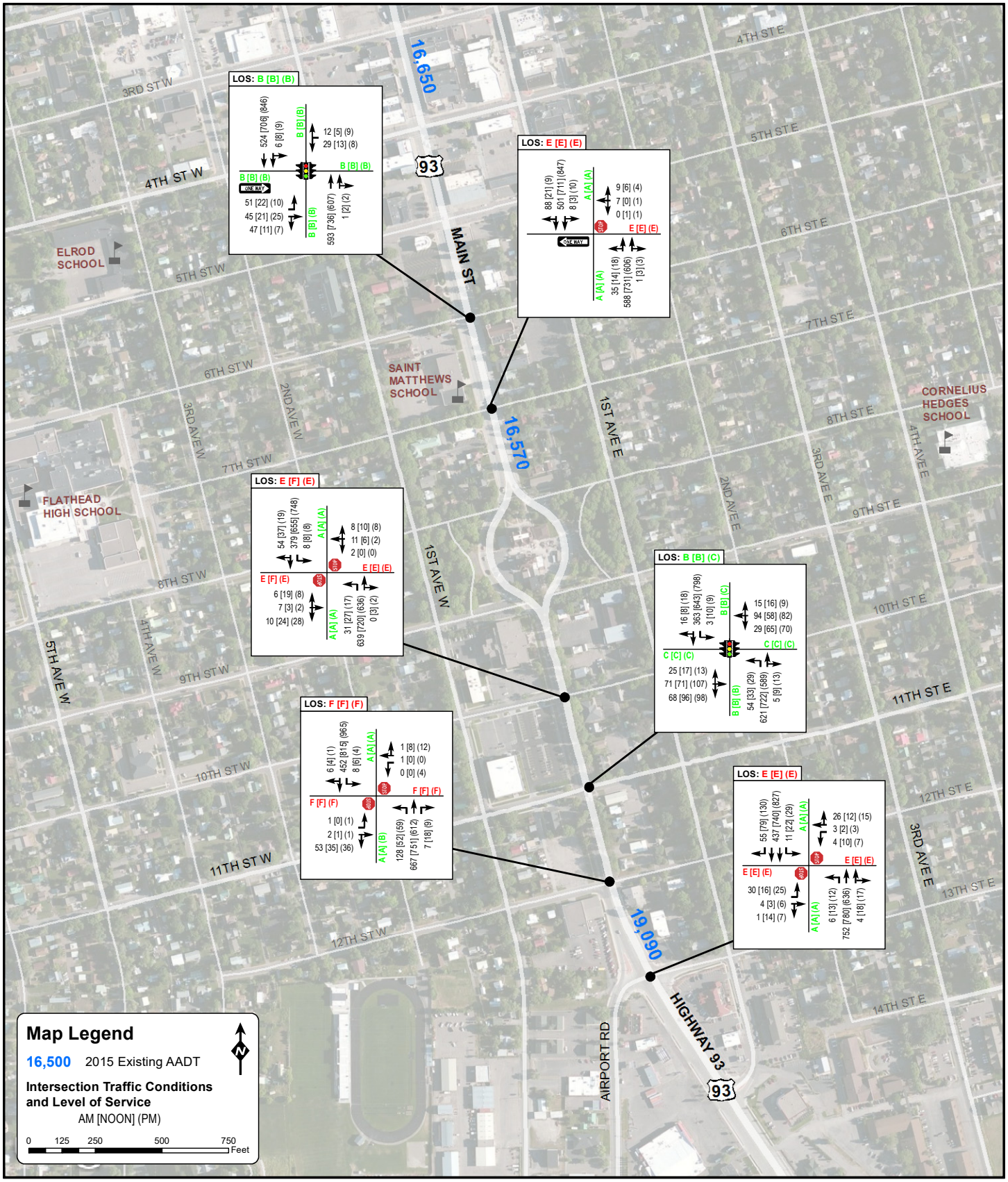

Figure 2.2: Existing (2015) Traffic Conditions

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3.0. PROJECTED CONDITIONS

The study corridor area has historically experienced variations in traffic volumes due to a number of factors. Area growth and increases in tourism traffic have generally increased traffic on the surrounding area. In fall of 2010, the southern portion of the US 93 Alternate Route (Bypass) was opened to traffic. The opening of the partial Bypass resulted in shifts in travel patterns throughout the area. The remaining portion of the Bypass is currently under construction. Once finished, additional changes in travel patterns are expected to occur.

3.1. PROJECTED TRAFFIC GROWTH

Historic and projected conditions were evaluated to help identify an appropriate growth rate for the study area. The selection of an appropriate growth rate is important for forecasting future traffic conditions and to help identify corridor needs. This section presents two methodologies for determining projected traffic conditions. The first approach utilizes available historic traffic data to evaluate how traffic has changed in the past. The second approach uses a travel demand model to project how changes to area land use and the construction of the full Bypass might affect traffic conditions in the future. The following sections discuss these methodologies in more detail.

3.1.1. Historic Traffic and Growth Rates

Historic AADT traffic counts for the three locations near the study corridor were provided by MDT. The historic counts were plotted in **Figure 3.1**. These counts provide a look at traffic conditions over the past 20 years. The historic traffic counts were used to help evaluate how traffic has changed in the area. Of note is the change in conditions after the partial Bypass opened in the fall of 2010.

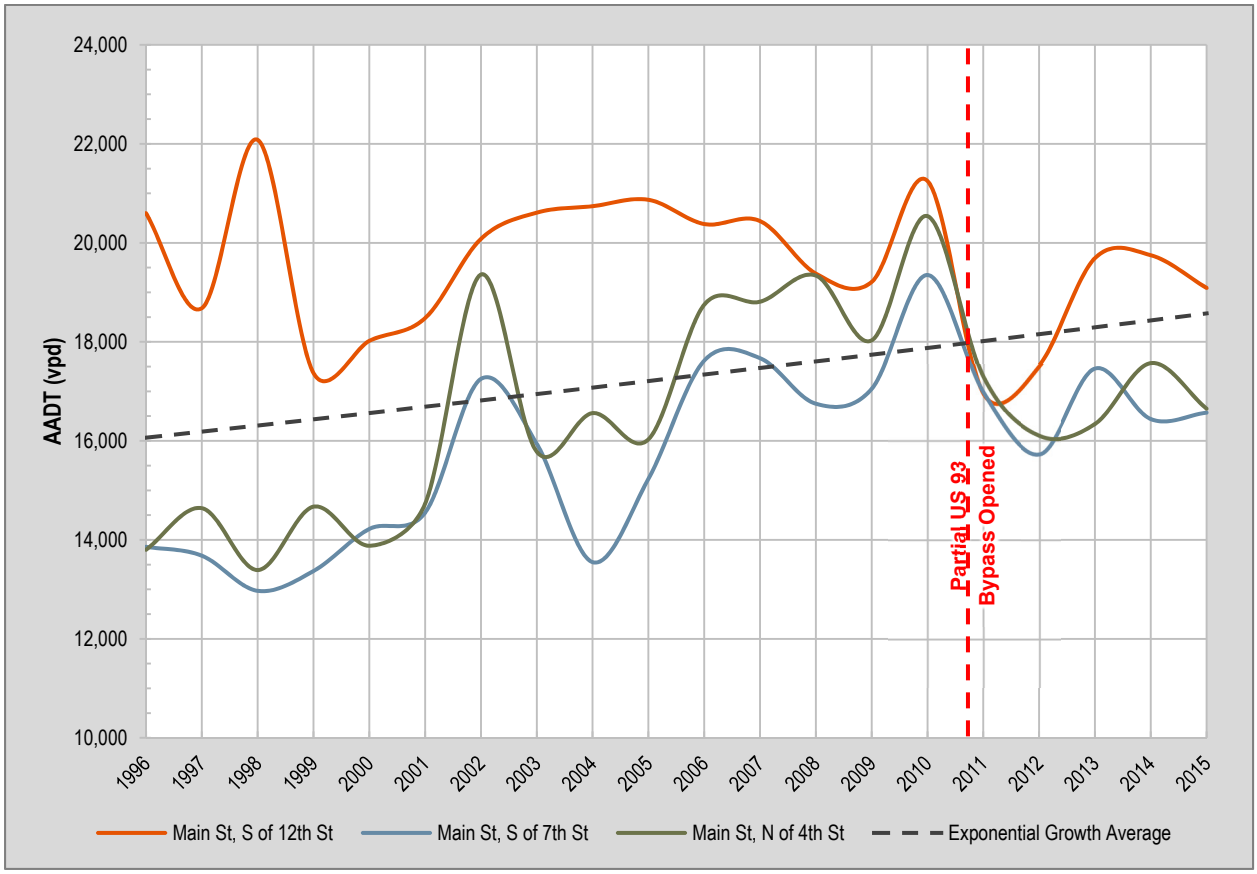

Figure 3.1: Historic AADT Counts

Historic growth rates for the study were used to help project future traffic conditions. Past growth is typically used as an indicator for future growth. Traffic volumes can vary greatly over short periods of time. As such, an analysis of multiple years of historic data is needed to more accurately project future conditions. **Table 3.1** shows the growth rates experienced during various time periods near the study corridor.

Table 3.1: Historic Traffic Average Annual Growth Rates

Time Period	AADT Count Location			Weighted Average
	Main St, S of 12th St	Main St, S of 7th St	Main St, N of 4th St	
Past 20 Years ***(1996 – 2015)***	-0.15%	1.42%	1.31%	**0.81%**
Past 10 Years ***(2006 – 2015)***	-0.76%	-0.74%	-1.74%	**-1.06%**
Prior to Partial Bypass ***(1996 – 2010)***	0.35%	2.36%	2.82%	**1.77%**
After Partial Bypass ***(2011 – 2015)***	3.65%	-0.04%	0.13%	**1.36%**

As shown in the table, traffic has experienced moderate growth over the past 20 years. The effects of the Bypass are shown to reduce the average annual growth over the past 20 years. Volumes in 2011 were on average over 16 percent lower than in 2010. Since the opening of the partial Bypass traffic volumes have increased steadily at an average annual rate of over 1.3 percent. Similarly, prior to construction of the partial Bypass, traffic volumes experienced an average annual growth of 1.8 percent since 1996.

It is expected that once the full Bypass is constructed, there may be an initial reduction in traffic volumes along the study corridor. However, it is likely that after the initial reduction volumes will rebound and continue to grow into the future. **Section 3.1.2** discusses traffic modeling exercises which were used to evaluate the effects that construction of the full Bypass and potential future development may have on the study corridor.

3.1.2. Travel Demand Model

Due to anticipated changed in travel patterns as a result of the full Bypass, a travel demand model was developed to project impacts to traffic along the study corridor. The travel demand model uses the transportation network and land use assignments to determine the number of trips for roadway segments. The model was initially developed and calibrated to existing conditions for the year 2013. To project future conditions, future growth and land use changes were completed using a combination of socioeconomic data, census projections, and economic projections and were vetted through a workshop with staff from MDT, the City of Kalispell, and Flathead County. Future projections were made out to the year 2040. Future traffic volumes were estimated by applying the projected land use changes to the existing conditions model. In addition to land use changes, anticipated changes to the road network were applied. Build-out of the full Bypass was included in the future model.

