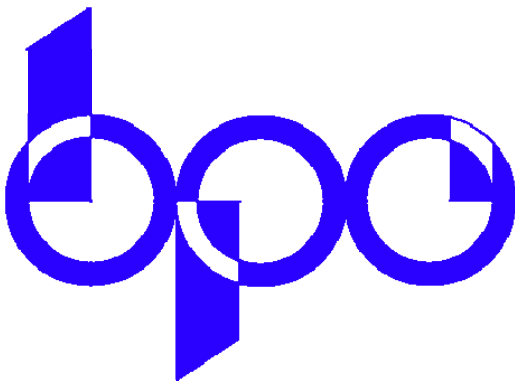


Un-Signalized Intersection

Warrant Study



Bannock Planning Organization

P.O. Box 6129 * Pocatello, Idaho 83205-6129

(208) 233-9322

FAX (866) 230-4709

www.bannockplanning.org

**Approved
May 7, 2007**

This document was prepared by the Bannock Planning Organization (in cooperation with the City of Pocatello, the City of Chubbuck, Bannock County, and the Idaho Transportation Department. It was financed in part by funds from the U.S. Department of Transportation. The opinions, findings, and conclusions expressed in this publication are those of the author and not necessarily those of the U.S. Department of Transportation.

Table of Contents

Background and Introduction	1
Methodology	1
Data Methodology	2
Warrant Data Collection Methodology.....	2
Level of Service Data Collection Methodology	2
Warrant Methodology.....	2
Level of Service Methodology.....	7
Study Intersections.....	7
Level of Service Results	10
Warrant Analysis Results.....	12
Future Years Analysis.....	13
Conclusions.....	13
Appendix A: Intersections with LOS below C.	15
Bannock Highway and Johnny Creek.....	16
South 5 th and East Carter Street	17
Jefferson Avenue and East Maple Street	18
Hawthorne Road and West Quinn	20
West Chubbuck Road and Hawthorne Road	21
Hiline Road and Flandro Road	22
North Arthur and West Carson Avenue.....	23
Hiline Road and Pearl Street/El Rancho Street.....	24
Yellowstone Highway and Siphon.....	25
Jefferson Avenue and East Cedar Street.....	26
North Main Street and West Fremont Street.....	27

List of Figures

Figure 1: MUTCD Figure 4C-1	4
Figure 2: Mathematical Equivalency to Figure 4C-1	4
Figure 3: MUTCD Figure 4C-3.....	5
Figure 4: Mathematical Equivalency to Figure 4C-3	6
Figure 5: Location of Intersections.....	9

List of Tables

Table 1: MUTCD's Table 4C- Eight-Hour Vehicular Volume.....	3
Table 2: Mathematical Formulas for Indiana Manual	4
Table 3: Formula for Mathematical Equivalency chart.....	5
Table 4: Intersections of Interest.....	8
Table 5: Level of Service Results	11
Table 6: 2006 Warrant Analysis Results	12
Table 7: Bannock Highway and Johnny Creek Intersection Description.....	16
Table 8: Bannock Highway and Johnny Creek Level of Service Summary.....	16
Table 9: South 5th and East Carter Intersection Description.....	17
Table 10: Level of Service for South 5th and E Carter.....	17
Table 11: Jefferson Ave and E Maple St Intersection Diagram	18
Table 12: Jefferson Ave. and E Maple St. Level of Service.....	18
Table 13: N Main St and W Custer St Intersection Description.....	19
Table 14: N Main St and W Custer St LOS Results.....	19

Table 15: Hawthorne Rd and W Quinn Rd Intersection Description	20
Table 16: Hawthorne Rd and W Quinn LOS Results	20
Table 17: W Chubbuck Rd and Hawthorne Rd Intersection Description.....	21
Table 18: W Chubbuck Rd and Hawthorne Rd LOS Results	21
Table 19: Hiline Rd and Flandro Rd Intersection Description	22
Table 20: Hiline Rd and Flandro RD LOS Results.....	22
Table 21: N Arthur Ave and W Carson Ave Intersection Description	23
Table 22: N Arthur Ave and W Carson Ave LOS Results	23
Table 23: Hiline Rd and Pearl St/El Rancho St Intersection Description.....	24
Table 24: Hiline Rd and Pearl St/El Rancho St LOS Results.....	24
Table 25: Yellowstone Hwy and Siphon Intersection Description.....	25
Table 26: Yellowstone Hwy and Siphon LOS Results	25
Table 27: Jefferson Ave and E Cedar St Intersection Description	26
Table 28 Jefferson Ave and E Cedar St LOS Results.....	26
Table 29: N Main St and W Fremont St Intersection Description.....	27
Table 30: N Main St and W Fremont St LOS Results	27
Table 31: Warrant Analysis Bannock Highway and Johnny Creek	29
Table 32: Warrant Analysis S 5th and Barton	30
Table 33: Warrant Analysis S 4th and Barton	31
Table 34: Warrant Analysis S 4th and E Carter.....	32
Table 35: Warrant Analysis S 5th and E Carter.....	33
Table 36: Warrant Analysis Main and W Fremont.....	34
Table 37: Warrant Analysis Arthur and W Fremont	35
Table 38: Warrant Analysis Jefferson and Maple.....	36
Table 39: Warrant Analysis Main and Custer.....	37
Table 40: Warrant Analysis Arthur and Carson	38
Table 41: Warrant Analysis McKinley and Maple	39
Table 42: Warrant Analysis Main and Kraft.....	40
Table 43: Warrant Analysis McKinley and W Pine St	41
Table 44: Warrant Analysis Jefferson and E Cedar St.	42
Table 45: Warrant Analysis W Cedar St. and McKinley Ave.....	43
Table 46: Warrant Analysis Yellowstone Ave and Pearl St.	44
Table 47: Warrant Analysis Hawthorne Rd. and W Quinn Rd.....	45
Table 48: Warrant Analysis Hiline Rd. and El Rancho	46
Table 49: Warrant Analysis Olympus Drive and Butte St.....	48
Table 50: Warrant Analysis W Chubbuck and Hawthorne Rd.....	49
Table 51: Warrant Analysis Yellowstone Hwy and Siphon Rd	50
Table 52: Warrant Analysis Philbin and Tyhee.....	51
Table 53: Warrant Analysis Philbin and West Chubbuck	52

Background and Introduction

Bannock Planning Organization is the metropolitan planning organization for the Pocatello/Chubbuck urbanized area. BPO is responsible for long-range transportation planning within the urbanized area. As part of this responsibility, BPO has developed a Long Range Transportation Plan (LRTP) which identifies the needs of the system and identifies solutions.

The ability to determine when intersections might need to be signalized was identified as a critical issue in the LRTP. The LRTP only identified the Level-of-Service (LOS) for signalized and 4-Way Stop controlled intersections. The LRTP tends to focus on projects for federal aid funding. The improvements of non-signalized intersections have a significant impact on the system even if they are not funded with federal funds.

This plan reviews twenty-four (24) intersections of roads classified as collectors and above with other roads classified as collectors and above. These higher classed roadways have a greater likelihood of requiring a traffic control device above a two-way or four-way stop control. Each intersection was analyzed for signal warrants as per the Manual of Uniform Traffic Control Devices (MUTCD) and LOS using the Highway Capacity Manual procedures. *Although this study uses warrant analysis procedures it is not to be considered an engineering study as required by the MUTCD.*

The purpose of this planning study is to identify those intersections with a high likelihood of requiring a signal or other treatment today and within the next ten-years and to provide a baseline numbers for comparisons. The study will identify those intersection which meet one of more warrants today; which would meet volumes thresholds within ten-years, and the current LOS for each movement; and possible treatments.

Intersections near the University and Hospital Way were not included due to other studies identifying their potential for signalization or treatment identified as part of a traffic impact study.

Determining the current Level-of-Service is the first step in defining the need for signalization. Intersections with LOS below C might have problems providing smooth traffic operations. Eleven intersections fall below the LOS standards but only six preliminary meet one or more warrants.

Methodology

The project is intended to provide a base number and evaluation of all intersections streets classified as collectors and arterials with few exceptions. This section will cover the methodology used to collect data needed for analysis and the procedures used for warrant and LOS analysis.

A warrant analysis and a Level-of-Service analysis were completed for each intersection. The warrant analysis methodology describes the steps used to determine if an intersection met the minimum criteria to be considered for a signalized intersection. The LOS

Un-Signalized Intersection Report

methodology describes the procedure used to determine the operational conditions of an intersection.

Data Methodology

BPO chose to collect the data in two different ways. A warrant analysis and LOS can be determined using twelve hour turn counts, but this was unfeasible given our personnel available and needs of other data collection efforts.

Warrant Data Collection Methodology

72-hour bi-directional tube counts were conducted for each approach of the various intersections. For each approach the average of the three days entering vehicle count was used. If for some reason the data was not valid for the three days a minimum of 48-hour count was used. The data for 07:00 to 21:00 or 14-hours were used to in the analysis with the highest eight hours selected for the actual warrant determination. The summarized data for each intersection is located in Appendix B.

Level of Service Data Collection Methodology

Three different turning counts were collected for each intersection. An AM Peak (06:30 – 08:30), a Noon Peak (11:00 – 13:00), and PM Peak (16:00 – 18:00) count was taken using Jamar Technologies turning boards. Each vehicle's movement was tracked through the intersection and collected in 15-minute intervals. Bicycles were treated as pedestrians if they were on the sidewalk and as a vehicle if they were on the roadway.

Warrant Methodology

Eight warrants are identified in the Manual on Uniform Traffic Control Devices (MUTCD) 2003 Edition. For each warrant the data used and method will be detailed. The manual does provide a method but that method is a method requiring plotting on a graph. To help expedite the analysis, alternate methods will be reviewed.

Justification for Traffic Control Signals Need Studies:

Warrant 1: Eight-hour Vehicular Volume

Warrant 2: Four-hour Vehicular Volume

Warrant 3: Peak hour

Warrant 4: Pedestrian Volume

Warrant 5: School Crossing

Warrant 6: Coordinated Signal System

Warrant 7: Crash Experience

Warrant 8: Roadway Network

Guidance from the manual suggests traffic control signal should not be installed unless one or more of the factors above are met. This study is not recommending the installation of signals only identify potential locations where further study should take place.

Un-Signalized Intersection Report

Each of the warrants can be considered as a reason for installing a traffic signal. Careful study of the traffic and accident data and geometry must be made before placement of a traffic signal control.

The study focus is primarily on the traffic related warrants 1, 2, and 3. The other five focus on other factors which affect the intersections performance. The methodologies for all eight are listed and will be considered for certain intersections.

Warrant 1: Eight-hour Vehicular Volume:

The Eight-hour warrant is intended to identify where large traffic volumes are the reason for considering a traffic control signal. The warrant is divided into two conditions one for high volume and the other for interrupted flow. For the warrant to be met traffic volumes need to be minimums for each of any eight hours during an average day. MUTCD's Table 4C-1 (Table 1) lists the values for minimum volumes (Condition A) and interruption (Condition B) this table will be used to determine if the warrant is met. It should be noted if volumes are met for either condition the entire warrant is met.

Table 1: MUTCD's Table 4C- Eight-Hour Vehicular Volume

Table 4C-1 Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume							
Number of lanes for moving traffic on each approach		Vehicles Per Hour on Major Street (total of both approaches)			Vehicles Per Hour on higher-volume minor - street approach		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

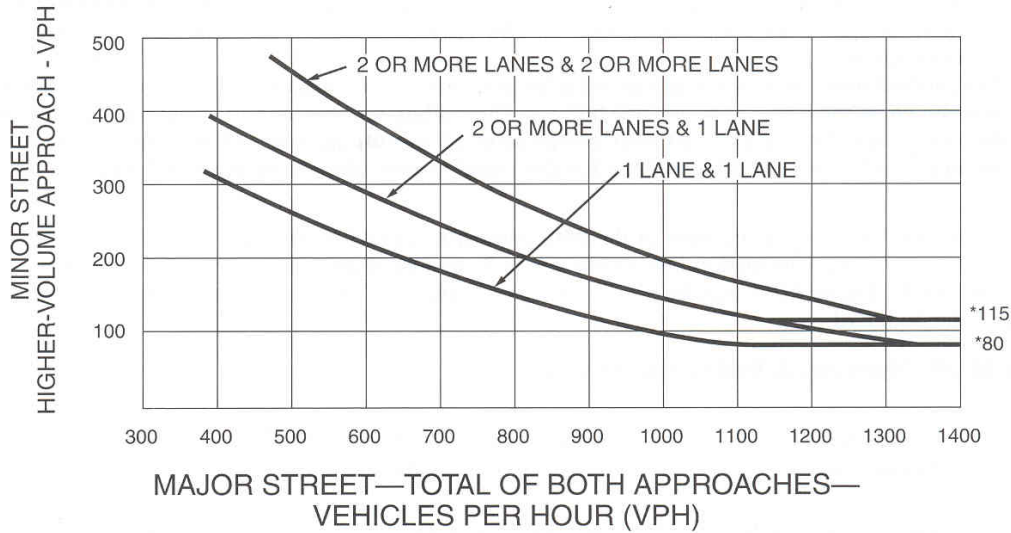
Condition B - Interruption of Continuous Traffic							
Number of lanes for moving traffic on each approach		Vehicles Per Hour on Major Street (total of both approaches)			Vehicles Per Hour on higher-volume minor - street approach		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

Warrant 2: Four-hour Vehicular Volume

Figure 4C-1 (Figure 1) in the MUTCD applies to four-hour warrant. For the warrant to be met each of any four hours must plot above the corresponding curve. The three curves represent the number of lanes for the major and minor streets. The Indiana Supplement to Millennium Edition National Manual of Uniform Traffic Control Devices has mathematical equivalency equations for this warrant and the peak-hour warrant. Table 2 lists the formula and Figure 2 shows the curve. The MUTCD figure 4C-2 for streets with speeds over 40 mph was used for three intersections.

