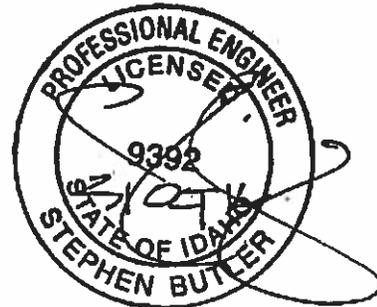
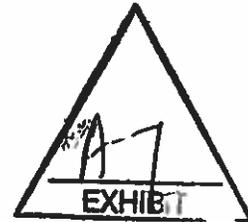


# Croy Creek Road: Preliminary Left Turn Lane Warrant Analysis

*Prepared for:*  
**Animal Shelter of the Wood River Valley**

September 9, 2016  
*Revised October 31, 2016*

**Benchmark Associates, P.A.**



**Benchmark Associates, P. A.**  
PO Box 733, Ketchum, Idaho 83340  
Phone 208-726-9512 • [www.benchmark-associates.com](http://www.benchmark-associates.com)



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*Appendix B:* Blaine County Traffic Data, Monday, Jun 30, 2014- Monday, July 7, 2014



## **I. Introduction**

Per the Blaine County Engineer's request, our engineering department has prepared a preliminary study of existing and proposed traffic conditions at 101 Croy Creek Road (Croy Canyon Ranch #1, Lot 1) in Blaine County to determine if a left turn lane is warranted to accommodate the proposed replacement of the existing Animal Shelter with a new, larger Animal Shelter west of Hailey, ID. The proposed facility construction is anticipated to begin in the spring of 2017 with a fall 2018 completion date. Benchmark Associates utilized visitor attendance and staff day-time occupancy to conclude that a left turn lane is not required on Croy Creek Road to serve the proposed Animal Shelter facility.

## **II. Background Conditions**

Existing traffic counts were requested from the Blaine County Road and Bridge department. Counts were collected in 2008, 2011 and 2014 at two locations on Croy Creek Road: west of the Big Wood River (BWR) Bridge and Carbonate Trail Head and at the end of asphalt paving. 2008 data was collected between Tuesday, April 22<sup>nd</sup> and Tuesday, April 29<sup>th</sup>, 2011 data was collected between Tuesday, July 26<sup>th</sup> and Thursday, August 18<sup>th</sup>. 2014 data was collected between Monday, June 30<sup>th</sup> and Monday, July 7<sup>th</sup>. Only 2008 and 2014 data was collected at the BWR Bridge. See attached for the reports received from the Blaine County Road and Bridge Department on September 1<sup>st</sup>, 2016.

The proposed Animal Shelter is located approximately 0.9 miles from the above described data collection site west of the BWR Bridge and Carbonate Trail Head and approximately 2.9 miles from the end of asphalt paving on Croy Creek Road. Data collected west of the BWR and Carbonate Trail Head was utilized for the purpose of this study because of the proposed site's proximity to the collection site and the assumption that a majority of proposed staff and visitor traffic will be traveling to the site from Hailey.

Noticeable outliers recorded on Sunday, July 6<sup>th</sup> 2014 between 20:00 and 22:00 were discarded from the data set. These counts were two to three times larger than the peak traffic volumes recorded during all other one hour periods and were not consistent with the time periods of other peak volumes.

Benchmark Associates calculated the average daily traffic (ADT) for two-way traffic in 2008 and 2014. An average directional factor (D) was calculated for AM and PM traffic separately, and the directional design hourly volume (DDHV) was calculated using the largest directional factor, the east-bound AM portion. The design hourly volume (DHV) was calculated using a K-factor of 0.151 based upon exhibit 3-9 in the Highway Capacity Manual 2010. After comparing these calculated DDHVs with the actual data collected in both years and both directions, the K-factor was reduced to 0.11 to better fit the actual traffic counts conducted by Blaine County. The peak hourly volume collected in 2008 was 48 vehicles and in 2014 was 54 vehicles; both volumes are within 1 vehicle of the DDHV when a K-factor of 0.11 is used. See Table 1 on page 2 for a summary of this data.