Two scenarios were modeled to estimate growth on Main Street. The first scenario represents the existing configuration along the study corridor. No changes were made to the transportation system other than construction of the full Bypass. This scenario results in traffic volumes along the study corridor that are at, or exceed, capacity thresholds for the current facility. As a result, future traffic demand in the area is diverted onto alternate routes due to capacity constraints of the existing facility. This rerouting of traffic results in a lower growth rate than future demand might project. This scenario results in an average annual growth rate of 0.4 percent out to the year 2040.

The second scenario modeled for this exercise was based on expanding capacity of the couplet corridor to that of a typical four-lane road. Under this scenario, capacity along this study corridor was increased to remove the existing capacity constraints. As with the first scenario, the full Bypass was also included in the model. This scenario is more likely to predict the true traffic demand for the corridor given that there are no constraints for roadway capacity. This scenario results in an average annual growth rate of just over 1.6 percent. Unlike the first scenario, the corridor has available capacity to meet future demands and does not result in traffic being diverted onto the adjacent road network.

Results of the modeling exercise for the two scenarios are shown in **Table 3.2**. Further discussion on the travel demand model and evaluation of alternative scenarios is included in **Section 5**.

Table 3.2: Travel Demand Model Average Annual Growth Rates

Time Period	AADT Count Location			Weighted Average
	Main St, S of 12th St	Main St, S of 7th St	Main St, N of 4th St	
Existing Configuration ***(Two-lane Configuration)***	0.72%	0.12%	0.31%	**0.40%**
Increased Capacity ***(Four-lane Configuration)***	1.73%	1.82%	1.31%	**1.62%**

3.1.3. Projected Growth Summary

Over the past 20 years, the study corridor has experienced an average annual growth rate of just over 0.8 percent. The historic growth is influenced by the recent construction of the southern portion of the US 93 Bypass. It is expected that volumes will be further influenced by the ongoing construction of the remaining portion of the Bypass. As such, the travel demand model was used as a tool to help predict these effects. The model suggests an average annual growth rate of 0.4 percent under a constrained capacity scenario and a true demand rate of just over 1.6 percent. Factoring in historic growth along with the modeling exercise, it was determined that an average annual growth of 1.0 percent would be appropriate for the study corridor. As such, a 1.0 percent average annual growth rate was applied to existing traffic volumes for the projected operational analysis in the following section.

3.2. Projected Operational Analysis

Intersection turning movement volumes were projected to estimate future year conditions. The growth rate discussed previously was applied to the existing turning movement volumes from **Section 2.2.1**. The analysis assumes that no geometric modifications would be made to the intersections. **Table 3.3** presents the results of the projected intersection operational analysis. The projected intersection turning movements and roadway AADT volumes are shown graphically in **Figure 3.2**. More detailed information is provided in **Appendix D**.

The projected operational analysis shows that the signalized intersections generally operate at a LOS C or better during the peak hours. One exception is the intersection with 11th Street which is projected to operate at a LOS D during the PM peak hour. All stop controlled intersections are projected to have high amounts of vehicle delay along the minor approach legs, resulting in a LOS F during the peak hours. If no improvements are made, projected increases in traffic volume along Main Street and along the minor approaches are shown to further degrade operations compared to existing conditions.

Table 3.3: Projected (2040) Intersection Operational Analysis

Intersection	AM Peak Hour		Noon Peak Hour		PM Peak Hour	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
6th Street (Signal)	**20.9**	**C**	**20.2**	**C**	**19.0**	**B**
Northbound	*21.9*	*C*	*20.0*	*B*	*15.7*	*B*
Southbound	*21.0*	*C*	*20.5*	*C*	*21.4*	*C*
Eastbound	*17.9*	*B*	*19.0*	*B*	*19.6*	*B*
Westbound	*17.0*	*B*	*17.6*	*B*	*18.5*	*B*
7th Street (Stop)	**58.4**	**F**	**79.2**	**F**	**87.3**	**F**
Northbound	*9.7*	*A*	*10.4*	*B*	*11.3*	*B*
Southbound	*9.5*	*A*	*12.0*	*B*	*9.6*	*A*
Eastbound	*58.4*	*F*	*79.2*	*F*	*87.3*	*F*
10th Street (Stop)	**62.0**	**F**	**265.6**	**F**	**123.0**	**F**
Northbound	*8.9*	*A*	*10.3*	*B*	*10.7*	*B*
Southbound	*9.7*	*A*	*10.3*	*B*	*9.7*	*A*
Eastbound	*62.0*	*F*	*265.6*	*F*	*123.0*	*F*
Westbound	*58.6*	*F*	*124.0*	*F*	*112.9*	*F*
11th Street (Signal)	**22.1**	**C**	**30.7**	**C**	**46.2**	**D**
Northbound	*23.9*	*C*	*33.4*	*C*	*21.6*	*C*
Southbound	*11.7*	*B*	*22.7*	*C*	*57.3*	*E*
Eastbound	*32.1*	*C*	*37.0*	*D*	*46.4*	*D*
Westbound	*30.4*	*C*	*45.6*	*D*	*85.3*	*F*
12th Street (Stop)	**117.0**	**F**	**214.6**	**F**	**347.1**	**F**
Northbound	*9.6*	*A*	*11.7*	*B*	*13.2*	*B*
Southbound	*10.0*	*A*	*10.5*	*B*	*9.6*	*A*
Eastbound	*94.7*	*F*	*173.1*	*F*	*193.9*	*F*
Westbound	*117.0*	*F*	*214.6*	*F*	*347.1*	*F*
13th Street (Stop)	**47.5**	**E**	**134.9**	**F**	**170.6**	**F**
Northbound	*8.7*	*A*	*10.4*	*B*	*11.0*	*B*
Southbound	*10.5*	*B*	*11.2*	*B*	*10.0*	*B*
Eastbound	*47.5*	*E*	*108.3*	*F*	*170.6*	*F*
Westbound	*46.6*	*E*	*134.9*	*F*	*88.9*	*F*

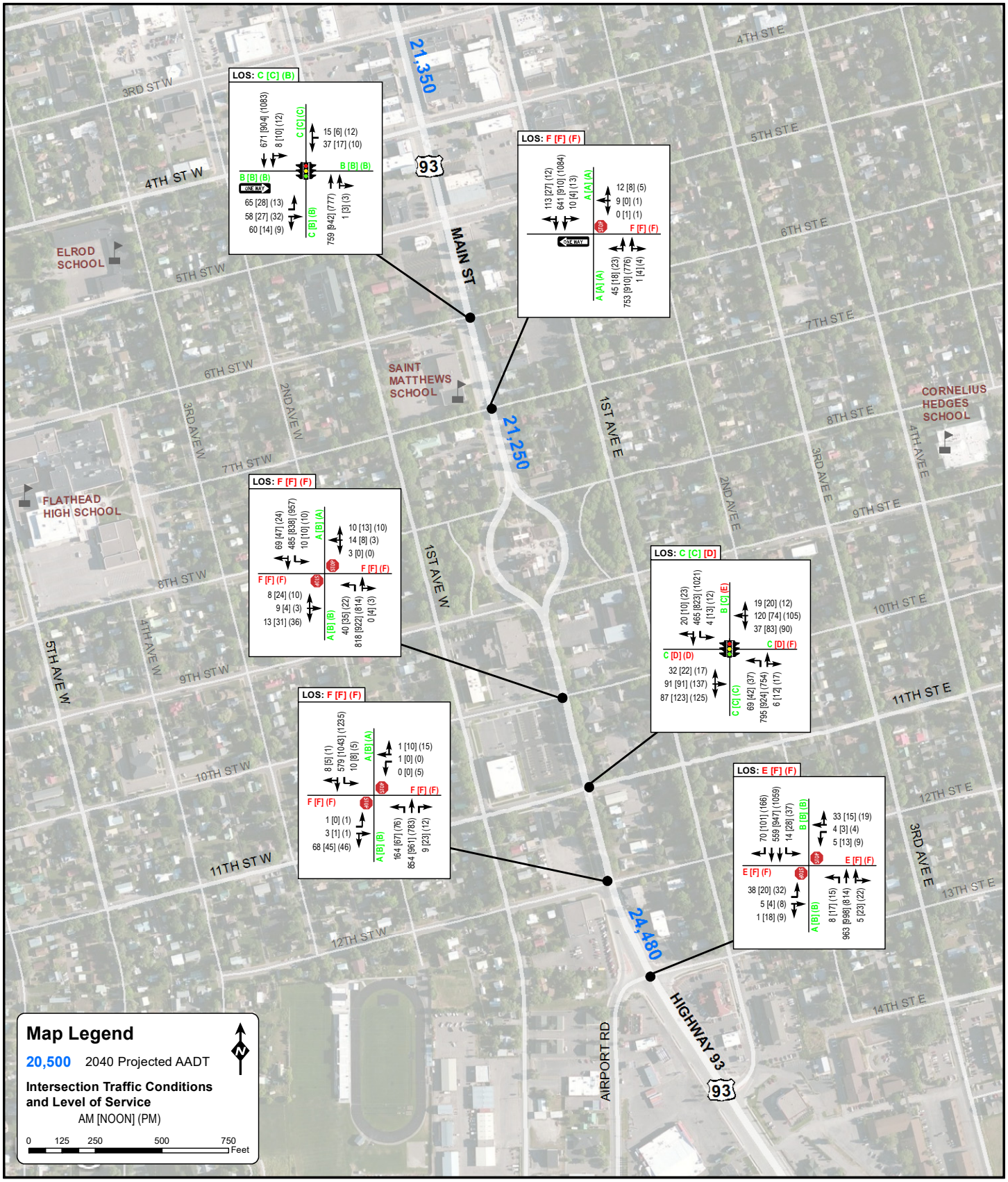

Figure 3.2: Projected (2040) Traffic Conditions

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4.0. SAFETY

Crash data was obtained from MDT for the five-year period from January 1st, 2010 to December 31st, 2014. The provided crash data included crash type, frequency, location, and severity of each crash. The crash reports are a summation of information from the scene of the crash provided by the responding officers. As such, some of the information contained in the crash reports may be subjective.

Over the five-year analysis period, there were a total of 83 crashes reported within the study area. This section provides an analysis of the reported crashes to identify any trends or clusters.

4.1. CRASH PERIOD

Crash data for the study corridor was evaluated based on the time of day the crash occurred. As presented in **Figure 4.1**, crashes appear to be distributed throughout the day with a peaks at 12:00 PM (11 crashes) and at 3:00 PM (12 crashes). Approximately 45 percent of crashes occurred between 12:00 PM and 4:00 PM.