Un-Signalized Intersection Report

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 1: MUTCD Figure 4C-1

Table 2: Mathematical Formulas for Indiana Manual

X = sum of both major street approach volumes		
Y = volume of a) single minor street approach or b) minor street high volume approach		
Minor Street (Y)	Major Street (X)	Equation
2 or more	2 or more	If $X \geq 1295$, $Y = 115$ or $Y = 879.23228 - 1.0038233X + 0.0003253082X^2$
2 or more	1	If $X \geq 1118$, $Y = 115$ or $Y = 651.50622395 - 0.7483745392X + 0.000240228X^2$
1	2 or more	If $X \geq 1340$, $Y = 80$ or $Y = 651.50622395 - 0.7483745392X + 0.000240228X^2$
1	1	If $X \geq 1142$, $Y = 80$ or $Y = 554.1310944 - 0.7134267844X + 0.0002312157X^2$

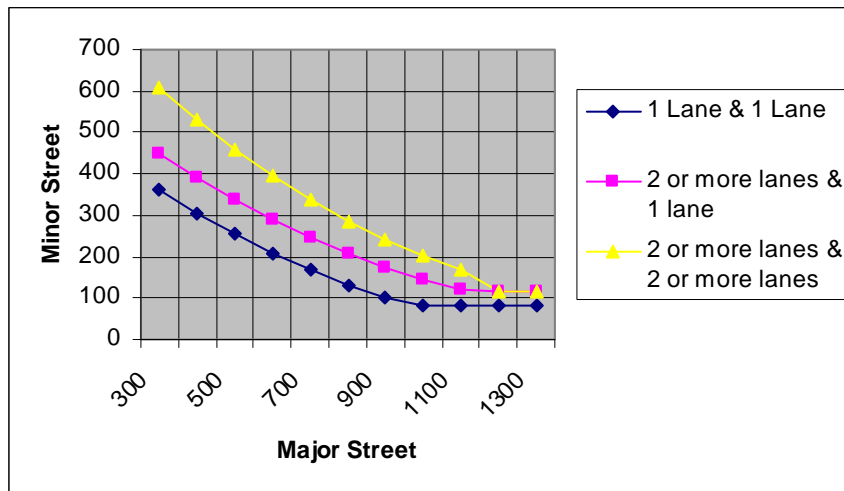
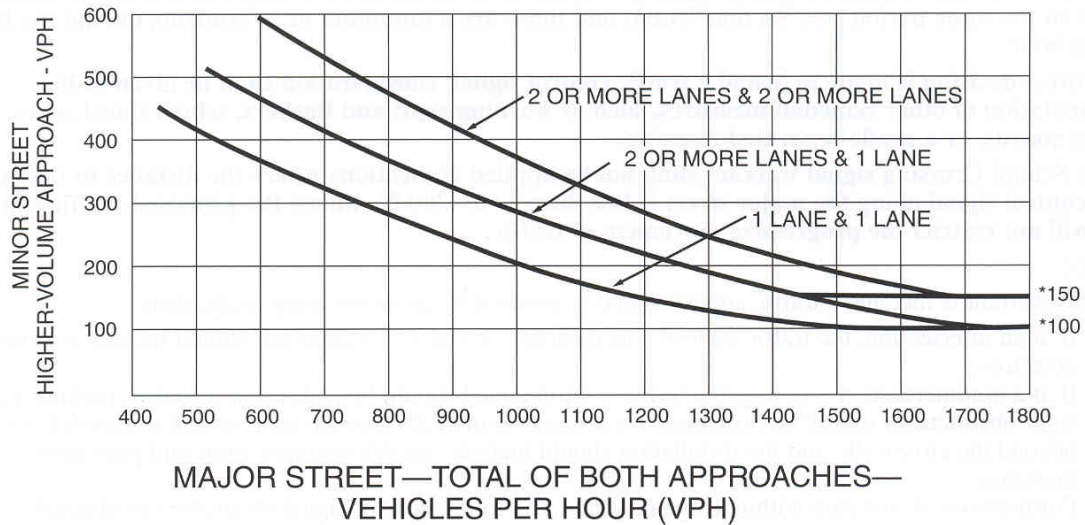


Figure 2: Mathematical Equivalency to Figure 4C-1

Warrant 3: Peak hour

Peak-hour warrant is for locations where the major street traffic volumes are so high during the peak one hour that excessive delay is caused on the minor street. Figure 4C-3 in the MUTCD applies to peak hour. This figure is a chart showing the minor street volume which meets warrants for various major street volumes. The Indiana Supplement to Millennium Edition National Manual of Uniform Traffic Control Devices has mathematical equivalency equations for this warrant and the peak-hour warrant. Table 3 lists the formula and Figure 4 shows the curve.

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 3: MUTCD Figure 4C-3

Table 3: Formula for Mathematical Equivalency chart

X = sum of both major street approach volumes		
Y = volume of a) single minor street approach or b) minor street high volume approach		
Minor Street (Y)	Major Street (X)	Eauation
2 or more	2 or more	If X => 1672, Y = 150 or Y = 1060.5405451-0.889969286X+0.0002059999X ²
2 or more	1	If X => 1461, Y = 150 or Y = 837.59424427-0.7219511908X+0.0001720248X ²
1	2 or more	If X => 1758, Y = 100 or Y = 837.59424427-0.7219511908X+0.0001720248X ²
1	1	If X => 1516, Y = 100 or Y = 745.652000052-0.7548866636X+0.00021703X ²

Un-Signalized Intersection Report

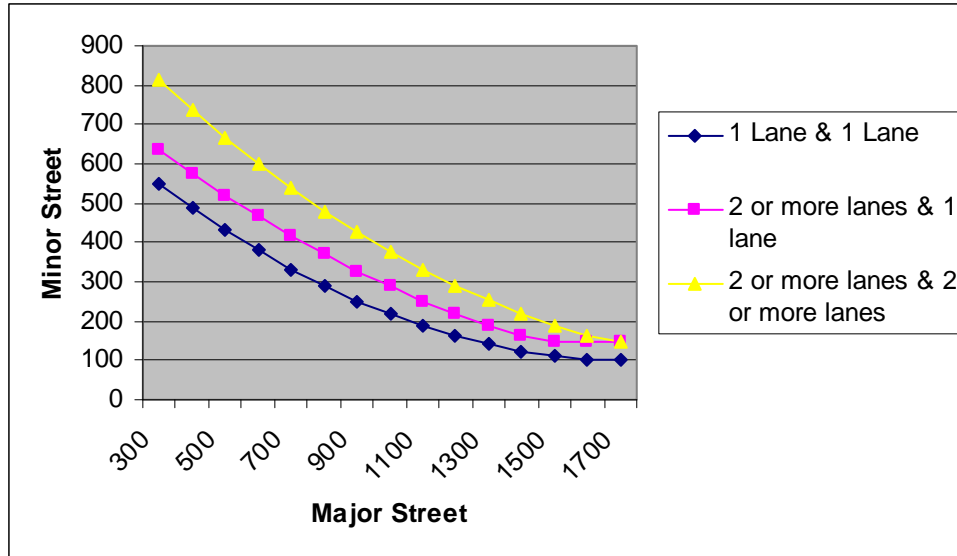


Figure 4: Mathematical Equivalency to Figure 4C-3

Warrant 4: Pedestrian Volume

The standard for pedestrian volume is 190 for an hour or 100 over 4 hours. No intersection outside the University area would even come close to these numbers. However, turning counts for each intersection will be reviewed to ensure there is not a high pedestrian volume.

Warrant 5: School Crossing

Bannock Planning Organization conducted a School Zone Improvement Study which reviewed all school crossings in our planning area. This study did not find any areas where a school crossing signal is warranted; therefore this warrant will not be evaluated.

Warrant 6: Coordinated Signal System

This warrant is looking at the need to platoon vehicles along a corridor. Yellowstone and Pearl and Main and Custer are the two intersections this could possibly apply. South 5th and Jason is another although Jason is not a collector or above. If the warrant is met a complete platoon analysis will occur.

Warrant 7: Crash Experience

The warrant calls for five accidents, of types susceptible to correction by a traffic signal. For this warrant the one year and five year accident history will be reviewed and shown. Angle crashes will be identified for the five accident warrant number. NCHRP report 491 Crash Experience Warrant for Traffic Signals will be reviewed if any intersections meet the minimum amount.

This warrant will not be used as a primary warrant. This means if this is the only warrant met, the intersection will not be recommended for further intersection analysis, but the intersection will be recommended for evaluation for potential safety improvement.

Warrant 8: Roadway Network

The roadway network warrant is to help concentrate vehicle traffic to a specific intersection. Other uses are to help organize the traffic flow into platoons. The standard is 1,000 for peak hour entering vehicle and meeting one or more of the other warrants with five year forecasts.

Level of Service Methodology

Highway Capacity Software (HCS) Version 5.2 from McTrans, University of Florida was used for the LOS analysis. The un-signalized procedures for all-way stop control and two-way stop control was used. The highest hour of the AM, Noon, and PM peaks were selected for the analysis in 15-minutes intervals.

In the un-signalized intersection analysis the intersection geometry, percent trucks, Peak Hour Factor (PHF), and pedestrians were varied from the defaults. Number of lanes was varied for turn lanes only if marked on pavement. Percent trucks was only varied on principal arterials and three percent was used. PHF is the percentage of vehicles in the peak 15-minutes as compared to the hour. This is used to determine the arrival times for intersection. The PHF is calculated for each leg and movement and the highest factors used for the entire leg. The actual 15 minute pedestrian count was entered.

Study Intersections

Figure 5 and Table 4 shows the location and the name of the 24 intersections of interest. The type control column is the existing traffic control device. The intersections are scattered throughout the community and represent collectors and arterials.

Un-Signalized Intersection Report

Table 4: Intersections of Interest

Intersection Name	Station Number	Type Control
Bannock Highway and Johnny Creek	36	Two Way Stop Control
S 5th and Barton Rd	47	Two Way Stop Control
S 4th and Barton Rd	49	Two Way Stop Control
S 4th and E Carter	106	Two Way Stop Control
S 5th and E Carter	107	Two Way Stop Control
N Main Street and W Fremont St	197	Two Way Stop Control
N Arthur Street and W Fremont St	198	Two Way Stop Control
Jefferson Avenue and E Maple	233	Two Way Stop Control
N Main and W Custer	246	Two Way Stop Control
N Arthur Street and W Carson	272	Two Way Stop Control
N Main Street and W Carson	273	Two Way Stop Control
McKinley W Maple	293	All Way Stop Control
Main Street and Kraft Rd	501	Two Way Stop Control
McKinley and W Pine St	507	All Way Stop Control
Jefferson Avenue and E Cedar Street	512	Two Way Stop Control
McKinley and W Cedar	524	All Way Stop Control
Yellowstone and Pearl	585	Two Way Stop Control
Hawthorne and E Quinn	608	Two Way Stop Control
Olympus and Butte	634	Two Way Stop Control
Hiline Rd and Flandro	635	Two Way Stop Control
E Chubbuck and Hawthorne	660	All Way Stop Control
Hiline Rd and El Rancho	702	All Way Stop Control
Yellowstone Ave and Siphon	3007	Two Way Stop Control
E Chubbuck and Philbin	3086	Two Way Stop Control

Un-Signalized Intersection Report

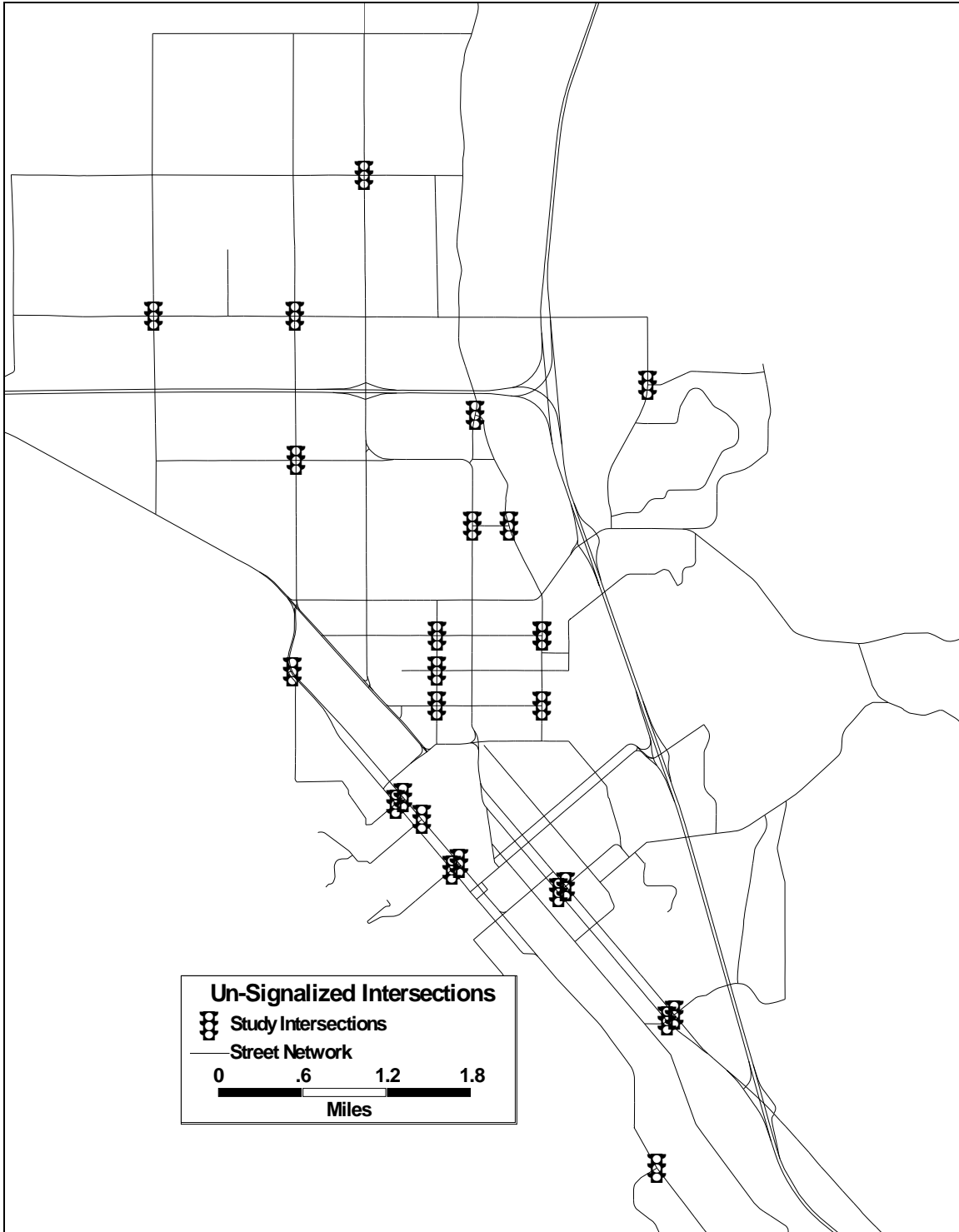


Figure 5: Location of Intersections

Level of Service Results

Table 5 shows the results of the LOS study for the AM, Noon, and PM peak hours. Thirteen of the twenty-four intersections have at least one approach during at least one time period with a LOS below LOS C. LOS C is the service standard for the urbanized area. The purpose of LOS analysis is to identify where operational problems occur during the peak hours. It should be noted that LOS is for peak hours and designed to detect operations problems where the warrant analysis looks and the feasibility and suitability of the intersection for signalization.

The first step in defining the need for signalization is where the current traffic control devices fail to provide smooth traffic operations. All 13 intersections should be reviewed for potential spot improvement which can reduce the need for signalization by improving the LOS at that intersection. Even if the intersections operation cannot be improved, this does not necessarily mean the intersection will be signalized. The results for each intersection is included in Appendix A.

The following intersections have at least one approach in one time period with LOS below "C":

- Bannock Highway and Johnny Creek
- South 5th Avenue and E Carter Street
- Jefferson Avenue and E Maple Street
- North Main Street and W Custer Avenue
- Hawthorne Road and West Quinn
- Hawthorne Road and West Chubbuck Road
- Hiline Road and Flandro Avenue
- North Arthur Avenue and West Carson Avenue
- Hiline Road and Pearl Street
- Yellowstone Highway and Siphon Avenue
- Jefferson Avenue and E Cedar Street
- North Main Street and West Fremont Street

With the exception of West Chubbuck Road and Hawthorne Road, all intersections with LOS problems arise from a major street with high volumes and lack of gaps during the peak hour. The arrival time of the streets are not concentrated into platoons where large gaps between platoons could clear the waiting vehicles on the minor street. With the exception of some added turn lanes the ability to improve Level of Service without signalizations is limited.