**Table 1: Background Traffic Analysis**

		<i>2008 Traffic Data</i>	<i>2014 Traffic Data</i>
1	Average Daily Traffic (ADT )	660 vehicles	826 vehicles
2	Design Hourly Volume (DHV )	100 vph	125 vph
3	AM Directional Factor (D)	0.61/0.39	0.59/0.41
4	PM Directional Factor (D)	0.45/0.55	0.46/0.54
5	Directional Design Hourly Volume (DDHV) K=0.151	61 vph	73 vph
6	Directional Design Hourly Volume (DDHV) K=0.11	48 vph	53 vph

A linear growth rate of 1.7%, calculated using data from row 6, was used to determine future DDHVs by scaling the 2014 vehicle counts. For the purpose of this study, 2018 and 2023 DDHV will be used to determine if a left turn lane is warranted to access the proposed Animal Shelter. The probable project completion year is 2018. A 2023 design horizon year was chosen because the facility is expected to be functioning at a foreseeable peak staff and visitor capacity within five years. See Table 2 below for background volumes used in this analysis.

**Table 2: Design Hourly Volumes**

	2018 (Construction Completion)	2023 (5-Year Design Horizon)
Directional Design Hourly Volume (DDHV) K=0.11	57 vehicles	62 vehicles

### **III. Project Conditions**

The proposed Animal Shelter's anticipated traffic includes staff, deliveries, and visitor volumes. Visitor and staff traffic will enter the site using separate driveways. According to Animal Shelter staff, existing staff volumes are approximately 18 individuals. Staff has also projected the need for 28 staff parking spaces and 30 visitor parking spaces for the new facility which will replace the existing facility. Staff volumes in 2018 when the new facility is completed are anticipated to be 30% higher than existing. The larger facility will produce approximately 36% more staff volume when at the foreseeable peak staff employment which is expected to be reached by the year 2023. Based upon the current building layout by I.B.C. occupancy type, a total of 119 parking spaces are required; however, comparisons with similar sized animal shelter facilities show that 70-80 spaces are sufficient to serve the proposed uses. 40 visitor, 30 staff (including volunteers), and 40 overflow event parking spaces are proposed. Events may occur after 5 PM up to six times per year, according the Animal Shelter staff, and would host as many as 350 people. Because there is an extensive 300'+/- driveway available for queuing during these events, project traffic volumes will not include proposed event traffic volumes.

Though a small portion of staff and visitor traffic may enter the site from the west, this study assumes all traffic will enter the site from the east and exit to the east. Animal Shelter staff provided a summary of staff arrival and departure times which are depicted in the project traffic volumes. Table 3 on page 4 shows the anticipated staff AM and PM peak traffic volumes entering (west-bound left turns) and exiting (east-bound right-turns) the proposed site.

**Table 3: Approximate Weekday Project Staff Traffic Volumes (Foreseeable Capacity of Proposed Facility-2023)**

	West-Bound Traffic (Left Turns)		East-Bound Traffic	
	2018	2023	2018	2023
08:00-09:00 (AM)	20 (20 Staff)	23 (23 Staff)	0	0
09:00-10:00	2 (2 Staff)	2 (2 Staff)	0	0
10:00-11:00	6 (5 Visitors, 1 Volunteers)			
11:00-12:00	6 (5 Visitors, 1 Volunteers)			
12:00-13:00 (PM)	6 (5 Visitors, 1 Volunteers)	6 (5 Visitors, 1 Volunteers)	16 (5 Visitors, 1 Volunteers, 10 Staff)	16 (5 Visitors, 1 Volunteers, 10 Staff)
13:00-14:00	16 (5 Visitors, 1 Volunteers, 10 Staff)	16 (5 Visitors, 1 Volunteers, 10 Staff)	6 (5 Visitors, 1 Volunteers)	6 (5 Visitors, 1 Volunteers)
14:00-15:00	6 (5 Visitors, 1 Volunteers)			
15:00-16:00	6 (5 Visitors, 1 Volunteers)			
16:00-17:00	6 (5 Visitors, 1 Volunteers)	6 (5 Visitors, 1 Volunteers)	8 (5 Visitors, 1 Volunteers, 2 Staff)	8 (5 Visitors, 1 Volunteers, 2 Staff)
17:00-18:00	6 (5 Visitors, 1 Volunteers)	6 (5 Visitors, 1 Volunteers)	26 (5 Visitors, 1 Volunteers, 20 Staff)	26 (5 Visitors, 1 Volunteers, 20 Staff)