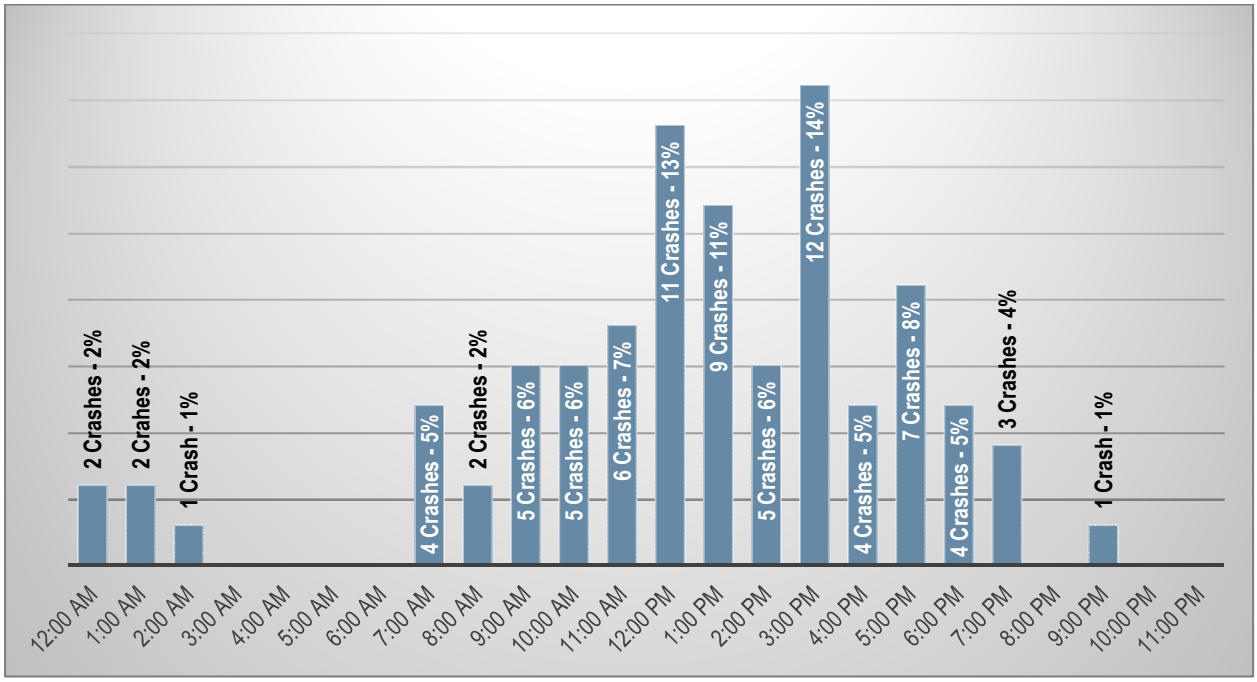

Figure 4.1: Crashes by Time of Day

Figure 4.2 shows the number of crashes based on the day of the week and month of year in which the crash occurred. Crashes during the work week account for 87 percent of crashes, with Tuesday and Friday having the most daily crashes (17 crashes each). Both Saturday and Sunday experienced fewer crashes than any workday.

With respect to the month of the year in which a crash occurred, July and September each accounted for 14 percent of crashes. Almost 50 percent of all crashes occurred during the summer months (June through September).

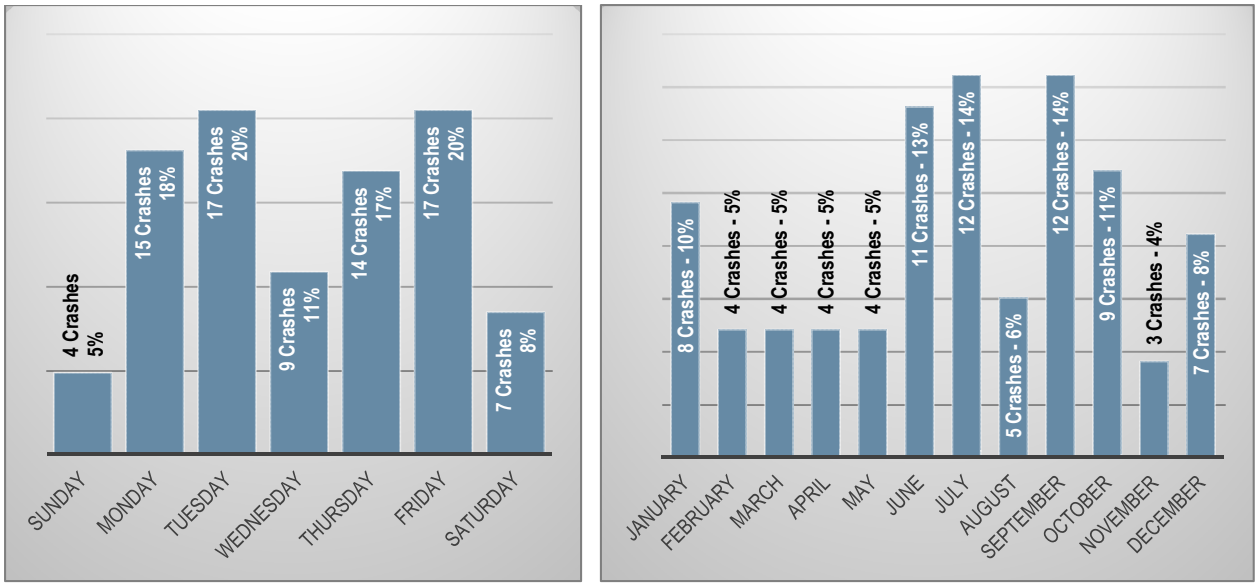

Figure 4.2: Crashes by Day of the Week and Month of the Year

4.2. Environmental Factors

Crash data was reviewed to identify any trends that may exist related to environmental factors such as weather, roadway surface condition, and light condition. Approximately 84 percent of crashes occurred during daylight conditions. Furthermore, 63 percent of crashes occurred during clear weather conditions while 75 percent occurred on dry roadways. **Table 4.1** shows the relationship between the weather condition, road surface condition, and lighting condition. There were no noted trends related to poor environmental conditions.

Table 4.1: Environmental Conditions

Weather Condition / Road Surface Condition	Daylight	Dark Lighted	Dark Not Lighted	Dusk/Dawn	Total
Clear	**43**	**5**	**1**	**3**	**52**
Dry	38	3	1	3	45
Ice/Frost	3				3
Mud/Dirt/Gravel		1			1
Snow		1			1
Wet	2				2
Cloudy	**24**	**2**			**26**
Dry	16				16
Ice/Frost	1	1			2
Snow	4				4
Wet	3	1			4
Rain	**2**				**2**
Wet	2				2
Severe Crosswinds	**1**				**1**
Dry	1				1
Snow		**1**			**1**
Snow		1			1
Total	**70**	**9**	**1**	**3**	**83**

4.3. Crash Type

Of the 83 reported crashes, 74 crashes (89 percent) involved multiple vehicles. The remaining nine crashes (11 percent) involved only a single vehicle. With respect to single vehicle crashes, the most common crash type was fixed object crashes with four reported crashes. For crashes involving multiple vehicles, the most common crash type was rear-end with 55 reported crashes. Rear end crashes accounted for two-thirds of all reported crashes. **Figure 4.3** presents the distribution of single and multiple vehicle crashes by type.

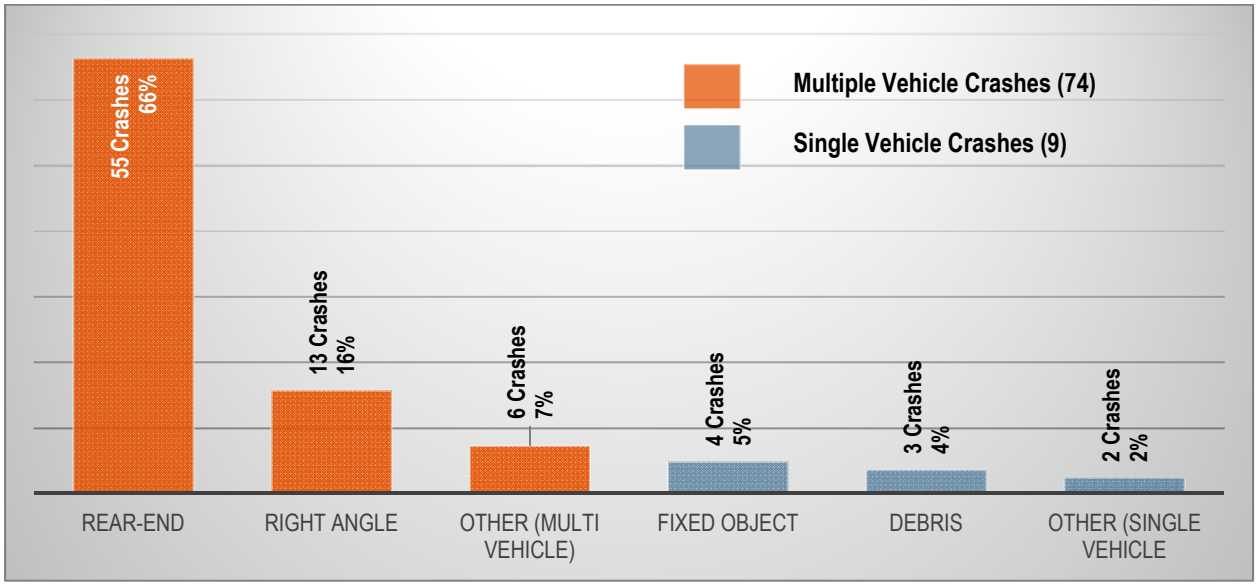

Figure 4.3: Crash Type

4.4. Crash Severity

Crash severity is reported based on the worst injury that occurred during the crash. For example, if there are three individuals involved in a crash and two are uninjured and the third has a non-incapacitating evident injury, the crash would be reported as a non-incapacitating injury crash. Crash severity can be defined as non-injury, property damage only (PDO); possible injury; non-incapacitating injury, incapacitating injury; or fatal injury. An incapacitating injury is defined as an injury, other than a fatality, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before injury. During the analysis period, there were no reported fatal injury crashes and two incapacitating injury crashes. The remaining 81 crashes (98 percent) were either non-incapacitating injury, possible injury, or PDO crashes. **Figure 4.4** presents the percentage and number of crashes based on crash severity.

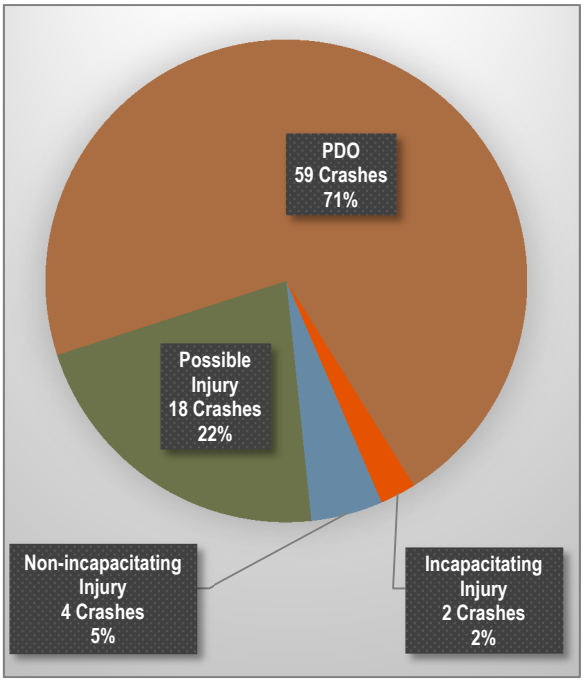

Figure 4.4: Crash Severity

4.5. Crashes within the Couplet

A total of 25 crashes were reported to have occurred within the Courthouse Couplet. Of those crashes, 16 occurred on the southbound side and 9 occurred on the northbound side. All of the crashes within the couplet were reported to be either PDO or possible injury crashes. **Table 4.2** tabulates the crash type by severity for the two sides of the couplet.

Table 4.2: Crash Direction, Type, and Severity through the Couplet

Crash Type	Crash Severity		
	PDO	Possible Injury Crash	Total
Southbound	**14**	**2**	**16**
Rear-end	7	1	8
Fixed Object	3	0	3
Sideswipe, SD (i)	2	0	2
Not Fixed Object or Debris	2	0	2
Right Angle	0	1	1
Northbound	**5**	**4**	**9**
Rear-end	5	3	8
Roll Over	0	1	1
Total	**19**	**6**	**25**

(i) SD – Same Direction

4.6. Driver Demographics

Information on driver's age and gender were provided as part of the crash data. A total of 159 drivers were involved in crashes during the analysis period. Of those drivers, 89 were reported as male and 70 female. Driver's age information showed that approximately 18 percent of drivers were between the ages of 15 and 20. **Figure 4.5** presents a graph depicting the age and gender of drivers involved in crashes during the analysis period.