Un-Signalized Intersection Report

Table 5: Level of Service Results

Intersection Name	Station Number	Type Control	2006 LOS AM				2006 LOS Noon				2006 LOS PM			
			Approach				Approach				Approach			
			Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound
Bannock Highway and Johnny Creek	36	Two Way Stop Control	D	A	B	B	A	A	B	B	B	B	A	C
S 5th and Barton Rd	47	Two Way Stop Control	C	B	A		C	B	A		C	B	A	
S 4th and Barton Rd	49	Two Way Stop Control	B	C		A	B	C		A	C	C		A
S 4th and E Carter	106	Two Way Stop Control	B	B		B	B		C	B	B			C
S 5th and E Carter	107	Two Way Stop Control	D	B	A		F	F	A		F	E	A	
N Main Street and W Fremont St	197	Two Way Stop Control	C	C	A		C	B	A		D	C	A	
N Arthur Street and W Fremont St	198	Two Way Stop Control	C	C		A	B	B		A	C	C		A
Jefferson Avenue and E Maple	233	Two Way Stop Control	D	D	A	A	E	D	A	A	F	E	A	A
N Main and W Custer	246	Two Way Stop Control	C	B	A		C	C	A		F	E	A	
N Arthur Street and W Carson	272	Two Way Stop Control	C	C		A	B	C		A	F	F		A
N Main Street and W Carson	273	Two Way Stop Control	B	B	A		C	C	A		C	C	A	
McKinley W Maple	292	All Way Stop Control	A	A	A	A	A	B	B	A	B	B	B	B
McKinley and W Pine St	293	All Way Stop Control	A	A	A	A	A	A	A	A	A	B	B	A
Main Street and Kraft Rd	501	Two Way Stop Control	C	B	A	A	C	B	A	A	B	B	A	A
Jefferson Avenue and E Cedar Street	512	Two Way Stop Control	B		A	A	C		A	A	D		A	A
McKinley and W Cedar	524	All Way Stop Control	A	A	A	A	B	B	B	B	B	C	B	B
Yellowstone and Pearl	585	Two Way Stop Control	C	A	A	A	C	C	A	A	C	C	B	B
Hawthorne and E Quinn	608	Two Way Stop Control	B	B	B	B	B	B	C	B	E	D	F	E
Olympus and Butte	634	Two Way Stop Control		C	A	A		B	A	A		B	A	A
Hiline Rd and Flandro	635	Two Way Stop Control	D	B	A	A	C	B	A	A	F	C	A	A
E Chubbuck and Hawthorne	660	All Way Stop Control	B	A	A	A	C	C	B	B	E	F	C	C
Hiline Rd and El Rancho	702	All Way Stop Control	A	A	B	C	B	B	C	C	B	B	F	F
Yellowstone Ave and Siphon	3007	Two Way Stop Control	B	B	A	A	B	C	A	A	C	D	A	A
E Chubbuck and Philbin	3086	Two Way Stop Control	A	A	B	B	A	A	B	B	A	A	B	B

Warrant Analysis Results

Table 6 shows the results of the warrant analysis. In summary; six intersections meet Eight-Hour Warrant, four intersections meet Four-Hour Warrant, and one intersection met the Peak Hour warrant. In total, seven intersections meet at least one warrant. Appendix B has a detailed description of all intersections including volumes and warrant conditions.

Intersections meeting one or more signal warrants are:

- South 4th Avenue and Barton Road
- South 5th Avenue and East Carter Road
- Jefferson Avenue and East Maple Street
- Jefferson Avenue and East Cedar Street
- Yellowstone Avenue and Pearl Street
- Hawthorne Road and W Quinn Street
- West Chubbuck Road and Hawthorne Road

Table 6: 2006 Warrant Analysis Results

Intersection Name	Station Number	Conditions			
		Eight-Hour		Four-Hour	Peak Hour
		Condition A	Condition B		
Bannock Highway and Jhonny Creek	36	No	No	No	No
S 5th Avenue and Barton Road	47	No	No	No	No
S 4th Avenue and Barton Road	49	Yes	No	Yes	No
S 4th Avenue and E Carter Street	106	No	No	No	No
S 5th Avenue and E Carter Street	107	Yes	No	Yes	No
N Main Street and W Fremont St	197	No	No	No	No
N Arthur Street and W Fremont St	198	No	No	No	No
Jefferson Avenue and E Maple	233	No	Yes	No	No
N Main Street and W Custer Street	246	No	No	No	No
N Arthur Street and W Carson Street	272	No	No	No	No
N Main Street and W Carson Street	273	No	No	No	No
McKinley and W Maple Street	293	No	No	No	No
N Main Street and Kraft Road	501	No	No	No	No
McKinley Avnue and W Pine Street	504	No	No	No	No
Jefferson Avenue and E Cedar Street	512	No	Yes	Yes	Yes
W Cedar Street and McKinley Avenue	524	No	No	No	No
Yellowstone Avenue and Pearl Street	585	No	Yes	Yes	No
Hawthorne Raod and E Quinn Street	608	No	No	Yes	Yes
Olympus and Butte	634	No	No	No	No
Hiline Rd and Flandro	635	No	No	No	No
W Chubbuck and Hawthorne	660	Yes	No	No	No
Hiline Rd and El Rancho (Pearl)	702	No	No	No	No
Yellowstone Ave and Siphon	3007	No	No	No	No
Philbin and Tyhee	3061	No	No	No	No
W Chubbuck and Philbin	3086	No	No	No	No

The warrant analysis is intended to be a base number for further analysis. The report did not determine if right turn vehicles should be discounted from the intersection counts. This type of follow-up analysis needs to take place prior to recommending a signal be installed.

Future Years Analysis

Applying a growth rate of 11.88% for the period from 2006 to 2015 did not have a significant change on the results. Only Flandro Drive and Hiline Road met a warrant in 2015 which was not on the list in 2006. This intersections lane configuration will change in the next several years to move to two lanes which would increase the volumes requirements. Several intersections moved closer to one or more warrants, but none past the thresholds. Hawthorne Road and W Quinn Road added an 8-hour Condition A warrant to the existing 4-hour and peak-hour warrants.

Conclusions

The purpose of this report is to provide data to the city of Pocatello and the city of Chubbuck the current status of key intersections within their area which are not currently signalized. The data presented can help anticipate and plan for intersection improvements now and in 2015.

The five intersections which have LOS below C and meet one or more signal warrants are:

- South 5th Avenue and East Carter Road
- Jefferson Avenue and East Maple Street
- Jefferson Avenue and East Cedar Street
- Hawthorne Road and W Quinn Street
- West Chubbuck Road and Hawthorne Road

South 5th Avenue and East Carter Street were listed at needing to be signalized in the 2002 Yellowstone Corridor Study. This intersection meets two warrants and has LOS F in the noon and evening peaks for the side street. The location around the university contributes to the issues with this intersection.

Jefferson Avenue is a major north/south corridor. The route is signalized at each end and in the middle. The routes signals are not tied into the signal coordination system. Exploring if there is a benefit to tying the three together could provide benefit to Maple and Cedar. Jefferson and E Maple only meet the interrupted of continuous flow warrant (warrant 1 condition B) and the delay is a minute per vehicle during the worst conditions. Jefferson and Cedar however, meet three warrants but has less average vehicle delay of around 30 seconds per vehicle. Both intersections have turn lanes on all approach. These intersections should be recounted annually and monitored for operations.

Hawthorne and West Quinn Road is near a retail and housing unit growth area. Hawthorne Road is also a bypass to Yellowstone Ave, and a major/north south route. Environmental and current infrastructure limits the ability to make minor improvements to this intersection. A right turn lane on the north and east bound approaches could improve LOS and reduce the need for a signal. Power line transformers and a canal do not allow for this type of improvement.

Un-Signalized Intersection Report

West Chubbuck Road and Hawthorne Road is currently going through an alternative design study to determine whether a signal or roundabout would work at that intersection. The study is ongoing and there are no results to date.

Three of the five intersections can be characterized as lacking gaps to get across the intersection. With South 5th and Carter and both Jefferson intersections, the volume of the major street is the reason signalization should be considered. The equivalent approach from Indiana suggests intersection volumes should reach 4,600 ADT on the minor street for 8-hour warrant Condition A and 2,300 ADT for Condition B. Using this minimum volume standard only South 5th and E Carter meet the minor street volumes.

The other two intersections at Hawthorne and W Quinn and Hawthorne and W Chubbuck are both four-way stop controlled. Hawthorne and W Chubbuck intersection is currently being studied for signalization. Hawthorne and W Quinn geometric issues and lack of right-of-way for improvement should be the first priority at this intersection.

The keep up with the anticipated needs the community should plan of improving one intersection per year. With seven intersections meeting warrants and additional one by 2015 the annual improvement this schedule will ensure improvements keep pace with needs. The annual improvement does not need to be signalization since there are thirteen other intersections with Level of Service issues.

Appendix A: Intersections with LOS below C.

Twelve of the twenty-six intersections surveyed have at least one approach below LOS C during a peak period. The tables below outline the current lane configuration, width, parking, and results of the LOS calculation. The turning counts were entered into HSC+ software. All the defaults were used in the calculations. Bicycles were treated as vehicles if on the street and pedestrian if on the sidewalk.

Bannock Highway and Johnny Creek



East Bound

South Bound

North Bound

Intersection Description:

Table 7: Bannock Highway and Johnny Creek Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1 TL	1 TR	1 TL 1 TR	NA
Parking	Both sides	Both sides	Both sides	Both sides
Roadway Width	40 Feet	37 Feet	40 Feet	40 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane.

LOS Results

Table 8: Bannock Highway and Johnny Creek Level of Service Summary

Intersection #	Johnny Creek				Private				Bannock Highway				Bannock Highway			
	Eastbound				Westbound				Northbound				Southbound			
36	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	204	0	14	1	0	0	0	0	8	410	0	0	0	106	38	0
Noon Counts	89	0	9	0	0	0	0	0	9	196	0	0	0	178	99	0
PM Counts	70	0	6	0	0	0	0	0	10	141	0	0	0	324	193	0
AM LOS	D								A				A			
AM Delay	30												B			
Noon LOS	A												B			
Noon Delay									13.1				13.7			
PM LOS	A								A				C			
PM Delay													15.9			

Note: Delay in seconds. Grey area represents lack of approach.

South 5th and East Carter Street



West Bound

East Bound

North Bound

Intersection Description:

Table 9: South 5th and East Carter Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1 TL	1 TR	1 TL 1 TR	NA
Parking	Both sides	Both sides	Both sides	Both sides
Roadway Width	40 Feet	40 Feet	40 Feet	40 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane.

LOS Results

Table 10: Level of Service for South 5th and E Carter

Intersection #	E Carter St Eastbound				E Carter St Westbound				South 5th Northbound				South 5th Southbound			
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
107	8	139	0	26	0	34	33	4	0	421	68	3				6
AM Counts	24	87	0	0	0	94	151	0	11	829	118	0				0
Noon Counts	14	132	0	0	0	92	140	1	5	784	85	15				0
PM Counts																
AM LOS	D				B				A							
AM Delay	29.7				13.9											
Noon LOS	F				F				A							
Noon Delay	63.6				70.6											
PM LOS	F				D				A							
PM Delay	58.4				29.9											

Note: Delay in seconds. Grey area represents lack of approach.

Jefferson Avenue and East Maple Street



East Bound



West Bound



South Bound

Intersection Description:

Table 11: Jefferson Ave and E Maple St Intersection Diagram

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1L 1 TR	1L 1 TR	1L 1 TR	1L 1 TR
Parking	Both sides	Both sides	Both sides	Both sides
Roadway Width	48 Feet	48 Feet	37 Feet	37 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 12: Jefferson Ave. and E Maple St. Level of Service

Intersection #	E Maple Eastbound				E Maple Westbound				Jefferson Northbound				Jefferson Southbound			
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	10	11	11	0	8	10	10	0	19	216	3	1	5	425	28	0
Noon Counts	19	15	43	3	7	8	17	2	45	488	7	1	10	471	28	0
PM Counts	33	21	35	1	10	13	16	0	44	616	12	0	19	438	44	1
AM LOS	C				C				A				A			
AM Delay	23.8				24.6											
Noon LOS	D				D				A				A			
Noon Delay	27.9				27.9											
PM LOS	E				E				A				A			
PM Delay	49				35.4											

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Appendix A

North Main Street and West Custer Street



West Bound



East Bound



North Bound

Intersection Description:

Table 13: N Main St and W Custer St Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1TR	1LT	1LT 1 TR	
Parking	Both	Both	West Side only	
Roadway Width	44 Feet	40 Feet	40 Feet	

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 14: N Main St and W Custer St LOS Results

Intersection #	W Custer St				W Custer St				N Main Street				Southbound			
	Eastbound				Westbound				Northbound							
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	156	1	0	1	0	2	1	3	70	457	1	0	0	0	0	4
Noon Counts	157	11	0	0	0	6	4	1	79	600	4	0	0	0	0	0
PM Counts	197	7	0	0	0	9	3	3	141	911	3	0	0	0	0	0
AM LOS	C				B				A							
AM Delay	16.6				13.5											
Noon LOS	C				C				A							
Noon Delay	23.9				16.1											
PM LOS	F				E				A							
PM Delay	279.9				39.8											

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Hawthorne Road and West Quinn



East Bound

West Bound

North Bound

South Bound

Intersection Description:

Table 15: Hawthorne Rd and W Quinn Rd Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1LTR	1 LT 1R	1LTR	1L 1 TR
Parking	No	No	No	No
Roadway Width	36 Feet	24 Feet	24 Feet	53 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 16: Hawthorne Rd and W Quinn LOS Results

Intersection # 608	Quinn St Eastbound				Quinn St Westbound				Hawthorne Northbound				Hawthorne Southbound			
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	31	108	53	0	18	33	26	0	18	79	40	1	76	150	8	0
Noon Counts	36	109	16	1	47	131	72	2	15	173	64	3	60	120	37	2
PM Counts	54	121	84	2	78	206	123	0	27	281	65	0	75	183	75	0
AM LOS	B				B				B				B			
AM Delay	14.16				10.3				11.62				12.09			
Noon LOS	B				B				C				B			
Noon Delay	13.13				12.75				15.38				12.75			
PM LOS	E				D				F				E			
PM Delay	41.41				31.9				71.37				36.03			

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

West Chubbuck Road and Hawthorne Road



East Bound



West Bound



North Bound



South Bound

Intersection Description:

Table 17: W Chubbuck Rd and Hawthorne Rd Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1L 1T 1R	1L 1T 1R	1L 1T 1R	1L 1 TR
Parking	No	No	No	No
Roadway Width	44 Feet	50 Feet	50 Feet	44 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 18: W Chubbuck Rd and Hawthorne Rd LOS Results

Intersection #	E Chubbuck Rd				E Chubbuck Rd				Hawthorne Rd				Hawthorne Rd				
	Eastbound				Westbound				Northbound				Southbound				
660	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	
AM Counts	9	174	35	4	4	32	68	16	3	7	26	56	1	67	67	8	2
Noon Counts	23	199	46	3	106	211	54	4	54	84	54	4	25	79	55	2	
PM Counts	32	229	64	1	139	331	95	1	74	136	126	4	63	91	50	7	
AM LOS	B				A				A				A				
AM Delay	11.8				9.26				9.64				9.59				
Noon LOS	C				C				B				B				
Noon Delay	15.9				15.76				12.62				13.29				
PM LOS	E				F				C				C				
PM Delay	36.26				101.8				24.19				15.76				

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Hiline Road and Flandro Road



West Bound



East Bound



South Bound



North Bound

Intersection Description:

Table 19: Hiline Rd and Flandro Rd Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1LT 1R	1LTR	1LT 1R	1L 1T 1R
Parking	No	No	No	No
Roadway Width	40 Feet	40 Feet	24 Feet	60 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 20: Hiline Rd and Flandro RD LOS Results

Intersection #	Oriida Crt				Hiline Rd				Flandro				Hiline			
	Eastbound				Westbound				Northbound				Southbound			
635	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	6	5	15	0	0	4	105	0	21	155	6	0	228	391	9	0
Noon Counts	7	6	29	0	5	5	113	0	24	256	15	0	134	268	10	0
PM Counts	22	14	47	0	10	0	225	0	5	464	3	0	164	277	3	0
AM LOS	D				B				A				A			
AM Delay	26.3				10.7											
Noon LOS	C				B				A				A			
Noon Delay	15				12.9											
PM LOS	C				C				B				B			
PM Delay	16.6				26.6											

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

North Arthur and West Carson Avenue



West Bound



North Bound



East Bound

Intersection Description:

Table 21: N Arthur Ave and W Carson Ave Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1TR	1LT		1LT 1 RT
Parking	Both	Both	Both	Both
Roadway Width	40 Feet	40 Feet	40 Feet	40 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 22: N Arthur Ave and W Carson Ave LOS Results