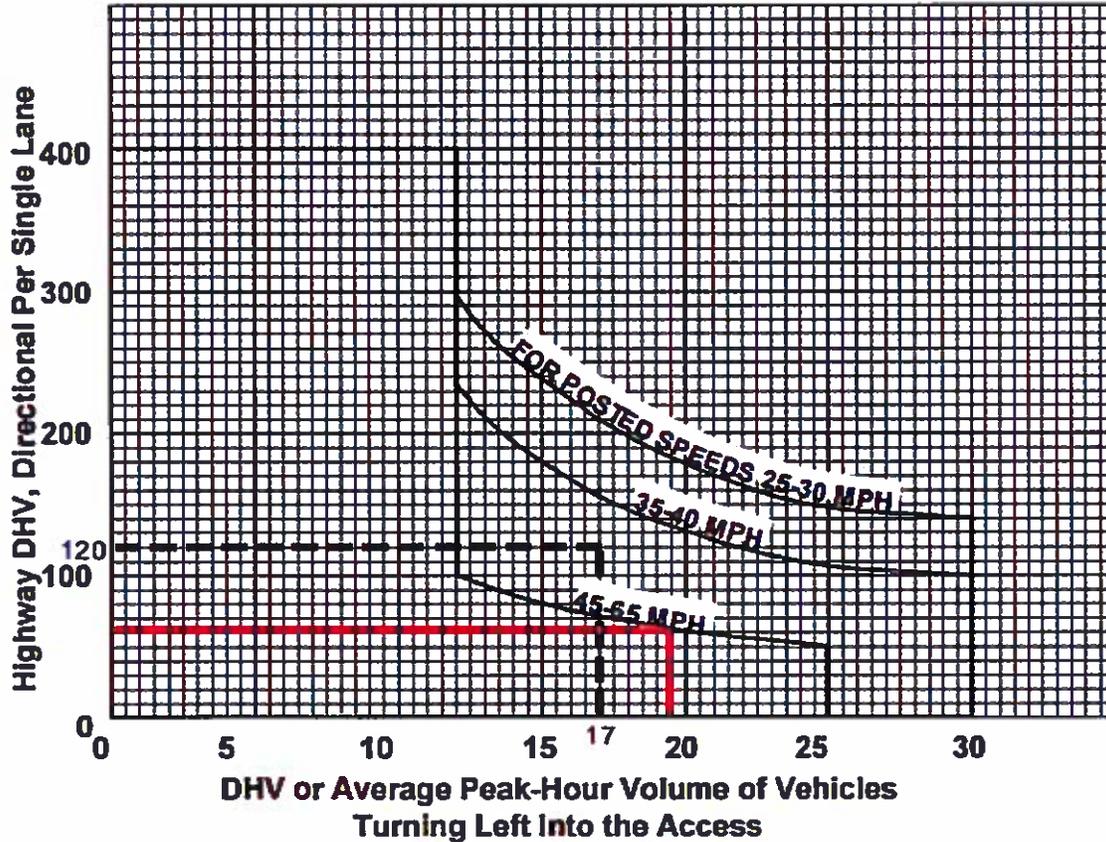
#### **IV. Background Plus Project Conditions Analysis**

Below is an analysis of the proposed peak hour left turn volumes and design volumes for 2018 traffic data using Section 451.02 of Idaho Transportation Department's (I.T.D.'s) Traffic Manual's method for determining left-turn lane warrants. I.T.D. recommends the consideration of a left turn lane when the single-lane portion of the DHV of the highway and the DHV of left turns intersect at a point on or above the curve for the posted speed.