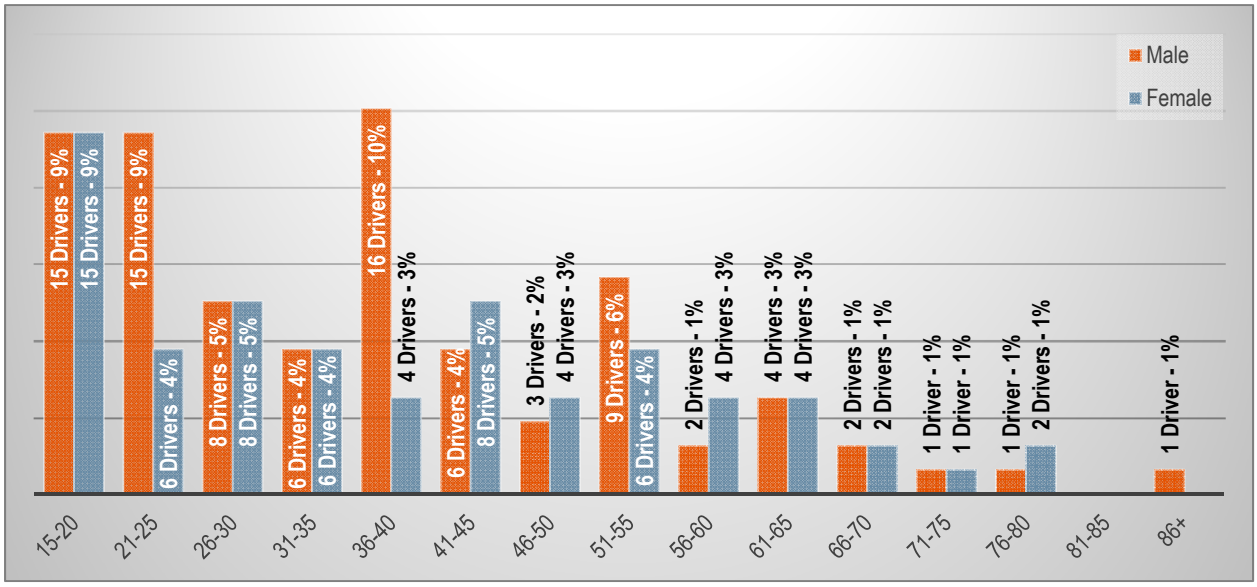

Figure 4.5: Driver's Age and Gender

4.7. Crash Density

Using the location data reported for each crash, the number of crashes per 100 feet was determine and plotted. As shown in **Figure 4.6** there are generally concentrations of crashes at the major intersections. The intersections with 10th Street and with 11th Street saw the highest concentrations of crashes.

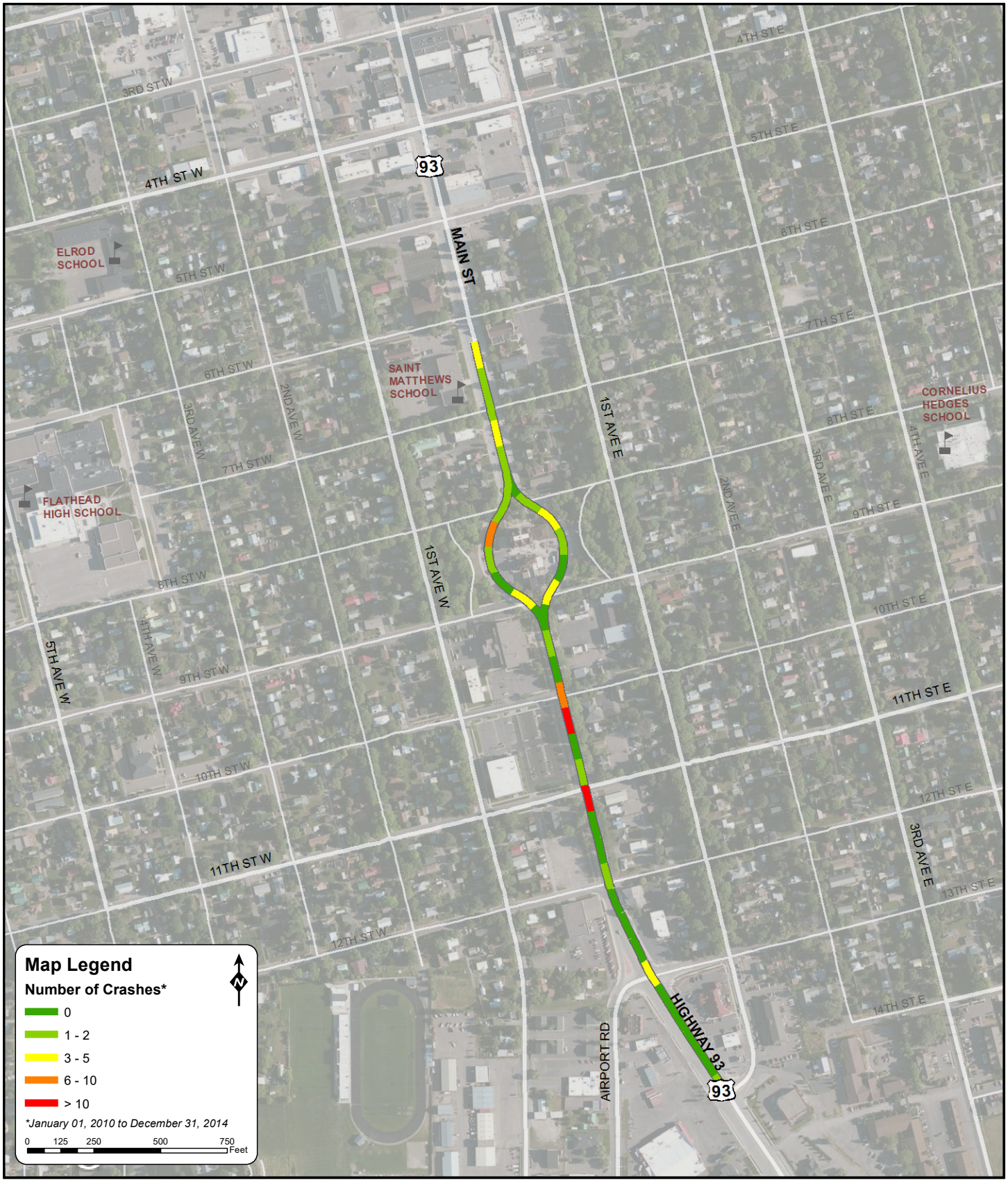

Figure 4.6: Crash Density

4.8. Safety Data Trend Analysis

Over the five-year crash review period there were a total of 83 crashes reported within the study area. A review of the reported crashes identified the following trends:

1. No fatal crashes and two incapacitating injury crashes were reported.
2. Approximately 87 percent of crashes occurred during the work week.
3. Almost 50 percent of all crashes occurred between June and September.
4. There were no noted trends related to poor weather or roadway conditions.
5. Over 89 percent of crashes involved multiple vehicles.
6. Two-thirds of crashes were rear-end crashes.

The crash characteristics along the study corridor are generally reflective of an urban area with high traffic density. The high percentage of multiple vehicle crashes and rear ends is common for urban environments.

5.0. ALTERNATIVE SCENARIOS

A list of transportation system improvements and strategies was developed to address identified transportation concerns within the study area. The goal of the improvement options is to improve safety and operations by providing the appropriate lane configurations, traffic control and geometrics to address existing and projected traffic conditions. Three steps were applied to develop the preliminary improvement options:

1. Identify roadway operational issues and areas of concern based on field review, engineering crash data analysis, consultation with local staff and elected officials, and information provided by the public.
2. Identify the needs of the corridor.
3. Analyze the information gathered to develop a range of improvement options that address the roadway operational issues and areas of concern.

5.1. IMPROVEMENT OPTIONS CONSIDERED

A list of improvement options was developed for the study corridor. The traffic conditions for each alternative were modeled using the travel demand model. Each alternative was modeled using full build-out of the Bypass. Future land use projections were input into the model to reflect anticipated year 2040 conditions. Note that the travel demand model is intended to be used as a tool to model a large-scale transportation network. As such, the model does not evaluate such elements as traffic control or detailed geometric layouts. Rather, the model utilizes roadway capacity and travel times to distribute vehicle traffic onto the transportation network.

Summary tables of traffic projections for select roadway segments are included with each alternative. The tables show the existing AADT, the projected AADT based on a 1.0% average annual growth rate, and the projected AADT from the travel demand model for each alternative. The projected AADT from the travel demand model was calculated by applying growth rates calculated between the existing year (2013) and future year (2040) models to known AADT counts.

In addition to the traffic operations analysis, a list of identified advantages and disadvantages, as well as potential barriers and constraints to project development were developed for each improvement option. A conclusion was then made whether to advance or not advance for further consideration based on the preliminary evaluation. Note that implementation of improvement options ultimately depends on available funding, ability to acquire needed right-of-way, addressing environmental considerations, and other project delivery elements. These improvement options are considered conceptual in nature and will require further evaluation during the project development process.

Alternative 1: Baseline

Description:

The study corridor currently consists of a two-lane road between 12th Street and 7th Street. South of 12th Street, the roadway has two lanes in each direction and a center two-way left-turn lane (TWLTL) or left-turn bays at major intersections. North of the couplet, the road transitions to a four-lane facility (two lanes in each direction) with restricted left-turns at intersections.

Alternative 1 represents the "no action" scenario and was used to establish baseline traffic conditions. This option includes no changes to the transportation network, other than completion of the full Bypass. **Figure 5.1** shows the current configuration of the corridor.

Figure 5.1: Alternative 1 Configuration

Traffic Operations:

Existing traffic volumes along the study corridor are at, or near, capacity for a two-lane facility. As a result, projected volumes along Main Street are shown to only increase slightly due to capacity constraints of the roadway. Additional traffic expected to be generated in the future is shown to shift onto the adjacent road network due to a lack of available capacity on the two-lane segment. In particular, 1st Avenue East, 1st Avenue West, 5th Avenue West, Center Street, and Willow Glen Drive are shown to increase at rates higher than standard growth projections might indicate.

The impact of the full Bypass can also be seen by the increases in traffic along the southern portion of the Bypass. As a whole, the Bypass is shown to accommodate between 12,000 vpd on the southern

end to over 17,000 vpd on the northern end. While the Bypass is shown to accommodate large increases in traffic, volumes in the downtown area are still expected to grow as a result of anticipated future development and demands. This suggests that the Bypass serves a different trip type than seen on Main Street through downtown. The Bypass is accommodating regional trip traffic (those wishing to travel from the southern end of Kalispell to the northern end), while Main Street downtown is serving local traffic (those with a destination in the downtown area). **Table 5.1** shows the existing and projected traffic volumes for select roadway segments.