Intersection #	W Carson St				W Carson St				N Arthur St				N Arthur St			
	Eastbound				Westbound				Northbound				Southbound			
272	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	0	45	71	0	6	20	0	0	0	0	0	0	11	456	18	0
Noon Counts	0	55	61	0	4	45	0	3	0	0	0	0	6	519	30	2
PM Counts	0	45	60	0	12	75	0	0	0	0	0	0	15	719	31	4
AM LOS	C				C								A			
AM Delay	15.1				15.5											
Noon LOS	B				C								A			
Noon Delay	13.3				15											
PM LOS	F				F								A			
PM Delay	583.5															

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Hiline Road and Pearl Street/El Rancho Street



West Bound



East Bound



North Bound



South Bound

Intersection Description:

Table 23: Hiline Rd and Pearl St/El Rancho St Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1 LTR	1L 1 TR	1LT 1R	1LTR
Parking	No	No	No	No
Roadway Width	38 Feet	35 Feet	40 Feet	35 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 24: Hiline Rd and Pearl St/El Rancho St LOS Results

Intersection #	El Rancho Eastbound				Pearl Westbound				Hiline Rd Northbound				Hiline Rd Southbound			
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
702																
AM Counts	9	7	17	0	0	6	74	1	31	84	2	1	120	286	15	0
Noon Counts	111	7	5	1	14	7	13	0	17	239	13	1	2	291	138	1
PM Counts	19	11	30	0	5	0	162	0	19	414	10	0	167	288	7	0
AM LOS	A				A				B				C			
AM Delay	9.21				9.06				10.18				15.79			
Noon LOS	B				B				C				C			
Noon Delay	12.46				10.25				16.08				24.82			
PM LOS	B				B				F				F			
PM Delay	13.04				14.44				111.75				62.9			

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Yellowstone Highway and Siphon



East Bound

Intersection Description:

Table 25: Yellowstone Hwy and Siphon Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1 LT	1 LRT	1L 1 TR	1L 1 TR
Parking	No	No	No	No
Roadway Width	43 Feet	30 Feet	48 Feet	48 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 26: Yellowstone Hwy and Siphon LOS Results

Intersection #	Siphon St Eastbound				Siphon St Westbound				Yellowstone Northbound				Yellowstone Southbound			
	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
3007																
AM Counts	5	11	33	0	15	4	7	0	16	97	20	0	14	174	3	0
Noon Counts	7	17	46	0	29	18	15	0	48	225	32	0	11	280	15	0
PM Counts	17	23	63	0	15	24	16	0	77	333	30	0	9	268	5	0
AM LOS	B				B				A				A			
AM Delay	11.1				12.5											
Noon LOS	B				C				A				A			
Noon Delay	15				24.4											
PM LOS	C				D				A				A			
PM Delay	17.4				26											

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Jefferson Avenue and East Cedar Street



East Bound



North Bound



South Bound

Intersection Description:

Table 27: Jefferson Ave and E Cedar St Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1L 1 TR		1L 1TR	1TR
Parking	No		No	No
Roadway Width	38 Feet		43 Feet	40 Feet

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 28 Jefferson Ave and E Cedar St LOS Results

Intersection #	E Cedar St				None				Jefferson				Jefferson			
	Eastbound				Westbound				Northbound				Southbound			
512	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	13	0	33	1	0	0	0	0	41	213	0	0	0	237	16	4
Noon Counts	53	0	98	0	0	0	0	0	100	446	0	2	0	410	46	0
PM Counts	70	0	113	3	0	0	0	0	83	608	0	1	0	488	67	1
AM LOS	B								A				A			
AM Delay	12.3															
Noon LOS	C								A				A			
Noon Delay	21.8															
PM LOS	D								A				A			
PM Delay	33.4															

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

North Main Street and West Fremont Street



East Bound



North Bound



West Bound

Intersection Description:

Table 29: N Main St and W Fremont St Intersection Description

	East Bound	West Bound	North Bound	South Bound
Approach Lanes	1 LTR	1 LTR		1LT 1 RT
Parking	Both Sides	Both Sides		Both Sides
Roadway Width	44	40		40

Note: Approach Lanes T = through, L = left turn Lane, and R = right turn lane

LOS Results

Table 30: N Main St and W Fremont St LOS Results

Intersection #	W Fremont				W Fremont				North Main St				Southbound			
	Eastbound				Westbound				Northbound							
197	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds
AM Counts	58	14	0	0	0	8	5	6	55	434	1	9				
Noon Counts	68	12	0	4	0	6	14	22	40	579	11	0				
PM Counts	103	9	0	1	0	8	17	0	62	805	9	4				
AM LOS	C				C				A							
AM Delay	17.5				15.1											
Noon LOS	C				B				A							
Noon Delay	15.4				13											
PM LOS	F				E				A							
PM Delay	94				36.6											

Note: Delay in seconds per vehicle. Grey area represents lack of approach.

Appendix B

Appendix B provides the table used in the warrant analysis. Each table has the data used in the analysis and the results of the 8-hour Condition A, 8-hour Condition B, 4-Hour, and Peak-hour. The results are also reported for 2006 and 2015. The 2015 numbers reflect an 11.78% increase in the 2006 numbers.

Assumptions:

- The data uses 100% numbers except for S 5th and Barton; S 4th and Barton; and Bannock Highway and Johnny Creek.
- Right turn vehicles were not discounted at any intersection.
- 72-hour tube counts were averaged. Where 72-hour did not exist 48-hour tube counts were used.
- Numbers are equivalent numbers from Indiana MUTCD and represent the tables found in the MUTCD.
- The 11.78% growth rate from 2006 to 2015 is the percentage change in all class of roadways with the exception of interstates from the BPO Travel Demand Model.

Appendix B

Table 31: Warrant Analysis Bannock Highway and Johnny Creek

Bannock Highway and Johnny Creek
 Major Street Bannock Hwy (N/S) Number of Lanes = 1
 Minor Street Johnny Creek (E/W) Number of Lanes = 1
 Used 70% formulas

Traffic Counts	Major Approach											Minor Approach										
	North Bound Approach					South Bound Approach						East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
		1-Aug	2-Aug	3-Aug			1-Aug	2-Aug	3-Aug				1-Aug	2-Aug	3-Aug			1-Aug	2-Aug	3-Aug		
1	07:00	224	228	220	224	07:00	86	112	106	101	325	07:00	130	130	131	130	07:00				130	
2	08:00	266	251	252	256	08:00	136	136	133	135	391	08:00	143	145	132	140	08:00				140	
3	09:00	208	193	221	207	09:00	184	132	164	160	367	09:00	106	123	111	113	09:00				113	
4	10:00	211	211	190	204	10:00	188	193	202	194	398	10:00	93	86	92	90	10:00				90	
5	11:00	199	196	167	187	11:00	229	220	228	226	413	11:00	104	100	85	96	11:00				96	
6	12:00	199	203	214	205	12:00	272	281	293	282	487	12:00	90	90	100	93	12:00				93	
7	13:00	186	199	204	196	13:00	233	269	275	259	455	13:00	108	99	93	100	13:00				100	
8	14:00	200	181	179	187	14:00	266	262	257	262	448	14:00	75	66	76	72	14:00				72	
	15:00	184	191	196	190	15:00	282	307	272	287	477	15:00	92	100	90	94	15:00				94	
	16:00	167	194	184	182	16:00	345	329	398	357	539	16:00	84	104	91	93	16:00				93	
	17:00	200	197	223	207	17:00	442	445	464	450	657	17:00	84	82	95	87	17:00				87	
	18:00	179	202	143	175	18:00	379	334	233	315	490	18:00	85	90	78	84	18:00				84	
	19:00	134	149	145	143	19:00	246	254	263	254	397	19:00	73	76	62	70	19:00				70	
	20:00	124	114	102	113	20:00	231	245	165	214	327	20:00	51	49	51	50	20:00				50	

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	657	87
2	18:00	539	93
3	16:00	490	84
4	15:00	487	93
5	14:00	477	94
6	13:00	455	100
7	08:00	448	72
8	19:00	413	96

Highest Four-Hours	
Major Street	Minor Street
657	87
539	93
490	84
487	93

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	657	87	No	Yes
18:00	539	93	No	Yes
16:00	490	84	No	No
15:00	487	93	No	No
12:00	477	94	No	No
11:00	455	100	No	No
13:00	448	72	No	No
14:00	413	96	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	731	97	No	Yes
18:00	600	103	No	Yes
16:00	545	94	No	Yes
15:00	542	104	No	Yes
12:00	531	105	No	Yes
11:00	507	111	Yes	No
13:00	499	80	No	No
14:00	460	107	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	657	87	82	Yes
18:00	539	93	113	No
16:00	490	84	128	No
15:00	487	93	129	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	731	97	68	Yes
18:00	600	103	96	Yes
16:00	545	94	111	No
15:00	542	104	112	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	657	87	170	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	731	97	148	No

Appendix B

Table 32: Warrant Analysis S 5th and Barton

S 5th and Barton Rd
 Major Street S 5th Ave (N/S) Number of Lanes = 2
 Minor Street Barton Rdt (E/W) Number of Lanes = 1
 Used 70% formulas

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach				
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour
	24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul			24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul	
1	12:00	526	453	555	511	12:00				511	12:00	112	131	147	130	12:00	130	96	109	112	130
2	13:00	509	534	480	508	13:00				508	13:00	103	153	127	128	13:00	93	99	113	102	128
3	16:00	511	481	485	492	16:00				492	16:00	128	137	128	131	16:00	157	170	163	163	163
4	14:00	459	474	450	461	14:00				461	14:00	120	143	111	125	14:00	98	103	83	95	125
5	11:00	544	363	458	455	11:00				455	11:00	110	132	101	114	11:00	95	141	101	112	114
6	15:00	436	468	429	444	15:00				444	15:00	109	107	122	113	15:00	86	73	93	84	113
7	17:00	379	470	443	431	17:00				431	17:00	162	194	145	167	17:00	158	167	145	157	167
8	08:00	418	422	413	418	08:00				418	08:00	78	79	84	80	08:00	74	75	68	72	80
	10:00	389	402	420	404	10:00				404	10:00	91	82	84	86	10:00	63	79	65	69	86
	09:00	396	408	346	383	09:00				383	09:00	61	80	77	73	09:00	94	66	66	75	75
	07:00	421	271	409	367	07:00				367	07:00	67	75	49	64	07:00	94	71	67	77	77
	18:00	269	426	374	356	18:00				356	18:00	103	148	98	116	18:00	111	102	82	98	116
	19:00	248	292	328	289	19:00				289	19:00	66	94	91	84	19:00	63	89	70	74	84
	20:00	229	254	303	262	20:00				262	20:00	80	61	80	74	20:00	57	55	51	54	74

Hour

Time of Day	Highest Eight-Hours	
	Major Street	Minor Street
1 17:00	511	130
2 18:00	508	128
3 16:00	492	163
4 15:00	461	125
5 12:00	455	114
6 11:00	444	113
7 13:00	431	167
8 14:00	418	80

Highest Four-Hours	
Major Street	Minor Street
511	130
508	128
492	163
461	125

2006

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	511	130	Yes	No
18:00	508	128	Yes	No
16:00	492	163	Yes	No
15:00	461	125	Yes	No
12:00	455	114	Yes	No
11:00	444	113	Yes	No
13:00	431	167	Yes	No
14:00	418	80	No	No

2015

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	569	145	Yes	No
18:00	565	142	Yes	No
16:00	548	182	Yes	No
15:00	513	139	Yes	No
12:00	506	127	Yes	No
11:00	494	125	Yes	No
13:00	479	186	Yes	No
14:00	465	89	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	511	130	164	No
18:00	508	128	165	No
16:00	492	163	172	No
15:00	461	125	185	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	569	145	142	Yes
18:00	565	142	144	No
16:00	548	182	150	Yes
15:00	513	139	163	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	511	130	280	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	569	145	253	No

Appendix B

Table 33: Warrant Analysis S 4th and Barton

S 4th and Barton Rd
 Major Street S 4th Ave (N/S) Number of Lanes = 2
 Minor Street Barton Rdt (E/W) Number of Lanes = 1
 Used 70% formulas

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach				
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour
	24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul			24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul		24-Jul	25-Jul	26-Jul	
1	07:00				07:00	266	249	274	263	263	07:00	137	158	142	146	07:00	67	75	49	64	146
2	08:00				08:00	316	323	313	317	317	08:00	136	140	133	136	08:00	78	79	84	80	136
3	09:00				09:00	372	347	299	339	339	09:00	100	116	114	110	09:00	61	80	77	73	110
4	10:00				10:00	373	364	399	379	379	10:00	109	123	128	120	10:00	91	82	84	86	120
5	11:00				11:00	461	475	519	485	485	11:00	163	151	167	160	11:00	110	132	101	114	160
6	12:00				12:00	593	585	600	593	593	12:00	171	208	165	181	12:00	112	131	147	130	181
7	13:00				13:00	552	550	567	556	556	13:00	155	165	184	168	13:00	103	153	127	128	168
8	14:00				14:00	548	518	514	527	527	14:00	177	179	140	165	14:00	120	143	111	125	165
	15:00				15:00	520	543	552	538	538	15:00	185	191	139	172	15:00	109	107	122	113	172
	16:00				16:00	593	546	547	562	562	16:00	153	213	217	194	16:00	128	137	128	131	194
	17:00				17:00	598	609	631	613	613	17:00	241	195	191	209	17:00	162	194	145	167	209
	18:00				18:00	456	528	487	490	490	18:00	127	175	161	154	18:00	103	148	98	116	154
	19:00				19:00	387	388	427	401	401	19:00	107	130	147	128	19:00	66	94	91	84	128
	20:00				20:00	365	310	367	347	347	20:00	117	217	151	162	20:00	80	61	80	74	162

Hour

Time of Day	Highest Eight-Hours	
	Major Street	Minor Street
1 17:00	613	209
2 18:00	593	181
3 16:00	562	194
4 15:00	556	168
5 12:00	538	172
6 11:00	527	165
7 13:00	490	154
8 14:00	485	160

Highest Four-Hours	
Major Street	Minor Street
613	209
593	181
562	194
556	168

2006

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	613	209	Yes	No
18:00	593	181	Yes	No
16:00	562	194	Yes	No
15:00	556	168	Yes	No
12:00	538	172	Yes	No
11:00	527	165	Yes	No
13:00	490	154	Yes	No
14:00	485	160	Yes	No

2015

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	682	233	Yes	Yes
18:00	660	202	Yes	Yes
16:00	625	216	Yes	No
15:00	619	187	Yes	No
12:00	599	191	Yes	No
11:00	586	184	Yes	No
13:00	546	172	Yes	No
14:00	540	178	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	613	209	128	Yes
18:00	593	181	134	Yes
16:00	562	194	145	Yes
15:00	556	168	147	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	682	233	107	Yes
18:00	660	202	113	Yes
16:00	625	216	123	Yes
15:00	619	187	125	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	613	209	234	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	682	233	206	Yes

Appendix B

Table 34: Warrant Analysis S 4th and E Carter

S 4th Ave and E Carter St
 Major Street S 4th Ave (N/S) Number of Lanes = 2
 Minor Street E Carter St (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					East Bound Approach					West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	3-Oct	4-Oct	5-Oct		3-Oct	4-Oct	5-Oct				3-Oct	4-Oct	5-Oct		3-Oct	4-Oct	5-Oct					
1	07:00					07:00	686	632		659	659	07:00	25	22		24	07:00	36	55		46	46
2	08:00					08:00	789	650		720	720	08:00	20	22		21	08:00	85	54		70	70
3	09:00					09:00	551	972		762	762	09:00	15	19		17	09:00	102	70		86	86
4	10:00					10:00	588	627		608	608	10:00	18	12		15	10:00	75	86		81	81
5	11:00					11:00	664	671		668	668	11:00	23	16		20	11:00	82	67		75	75
6	12:00					12:00	901	970		936	936	12:00	15	24		20	12:00	91	106		99	99
7	13:00					13:00	873	779		826	826	13:00	15	31		23	13:00	70	58		64	64
8	14:00					14:00	829	790		810	810	14:00	21	18		20	14:00	65	69		67	67
	15:00					15:00	1175	863		1019	1019	15:00	24	21		23	15:00	74	76		75	75
	16:00					16:00	1201	748		975	975	16:00	31	21		26	16:00	83	58		71	71
	17:00					17:00	1444	904		1174	1174	17:00	21	27		24	17:00	65	96		81	81
	18:00					18:00	1237	837		1037	1037	18:00	48	24		36	18:00	74	65		70	70
	19:00					19:00	913	627		770	770	19:00	23	20		22	19:00	58	51		55	55
	20:00					20:00	718	430		574	574	20:00	17	12		15	20:00	63	47		55	55