The assumed travel direction of all Animal Shelter traffic is west-bound, and the posted speed limit on Croy Creek Road is unclear in the west-bound direction. Currently a 25 mph speed limit sign exists on Bullion Road before west-bound traffic crosses the Big Wood River Bridge. A east-bound speed limit sign exists as cars enter the City of Hailey prior to crossing the Big Wood River Bridge. Another speed limit sign is not encountered until just east of Rodeo Drive. Section C of 5-1-2 in the Blaine County Code defines a blanket speed of 35 mph on all county roads not listed in that section; however, based upon existing traveling speeds and to be conservative, 45 mph was used for this analysis.

For the proposed Animal Shelter, left turning traffic is west-bound. The peak hour volume for left turns occurs from 08:00-09:00 when the peak proposed left-turn volume is 20 vehicles. Assuming 30% of this staff volume is new, 6 additional trips should be added to the 2018 DDHV for a total DDHV of 63.

## LEFT-TURN LANE WARRANT



*Figure 1: I.T.D. Left Turn Lane Warrant Diagram –08:00-09:00 West-Bound Traffic*

As shown in Figure 1, the proposed traffic condition is just below the 45 mph speed curve, showing a left turn lane should not be considered for 2018 traffic volumes. I.T.D. also recommends the consideration of a left turn lane if the left turn peak hour volume is more than 12 vph and the highway’s inside lane volume exceeds 250 vph for posted speeds 45 mph or higher. The single lane DHV in either direction on Croy Creek Road is only 63 vph; therefore, this condition does not warrant a left turn lane.

The peak hour volume for left turns in 2023 also occurs from 08:00-09:00 when the peak proposed left-turn volume is 23 vehicles. Assuming 33% of this staff volume is new, 9 additional trips should be added to the 2023 DDHV for a total DDHV of 71.