Table 5.1: Alternative 1 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	23,900
Main Street	South of 7th Street	16,570	21,250	18,010
Main Street	North of 4th Street	16,650	21,350	17,500
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,250
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,590
US 93 Alternate	South of Reserve Drive	-	-	17,340(ii)
1st Avenue East	South of 8th Street	3,430	4,400	5,080
1st Avenue West	North of 9th Street	4,440	5,690	5,170
5th Avenue West	North of 4th Street	4,700	6,030	5,630
Center Street	West of 2nd Avenue East	5,630	7,220	11,320
Woodland Avenue	South of 4th Street	4,270	5,480	5,600
Willow Glen Drive	North of US 93	4,480	5,750	8,500
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	8,680
US 93	South of Conway Drive	26,780	34,340	34,730
US 2	East of Flathead Drive	25,530	32,740	34,300
US 2	West of Meridian Road	18,520	23,750	19,090

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- No reconstruction required.

Disadvantages:

- Does not address identified traffic operational issues.
- Does not address existing crash trends and safety concerns.
- Traffic along the corridor is shown to exceed available capacity.

Potential Barriers/Constraints:

- Not applicable

Conclusion:

- **NOT ADVANCED** – Used to establish baseline conditions. Does not address identified transportation concerns.

Alternative 2: Two Travel Lanes with TWLTL/Left-turn Lanes

Description:

Alternative 2 consists of establishing a uniform roadway configuration on Main Street through downtown Kalispell. The configuration includes one travel lane in each direction and center TWLTL or left-turn lanes at major intersections. The alternative extends between 13th Street and Center Street. **Figure 5.2** shows the conceptual configuration.

Figure 5.2: Alternative 2 Configuration

Traffic Operations:

As with Alternative 1, traffic volumes are shown to only increase slightly through the couplet. Existing and projected volumes are at, or above, roadway capacity for the facility. As a result, notable increases in traffic are projected to occur on the nearby road network. Roadways such as 5th Avenue West, 1st Avenue West, 1st Avenue East, Center Street, and Woodland Avenue are projected to experience the majority of the overflow traffic. **Table 5.2** shows the traffic projections for Alternative 2.

Table 5.2: Alternative 2 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	24,980
Main Street	South of 7th Street	16,570	21,250	18,410
Main Street	North of 4th Street	16,650	21,350	16,070
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,300
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,570
US 93 Alternate	South of Reserve Drive	-	-	17,570(ii)
1st Avenue East	South of 8th Street	3,430	4,400	4,710
1st Avenue West	North of 9th Street	4,440	5,690	4,820
5th Avenue West	North of 4th Street	4,700	6,030	5,750
Center Street	West of 2nd Avenue East	5,630	7,220	11,420
Woodland Avenue	South of 4th Street	4,270	5,480	6,000
Willow Glen Drive	North of US 93	4,480	5,750	9,110
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,050
US 93	South of Conway Drive	26,780	34,340	34,730
US 2	East of Flathead Drive	25,530	32,740	34,240
US 2	West of Meridian Road	18,520	23,750	19,020

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Uniform typical section through downtown Kalispell.
- Additional room available for parking and non-motorized accommodations.
- Minimal impacts to adjacent properties.
- Supported by downtown Kalispell.

Disadvantages:

- Does not address identified traffic operational issues.
- Does not provide adequate capacity for projected conditions.
- Results in increased traffic volumes along adjacent local and urban roadways.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Does not meet the objectives of the National Highway System for this segment of US 93.

Conclusion:

- **ADVANCED** – Least impactful alternative. Represents vision by downtown Kalispell.

Alternative 3: Four Travel Lanes with TWLTL/Left-turn Lanes

Description:

Alternative 3 reflects the preferred alternative identified in the 1994 *U.S. Highway 93 Somers to Whitefish West Final EIS/Section 4(f) Evaluation*. This alternative would establish a consistent typical section through downtown Kalispell and includes two travel lanes in each direction and a center TWLTL or left-turn lanes where appropriate. The configuration would provide continuity along US 93 through Kalispell. **Figure 5.3** shows the conceptual configuration.

Figure 5.3: Alternative 3 Configuration

Traffic Operations:

Roadway capacity of the study corridor would be increased consistent with the northern and southern portions of Main Street. Merging conflicts to the north and south of the couplet would be reduced due to the consistent number of travel lanes.

Modeling shows increased traffic volumes on Main Street due to added capacity. Under this alternative there is less traffic being distributed onto adjacent roads. Volumes on 1st Avenue East and 1st Avenue West are projected to remain close to 2015 levels. Similarly, volumes along 5th Avenue West and Woodland Avenue are shown to increase at a rate lower than under Alternative 2. Volumes along Center Street, Willow Glen Drive, and the Bypass, however, are consistent with those projected under Alternative 2. **Table 5.3** provides a summary of traffic projections for this alternative.

Table 5.3: Alternative 3 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	31,270
Main Street	South of 7th Street	16,570	21,250	28,390
Main Street	North of 4th Street	16,650	21,350	22,870
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,010
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,280
US 93 Alternate	South of Reserve Drive	-	-	17,250(ii)
1st Avenue East	South of 8th Street	3,430	4,400	3,390
1st Avenue West	North of 9th Street	4,440	5,690	3,640
5th Avenue West	North of 4th Street	4,700	6,030	4,800
Center Street	West of 2nd Avenue East	5,630	7,220	11,470
Woodland Avenue	South of 4th Street	4,270	5,480	5,290
Willow Glen Drive	North of US 93	4,480	5,750	9,180
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,110
US 93	South of Conway Drive	26,780	34,340	34,830
US 2	East of Flathead Drive	25,530	32,740	34,090
US 2	West of Meridian Road	18,520	23,750	18,890

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Accommodates existing and projected traffic demands.
- Consistent with the 1994 EIS.
- Meets the objectives of the National Highway System for this portion of US 93.
- Reduced impact on adjacent local and urban roadways.

Disadvantages:

- Not supported by some in the local community.
- May result in additional traffic through the intersection with US Highway 2.
- Anticipated impacts to adjacent parcels.

Potential Barriers/Constraints:

- Additional right-of-way needed.
- Potential Section 4(f) involvement with historic properties and parkland.
- Potential effects to Courthouse Historic District and/or individual historic properties.

Conclusion:

- **ADVANCED** – Address existing and projected traffic operational issues. Consistent with the 1994 EIS.

Alternative 4: One-way Couplet (A)

Description:

Alternative 4 consists of establishing the same roadway section for Main Street as presented in Alternative 2 – one travel lane in each direction and a center TWLTL or left-turn lanes at major intersections – and changing 1st Avenue East and West to a one-way couplet. 1st Avenue East includes two northbound lanes between the intersection with US 93 to the south and Center Street to the north. 1st Avenue West includes two southbound lanes between Center Street and 12th Street West. Center Street and 12th Street East would also be enhanced to accommodate the additional traffic accessing the one-way roads.

Figure 5.4: Alternative 4 Configuration

Traffic Operations:

This alternative shows similar projected volumes along Main Street through downtown Kalispell as shown with Alternative 2. As with Alternative 2, volumes along Main Street are shown to exceed available roadway capacity. The couplet system along 1st Avenue East and 1st Avenue West is shown to provide little, if any, relief to congestion along Main Street, nor does it appear to provide any benefit to adjacent local and urban roads. The results of the traffic projections for this alternative are shown in **Table 5.4**.

Table 5.4: Alternative 4 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	25,670
Main Street	South of 7th Street	16,570	21,250	18,540
Main Street	North of 4th Street	16,650	21,350	16,610
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,210
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,560
US 93 Alternate	South of Reserve Drive	-	-	17,240(ii)
1st Avenue East	South of 8th Street	3,430	4,400	4,630
1st Avenue West	North of 9th Street	4,440	5,690	3,530
5th Avenue West	North of 4th Street	4,700	6,030	5,870
Center Street	West of 2nd Avenue East	5,630	7,220	10,810
Woodland Avenue	South of 4th Street	4,270	5,480	6,160
Willow Glen Drive	North of US 93	4,480	5,750	9,250
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,210
US 93	South of Conway Drive	26,780	34,340	35,300
US 2	East of Flathead Drive	25,530	32,740	33,940
US 2	West of Meridian Road	18,520	23,750	18,610

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Uniform typical section through downtown Kalispell.
- Additional room available for parking and non-motorized accommodations.

Disadvantages:

- Does not address identified traffic operational issues.
- Does not provide adequate capacity for projected conditions.
- Results in increased traffic volumes along adjacent local and urban roadways.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Does not meet the objectives of the National Highway System for this segment of US 93.

Conclusion:

- **NOT ADVANCED** – Does not address identified transportation concerns.

Alternative 5: One-way Couplet (B)

Description:

Alternative 5 consists of creating a one-way couplet using Main Street and 1st Avenue East. Under this configuration, Main Street would accommodate southbound traffic with three travel lanes between Center Street and 13th Street. Northbound traffic would be accommodated along 1st Avenue East with two travel lanes between Center Street and US 93. Improvements would also be made to Center Street to accommodate additional traffic.

Figure 5.5: Alternative 5 Configuration

Traffic Operations:

This alternative results in decreased traffic on Main Street. This decrease can be attributed to Main Street carrying only southbound traffic. 1st Avenue East would see an increase in traffic volumes as a result of northbound traffic being transferred from Main Street onto 1st Avenue East. A decrease in traffic is also shown along 1st Avenue West as a result of increased southbound capacity along Main Street. The results of the traffic projections for this alternative are shown in **Table 5.5**.

Table 5.5: Alternative 5 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	15,950
Main Street	South of 7th Street	16,570	21,250	14,950
Main Street	North of 4th Street	16,650	21,350	12,640
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,500
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,750
US 93 Alternate	South of Reserve Drive	-	-	17,400(ii)
1st Avenue East	South of 8th Street	3,430	4,400	8,690
1st Avenue West	North of 9th Street	4,440	5,690	4,350
5th Avenue West	North of 4th Street	4,700	6,030	5,140
Center Street	West of 2nd Avenue East	5,630	7,220	10,700
Woodland Avenue	South of 4th Street	4,270	5,480	5,970
Willow Glen Drive	North of US 93	4,480	5,750	9,040
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,040
US 93	South of Conway Drive	26,780	34,340	34,600
US 2	East of Flathead Drive	25,530	32,740	34,020
US 2	West of Meridian Road	18,520	23,750	18,530

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Additional room available for parking and non-motorized accommodations.
- One-way roads typically accommodate higher traffic volumes than two-way facilities.

Disadvantages:

- Does not address identified traffic operational issues.
- Results in increased traffic volumes along adjacent local and urban roadways.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Additional right-of-way may be needed.

Conclusion:

- **NOT ADVANCED** – Does not address identified transportation concerns.

Alternative 6: One-way Couplet (C)

Description:

This concept would create a one-way couplet system with Main Street and 1st Avenue West. Main Street would include three northbound travel lanes, while 1st Avenue West would include two southbound travel lanes. Center Street and 12th Street West would also be enhanced to accommodate additional traffic.

Figure 5.6: Alternative 6 Configuration

Traffic Operations:

Similar to Alternative 5, this alternative results in decreased traffic volumes on Main Street between 12th Street and Center Street. Traffic volumes on 1st Avenue West would increase to accommodate the southbound demand removed diverted from Main Street. Increased traffic volumes on 1st Avenue East are also projected. This increase is likely due to the non-direct connection to 1st Avenue West for southbound traffic. The results of this alternative are shown in **Table 5.6**.