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	1174	81
2	18:00	1037	70
3	16:00	1019	75
4	15:00	975	71
5	14:00	936	99
6	13:00	826	64
7	08:00	810	67
8	19:00	770	55

Hour	Highest Four-Hours	
	Major Street	Minor Street
1	1174	81
2	1037	70
3	1019	75
4	975	71

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1174	81	No	Yes
18:00	1037	70	No	No
16:00	1019	75	No	No
15:00	975	71	No	No
12:00	936	99	No	Yes
11:00	826	64	No	No
13:00	810	67	No	No
14:00	770	55	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1174	81	115	No
18:00	1037	70	134	No
16:00	1019	75	138	No
15:00	975	71	150	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1174	81	227	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1306	90	No	Yes
18:00	1154	77	No	Yes
16:00	1134	83	No	Yes
15:00	1084	78	No	Yes
12:00	1041	110	No	Yes
11:00	919	71	No	No
13:00	901	75	No	No
14:00	857	61	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1306	90	115	No
18:00	1154	77	115	No
16:00	1134	83	112	No
15:00	1084	78	122	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1306	90	188	No

Appendix B

Table 35: Warrant Analysis S 5th and E Carter

5th Avenue and E Carter Street
 Major Street S 5th Ave (N/S) Number of Lanes = 2
 Minor Street E Carter St (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach												
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach	
1	07:00			520	497	509	07:00				509	07:00	118	131	142	130	07:00			81	88	85	130
2	08:00			660	635	648	08:00				648	08:00	143	141	148	144	08:00			140	124	132	144
3	09:00			596	559	578	09:00				578	09:00	165	167	175	169	09:00			165	156	161	169
4	10:00			662	695	679	10:00				679	10:00	201	200	205	202	10:00			164	182	173	202
5	11:00			737	738	738	11:00				738	11:00	232	209	209	217	11:00			228	221	225	225
6	12:00			968	1044	1006	12:00				1006	12:00	261	288	263	264	12:00			276	259	268	268
7	13:00			911	845	878	13:00				878	13:00	237	265	233	245	13:00			194	176	185	245
8	14:00			806	855	831	14:00				831	14:00	275	256	256	262	14:00			315	221	268	268
	15:00			904	956	930	15:00				930	15:00	261	234	268	254	15:00			429	235	332	332
	16:00			936	927	932	16:00				932	16:00	329	295	303	309	16:00			324	210	267	309
	17:00			859	910	885	17:00				885	17:00	352	370	404	375	17:00			210	241	226	375
	18:00			716	757	737	18:00				737	18:00	297	329	274	300	18:00			186	185	186	300
	19:00			576	537	557	19:00				557	19:00	235	248	240	241	19:00			154	155	155	241
	20:00			461	382	422	20:00				422	20:00	207	230	216	218	20:00			190	159	175	218

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	1006	268
2	18:00	932	309
3	16:00	930	332
4	15:00	885	375
5	12:00	878	245
6	11:00	831	268
7	13:00	738	225
8	14:00	737	300

Highest Four-Hours	
Major Street	Minor Street
1006	268
932	309
930	332
885	375

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1006	268	Yes	Yes
18:00	932	309	Yes	Yes
16:00	930	332	Yes	Yes
15:00	885	375	Yes	No
12:00	878	245	Yes	No
11:00	831	268	Yes	No
13:00	738	225	Yes	No
14:00	737	300	Yes	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1119	298	Yes	Yes
18:00	1037	344	Yes	Yes
16:00	1035	369	Yes	Yes
15:00	984	418	Yes	Yes
12:00	977	273	Yes	Yes
11:00	924	298	Yes	Yes
13:00	821	250	Yes	No
14:00	820	334	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1006	268	142	Yes
18:00	932	309	163	Yes
16:00	930	332	163	Yes
15:00	885	375	177	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1119	298	115	Yes
18:00	1037	344	134	Yes
16:00	1035	369	134	Yes
15:00	984	418	147	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1006	268	285	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1119	298	245	Yes

Appendix B

Table 36: Warrant Analysis Main and W Fremont

N Main Street and W Fremont St
 Major Street N Main Street (N/S) Number of Lanes = 2
 Minor Street W Fremont (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					East Bound Approach					West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	24-Oct	25-Oct	26-Oct			24-Oct	25-Oct	26-Oct				24-Oct	25-Oct	26-Oct		24-Oct	25-Oct	26-Oct				
1	07:00	400	354	382	379	07:00					379	07:00	66	56	51	58	07:00	7	10	14	10	58
2	08:00	512	579	531	541	08:00					541	08:00	103	97	98	99	08:00	24	15	24	21	99
3	09:00	390	367	390	382	09:00					382	09:00	57	61	48	55	09:00	16	6	7	10	55
4	10:00	461	469	484	471	10:00					471	10:00	68	61	59	63	10:00	17	15	15	16	63
5	11:00	562	578	551	564	11:00					564	11:00	62	62	49	58	11:00	18	15	20	18	58
6	12:00	672	704	649	675	12:00					675	12:00	96	96	100	97	12:00	24	23	24	24	97
7	13:00	616	346	646	536	13:00					536	13:00	82	93	88	88	13:00	22	25	18	22	88
8	14:00	650	623	668	647	14:00					647	14:00	70	72	83	75	14:00	13	27	19	20	75
	15:00	870	777	843	830	15:00					830	15:00	106	128	109	114	15:00	26	27	27	27	114
	16:00	809	742	786	779	16:00					779	16:00	100	80	107	96	16:00	23	36	21	27	96
	17:00	896	829	873	866	17:00					866	17:00	90	110	99	100	17:00	29	38	30	32	100
	18:00	534	538	554	542	18:00					542	18:00	99	93	86	93	18:00	25	13	23	20	93
	19:00	406	379	424	403	19:00					403	19:00	84	63	68	72	19:00	9	12	11	11	72
	20:00	293	325	342	320	20:00					320	20:00	56	50	48	51	20:00	6	9	10	8	51

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	866	100
2	18:00	830	114
3	16:00	779	96
4	15:00	675	97
5	12:00	647	75
6	11:00	564	58
7	13:00	542	93
8	14:00	541	99

Highest Four-Hours	
Major Street	Minor Street
866	100
830	114
779	96
675	97

2006				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	866	100	No	No
18:00	830	114	No	No
16:00	779	96	No	No
15:00	675	97	No	No
12:00	647	75	No	No
11:00	564	58	No	No
13:00	542	93	No	No
14:00	541	99	No	No

2015				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	964	111	No	Yes
18:00	924	127	No	Yes
16:00	867	106	No	No
15:00	751	108	No	No
12:00	720	83	No	No
11:00	627	64	No	No
13:00	603	103	No	No
14:00	602	111	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	866	100	183	No
18:00	830	114	196	No
16:00	779	96	214	No
15:00	675	97	256	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	964	111	153	No
18:00	924	127	165	No
16:00	867	106	183	No
15:00	751	108	225	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	866	100	341	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	964	111	302	No

Appendix B

Table 37: Warrant Analysis Arthur and W Fremont

N Arthur Street and W Fremont St
 Major Street N Arthur Street (N/S) Number of Lanes = 2
 Minor Street W Fremont (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					East Bound Approach					West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	24-Oct	25-Oct	26-Oct			24-Oct	25-Oct	26-Oct				24-Oct	25-Oct	26-Oct		24-Oct	25-Oct	26-Oct				
1	08:00					08:00	624	720	685	676	676	08:00	199			199	08:00	56	68	68	64	199
2	17:00					17:00	626	684	716	675	675	17:00	150			150	17:00	79	72	84	78	150
3	15:00					15:00	702	634	661	666	666	15:00	168			168	15:00	97	97	87	94	168
4	16:00					16:00	641	635	625	634	634	16:00	148			148	16:00	62	57	74	64	148
5	13:00					13:00	569	576	554	566	566	13:00	181			181	13:00	68	69	57	65	181
6	12:00					12:00	527	589	569	562	562	12:00	157			157	12:00	61	59	67	62	157
7	18:00					18:00	522	545	554	540	540	18:00	117			117	18:00	63	65	55	61	117
8	14:00					14:00	512	551	514	526	526	14:00	186			186	14:00	55	53	55	54	186
	10:00					10:00	464	475	460	466	466	10:00	88			88	10:00	43	38	41	41	88
	11:00					11:00	479	445	452	459	459	11:00	95			95	11:00	45	32	37	38	95
	07:00					07:00	462	467	438	456	456	07:00	128			128	07:00	38	39	42	40	128
	09:00					09:00	397	362	403	387	387	09:00	117			117	09:00	32	25	23	27	117
	19:00					19:00	375	357	382	371	371	19:00	86			86	19:00	45	40	44	43	86
	20:00					20:00	266	255	277	266	266	20:00	89			89	20:00	20	40	37	32	89

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	676	199
2	18:00	675	150
3	16:00	666	168
4	15:00	634	148
5	12:00	566	181
6	11:00	562	157
7	13:00	540	117
8	14:00	526	186

Highest Four-Hours	
Major Street	Minor Street
676	199
675	150
666	168
634	148

2006				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	676	199	Yes	No
18:00	675	150	No	No
16:00	666	168	Yes	No
15:00	634	148	No	No
12:00	566	181	No	No
11:00	562	157	No	No
13:00	540	117	No	No
14:00	526	186	No	No

2015				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	753	221	Yes	No
18:00	752	167	Yes	No
16:00	741	187	Yes	No
15:00	705	165	Yes	No
12:00	630	201	Yes	No
11:00	625	175	Yes	No
13:00	601	130	No	No
14:00	585	207	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	676	199	255	No
18:00	675	150	256	No
16:00	666	168	260	No
15:00	634	148	274	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	753	221	224	No
18:00	752	167	225	No
16:00	741	187	229	No
15:00	705	165	243	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	676	199	428	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	753	221	392	No

Appendix B

Table 38: Warrant Analysis Jefferson and Maple

Jefferson St and E Maple
 Major Street Jefferson St (N/S) Number of Lanes = 1
 Minor Street E Maple St (E/W) Number of Lanes = 1

Traffic Counts	Major Approach											Minor Approach										
	North Bound Approach					South Bound Approach						East Bound Approach				West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
1	07:00	219	221	242	227	07:00	549	368	382	433	660	07:00	58	60	64	61	07:00	23	16	34	24	61
2	08:00	314	268	296	293	08:00	587	424	411	474	767	08:00	69	53	60	61	08:00	44	27	38	36	61
3	09:00	348	286	325	320	09:00	429	398	399	405	725	09:00	58	61	48	56	09:00	43	25	32	33	56
4	10:00	398	369	354	374	10:00	440	385	424	416	790	10:00	63	63	62	63	10:00	32	22	51	35	63
5	11:00	463	474	475	471	11:00	462	400	447	436	907	11:00	82	67	77	75	11:00	41	26	46	38	75
6	12:00	528	509	546	528	12:00	549	461	500	503	1031	12:00	76	102	84	87	12:00	53	27	39	40	87
7	13:00	479	453	468	467	13:00	541	518	554	538	1004	13:00	90	99	100	96	13:00	64	31	44	46	96
8	14:00	485	499	506	497	14:00	503	459	466	476	973	14:00	66	101	76	81	14:00	66	65	31	54	81
	15:00	532	571	589	564	15:00	483	492	512	496	1060	15:00	78	80	90	83	15:00	67	33	46	49	83
	16:00	657	639	586	627	16:00	508	486	503	499	1126	16:00	93	88	89	90	16:00	65	39	34	46	90
	17:00	715	669	665	683	17:00	563	540	547	550	1233	17:00	85	108	90	94	17:00	90	42	53	62	94
	18:00	488	479	463	477	18:00	472	440	414	442	919	18:00	86	95	60	80	18:00	47	39	38	41	80
	19:00	378	336	413	376	19:00	337	311	368	339	714	19:00	69	74	78	74	19:00	36	41	28	35	74
	20:00	320	338	313	324	20:00	330	276	286	297	621	20:00	75	59	61	65	20:00	34	19	27	27	65

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	1233	94
2	18:00	1126	90
3	16:00	1060	83
4	15:00	1031	87
5	14:00	1004	96
6	13:00	973	81
7	08:00	919	80
8	19:00	907	75

Highest Four-Hours	
Major Street	Minor Street
1233	94
1126	90
1060	83
1031	87

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1233	94	No	Yes
18:00	1126	90	No	Yes
16:00	1060	83	No	Yes
15:00	1031	87	No	Yes
12:00	1004	96	No	Yes
11:00	973	81	No	Yes
13:00	919	80	No	Yes
14:00	907	75	No	Yes

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1372	105	No	Yes
18:00	1253	100	No	Yes
16:00	1179	92	No	Yes
15:00	1147	97	No	Yes
12:00	1118	107	No	Yes
11:00	1082	90	No	Yes
13:00	1022	89	No	Yes
14:00	1009	84	No	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1233	94	80	Yes
18:00	1126	90	113	No
16:00	1060	83	128	No
15:00	1031	87	135	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1372	105	80	Yes
18:00	1253	100	80	Yes
16:00	1179	92	80	Yes
15:00	1147	97	80	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1233	94	115	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1372	105	115	No

Appendix B

Table 39: Warrant Analysis Main and Custer

N Main Street & W Custer Street
 Major Street N Main Street (N/S) Number of Lanes = 2
 Minor Street W Custer Street (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour
	17-Oct	18-Oct	19-Oct		17-Oct	18-Oct	19-Oct			17-Oct	18-Oct	19-Oct		25-Oct	25-Oct	26-Oct					
1	07:00	453	412	436	434	07:00				434	07:00	176	163	182	174	07:00	9	18	8	12	174
2	08:00	578	587	573	579	08:00				579	08:00	187	199	210	199	08:00	0	13	13	9	199
3	09:00	467	466	442	458	09:00				458	09:00	140	105	94	113	09:00	0	6	10	5	113
4	10:00	544	541	508	531	10:00				531	10:00	115	124	114	118	10:00	0	10	8	6	118
5	11:00	621	598	615	611	11:00				611	11:00	132	136	120	129	11:00	11	26	19	19	129
6	12:00	745	806	768	773	12:00				773	12:00	152	149	156	152	12:00	22	19	18	20	152
7	13:00	693	726	681	700	13:00				700	13:00	162	137	128	142	13:00	25	23	12	20	142
8	14:00	671	955	743	790	14:00				790	14:00	158	177	152	162	14:00	28	18	13	20	162
	15:00	952	870	950	924	15:00				924	15:00	177	209	218	201	15:00	14	18	44	25	201
	16:00	844	1043	946	944	16:00				944	16:00	161	173	176	170	16:00	9	23	12	15	170
	17:00	1037	678	958	891	17:00				891	17:00	209	219	176	201	17:00	8	15	22	15	201
	18:00	701	505	605	604	18:00				604	18:00	182	168	163	171	18:00	7	14	16	12	171
	19:00	478	520	511	503	19:00				503	19:00	120	123	123	122	19:00	10	11	12	11	122
	20:00	373	448	393	405	20:00				405	20:00	82	106	137	108	20:00	5	16	0	7	108

Hour	Highest Eight-Hours	
	Major Street	Minor Street
1	944	170
2	924	201
3	891	201
4	790	162
5	773	152
6	700	142
7	611	129
8	604	171