### LEFT-TURN LANE WARRANT

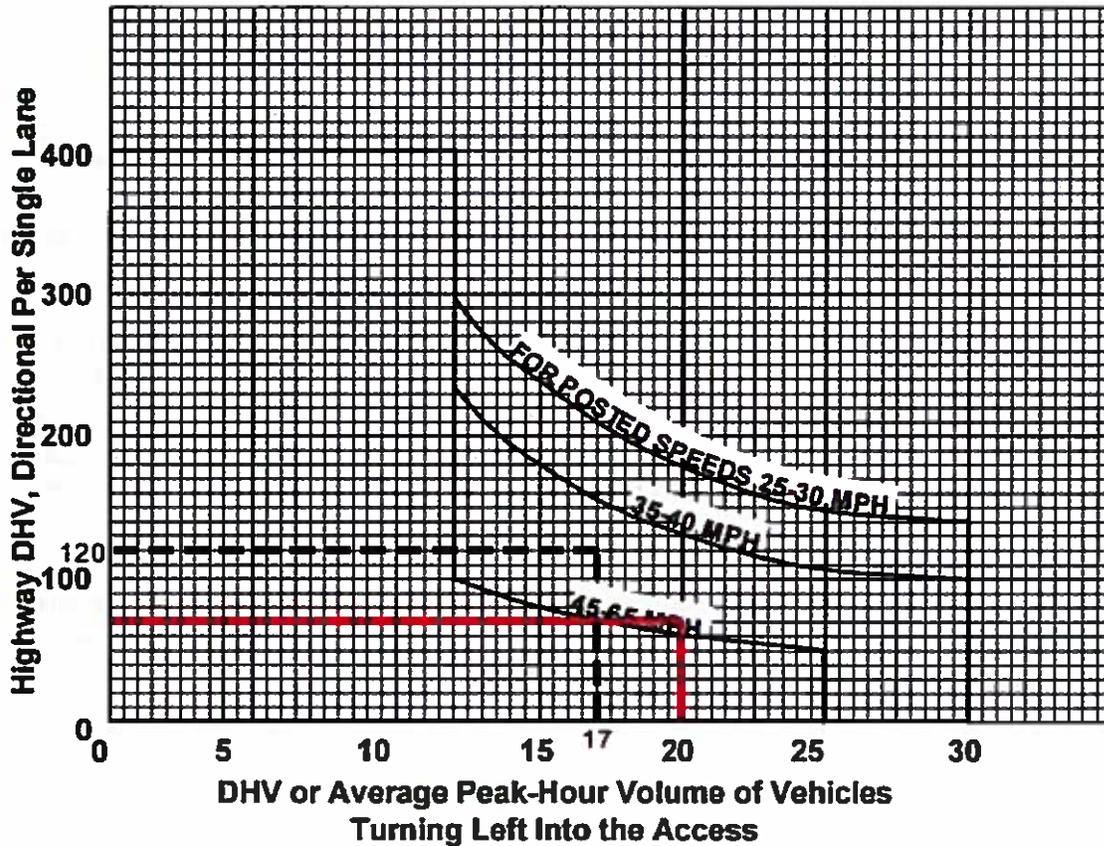


Figure 2: I.T.D. Left Turn Lane Warrant Diagram – 08:00-09:00 West-Bound Traffic

As shown in the above figure, the proposed traffic condition is above the 45 mph speed curve. Per Section 450 of I.T.D.'s Traffic manual, it is recommended to consider a left turn lane for the future 2023 condition.

## V. Conclusions

Benchmark Associates utilized existing data collected by Blaine County in 2008 and 2014 and anticipated staffing levels to analyze the left turn lane warrants on Croy Creek Road. Warrants were determined using 2018 and 2023 design years, and based upon I.T.D.'s Left Turn Lane Warrant Diagram, a left turn lane is not recommended in 2018, but should be considered for future 2023 traffic. This conclusion was reached under the following assumptions:

1. Existing traffic travels at an average speed of 45 mph. *The legal speed limit per section C of 5-1-2 in the Blaine County Code for Croy Creek Road is 35 mph but turn lane warrant analysis was conducted for 45 mph.*
2. 100% of traffic will turn left to enter the site. *A portion of traffic accessing the proposed Animal Shelter will be east-bound, turning right into the site.*

Though a 35 mph zone is unrealistic as a majority of traffic follows the 45 mph speed limit, the second assumption is conservative as not all staff traffic will be west-bound accessing the proposed Animal Shelter. Additionally, anticipated opposing traffic volumes are relatively low. Even in 2023, the DDHV for east-bound traffic is only 63 which is slightly higher than 1 car per minute. This provides ample space for west-bound cars to turn left into the proposed facility without delaying west-bound cars.

Based upon low traffic volumes and the conservative nature of the ITD analysis, Benchmark Associates does not recommend a left turn lane to accommodate increased traffic volumes produced by the proposed Animal Shelter at 101 Croy Creek Road.

***Appendix A:***

**Blaine County Traffic Data**

**Tuesday, April 22, 2008- Tuesday, April 29, 2008**

## Blaine County Road & Bridge Default

### CustomList-109 -- English (ENU)

#### Datasets:

**Site:** [Croy Cr. <25mph>] West of River Bridge Parking Lot Unit # 1  
**Attribute:**  
**Direction:** 8 - East bound A>B, West bound B>A. Lane: 0  
**Survey Duration:** 10:00 Tuesday, April 22, 2008 => 8:33 Tuesday, April 29, 2008,  
**Zone:**  
**File:** Croy Cr. \_25mph\_29Apr2008.EC0 (Plus )  
**Identifier:** W0236NJT MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v4.06)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### Profile:

**Filter time:** 10:00 Tuesday, April 22, 2008 => 8:33 Tuesday, April 29, 2008 (6.93961)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13  
**Speed range:** 5 - 100 mph.  
**Direction:** North, East, South, West (bound), P = East  
**Separation:** Headway > 0 sec, Span 0 - 300 ft  
**Name:** Default Profile  
**Scheme:** Vehicle classification (Scheme F3)  
**Units:** Non metric (ft, mi, ft/s, mph, lb, ton)

#### Column Legend:

0 [Total]	Number in time step (AB)
1 [Total]	Number in time step (BA)
2 [Time]	24-hour time (0000 - 2359)

AB = East bound  
BA = West bound

First and last days are incomplete.