Table 5.6: Alternative 6 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	25,440
Main Street	South of 7th Street	16,570	21,250	15,600
Main Street	North of 4th Street	16,650	21,350	12,640
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,270
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,510
US 93 Alternate	South of Reserve Drive	-	-	16,980(ii)
1st Avenue East	South of 8th Street	3,430	4,400	4,650
1st Avenue West	North of 9th Street	4,440	5,690	7,380
5th Avenue West	North of 4th Street	4,700	6,030	5,180
Center Street	West of 2nd Avenue East	5,630	7,220	11,410
Woodland Avenue	South of 4th Street	4,270	5,480	5,910
Willow Glen Drive	North of US 93	4,480	5,750	9,170
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,220
US 93	South of Conway Drive	26,780	34,340	35,360
US 2	East of Flathead Drive	25,530	32,740	34,070
US 2	West of Meridian Road	18,520	23,750	18,900

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Additional room available for parking and non-motorized accommodations.
- One-way roads typically accommodate higher traffic volumes than two-way facilities.

Disadvantages:

- Does not address identified traffic operational issues.
- Results in increased traffic volumes along adjacent local and urban roadways.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Additional right-of-way may be needed.

Conclusion:

- **NOT ADVANCED** – Does not address identified transportation concerns.

Alternative 7: Willow Glen Upgrade

Description:

Alternative 7 consists of improvements to Willow Glen Drive to increase capacity. A center TWLTL or left-turn lanes at major intersections would be added to improve traffic operations on Willow Glen Drive. In addition, a new, more direct connection would be made at the intersection with US Highway 2 and Montana Highway 35. No changes were included to the US 93/Main Street corridor under this alternative.

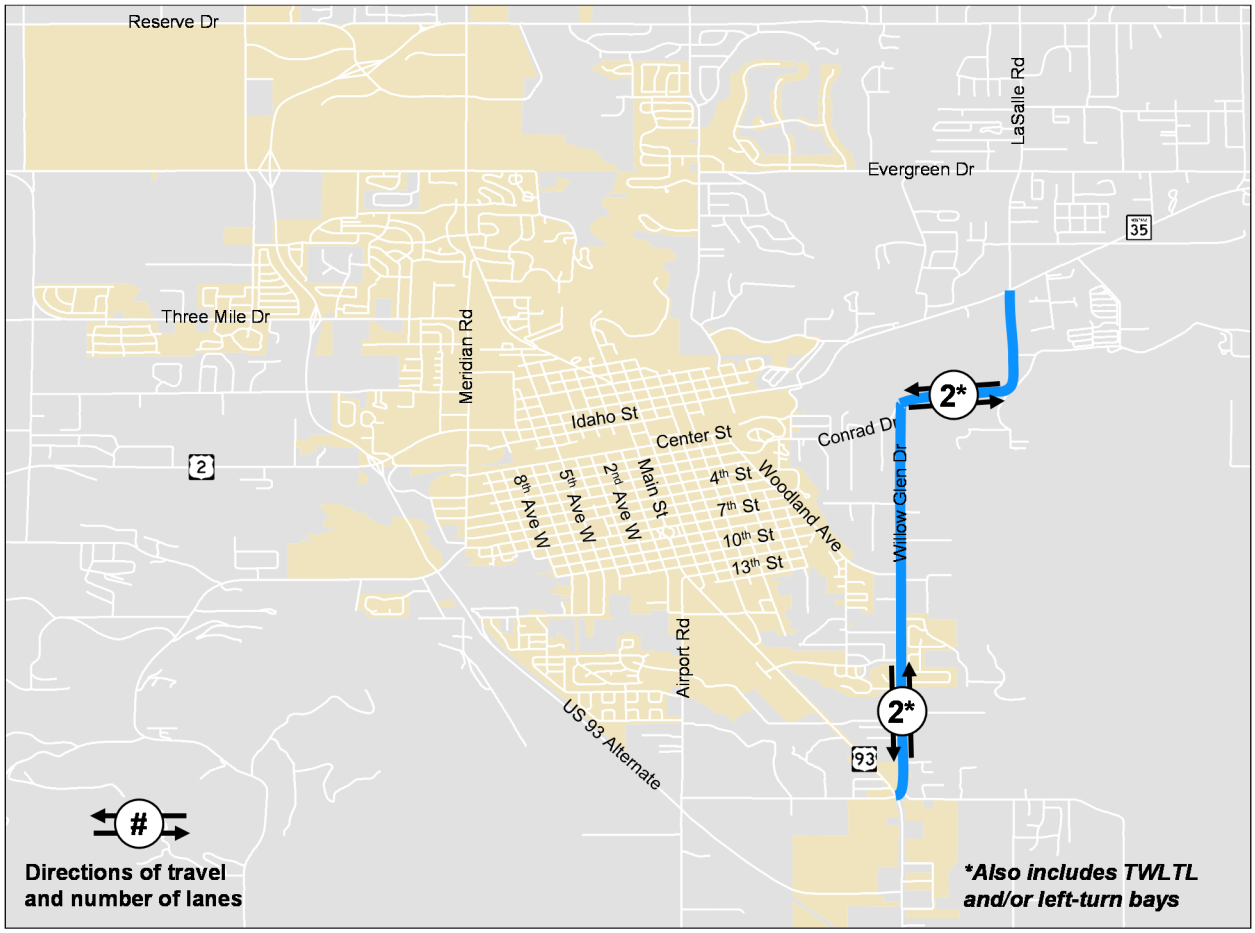

Figure 5.7: Alternative 7 Configuration

Traffic Operations:

Under this alternative, Main Street would experience a minor decrease in traffic volumes when compared to Alternative 1. Some traffic is likely re-routing to Willow Glen Drive. Traffic volumes on Willow Glen are shown to increase at more than double the current growth rate. Traffic volumes at the Courthouse Couplet are still shown to exceed roadway capacity. Traffic volumes along 1st Avenue East and 1st Avenue West are shown to increase at rates less than the current growth rate. The volumes along the Bypass are similar to those shown in the other alternatives. Results for this alternative are presented in **Table 5.7**.

Table 5.7: Alternative 7 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	23,200
Main Street	South of 7th Street	16,570	21,250	17,880
Main Street	North of 4th Street	16,650	21,350	17,000
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	11,850
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,180
US 93 Alternate	South of Reserve Drive	-	-	16,950(ii)
1st Avenue East	South of 8th Street	3,430	4,400	4,290
1st Avenue West	North of 9th Street	4,440	5,690	4,320
5th Avenue West	North of 4th Street	4,700	6,030	4,670
Center Street	West of 2nd Avenue East	5,630	7,220	10,900
Woodland Avenue	South of 4th Street	4,270	5,480	5,840
Willow Glen Drive	North of US 93	4,480	5,750	11,800
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	13,930
US 93	South of Conway Drive	26,780	34,340	33,940
US 2	East of Flathead Drive	25,530	32,740	29,880
US 2	West of Meridian Road	18,520	23,750	18,440

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- May result in decreased traffic through the intersection of Main Street with US 2.
- Less traffic diverted onto the local and urban road network.
- Improved connectivity to US 2/MT 35 on the east end Kalispell.

Disadvantages:

- Does not address identified traffic operational issues through the Courthouse Couplet corridor.
- Does not address existing crash trends and safety concerns.
- Does not provide adequate capacity for projected conditions.
- Improvements would be necessary to areas well outside of the study corridor.
- Unidentified funding for Willow Glen Drive improvements.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Does not meet the objectives of the National Highway System for this segment of US 93

Conclusion:

- **NOT ADVANCED** – Does not address identified transportation concerns.

Alternative 8: Two Travel Lanes with TWLTL/Left-turn Lanes and Willow Glen Upgrade

Description:

Alternative 8 combines the improvements included with Alternatives 2 and 7. Capacity would be increased along Willow Glen Drive and a new connection to US 2/MT 35 would be made. The Courthouse Couplet corridor would be modified to include one travel lane in each direction and a center TWLTL or left-turn lanes at major intersections.

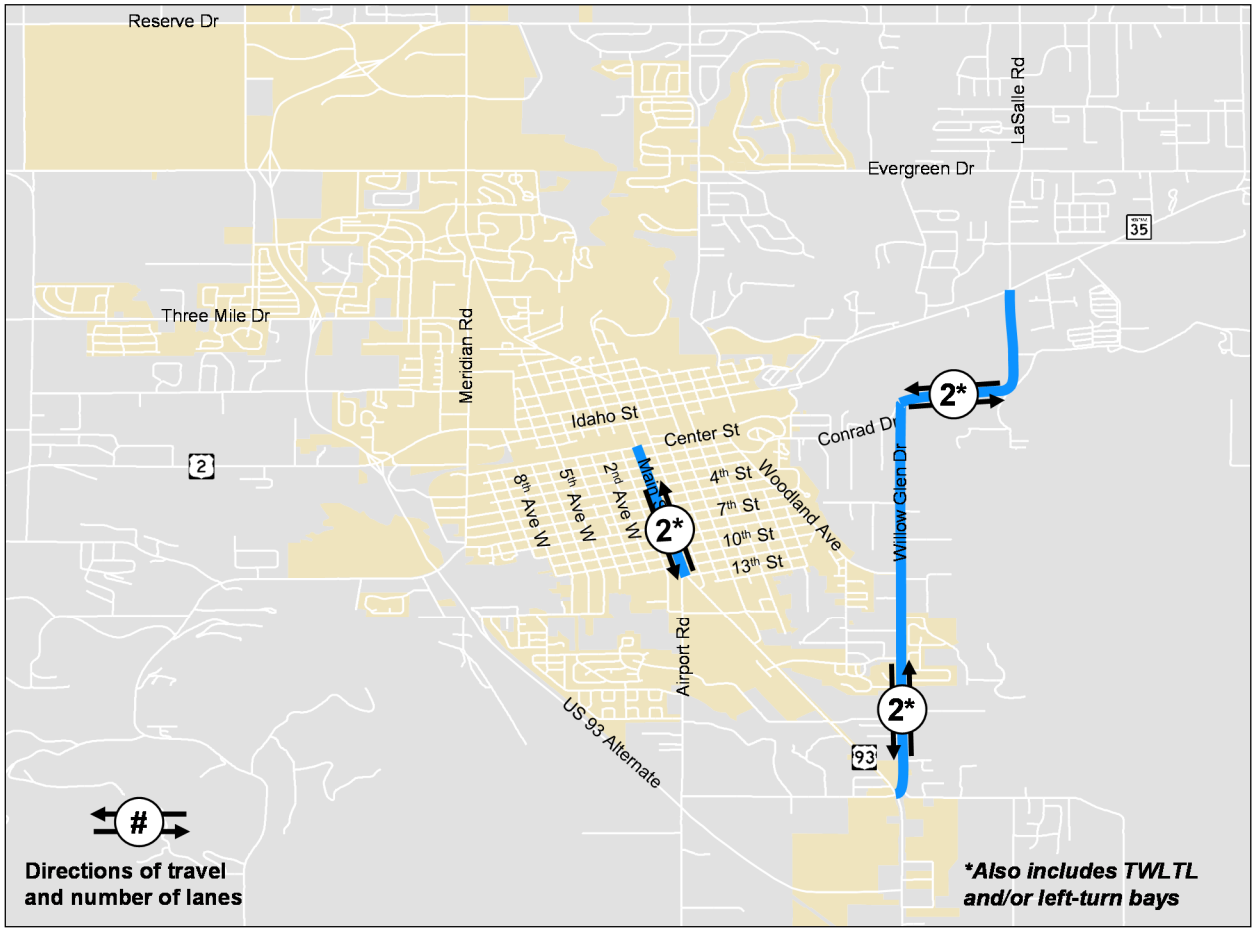

Figure 5.8: Alternative 8 Configuration

Traffic Operations:

Similar to Alternative 7, traffic volumes on Willow Glen Drive are projected to increase at a rate greater than the current growth rate. Furthermore, traffic volumes on Main Street are projected to increase at a rate slightly lower than Alternative 2 due to availability of a secondary route. The projections along Main Street exceed capacity levels for the facility, however. This alternative results in less traffic being diverted onto the local and urban transportation system than Alternatives 2 and 7. The volumes along the Bypass are similar to those shown in the other alternatives. The results of this alternative are given in **Table 5.8**.