Highest Four-Hours	
Major Street	Minor Street
944	170
924	201
891	201
790	162

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	944	170	Yes	Yes
18:00	924	201	Yes	Yes
16:00	891	201	Yes	No
15:00	790	162	Yes	No
12:00	773	152	Yes	No
11:00	700	142	No	No
13:00	611	129	No	No
14:00	604	171	Yes	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1051	189	Yes	Yes
18:00	1028	224	Yes	Yes
16:00	992	224	Yes	Yes
15:00	879	181	Yes	No
12:00	860	170	Yes	No
11:00	779	158	Yes	No
13:00	680	144	No	No
14:00	672	190	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	944	170	159	Yes
18:00	924	201	165	Yes
16:00	891	201	175	Yes
15:00	790	162	210	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1051	189	130	Yes
18:00	1028	224	136	Yes
16:00	992	224	145	Yes
15:00	879	181	179	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	944	170	309	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1051	189	269	No

Appendix B

Table 40: Warrant Analysis Arthur and Carson

N Arthur Street and W Carson
 Major Street N Arthur St (N/S) Number of Lanes = 2
 Minor Street W Carson (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	17-Oct	18-Oct	19-Oct		17-Oct	18-Oct	19-Oct			17-Oct	18-Oct	19-Oct		17-Oct	18-Oct	19-Oct		17-Oct	18-Oct	19-Oct		
1	07:00				07:00	471	440	249	387	387	07:00	135	134	122	130	07:00		26	29	33	29	130
2	08:00				08:00	622	692	604	639	639	08:00	116	142	146	135	08:00		37	32	28	32	135
3	09:00				09:00	380	400	384	388	388	09:00	101	98	93	97	09:00		40	39	37	37	97
4	10:00				10:00	451	453	489	464	464	10:00	74	87	102	88	10:00		32	41	55	43	88
5	11:00				11:00	546	563	523	544	544	11:00	95	92	96	94	11:00		50	41	37	43	94
6	12:00				12:00	657	561	581	600	600	12:00	125	116	119	120	12:00		58	46	59	54	120
7	13:00				13:00	580	629	638	616	616	13:00	102	107	124	111	13:00		54	60	44	53	111
8	14:00				14:00	735	613	607	652	652	14:00	149	113	121	128	14:00		56	54	56	55	128
	15:00				15:00	714	740	723	726	726	15:00	116	108	100	108	15:00		69	58	67	65	108
	16:00				16:00	867	786	753	802	802	16:00	139	117	114	123	16:00		68	40	59	56	123
	17:00				17:00	650	883	822	785	785	17:00	116	152	132	133	17:00		85	60	73	73	133
	18:00				18:00	530	675	711	639	639	18:00	119	128	136	128	18:00		60	58	37	52	128
	19:00				19:00	388	488	478	451	451	19:00	78	86	77	80	19:00		37	37	40	38	80
	20:00				20:00	270	379	347	332	332	20:00	84	59	76	73	20:00		38	42	39	40	73

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	802	123
2	18:00	785	133
3	16:00	726	108
4	15:00	652	128
5	14:00	639	135
6	13:00	639	128
7	08:00	616	111
8	19:00	600	120

Highest Four-Hours	
Major Street	Minor Street
802	123
785	133
726	108
652	128

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	802	123	No	No
18:00	785	133	No	No
16:00	726	108	No	No
15:00	652	128	No	No
12:00	639	135	No	No
11:00	639	128	No	No
13:00	616	111	No	No
14:00	600	120	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	892	137	No	No
18:00	874	148	No	No
16:00	808	120	No	No
15:00	725	142	No	No
12:00	711	150	No	No
11:00	711	142	No	No
13:00	685	124	No	No
14:00	667	134	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	802	123	206	No
18:00	785	133	212	No
16:00	726	108	235	No
15:00	652	128	266	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	892	137	175	No
18:00	874	148	181	No
16:00	808	120	204	No
15:00	725	142	235	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	802	123	369	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	892	137	330	No

Appendix B

Table 41: Warrant Analysis McKinley and Maple

McKinley and Maple
 Major Street McKinley (N/S) Number of Lanes = 1
 Minor Street W Maple (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach				
	Time	Date		Average Hour	Time	Date		Average Hour	Time	Date		Average Hour	Time	Date		Average Hour	Time	Date		Average Hour	Highest Approach
		6-Feb	7-Feb			6-Feb	7-Feb				6-Feb			7-Feb	6-Feb			7-Feb	6-Feb		
1	15:00	235	233	234	15:00	213	177	195	429	15:00	132			132	15:00	219	222	221	221		
2	16:00	241	231	236	16:00	187	184	186	422	16:00	126			126	16:00	189	185	187	187		
3	12:00	206	244	225	12:00	168	155	162	387	12:00	123			123	12:00	191	188	190	190		
4	17:00	177	234	206	17:00	170	177	174	379	17:00	128			128	17:00	232	233	233	233		
5	14:00	197	213	205	14:00	153	151	152	357	14:00	95			95	14:00	148	135	142	142		
6	13:00	210	179	195	13:00	166	150	158	353	13:00	117			117	13:00	153	181	167	167		
7	11:00	211	195	203	11:00	113	135	124	327	11:00	101			101	11:00	135	144	140	140		
8	08:00	132	150	141	08:00	181	174	178	319	08:00	93			93	08:00	158	149	154	154		
	18:00	124	191	158	18:00	149	112	131	288	18:00	73			73	18:00	151	156	154	154		
	10:00	161	166	164	10:00	105	109	107	271	10:00	56			56	10:00	114	125	120	120		
	09:00	118	123	121	09:00	107	106	107	227	09:00	93			93	09:00	107	124	116	116		
	19:00	93	115	104	19:00	71	82	77	181	19:00	45			45	19:00	93	111	102	102		
	07:00	74	79	77	07:00	92	106	99	176	07:00	71			71	07:00	109	123	116	116		
	20:00	71	88	80	20:00	50	54	52	132	20:00	27			27	20:00	58	83	71	71		

Hour

Time of Day	Highest Eight-Hours	
	Major Street	Minor Street
1 17:00	429	221
2 18:00	422	187
3 16:00	387	190
4 15:00	379	233
5 14:00	357	142
6 13:00	353	167
7 08:00	327	140
8 19:00	319	154

Highest Four-Hours	
Major Street	Minor Street
429	221
422	187
387	190
379	233

2006

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	429	221	No	No
18:00	422	187	No	No
16:00	387	190	No	No
15:00	379	233	No	No
12:00	357	142	No	No
11:00	353	167	No	No
13:00	327	140	No	No
14:00	319	154	No	No

2015

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	477	245	No	No
18:00	469	208	No	No
16:00	430	211	No	No
15:00	422	259	No	No
12:00	397	157	No	No
11:00	392	186	No	No
13:00	364	155	No	No
14:00	354	171	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	429	221	375	No
18:00	422	187	379	No
16:00	387	190	398	No
15:00	379	233	402	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	477	245	349	No
18:00	469	208	353	No
16:00	430	211	374	No
15:00	422	259	379	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	429	221	560	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	477	245	532	No

Appendix B

Table 42: Warrant Analysis Main and Kraft

N Main Street and Kraft Rd
 Major Street Main Street (N/S) Number of Lanes = 2
 Minor Street Kraft Rd (E/W) Number of Lanes = 1

Traffic Counts	Major Approach											Minor Approach										
	North Bound Approach					South Bound Approach						East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
		12-Sep	13-Sep	14-Sep			12-Sep	13-Sep	14-Sep				12-Sep	13-Sep	14-Sep			12-Sep	13-Sep	14-Sep		
1	07:00	287	293	298	293	07:00	310	326	315	317	610	07:00	35	43	30	36	07:00				36	
2	08:00	289	291	276	285	08:00	396	434	394	408	693	08:00	45	57	52	51	08:00				51	
3	09:00	200	226	227	218	09:00	206	221	196	208	425	09:00	24	29	36	30	09:00				30	
4	10:00	280	237	324	280	10:00	271	268	256	265	545	10:00	30	26	38	31	10:00				31	
5	11:00	279	250	247	259	11:00	251	285	283	273	532	11:00	24	29	60	38	11:00				38	
6	12:00	311	350	305	322	12:00	317	284	310	304	626	12:00	50	37	45	44	12:00				44	
7	13:00	290	310	393	331	13:00	321	313	294	309	640	13:00	47	60	50	52	13:00				52	
8	14:00	309	328	323	320	14:00	328	297	324	316	636	14:00	35	50	70	52	14:00				52	
9	15:00	422	407	456	428	15:00	363	358	361	361	789	15:00	36	43	57	45	15:00				45	
10	16:00	406	420	432	419	16:00	375	431	345	384	803	16:00	38	49	66	51	16:00				51	
11	17:00	480	552	534	522	17:00	419	401	449	423	945	17:00	46	50	50	49	17:00				49	
12	18:00	368	402	369	380	18:00	360	381	365	369	748	18:00	25	39	51	38	18:00				38	
13	19:00	323	261	323	302	19:00	241	314	261	272	574	19:00	30	33	36	33	19:00				33	
14	20:00	201	217	189	202	20:00	227	283	195	235	437	20:00	21	21	37	26	20:00				26	

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	945	49
2	18:00	803	51
3	16:00	789	45
4	15:00	748	38
5	14:00	693	51
6	13:00	640	52
7	08:00	636	52
8	19:00	626	44

Highest Four-Hours		
Time of Day	Major Street	Minor Street
17:00	945	49
18:00	803	51
16:00	789	45
15:00	748	38

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	945	49	No	No
18:00	803	51	No	No
16:00	789	45	No	No
15:00	748	38	No	No
12:00	693	51	No	No
11:00	640	52	No	No
13:00	636	52	No	No
14:00	626	44	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1052	54	No	No
18:00	894	57	No	No
16:00	878	50	No	No
15:00	833	43	No	No
12:00	772	57	No	No
11:00	713	58	No	No
13:00	708	57	No	No
14:00	696	49	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	945	49	159	No
18:00	803	51	205	No
16:00	789	45	210	No
15:00	748	38	226	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1052	54	130	No
18:00	894	57	174	No
16:00	878	50	179	No
15:00	833	43	195	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	945	49	309	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1052	54	269	No

Appendix B

Table 43: Warrant Analysis McKinley and W Pine St

McKinley and W Pine St
 Major Street McKinley Ave (N/S) Number of Lanes = 1
 Minor Street W Pine St (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	26-Jun	27-Jun	28-Jun		26-Jun	27-Jun	28-Jun			26-Jun	27-Jun	28-Jun		26-Jun	27-Jun	28-Jun		26-Jun	27-Jun	28-Jun		
1	07:00	59	50	55	07:00	80	78	94	84	139	07:00	31	43	53	42	07:00	31	33	94	53	53	
2	08:00	79	87	83	08:00	101	99	88	96	179	08:00	40	56	58	51	08:00	51	60	58	56	56	
3	09:00	100	98	99	09:00	95	111	114	107	206	09:00	42	42	45	43	09:00	60	88	52	67	67	
4	10:00	102	104	103	10:00	100	110	96	102	205	10:00	35	39	48	41	10:00	56	79	77	71	71	
5	11:00	53	30	42	11:00	120	120	158	133	174	11:00	79	46	49	58	11:00	98	121	87	102	102	
6	12:00	111	85	98	12:00	132	166	144	147	245	12:00	106	51	47	68	12:00	111	138	115	121	121	
7	13:00	71	93	82	13:00	131	155	145	144	226	13:00	102	73	45	73	13:00	96	113	90	100	100	
8	14:00	115	103	109	14:00	148	141	133	141	250	14:00	84	45	58	62	14:00	85	131	108	108	108	
	15:00	126	101	114	15:00	149	159	158	155	269	15:00	95	48	52	65	15:00	99	113	119	110	110	
	16:00	141	117	129	16:00	136	145	143	141	270	16:00	91	48	61	67	16:00	95	146	173	138	138	
	17:00	168	157	163	17:00	167	185	154	169	331	17:00	105	56	61	74	17:00	147	158	177	161	161	
	18:00	126	132	129	18:00	123	132	126	127	256	18:00	54	41	43	46	18:00	125	97	97	106	106	
	19:00	108	112	110	19:00	106	103	99	103	213	19:00	38	47	34	40	19:00	108	78	116	101	101	
	20:00	83	80	82	20:00	79	91	86	85	167	20:00	35	33	29	32	20:00	77	74	65	72	72	

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	331	161
2	18:00	270	138
3	16:00	269	110
4	15:00	256	106
5	14:00	250	108
6	13:00	245	121
7	08:00	226	100
8	19:00	213	101

Highest Four-Hours	
Major Street	Minor Street
331	161
270	138
269	110
256	106

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	331	161	No	No
18:00	270	138	No	No
16:00	269	110	No	No
15:00	256	106	No	No
12:00	250	108	No	No
11:00	245	121	No	No
13:00	226	100	No	No
14:00	213	101	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	369	179	No	No
18:00	301	154	No	No
16:00	299	123	No	No
15:00	285	118	No	No
12:00	278	120	No	No
11:00	273	135	No	No
13:00	251	111	No	No
14:00	237	112	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	331	161	343	No
18:00	270	138	467	No
16:00	269	110	468	No
15:00	256	106	476	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	369	179	323	No
18:00	301	154	448	No
16:00	299	123	449	No
15:00	285	118	458	No

Appendix B

Table 44: Warrant Analysis Jefferson and E Cedar St.

Jefferson and E Cedar Street
 Major Street Jefferson Ave (N/S) Number of Lanes = 1
 Minor Street Cedar Street (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	23-Oct	24-Oct	25-Oct		23-Oct	24-Oct	25-Oct			23-Oct	24-Oct	25-Oct		23-Oct	24-Oct	25-Oct		23-Oct	24-Oct	25-Oct		
1	07:00	325	313	319	07:00	438	397	376	404	723	07:00	60	61	55	59	07:00						59
2	08:00	419	396	408	08:00	495	519	516	510	918	08:00	90	94	81	88	08:00						88
3	09:00	331	307	319	09:00	393	343	430	389	708	09:00	83	69	80	77	09:00						77
4	10:00	360	338	349	10:00	396	375	368	380	729	10:00	100	98	75	91	10:00						91
5	11:00	544	495	520	11:00	427	486	494	469	989	11:00	97	137	114	116	11:00						116
6	12:00	527	550	539	12:00	502	559	526	529	1068	12:00	173	153	153	160	12:00						160
7	13:00	491	465	478	13:00	503	511	482	499	977	13:00	173	174	166	171	13:00						171
8	14:00	621	505	563	14:00	480	494	572	515	1078	14:00	169	147	143	153	14:00						153
	15:00	632	596	614	15:00	583	573	635	597	1211	15:00	160	151	148	153	15:00						153
	16:00	734	658	696	16:00	556	550	670	592	1288	16:00	159	184	178	174	16:00						174
	17:00	806	730	768	17:00	662	593	713	656	1424	17:00	202	191	183	192	17:00						192
	18:00	546	540	543	18:00	533	519	595	549	1092	18:00	197	191	165	184	18:00						184
	19:00	412	389	401	19:00	396	329	464	396	797	19:00	129	132	144	135	19:00						135
	20:00	309	297	303	20:00	334	214	374	307	610	20:00	104	123	114	114	20:00						114

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	1424	192
2	18:00	1288	174
3	16:00	1211	153
4	15:00	1092	184
5	14:00	1078	153
6	13:00	1068	160
7	08:00	989	116
8	19:00	977	171

Hour	Time of Day	Highest Four-Hours	
		Major Street	Minor Street
1	17:00	1424	192
2	18:00	1288	174
3	16:00	1211	153
4	15:00	1092	184