**\* Tuesday, April 22, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
20	15	1000
25	19	1100
21	28	1200
27	22	1300
21	17	1400
19	23	1500
32	45	1600
33	48	1700
23	37	1800
12	22	1900
9	16	2000
7	7	2100
2	5	2200
0	1	2300

**\* Wednesday, April 23, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
0	2	0000
0	0	0100
0	0	0200
0	0	0300
1	0	0400
2	0	0500
11	4	0600
36	13	0700
37	20	0800
23	6	0900
15	18	1000
17	23	1100
22	23	1200
21	22	1300
25	20	1400
21	34	1500
36	36	1600
21	43	1700
19	26	1800
13	19	1900
10	19	2000
3	6	2100
1	2	2200
0	0	2300

**\* Thursday, April 24, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
0	1	0000
0	0	0100
0	0	0200
0	0	0300
0	0	0400
1	1	0500
7	2	0600
44	12	0700
31	19	0800
26	13	0900
18	13	1000
17	20	1100
20	19	1200
28	30	1300
18	21	1400
24	36	1500
31	29	1600
26	36	1700
23	39	1800
24	13	1900
10	25	2000
2	8	2100
3	4	2200
0	2	2300

**\* Friday, April 25, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
1	3	0000
0	1	0100
0	0	0200
0	0	0300
0	0	0400
3	1	0500
10	3	0600
28	8	0700
22	19	0800
30	15	0900
13	18	1000
26	22	1100
33	33	1200
32	36	1300
31	29	1400
32	35	1500
27	39	1600
28	32	1700
25	22	1800
14	19	1900
12	17	2000
5	14	2100
2	5	2200
1	0	2300

**\* Saturday, April 26, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
0	3	0000
0	0	0100
0	1	0200
1	2	0300
1	0	0400
1	0	0500
3	1	0600
7	7	0700
17	12	0800
20	6	0900
26	23	1000
24	14	1100
28	38	1200
32	36	1300
29	22	1400
11	12	1500
9	7	1600
17	28	1700
21	18	1800
19	21	1900
12	13	2000
3	9	2100
1	7	2200
0	2	2300

**\* Sunday, April 27, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
1	1	0000
1	1	0100
0	2	0200
0	0	0300
0	0	0400
0	0	0500
2	1	0600
6	9	0700
9	7	0800
19	11	0900
14	15	1000
32	33	1100
25	23	1200
33	34	1300
34	40	1400
39	36	1500
31	18	1600
26	40	1700
14	24	1800
9	13	1900
11	7	2000
7	6	2100
4	2	2200
0	1	2300

**\* Monday, April 28, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
0	1	0000
0	1	0100
0	1	0200
0	0	0300
0	0	0400
2	1	0500
7	3	0600
32	11	0700
30	20	0800
21	20	0900
21	16	1000
19	18	1100
25	21	1200
28	28	1300
32	28	1400
22	44	1500
31	24	1600
32	38	1700
16	30	1800
13	17	1900
7	15	2000
5	5	2100
2	5	2200
2	2	2300

**\* Tuesday, April 29, 2008**

<b>Total</b>	<b>Total</b>	<b>Time</b>
<b>AB</b>	<b>BA</b>	
0	0	0000
0	0	0100
0	0	0200
0	0	0300
0	0	0400
1	0	0500
9	2	0600
38	18	0700
19	21	0800

**In profile:** Vehicles = 4677 / 4681 (99.91%)

***Appendix B:***

**Blaine County Traffic Data**

**Monday, June 30, 2014- Monday, July 7, 2014**

## Blaine County Road & Bridge Default

### CustomList-102 -- English (ENU)

#### Datasets:

**Site:** [CROY CRK ROAD] West of BWR BRIDGE  
**Attribute:**  
**Direction:** 2 - East bound, A trigger first. Lane: 0  
**Survey Duration:** 11:20 Monday, June 30, 2014 => 10:01 Monday, July 07, 2014,  
**Zone:**  
**File:** CROY CRK ROAD07Jul2014.EC0 (Plus )  
**Identifier:** W667KGY3 MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v4.06)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### Profile:

**Filter time:** 11:21 Monday, June 30, 2014 => 10:01 Monday, July 07, 2014 (6.94466)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13  
**Speed range:** 5 - 100 mph.  
**Direction:** North, East, South, West (bound), P = East  
**Separation:** Headway > 0 sec, Span 0 - 300 ft  
**Name:** Default Profile  
**Scheme:** Vehicle classification (Scheme F3)  
**Units:** Non metric (ft, mi, ft/s, mph, lb, ton)

#### Column Legend:

0 [Time]	24-hour time (0000 - 2359)
1 [Total]	Number in time step (AB)
2 [Total]	Number in time step (BA)

AB = EAST BOUND  
BA = WEST BOUND

**\* Monday, June 30, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
1100	0	0
1200	0	0
1300	3	2
1400	35	24
1500	31	23
1600	26	49
1700	35	46
1800	21	42
1900	20	24
2000	18	16
2100	8	15
2200	9	10
2300	2	4

**\* Tuesday, July 01, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	3	4
0100	0	0
0200	0	0
0300	0	0
0400	0	1
0500	3	1
0600	10	3
0700	38	19
0800	31	26
0900	45	29
1000	30	22
1100	30	29
1200	41	30
1300	35	42
1400	25	25
1500	31	35
1600	24	30
1700	28	49
1800	27	35
1900	23	29
2000	18	24
2100	11	18
2200	6	8
2300	0	5

**\* Wednesday, July 02, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	1	0
0100	0	0
0200	0	1
0300	0	0
0400	1	1
0500	2	0
0600	11	2
0700	41	14
0800	39	28
0900	41	25
1000	32	33
1100	30	22
1200	36	31
1300	31	41
1400	30	28
1500	23	21
1600	35	43
1700	28	48
1800	29	36
1900	17	16
2000	12	17
2100	9	11
2200	5	18
2300	4	10

**\* Thursday, July 03, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	1	2
0100	2	1
0200	1	0
0300	0	1
0400	0	1
0500	2	5
0600	6	2
0700	31	20
0800	50	31
0900	31	20
1000	33	33
1100	36	34
1200	40	30
1300	41	29
1400	37	35
1500	30	33
1600	28	38
1700	32	40
1800	24	32
1900	22	30
2000	11	17
2100	14	31
2200	9	10
2300	1	7

**\* Friday, July 04, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	2	5
0100	2	0
0200	1	3
0300	1	0
0400	4	0
0500	2	1
0600	4	2
0700	13	18
0800	19	14
0900	22	14
1000	28	21
1100	54	13
1200	20	13
1300	26	40
1400	20	35
1500	21	25
1600	17	40
1700	31	27
1800	32	12
1900	16	11
2000	15	16
2100	26	15
2200	7	32
2300	9	18

**\* Saturday, July 05, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	5	12
0100	2	2
0200	0	1
0300	0	0
0400	0	0
0500	1	0
0600	4	0
0700	11	14
0800	22	15
0900	33	24
1000	28	26
1100	31	23
1200	39	26
1300	20	29
1400	38	29
1500	29	18
1600	28	22
1700	15	25
1800	19	25
1900	14	18
2000	12	16
2100	8	14
2200	11	10
2300	4	6

**\* Sunday, July 06, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	0	2
0100	0	0
0200	1	1
0300	0	0
0400	0	0
0500	0	0
0600	4	3
0700	9	15
0800	19	7
0900	27	17
1000	28	22
1100	31	25
1200	29	23
1300	22	25
1400	21	26
1500	24	32
1600	30	23
1700	22	25
1800	19	15
1900	8	40
2000	75	144
2100	136	127
2200	46	15
2300	18	11

**\* Monday, July 07, 2014**

<b>Time</b>	<b>Total</b>	<b>Total</b>
	<b>AB</b>	<b>BA</b>
0000	7	7
0100	4	1
0200	1	0
0300	4	2
0400	4	4
0500	11	4
0600	12	4
0700	31	21
0800	37	28
0900	0	0

**In profile:** Vehicles = 6098 / 6121 (99.62%)