Table 5.8: Alternative 8 Traffic Projections

Road	Location	2015 AADT	2040 Projected(i)	2040 Model
Main Street	South of 12th Street	19,090	24,480	24,410
Main Street	South of 7th Street	16,570	21,250	18,240
Main Street	North of 4th Street	16,650	21,350	15,750
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	11,720
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,140
US 93 Alternate	South of Reserve Drive	-	-	17,240(ii)
1st Avenue East	South of 8th Street	3,430	4,400	3,910
1st Avenue West	North of 9th Street	4,440	5,690	4,450
5th Avenue West	North of 4th Street	4,700	6,030	5,200
Center Street	West of 2nd Avenue East	5,630	7,220	11,090
Woodland Avenue	South of 4th Street	4,270	5,480	5,480
Willow Glen Drive	North of US 93	4,480	5,750	11,830
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	14,030
US 93	South of Conway Drive	26,780	34,340	34,270
US 2	East of Flathead Drive	25,530	32,740	30,020
US 2	West of Meridian Road	18,520	23,750	19,060

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

Advantages:

- Uniform typical section through downtown Kalispell.
- Additional room available for parking and non-motorized accommodations.
- Less traffic diverted onto the local and urban road network.
- May result in decreased traffic through the intersection of Main Street with US 2.
- Improved connectivity to US 2/MT 35 on the east end Kalispell.
- Expressed support from the local community.

Disadvantages:

- Does not address identified traffic operational issues through the Courthouse Couplet corridor.
- Does not provide adequate capacity for projected conditions.
- Improvements would be necessary to areas well outside of the study corridor.
- Unidentified funding for Willow Glen Drive improvements.

Potential Barriers/Constraints:

- Not consistent with purpose and need identified in the 1994 EIS.
- Does not meet the objectives of the National Highway System for this segment of US 93

Conclusion:

- **ADVANCED** – Support expressed from local community.

5.2. Summary of Advanced Alternatives

Eight improvement options were initially evaluated for the study corridor. The options were selected to represent conceptual configurations of the study corridor and surrounding roadway network. After thorough evaluation of all options, and considering input from the local community, three were advanced for further consideration. Options that do not address the identified transportation concerns, or that are likely unfeasible to construct, were not advanced for further consideration. The options advanced for further consideration consist of one travel lane in each direction with a center TWLTL or left-turn lanes (Alternative 2), two travel lanes in each direction with a center TWLTL or left-turn lanes (Alternative 3), and one travel lane in each direction with a center TWLTL or left-turn lanes coupled with improvements to Willow Glen Drive (Alternative 8). Each advanced option provides a number of benefits while having some limitations and constraints that may inhibit project development and will need to be explored further. The following discusses the limitations of these options in more detail. A summary table of the project traffic operation for the three alternatives is shown in **Table 5.9**.

Alternative 2: Two Travel Lanes with TWLTL/Left-turn Lanes

This alternative would result in one travel lane in each direction and a center TWLTL or left-turn lanes at major intersections along Main Street between 12th Street and Center Street. The traffic analysis shows projected traffic volumes exceeding capacity for this configuration. As a result, there are increases in volumes along adjacent roadways. This configuration is the least impactful alternative advanced in this report

The configuration of this alternative represents a significant departure from the preferred alternative identified in the 1994 EIS. The 1994 EIS identifies reducing congestion, improving mobility, and increasing overall safety as the primary elements of the purpose and need for improving US 93. This alternative results in a decrease in available roadway capacity along segments of Main Street and appears to offer no reduction in congestion along the corridor. The alternative is not consistent with the purpose and need stated in the 1994 EIS and does not provide the same National Highway System (NHS) performance as adjoining sections of US 93.

Alternative 3: Four Travel Lanes with TWLTL/Left-turn Lanes

Alternative 3 matches the preferred alternative identified in the 1994 EIS. The configuration would consist of two travel lanes in each direction and a center TWLTL or left-turn lanes at major intersections. The configuration would result in US 93 being a continuous four-lane roadway between Somers and Whitefish.

This alternative has adequate roadway capacity to accommodate existing and projected traffic demands. The option also meets the objectives of the NHS for this portion of US 93. However, implementing this option also faces challenges. The configuration does not match the desires of some within the local community. There are also issues associated with new right-of-way acquisition and potential impacts on the Courthouse Historic District and associated historic structures and contributing features. Updated supporting studies would be needed during project development activities to help determine the potential for new or changed effects to environmental resources within the corridor and possible mitigating measures.

Alternative 8: Two Travel Lanes with TWLTL/Left-turn Lanes and Willow Glen Upgrade

Alternative 8 includes reconstruction of Main Street as described in Alternative 2 in addition to upgrading Willow Glen Drive and the connection to US 2/MT 35. This configuration would provide a roadway on Main Street that matches the current vision of downtown Kalispell. Modeling and analysis shows that projected traffic volumes along the Courthouse Couple corridor and through downtown Kalispell exceed roadway capacity realized under this alternative. In addition, traffic volumes are

shown to substantially increase along Willow Glen Drive. The projected traffic volume increases on Willow Glen Drive signal the likely need for facility improvements to safely meet the new travel demands and address potential impacts associated with traffic increases in the roadway corridor. Improvements to Willow Glen Drive would be outside of the scope to develop a project along the couplet and would likely have funding and implementation challenges.

As with Alternative 2, this option is not consistent with the purpose and need stated in the 1994 EIS and does not match the NHS performance objectives on adjoining sections of US 93. The alternative does not remedy congestion and operational concerns within the corridor or along Main Street through the downtown. This alternative would require allocation of additional funding sources and would result in a substantially more complex project development process.

Traffic Operations Summary

Table 5.9: Summary of Traffic Operations for Advanced Alternatives

Road	Location	2015 AADT	2040 Projected(i)	2040 Model (Alt 2)	2040 Model (Alt 3)	2040 Model (Alt 8)
Main Street	South of 12th Street	19,090	24,480	24,980	31,270	24,410
Main Street	South of 7th Street	16,570	21,250	18,410	28,390	18,240
Main Street	North of 4th Street	16,650	21,350	16,070	22,870	15,750
US 93 Alternate	Between Airport Road and US 93	4,300	5,510	12,300	12,010	11,720
US 93 Alternate	Between Meridian Road and Airport Road	6,590	8,450	15,570	15,280	15,140
US 93 Alternate	South of Reserve Drive	-	-	17,570(ii)	17,250(ii)	17,240(ii)
1st Avenue East	South of 8th Street	3,430	4,400	4,710	3,390	3,910
1st Avenue West	North of 9th Street	4,440	5,690	4,820	3,640	4,450
5th Avenue West	North of 4th Street	4,700	6,030	5,750	4,800	5,200
Center Street	West of 2nd Avenue East	5,630	7,220	11,420	11,470	11,090
Woodland Avenue	South of 4th Street	4,270	5,480	6,000	5,290	5,480
Willow Glen Drive	North of US 93	4,480	5,750	9,110	9,180	11,830
Willow Glen Drive	North of Woodland Avenue	5,410	6,940	9,050	9,110	14,030
US 93	South of Conway Drive	26,780	34,340	34,730	34,830	34,270
US 2	East of Flathead Drive	25,530	32,740	34,240	34,090	30,020
US 2	West of Meridian Road	18,520	23,750	19,020	18,890	19,060

(i) Based on 1.0% AAGR applied to 2015 AADT
(ii) Model volume used

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6.0. ADDITIONAL CONSIDERATIONS

The previous sections focused on the traffic operations of various improvement options for the study corridor. Additional considerations should be taken into account when identifying the preferred alternative. This section addresses additional considerations relevant to the development of improvements to the Kalispell Courthouse Couplet corridor.

6.1. FUTURE GROWTH AND TRANSPORTATION NETWORK CHANGES

A number of factors can influence how traffic is distributed on the transportation system. Assumptions in traffic growth and distribution are necessary to project design year conditions. Consideration should be given to changes in traffic patterns and characteristics when identifying recommendations. Future development and land use changes may affect travel patterns in the corridor resulting in traffic operations differing from those projected in this report. Additionally, completion of the US 93 Bypass may further effect traffic patterns through the Courthouse Couplet corridor.

The future growth rates defined for the study corridor are based on historic and anticipated future growth characteristics. The location, type, and design of land use developments ultimately impacts the existing and future transportation system. It is anticipated that the current facility will be unable to accommodate future traffic demands. However, if growth in the area differs from those assumptions made in this report, the results of the traffic operational analysis may no longer hold true.

6.2. SAFETY

Reducing congestion, improving mobility, and increasing the overall safety of US 93 are the primary elements of the purpose and need identified in the 1994 EIS. A detailed discussion about existing safety and crash trends for the corridor is provided in **Section 4.0**. Additional consideration should be given to the future impacts on safety should an improvement option be developed. The trend of multi-vehicle and rear end crashes suggest issues related to vehicle congestion. Additionally, a concentration of crashes was noted at the major intersections along the study corridor, specifically at the intersections with 10th Street and with 11th Street.

6.3. NON-MOTORIZED CONSIDERATIONS

The Courthouse Couplet area and downtown Kalispell have a variety of non-motorized activity and needs. There are currently sidewalks on both sides of the study corridor. There are also parking lots on both sides of the couplet which require pedestrians to cross Main Street in order to access the courthouse. Crosswalks are provided at multiple locations along the couplet. There are no bike lanes along the study corridor.

Non-motorized considerations were not specifically addressed during the improvement options analysis. It is expected that safe and appropriate accommodations would be provided with any project. A detailed evaluation of non-motorized needs would occur during the project development process.

6.4. FUNDING

MDT administers a number of programs that are funded from state and federal sources. Each year, in accordance with Montana Code Annotated (MCA) 60-2-127, the Montana Transportation Commission allocates a portion of available Federal-aid highway funds for construction purposes and for projects located on the various systems in the state. This includes federal funds the state receives under the Fixing America's Surface Transportation Act (FAST Act).

National Highway System

The most logical source of funding for the Courthouse Couplet corridor is the National Highway Performance Program (NHPP). The NHPP provides funding for the National Highway System with the purpose of providing an interconnected system of principal arterial routes which will serve major population centers, international border crossings, intermodal transportation facilities, and other major travel destinations; meet national defense requirements; and serve Interstate and interregional travel.

Activities eligible for NHS funding include construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of the NHS roadway; construction, replacement, rehabilitation, preservation, and protection of bridges on the NHS; and projects or part of a program supporting national goals for improving infrastructure condition, safety, mobility, or freight movements on the NHS. Operational improvements, as well as highway safety improvements, are also eligible. Other miscellaneous activities that may qualify for NHS funding include bikeways and pedestrian walkways, environmental mitigation, restoration and pollution control, infrastructure-based intelligent transportation systems, traffic and traveler monitoring and control, and construction of intra or inter-city bus terminals serving the NHS. The Transportation Commission establishes priorities for the use of NHPP funds, and projects are let through a competitive bidding process.