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1424	192	Yes	Yes
18:00	1288	174	Yes	Yes
16:00	1211	153	Yes	Yes
15:00	1092	184	Yes	Yes
12:00	1078	153	Yes	Yes
11:00	1068	160	Yes	Yes
13:00	989	116	No	Yes
14:00	977	171	Yes	Yes

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1585	214	Yes	Yes
18:00	1433	193	Yes	Yes
16:00	1348	170	Yes	Yes
15:00	1215	205	Yes	Yes
12:00	1200	170	Yes	Yes
11:00	1188	178	Yes	Yes
13:00	1100	129	No	Yes
14:00	1087	190	Yes	Yes

Time of Day	Highest Four-Hours			Standard	Meets
	Major Street	Minor Street			
17:00	1424	192	80	Yes	
18:00	1288	174	80	Yes	
16:00	1211	153	80	Yes	
15:00	1092	184	51	Yes	

Time of Day	Highest Four-Hours			Standard	Meets
	Major Street	Minor Street			
17:00	1585	214	80	Yes	
18:00	1433	193	80	Yes	
16:00	1348	170	80	Yes	
15:00	1215	205	80	Yes	

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1424	192	120	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1585	214	100	Yes

Appendix B

Table 45: Warrant Analysis W Cedar St. and McKinley Ave

W Cedar and McKinley
 Major Street W Cedar Ave (E/W) Number of Lanes = 1
 Minor Street McKinley St (N/S) Number of Lanes = 1

Traffic Counts	Major Approach											Minor Approach										
	East Bound Approach					West Bound Approach						North Bound Approach					South Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	26-Jun	27-Jun	28-Jun			26-Jun	27-Jun	28-Jun				26-Jun	27-Jun	28-Jun		26-Jun	27-Jun	28-Jun				
1	07:00	109	101	126	112	07:00	56	66	77	66	178	07:00	69	59	71	66	07:00	69	77	87	78	78
2	08:00	140	130	125	132	08:00	76	115	102	98	229	08:00	93	101	109	101	08:00	91	91	80	87	101
3	09:00	110	155	139	135	09:00	147	189	1115	484	618	09:00	96	112	115	108	09:00	111	107	102	107	108
4	10:00	154	154	164	157	10:00	224	248	157	210	367	10:00	123	124	131	126	10:00	103	108	91	101	126
5	11:00	171	155	195	174	11:00	280	172	181	211	385	11:00	180	167	160	169	11:00	111	118	139	123	169
6	12:00	202	204	213	206	12:00	360	187	240	262	469	12:00	190	197	204	197	12:00	128	135	148	137	197
7	13:00	170	203	172	182	13:00	383	251	210	281	463	13:00	140	168	165	158	13:00	118	149	147	138	158
8	14:00	182	164	197	181	14:00	364	262	225	284	465	14:00	171	128	150	150	14:00	127	125	121	124	150
9	15:00	170	180	213	188	15:00	323	216	226	255	443	15:00	149	180	155	161	15:00	122	141	128	130	161
10	16:00	200	217	188	202	16:00	373	234	244	284	485	16:00	195	193	177	188	16:00	126	127	132	128	188
11	17:00	218	217	225	220	17:00	627	285	257	390	610	17:00	202	209	203	205	17:00	158	149	132	146	205
12	18:00	164	177	155	165	18:00	239	178	210	209	374	18:00	154	137	139	143	18:00	121	128	125	125	143
13	19:00	126	121	109	119	19:00	178	156	153	162	281	19:00	122	134	113	123	19:00	104	98	89	97	123
14	20:00	100	94	101	98	20:00	194	128	142	155	253	20:00	107	96	77	93	20:00	75	95	79	83	93

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	618	108
2	18:00	610	205
3	16:00	485	188
4	15:00	469	197
5	14:00	465	150
6	13:00	463	158
7	08:00	443	161
8	19:00	385	169

Highest Four-Hours		
Time of Day	Major Street	Minor Street
1	618	108
2	610	205
3	485	188
4	469	197

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	618	108	No	No
18:00	610	205	Yes	No
16:00	485	188	No	No
15:00	469	197	No	No
12:00	465	150	No	No
11:00	463	158	No	No
13:00	443	161	No	No
14:00	385	169	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	688	120	No	No
18:00	678	228	Yes	No
16:00	540	210	Yes	No
15:00	522	219	Yes	No
12:00	517	167	Yes	No
11:00	515	175	Yes	No
13:00	493	180	No	No
14:00	428	188	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	618	108	201	No
18:00	610	205	284	No
16:00	485	188	345	No
15:00	469	197	353	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	688	120	173	No
18:00	678	228	177	Yes
16:00	540	210	236	No
15:00	522	219	245	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	618	108	281	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	688	120	250	No

Appendix B

Table 46: Warrant Analysis Yellowstone Ave and Pearl St.

Yellowstone and Pearl
 Major Street Yellowstone (N/S) Number of Lanes = 2
 Minor Street Pearl (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach													
	North Bound Approach					South Bound Approach					East Bound Approach				West Bound Approach									
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach		
	3-Jan	4-Jan	5-Jan		3-Jan	4-Jan	5-Jan				3-Jan	4-Jan	5-Jan		3-Jan	4-Jan	5-Jan							
1	13:00	1188	1117	1267	1191	13:00	1117	1018	1077	1071	2261	13:00							0	13:00	119	128	124	124
2	16:00	1209	1123	1136	1156	16:00	1074	1032	1088	1065	2221	16:00							0	16:00	125	152	139	139
3	12:00	1140	1088	1035	1088	12:00	1143	1059	1031	1078	2165	12:00							0	12:00	130	121	126	126
4	14:00	1165	1092	1102	1120	14:00	1094	1004	1009	1036	2155	14:00							0	14:00	136	113	125	125
5	15:00	1190	1078	1109	1126	15:00	1127	944	1008	1026	2152	15:00							0	15:00	155	136	146	146
6	17:00	1077	1100	1119	1099	17:00	1042	1021	982	1015	2114	17:00							0	17:00	157	166	162	162
7	11:00	1007	931	957	965	11:00	951	823	862	879	1844	11:00							0	11:00	102	80	91	91
8	18:00	790	775	774	780	18:00	742	759	807	769	1549	18:00							0	18:00	193	169	181	181
	10:00	829	743	739	770	10:00	782	683	682	716	1486	10:00							0	10:00	96	93	95	95
	19:00	629	582	660	624	19:00	562	570	572	568	1192	19:00							0	19:00	115	99	107	107
	09:00	611	524	536	557	09:00	647	517	563	576	1133	09:00							0	09:00	107	120	114	114
	08:00	493	431	433	452	08:00	580	530	580	563	1016	08:00							0	08:00	237	228	233	233
	20:00	428	389	450	422	20:00	433	413	467	438	860	20:00							0	20:00	66	69	68	68
	07:00	304	325	279	303	07:00	407	438	396	414	716	07:00							0	07:00	178	182	180	180

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	13:00	2261	124
2	16:00	2221	139
3	12:00	2165	126
4	14:00	2155	125
5	15:00	2152	146
6	17:00	2114	162
7	11:00	1844	91
8	18:00	1549	181

Highest Four-Hours	
Major Street	Minor Street
2261	124
2221	139
2165	126
2155	125

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
13:00	2261	124	No	Yes
16:00	2221	139	No	Yes
12:00	2165	126	No	Yes
14:00	2155	125	No	Yes
15:00	2152	146	No	Yes
17:00	2114	162	Yes	Yes
11:00	1844	91	No	Yes
18:00	1549	181	Yes	Yes

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	2516	137	No	Yes
18:00	2471	154	Yes	Yes
16:00	2410	140	No	Yes
15:00	2398	139	No	Yes
12:00	2395	162	Yes	Yes
11:00	2352	180	Yes	Yes
13:00	2052	101	No	Yes
14:00	1724	201	Yes	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	2261	124	115	Yes
18:00	2221	139	115	Yes
16:00	2165	126	115	Yes
15:00	2155	125	115	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	2516	137	115	Yes
18:00	2471	154	115	Yes
16:00	2410	140	115	Yes
15:00	2398	139	115	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	2261	124	150	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	2516	137	150	No

Appendix B

Table 47: Warrant Analysis Hawthorne Rd. and W Quinn Rd

Hawthorne Rd and W Quinn Rd
 Major Street Hawthorne (N/S) Number of Lanes = 1
 Minor Street E Quinn Rd (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
1	07:00	4-Oct	5-Oct	6-Oct	164	07:00	4-Oct	5-Oct	6-Oct	250	413	07:00	4-Oct	5-Oct	6-Oct	219	07:00	4-Oct	5-Oct	6-Oct	95	219
2	08:00	203	209		206	08:00	271	257		264	470	08:00	178	175		177	08:00	106	105		106	177
3	09:00	186	162		174	09:00	176	168		172	346	09:00	128	141		135	09:00	127	141		134	135
4	10:00	185	159		172	10:00	190	177		184	356	10:00	138	144		141	10:00	145	138		142	142
5	11:00	190	223		207	11:00	193	204		199	405	11:00	127	146		137	11:00	183	178		181	181
6	12:00	238	239		239	12:00	225	200		213	451	12:00	162	194		178	12:00	231	250		241	241
7	13:00	218	245		232	13:00	244	242		243	475	13:00	156	171		164	13:00	203	212		208	208
8	14:00	303	259		281	14:00	217	233		225	506	14:00	170	182		176	14:00	254	231		243	243
	15:00	282	309		296	15:00	269	294		282	577	15:00	173	183		178	15:00	275	264		270	270
	16:00	357	333		345	16:00	293	281		287	632	16:00	194	187		191	16:00	284	306		295	295
	17:00	405	394		400	17:00	342	326		334	734	17:00	226	206		216	17:00	371	359		365	365
	18:00	343	324		334	18:00	337	279		308	642	18:00	205	238		222	18:00	328	281		305	305
	19:00	252	262		257	19:00	200	207		204	461	19:00	165	171		168	19:00	215	226		221	221
	20:00	173	153		163	20:00	132	136		134	297	20:00	98	99		99	20:00	194	166		180	180

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	734	365
2	18:00	642	305
3	16:00	632	295
4	15:00	577	270
5	14:00	506	243
6	13:00	475	208
7	08:00	470	177
8	19:00	461	221

Highest Four-Hours	
Major Street	Minor Street
734	365
642	305
632	295
577	270

Time of Day	2006 Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	734	365	Yes	No
18:00	642	305	Yes	No
16:00	632	295	Yes	No
15:00	577	270	Yes	No
12:00	506	243	Yes	No
11:00	475	208	No	No
13:00	470	177	No	No
14:00	461	221	No	No

Time of Day	2015 Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	816	406	Yes	Yes
18:00	714	339	Yes	No
16:00	703	328	Yes	No
15:00	642	300	Yes	No
12:00	563	270	Yes	No
11:00	528	231	Yes	No
13:00	523	196	Yes	No
14:00	512	245	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	734	365	155	Yes
18:00	642	305	192	Yes
16:00	632	295	196	Yes
15:00	577	270	219	Yes

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	816	406	126	Yes
18:00	714	339	163	Yes
16:00	703	328	167	Yes
15:00	642	300	191	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	734	365	318	Yes

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	816	406	283	Yes

Appendix B

Table 48: Warrant Analysis Hiline Rd. and El Rancho

Flandro and Hiline
 Major Street Flandro (N/S) Number of Lanes = 1
 Minor Street E Pine St (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach				
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour
	13-Jun	14-Jun	15-Jun		13-Jun	14-Jun	15-Jun			13-Jun	14-Jun	15-Jun			13-Jun	14-Jun	15-Jun				
1	17:00	263	374	347	328	17:00	448	459	426	444	772	17:00				17:00	230	194	162	195	195
2	13:00	347	328	353	343	13:00	430	420	437	429	772	13:00				13:00	148	147	181	159	159
3	12:00	302	334	378	338	12:00	376	412	415	401	739	12:00				12:00	174	149	154	159	159
4	15:00	351	342	389	361	15:00	343	366	410	373	734	15:00				15:00	163	145	195	168	168
5	16:00	337	336	331	335	16:00	400	401	396	399	734	16:00				16:00	186	198	224	203	203
6	14:00	324	316	383	341	14:00	391	351	392	378	719	14:00				14:00	140	141	161	147	147
7	11:00	298	312	307	306	11:00	357	391	342	363	669	11:00				11:00	125	111	167	134	134
8	08:00	336	320	336	331	08:00	424	111	376	304	634	08:00				08:00	95	89	108	97	97
	10:00	287	257	322	289	10:00	342	290	333	322	610	10:00				10:00	99	105	127	110	110
	07:00	296	306	321	308	07:00	397	156	257	270	578	07:00				07:00	67	78	85	77	77
	18:00	168	237	376	260	18:00	353	291	239	294	555	18:00				18:00	179	133	139	150	150
	09:00	266	260	286	271	09:00	359	146	326	277	548	09:00				09:00	81	76	88	82	82
	19:00	130	176	200	169	19:00	242	241	214	232	401	19:00				19:00	115	112	101	109	109
	20:00	92	152	168	137	20:00	212	220	228	220	357	20:00				20:00	105	114	97	105	105

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	772	195
2	18:00	772	159
3	16:00	739	159
4	15:00	734	168
5	14:00	734	203
6	13:00	719	147
7	08:00	669	134
8	19:00	634	97

Hour	Time of Day	Highest Four-Hours	
		Major Street	Minor Street
		772	195
		772	159
		739	159
		734	168

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	772	195	Yes	Yes
18:00	772	159	Yes	Yes
16:00	739	159	Yes	No
15:00	734	168	Yes	No
12:00	734	203	Yes	No
11:00	719	147	No	No
13:00	669	134	No	No
14:00	634	97	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	859	217	Yes	Yes
18:00	859	177	Yes	Yes
16:00	822	177	Yes	Yes
15:00	816	187	Yes	Yes
12:00	816	226	Yes	Yes
11:00	800	164	Yes	Yes
13:00	744	149	No	No
14:00	706	108	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	772	195	141	Yes
18:00	772	159	217	No
16:00	739	159	230	No
15:00	734	168	232	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	859	217	112	Yes
18:00	859	177	217	No
16:00	822	177	230	No
15:00	816	187	232	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	772	195	217	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	859	217	217	Yes

Appendix B

Table 49: Warrant Analysis Olympus Drive and Butte St

Olympus Drive and Butte Street
 Major Street Olympus Dr (N/S) Number of Lanes = 1
 Minor Street Butte (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach										
	North Bound Approach					South Bound Approach					East Bound Approach				West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour
	16-May	17-May	18-May		07:00	16-May	17-May	18-May				16-May	17-May	18-May		07:00	16-May	17-May	18-May		
1	07:00	114	121	127	121	07:00	308	288	287	294	415	07:00				07:00	201	203	207	204	204
2	08:00	213	219	208	213	08:00	413	452	416	427	640	08:00				08:00	235	198	186	206	206
3	09:00	123	139	127	130	09:00	143	140	154	146	275	09:00				09:00	80	117	96	98	98
4	10:00	152	146	148	149	10:00	114	148	110	124	273	10:00				10:00	100	90	99	96	96
5	11:00	210	187	188	195	11:00	156	135	151	147	342	11:00				11:00	111	102	107	107	107
6	12:00	278	280	270	276	12:00	163	141	149	151	427	12:00				12:00	110	126	130	122	122
7	13:00	205	238	209	217	13:00	201	175	166	181	398	13:00				13:00	105	105	125	112	112
8	14:00	252	263	240	252	14:00	165	155	267	196	447	14:00				14:00	129	134	133	132	132
	15:00	479	478	495	484	15:00	214	206	403	274	758	15:00				15:00	140	136	145	140	140
	16:00	385	397	331	371	16:00	217	221	215	218	589	16:00				16:00	139	149	142	143	143
	17:00	434	506	432	457	17:00	255	297	323	292	749	17:00				17:00	155	162	173	163	163
	18:00	291	329	317	312	18:00	225	264	314	268	580	18:00				18:00	164	128	142	145	145
	19:00	229	298	253	260	19:00	189	167	291	216	476	19:00				19:00	92	108	108	103	103
	20:00	299	214	221	245	20:00	141	103	117	120	365	20:00				20:00	97	80	86	88	88

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	758	140
2	18:00	749	163
3	16:00	640	206
4	15:00	589	143
5	14:00	580	145
6	13:00	476	103
7	08:00	447	132
8	19:00	427	122

Highest Four-Hours		
Time of Day	Major Street	Minor Street
17:00	758	140
18:00	749	163
16:00	640	206
15:00	589	143

2006				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	758	140	No	Yes
18:00	749	163	Yes	No
16:00	640	206	Yes	No
15:00	589	143	No	No
12:00	580	145	No	No
11:00	476	103	No	No
13:00	447	132	No	No
14:00	427	122	No	No

2015				
Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	844	156	Yes	Yes
18:00	833	182	Yes	Yes
16:00	713	230	Yes	No
15:00	655	160	Yes	No
12:00	645	161	Yes	No
11:00	529	114	No	No
13:00	498	147	No	No
14:00	475	136	No	No

Highest Four-Hours				
Time of Day	Major Street	Minor Street	Standard	Meets
17:00	758	140	146	No
18:00	749	163	149	Yes
16:00	640	206	192	Yes
15:00	589	143	214	No

Highest Four-Hours				
Time of Day	Major Street	Minor Street	Standard	Meets
17:00	844	156	117	Yes
18:00	833	182	120	Yes
16:00	713	230	163	Yes
15:00	655	160	186	No

Peak Hour				
Time of Day	Major Street	Minor Street	Standard	Meets
17:00	758	140	307	No

Peak Hour				
Time of Day	Major Street	Minor Street	Standard	Meets
17:00	844	156	272	No

Appendix B

Table 50: Warrant Analysis W Chubbuck and Hawthorne Rd

W Chubbuck and Hawthorne
 Major Street Chubbuck (E/W) Number of Lanes = 2
 Minor Street Hawthorne (N/S) Number of Lanes = 2

Traffic Counts	Major Approach											Minor Approach									
	East Bound Approach					West Bound Approach						North Bound Approach					South Bound Approach				
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour
	11-Jul	12-Jul	13-Jul			11-Jul	12-Jul	13-Jul				11-Jul	12-Jul	13-Jul		11-Jul	12-Jul	13-Jul			
1	07:00	315	313	283	304	07:00	165	151	149	155	459	07:00	118	131	142	130	07:00	175	169	153	166
2	08:00	275	270	287	277	08:00	224	233	212	223	500	08:00	143	141	148	144	08:00	144	156	152	151
3	09:00	230	236	274	247	09:00	260	260	259	260	506	09:00	165	167	175	169	09:00	116	114	125	118
4	10:00	301	293	267	287	10:00	258	305	299	287	574	10:00	201	200	205	202	10:00	166	143	129	146
5	11:00	340	312	319	324	11:00	332	284	327	314	638	11:00	232	209	209	217	11:00	157	148	165	157
6	12:00	256	259	310	275	12:00	368	393	368	376	651	12:00	261	268	263	264	12:00	158	176	162	165
7	13:00	268	265	263	265	13:00	324	345	394	354	620	13:00	237	265	233	245	13:00	153	196	151	167
8	14:00	277	255	259	264	14:00	347	344	335	342	606	14:00	275	256	256	262	14:00	163	139	148	150
9	15:00	271	272	270	271	15:00	397	382	391	390	661	15:00	261	234	268	254	15:00	144	152	166	154
10	16:00	335	258	290	294	16:00	497	486	457	480	774	16:00	329	295	303	309	16:00	166	181	162	170
11	17:00	344	305	320	323	17:00	578	537	607	574	897	17:00	352	370	404	375	17:00	151	179	186	172
12	18:00	297	330	307	311	18:00	493	471	443	469	780	18:00	297	329	274	300	18:00	187	169	181	179
13	19:00	230	268	238	245	19:00	359	372	346	359	604	19:00	235	248	240	241	19:00	119	130	128	126
14	20:00	262	212	277	250	20:00	312	344	357	338	588	20:00	207	230	216	218	20:00	134	112	108	118

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	897	375
2	18:00	780	300
3	16:00	774	309
4	15:00	661	254
5	12:00	651	264
6	11:00	638	217
7	13:00	620	245
8	14:00	606	262

Highest Four-Hours	
Major Street	Minor Street
897	375
780	300
774	309
661	254

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	897	375	Yes	No
18:00	780	300	Yes	No
16:00	774	309	Yes	No
15:00	661	254	Yes	No
12:00	651	264	Yes	No
11:00	638	217	Yes	No
13:00	620	245	Yes	No
14:00	606	262	Yes	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	998	418	Yes	Yes
18:00	868	334	Yes	No
16:00	862	344	Yes	No
15:00	736	283	Yes	No
12:00	725	294	Yes	No
11:00	710	241	Yes	No
13:00	690	273	Yes	No
14:00	674	292	Yes	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	897	375	241	Yes
18:00	780	300	294	Yes
16:00	774	309	297	Yes
15:00	661	254	358	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	998	418	241	Yes
18:00	868	334	294	Yes
16:00	862	344	297	Yes
15:00	736	283	358	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	897	375	428	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	998	418	428	No

Appendix B

Table 51: Warrant Analysis Yellowstone Hwy and Siphon Rd

Yellowstone and Siphon
 Major Street Yellowstone (N/S) Number of Lanes = 1
 Minor Street Siphon Rd (E/W) Number of Lanes = 1

Traffic Counts	Major Approach											Minor Approach										
	North Bound Approach					South Bound Approach						East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	24-Oct	25-Oct	26-Oct		24-Oct	25-Oct	26-Oct				24-Oct	25-Oct	26-Oct		24-Oct	25-Oct	26-Oct		24-Oct	25-Oct	26-Oct	
1	07:00	331	313	311	318	07:00	308	339	291	313	631	07:00	125	120	118	121	07:00	0	0	0	0	121
2	08:00	398	345	403	382	08:00	291	310	268	290	672	08:00	99	110	97	102	08:00	0	0	0	0	102
3	09:00	346	302	355	334	09:00	218	210	208	212	546	09:00	82	70	90	81	09:00	0	0	0	0	81
4	10:00	314	333	333	327	10:00	225	215	196	212	539	10:00	68	81	64	71	10:00	0	0	0	0	71
5	11:00	376	359	321	352	11:00	275	235	222	244	596	11:00	80	79	85	81	11:00	0	0	0	0	81
6	12:00	426	523	462	470	12:00	270	245	292	269	739	12:00	82	87	114	94	12:00	0	0	0	0	94
7	13:00	361	529	370	420	13:00	235	209	210	218	638	13:00	68	87	61	72	13:00	0	0	0	0	72
8	14:00	423	534	435	464	14:00	256	239	244	246	710	14:00	73	86	68	76	14:00	0	0	0	0	76
	15:00	453	521	433	469	15:00	259	253	243	252	721	15:00	89	85	117	97	15:00	0	0	0	0	97
	16:00	580	556	521	552	16:00	294	281	280	285	837	16:00	92	90	113	98	16:00	0	0	0	0	98
	17:00	599	636	602	612	17:00	302	298	300	300	912	17:00	99	87	114	100	17:00	0	0	0	0	100
	18:00	473	527	491	497	18:00	279	240	269	263	760	18:00	91	73	83	82	18:00	0	0	0	0	82
	19:00	336	327	238	300	19:00	183	172	176	177	477	19:00	61	53	55	56	19:00	0	0	0	0	56
	20:00	238	264	255	252	20:00	108	139	113	120	372	20:00	53	35	33	40	20:00	0	0	0	0	40

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	912	100
2	18:00	837	98
3	16:00	760	82
4	15:00	739	94
5	14:00	721	97
6	13:00	710	76
7	08:00	672	102
8	19:00	638	72

Highest Four-Hours		
Major Street	Minor Street	
912	100	
837	98	
760	82	
739	94	

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	912	100	No	Yes
18:00	837	98	No	Yes
16:00	760	82	No	Yes
15:00	739	94	No	No
12:00	721	97	No	No
11:00	710	76	No	No
13:00	672	102	No	No
14:00	638	72	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	1015	111	No	Yes
18:00	932	109	No	Yes
16:00	845	92	No	Yes
15:00	823	105	No	Yes
12:00	802	108	No	Yes
11:00	790	84	No	Yes
13:00	747	114	No	No
14:00	710	80	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	912	100	96	Yes
18:00	837	98	119	No
16:00	760	82	146	No
15:00	739	94	153	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	1015	111	68	Yes
18:00	932	109	90	Yes
16:00	845	92	116	No
15:00	823	105	124	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	912	100	247	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	1015	111	212	No

Appendix B

Table 52: Warrant Analysis Philbin and Tyhee

Philbin and Tyhee
 Major Street N Philbin (N/S) Number of Lanes = 1
 Minor Street Tyhee (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					Total Approach	East Bound Approach					West Bound Approach					
	Time	Date			Average Hour	Time	Date			Average Hour		Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	7-Jul	8-Jul	9-Jul		7-Jul	8-Jul	9-Jul			7-Jul	8-Jul	9-Jul		7-Jul	8-Jul	9-Jul		7-Jul	8-Jul	9-Jul		
1	07:00	13	30	31	25	07:00	26		33	30	54	07:00	5	17	11		07:00	6	17	20	14	14
2	08:00	22	32	33	29	08:00	39		40	40	69	08:00	10	13	10		08:00	9	19	18	15	15
3	09:00	21	19	55	32	09:00	38		32	35	67	09:00	10	16	21		09:00	18	17	36	24	24
4	10:00	28	35	47	37	10:00	35		32	34	70	10:00	12	15	23		10:00	10	21	35	22	22
5	11:00	31	47	37	38	11:00	31		27	29	67	11:00	14	15	17		11:00	20	29	23	24	24
6	12:00	27	35	29	30	12:00	37		40	39	69	12:00	14	17	35		12:00	18	16	39	24	24
7	13:00	33	44	33	37	13:00	70		28	49	86	13:00	13	18	20		13:00	22	25	19	22	22
8	14:00	20	33	41	31	14:00	50		23	37	68	14:00	18	15	19		14:00	18	23	20	20	20
	15:00	27	42	53	41	15:00	21		32	27	67	15:00	20	31	19		15:00	24	25	16	22	22
	16:00	25	78	64	55	16:00	35		34	35	90	16:00	28	28	22		16:00	24	36	34	31	31
	17:00	38	56	78	57	17:00	13		42	28	85	17:00	18	28	43		17:00	31	40	44	38	38
	18:00	47	55	70	57	18:00			32	32	89	18:00	13	20	28		18:00	19	23	34	25	25
	19:00	25	47	34	35	19:00			34	34	69	19:00	8	13	29		19:00	18	18	43	26	26
	20:00	16	38	28	27	20:00			29	29	56	20:00	5	22	19		20:00	6	26	25	19	19

Hour	Time of Day	Highest Eight-Hours	
		Major Street	Minor Street
1	17:00	90	31
2	18:00	89	25
3	16:00	86	22
4	15:00	85	38
5	14:00	70	22
6	13:00	69	26
7	08:00	69	24
8	19:00	69	15

Highest Four-Hours	
Major Street	Minor Street
90	31
89	25
86	22
85	38

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	90	31	No	No
18:00	89	25	No	No
16:00	86	22	No	No
15:00	85	38	No	No
12:00	70	22	No	No
11:00	69	26	No	No
13:00	69	24	No	No
14:00	69	15	No	No

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	100	35	No	No
18:00	99	28	No	No
16:00	95	24	No	No
15:00	94	43	No	No
12:00	78	24	No	No
11:00	77	29	No	No
13:00	77	27	No	No
14:00	76	17	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	90	31	492	No
18:00	89	25	492	No
16:00	86	22	495	No
15:00	85	38	495	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	100	35	485	No
18:00	99	28	485	No
16:00	95	24	488	No
15:00	94	43	489	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	90	31	689	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	100	35	682	No

Appendix B

Table 53: Warrant Analysis Philbin and West Chubbuck

Philbin and W Chubbuck
 Major Street Philbin (N/S) Number of Lanes = 1
 Minor Street E Chubbuck Rd (E/W) Number of Lanes = 1

Traffic Counts	Major Approach										Minor Approach											
	North Bound Approach					South Bound Approach					East Bound Approach					West Bound Approach						
	Time	Date			Average Hour	Time	Date			Average Hour	Total Approach	Time	Date			Average Hour	Time	Date			Average Hour	Highest Approach
	12-Sep	13-Sep	14-Sep			12-Sep	13-Sep	14-Sep				12-Sep	13-Sep	14-Sep			12-Sep	13-Sep	14-Sep			
1	07:00	135	187	123	148	07:00	76	94	93	88	236	07:00	44	49	45	46	07:00	154	166		160	160
2	08:00	136	185	115	145	08:00	87	69	63	73	218	08:00	50	55	41	49	08:00	152	145		149	149
3	09:00	126	161	111	133	09:00	61	69	82	71	203	09:00	36	37	40	38	09:00	85	105		95	95
4	10:00	126	138	98	121	10:00	61	84	58	68	188	10:00	49	36	51	45	10:00	99	113		106	106
5	11:00	143	78	112	111	11:00	75	65	71	70	181	11:00	59	49	60	56	11:00	116	99		108	108
6	12:00	179	170	142	164	12:00	87	107	96	97	260	12:00	73	72	61	69	12:00	128	149		139	139
7	13:00	185	172	149	169	13:00	113	112	104	110	278	13:00	57	49	59	55	13:00	140	130		135	135
8	14:00	188	145	147	160	14:00	109	103	113	108	268	14:00	58	60	60	59	14:00	134	132		133	133
	15:00	219	184	183	195	15:00	96	112	123	110	306	15:00	72	63	82	72	15:00	161	137		149	149
	16:00	240	224	243	236	16:00	143	136	149	143	378	16:00	62	75	51	63	16:00	164	151		158	158
	17:00	292	281	277	283	17:00	159	168	170	166	449	17:00	72	70	50	64	17:00	134	160		147	147
	18:00	175	202	196	191	18:00	137	152	137	142	333	18:00	58	49	37	48	18:00	141	113		127	127
	19:00	126	143	132	134	19:00	109	102	111	107	241	19:00	52	54	28	45	19:00	106	183		145	145
	20:00	109	124	102	112	20:00	77	85	75	79	191	20:00	52	33	11	32	20:00	103	217		160	160

Hour

Time of Day	Highest Eight-Hours	
	Major Street	Minor Street
1 17:00	449	147
2 18:00	378	158
3 16:00	333	127
4 15:00	306	149
5 14:00	278	135
6 13:00	268	133
7 08:00	260	139
8 19:00	241	145

Highest Four-Hours	
Major Street	Minor Street
449	147
378	158
333	127
306	149

2006

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	449	147	No	No
18:00	378	158	No	No
16:00	333	127	No	No
15:00	306	149	No	No
12:00	278	135	No	No
11:00	268	133	No	No
13:00	260	139	No	No
14:00	241	145	No	No

2015

Time of Day	Highest Eight-Hours		Condition	
	Major Street	Minor Street	1-A	1-B
17:00	500	164	No	No
18:00	421	175	No	No
16:00	371	141	No	No
15:00	340	166	No	No
12:00	310	150	No	No
11:00	299	148	No	No
13:00	290	154	No	No
14:00	268	161	No	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	449	147	280	No
18:00	378	158	317	No
16:00	333	127	342	No
15:00	306	149	358	No

Time of Day	Highest Four-Hours			
	Major Street	Minor Street	Standard	Meets
17:00	500	164	255	No
18:00	421	175	295	No
16:00	371	141	322	No
15:00	340	166	338	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	449	147	459	No

Time of Day	Peak Hour			
	Major Street	Minor Street	Standard	Meets
17:00	500	164	432	No