NHPP funds are federally apportioned to Montana and allocated to Districts by the Montana Transportation Commission. Based on system performance, the funds are allocated to three programs: Interstate Maintenance, National Highway (NH), and NHPP Bridge. Specific to the Courthouse Couplet corridor, the NH program is applicable. While additional funding sources are possible, NH funds are the most probable source. Funding has not been dedicated to any of the improvement options at this time.

The federal share for non-Interstate NHS projects is 86.58 percent, and the state is responsible for the remaining 13.42 percent. The state share is funded through the Highway State Special Revenue Account (HSSR). The Missoula District receives approximately $14.0M to $20.0M in annual NH funding. Funding is currently obligated for the next five years (through 2020). Unfunded projects (beyond 2020) total approximately $32.0M.

Urban Funds

For improvements to facilities not on the National Highway System, alternative funding sources would need to be identified. Willow Glen Drive, for example, is an urban roadway and would be eligible for Urban Highway System funding. Urban funding allocations are based on a per capita distribution and are recalculated each decade following the US Census. Urban funds are primarily used for resurfacing, rehabilitation, or reconstruction of existing facilities; operational improvements; bicycle facilities; pedestrian walkways, and carpool projects. Priorities for the use of urban funds are established at the local level through local planning processes with final approval by the Transportation Commission.

Kalispell receives approximately $718k in annual urban funding. The current balance of urban funding for Kalispell is $222k.

6.5. Environmental Considerations

6.5.1. NEPA/MEPA Reevaluation

The Kalispell Courthouse Couplet corridor is part of US Highway 93 and was evaluated in the 1994 *U.S. Highway 93 Somers to Whitefish West Final EIS/Section 4(f) Evaluation*. In accordance with the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA), an EIS was prepared to analyze the potential environmental effects associated with various alternatives for the reconstruction of US 93. The preferred alternative in the Final EIS shows two northbound and two southbound lanes for US 93 in the Kalispell Courthouse Couplet area.

Due to the age of the Final EIS and its supporting documents and the fact the project area has seen only limited pre-design activity since the Record of Decision (ROD) for the Final EIS was signed, it will be necessary to prepare a NEPA/MEPA reevaluation and to update supporting environmental studies as part of any project implementation activities. The reevaluation document would describe the proposed improvements for the corridor, evaluate the proposed project's consistency with the purpose and need in the 1994 Final EIS/ROD, and identify any changed environmental conditions within the area affected by the proposed project. The document would also need to describe potential permanent and temporary impacts and associated mitigation measures for relevant environmental resources or considerations.

Ultimately, the reevaluation document would demonstrate whether or not the conclusions about potential environmental effects made in the Final EIS/ROD remain valid for the Kalispell Courthouse Couplet segment of US 93.

6.5.2. Historic Districts and Historic Properties

The Courthouse Couplet is located within the Courthouse Historic District which was listed on the National Register of Historic Places (NRHP) in August 1994. The Courthouse Historic District encompasses the 500-800 blocks of South Main Street and includes the Courthouse complex and more than 25 other structures dating to the 1920s and 1930s. Additionally, the Kalispell Westside and Eastside Historic Districts adjoin the Courthouse Historic District and the Main Street Historic District generally extends from Center Street to the Courthouse Historic District.

The historic districts in the corridor area contain individual structures listed on the NRHP that contribute to the historical significance of each district. Section 106 of the *National Historic Preservation Act* (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties. Right-of-way acquisition, tree removal, and design changes associated with improvements to US 93 have the potential to affect individual historic properties and change the appearance (setting) of established historic districts.

To comply with Section 106, a cultural resources inventory would be necessary to identify previously recorded historic properties and to any newly identified historic-period properties within the area affected by roadway improvements. An evaluation would be necessary to determine the potential impacts to individual historic properties and the historic district. Coordination with the Montana State Historic Preservation Office (SHPO) would also be required to seek concurrence with conclusions about potential effects on historic properties and identify potential mitigation measures for impacted historic resources as part of the Section 106 compliance process.

6.5.3. Section 4(f)

Projects undertaken by or that may receive federal funding and/or discretionary approvals from the Federal Highway Administration (FHWA) must demonstrate compliance with Section 4(f) of the *Department of Transportation Act of 1966*. Section 4(f) protects publicly-owned public parks, recreation areas, and wildlife/waterfowl refuges. Section 4(f) also protects historic sites of national, state, or local significance that are listed or potentially eligible for listing on the NRHP.

Numerous properties subject to protection under Section 4(f) exist in the vicinity of the Courthouse Couplet. These properties include the NRHP-listed individual historic structures, the Courthouse Historic District (and possibly adjoining historic districts), and public recreational land associated with Courthouse Park. Right-of-way acquisition, removal of trees, and design changes associated with improvements to US 93 could potentially impact historic and public recreational properties in the corridor. Compliance with Section 4(f) typically requires an evaluation be prepared demonstrating that: 1) there is no feasible and prudent avoidance alternative to the use of the Section 4(f) property; and

2) all possible planning to minimize harm to the Section 4(f) property has been incorporated into the alternative.

6.5.4. Section 6(f)

Local governments often obtain grants through the *Land and Water Conservation Fund Act* (LWCF) to acquire or make improvements to public parks and recreation areas. Section 6(f)(3) of the LWCF Act requires that no property acquired or developed with LWCF assistance be converted to other than public outdoor recreation uses without the approval of U.S. Department of the Interior's National Park Service. Section 6(f) directs the Department to ensure that replacement lands of comparable value and function, location, and usefulness are provided as conditions to such conversions. A review of previous LWCF grants in Flathead County shows the City of Kalispell has routinely used these funds for park acquisition and development. If future improvements affect public parkland, further review should occur to determine if potential LWCF encumbrances exist.

7.0. CONCLUSION AND RECOMMENDATIONS

An EIS for US 93 between Whitefish and Somers was completed in 1994. The Courthouse Couplet corridor is the last remaining unimproved segment of US 93 as identified in the EIS. The EIS identified the preferred alternative of two northbound and two southbound lanes for the corridor. Due to the presence of historically significant properties, perceived right-of-way impacts, and lack of funding, limited pre-design activity has occurred since 1994. A reevaluation of traffic conditions was desired to help determine the appropriate improvements for the corridor.

This *Traffic Engineering Report* provides a thorough study of the Kalispell Courthouse Couplet corridor between 13th Street and 6th Street. The corridor is currently experiencing traffic operational issues related to congestion, which are projected to worsen in the future. The existing conditions of the corridor were defined through field review and data collection in 2015. Existing traffic volumes along the corridor range from approximately 19,000 vpd on the southern end to 16,500 vpd on the northern end. Future traffic projections were made out to the year 2040 using a combination of historic growth rates and travel demand modeling exercises. Traffic volumes are projected to increase to approximately 24,500 vpd on the southern end and to 21,350 vpd on the northern end by the year 2040. Without improvement to the corridor and/or adjacent transportation system, traffic volumes are projected to exceed the capacity of the current facility.

Identification of improvement options for the corridor resulted in eight potential options. An analysis of each improvement option was conducted to determine the anticipated effects on the transportation system. The results of the analysis were vetted through the public involvement process as discussed in the following section.

7.1. PUBLIC INVOLVEMENT AND OUTREACH

An open house and informational meeting was held on June 28th, 2016 at the Red Lion Hotel to discuss potential improvement option to the Kalispell Courthouse Couple corridor. The purpose of the meeting was to inform interested parties about the scope and purpose of the improvement options being considered, and to solicit input from the public. The options discussed in **Section 5** were presented to the public.

The informational meeting consisted of an open house format from 4:00 PM to 6:00 PM, followed by a presentation. During the meeting, information was presented about existing conditions, projected conditions, and the results of the traffic analysis for the improvement options being considered. The informational meeting materials are included in **Appendix E**.

7.1.1. Public Comments Received

A project website, interactive online map, and informational handout were developed to encourage public involvement. A 30-day public comment period was opened on June 28th and ended July 28th. A total of 16 public comments were submitted, either in person at the informational meeting, or in writing during the public comment period. The public comments are included for reference in **Appendix A**. The following summarizes public comments received:

- There were eight comments expressing support of a two-lane facility and three comments supporting a four-lane facility.
- There was a lack of support for the one-way couplet concepts utilizing 1st Avenue East and/or 1st Avenue West.
- There was generally a desire for improvements to Willow Glen Drive, with the exception of one commenter being against expansion.

- Concerns were expressed about increasing traffic to the nearby neighborhoods as a result of a two-lane facility (specifically along 1st Avenue East and 1st Avenue West).
- A desire was expressed about making the downtown and the Courthouse Couplet corridor more bicycle and pedestrian friendly.
- Concerns were noted about additional traffic in the downtown area, and specifically the ability of the intersection with US 2 to the north to handle increased traffic.

7.1.2. Engagement with Elected Officials

The draft *Traffic Engineering Report* was presented to the County Commission on February 9th, 2017 and to the City Council on February 13th, 2017. The presentations to the elected bodies were identical and focused on the process to develop the report and the selection of a preferred alternative (see **Appendix F**). Discussion with each body was held following the presentation. It was noted that a working group will be created to help facilitate the design process moving forward. Details about the design configuration and amenities would be identified at that time.

7.2. Selection of Preferred Alternative

Following the informational meeting and public comment period, the options were discussed and evaluated in more detail. Ultimately, three alternatives were advanced for further consideration: Alternative 2: Two Travel Lanes with TWLTL/Left-turn Lanes; Alternative 3: Four Travel Lanes with TWLTL/Left-turn Lanes; and Alternative 8: Two Travel Lanes with TWLTL/Left-turn Lanes and Willow Glen Upgrade. Of the three alternatives advanced, only one (Alternative 3) meets the purpose and needs identified in the 1994 EIS. The purpose and needs are essential in establishing a basis for the development of the range of reasonable alternatives and assists with the identification and eventual selection of a preferred alternative. In order to move forward with an alternative that does not meet the purpose and needs, considerable coordination would be required between project stakeholders, MDT, and FHWA to determine if the purpose and needs from the 1994 EIS remains valid or how the purpose and needs for this section of US 93 should be reframed.

US 93 is a component of the NHS which consists of roadways important to the nation's economy, defense, and mobility. Unless this section of US 93 is removed from the NHS, the roadway needs to continue to fulfill its function as an element of the NHS system. Removing the roadway from the NHS has major implications for route continuity and continued federal and state financial support.

Given the purpose and need in the EIS, and through the analysis of traffic conditions of the corridor and surrounding area, Alternative 3: Four Travel Lanes with TWLTL/Left-turn Lanes, was selected as the preferred alternative. While the configuration aligns with the 1994 EIS and best addresses transportation concerns identified along the corridor, there are still implementation challenges. The configuration does not match desires expressed by some within the local community. There are also likely issues associates with new right-of-way acquisition and potential impacts on the Courthouse Historic District. Additional study would ultimately be needed during the project development process to determine new or changed effects to environmental resources within the corridor.

Following the culmination of this *Traffic Engineering Report*, it is planned that the project will move into the preliminary design phase. Due to the heightened interest, a working group will be formed which will likely include representatives from the City, County, MDT, FHWA, and local stakeholders. The purpose of the committee will be to discuss and guide the design of the couplet corridor. Details regarding lane configurations, impacts, non-motorized accommodations, and other design details will be determined during the design phase.

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