



AUTOMATED TRAFFIC SIGNAL PERFORMANCE MEASURES

Mark Taylor & Jamie Mackey
Utah Department of Transportation

UDOT Annual Conference • Session 27 • November 6, 2018, Sandy, Utah

Objectives

- | | |
|---|-------|
| • Introduction, history and how ATSPMs work | Mark |
| • New ATSPM features | Jamie |
| • ATSPM Applications | |
| • Approach Volumes | Jamie |
| • Approach Speeds | Mark |
| • Active Transportation | Jamie |
| • Future development and benefits | Mark |

Brief Traffic Signal Update

- 2111 Traffic Signals in the State of Utah
 - 1237 owned and operated by UDOT (59%)
 - 874 owned and operated by cities /counties (41%)



- Goal: 100% Connection to all Traffic Signals and HAWKS
 - 97% of UDOT signals connected
 - 41 signals still to connect
 - 82% of partner agency signals connected
 - 155 signals still to connect





Started Development November 2012

- State of Utah Department of Technology Services

Estimate 12,000+ hours of development
(November 2012 to October 2018)

UDOT Development of ATSPMs

Andre Sanchez, Derek Lowe,
Sarah Xing



State of Utah – Department of
Technology Services

Shane Johnson



Previous Employment: Utah
DTS – Now works for Intelight

Jamie Mackey



UDOT Signal Operations

UDOT Development of ATSPMs



22+ Installations of ATSPMs



Current Contributors to Open Source ATSPMs



UDOT ATSPM Open Source




[HOME](#)
[INFORMATION](#)
[COMMUNITY](#)
[CONTACT](#)
[LOGIN](#)

Explore Applications

APPLICATION CATEGORIES

- All Active Releases 62
- Arterial Management** 25
- Collision Avoidance 6
- Collision Notification 7
- Commercial Vehicle Operations 11
- Crash Prevention & Safety 16
- Driver Assistance 21
- Electronic Payment & Pricing 0
- Emergency Management 8
- Freeway Management 25
- Information Management 27

Sort by Name 

Show 5 Items 

<< First < Previous Next > Last >>



AMS_TCA_Aimsun_v1
Trajectory Conversion Algorithm-Aimsun (TCA-A)

Version: **AMS_TCA_Aimsun_v1**
Modified: **May 24, 2017**
Downloads: **28**

Keywords: [Connected Vehicles](#) [traffic simulation](#) [communication](#)

STABLE



Automated Traffic Signal Performance Measures (ATSPM) 4.0.1
Automated Traffic Signal Performance Measures 4.0.1

Version: **ATSPM-4.0.1**
Modified: **Mar 27, 2018**
Downloads: **327**

Keywords: [signals](#) [ATSPM](#) [Performance Measures](#) [Signal Metrics](#)

STABLE

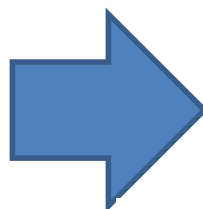
<https://www.itsforge.net>

ATSPMs – Traffic Data for Everyone



Automated Traffic Signal Performance Measures Basic Concept

Automated Data
Collection



Useful Information
about Performance

- 1/10th sec. data - Signal controller

- Intersection, Corridor, City, System

- Traffic volume counts
- Average speeds
- % of vehicles arriving on the green light
- Pedestrian delay
- Did initial queue of vehicles get through on green?

Why model or estimate what you can measure?

UDOT's ATSPM Website

<https://udottraffic.utah.gov/ATSPM>



Measures Reports Log Action Taken Links FAQ About

Register Log in

Signal

Signal Selection

Signal ID
7220 **Select** Foothill Drive @ 1300 South

Signal List

Signal Map
Region
--Select Region--
Metric Type
--Select a Metric--

Chart Selection

Metrics List
Purdue Phase Termination
Split Monitor
Pedestrian Delay
Preemption Details
Turning Movement Counts
Purdue Coordination Diagram
Approach Volume
Approach Delay
Arrivals On Red
Approach Speed
Yellow and Red Actuations
Purdue Split Failure

Phase Termination Options

Y-axis Max
Auto

Consecutive Count
1

☒ Show Plans
☒ Show Ped Activity

Date Selection

Start Date
09/14/2018 12:00 AM

End Date
09/14/2018 11:59 PM
Reset Date

Create Chart

<https://udottraffic.utah.gov/atspm>

Step 1: Sort by metric type and Select a signal from the map.

Step 2: Select the metric from the available list for that signal.

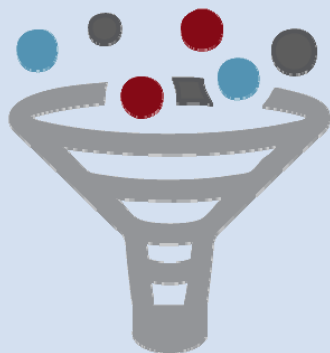
Step 3: Adjust options for the metric selected.

Step 4: Select a date and time range (you can select multiple days).

Step 5: Click “Create Chart”, scroll down to see the charts & data.

What's new in ATSPM 4.2?

**Aggregate
Database and
Reporting**



**Raw Data
Export**



**Data
Archive**



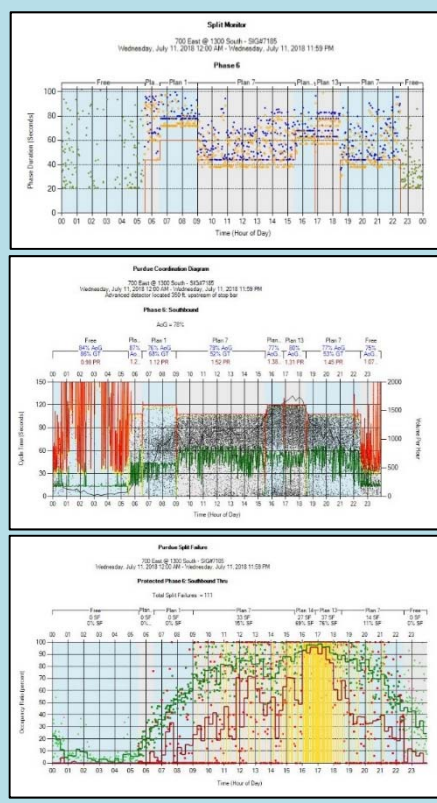
ATSPM Raw Data Aggregation

0.1-second resolution

Timestamp	Event Code	Event Parameter
6/27/2013 1:29:51.1	10	8
6/27/2013 1:29:51.1	82	5
6/27/2013 1:29:52.2	1	2
6/27/2013 1:29:52.2	1	6
6/27/2013 1:29:52.3	82	2
6/27/2013 1:29:52.8	82	4
6/27/2013 1:29:52.9	81	4
6/27/2013 1:29:54.5	81	2
6/27/2013 1:30:02.2	8	2
6/27/2013 1:30:02.2	8	6
6/27/2013 1:30:06.1	10	2
6/27/2013 1:30:06.1	10	6
6/27/2013 1:30:08.1	1	8
6/27/2013 1:30:15.8	81	5
6/27/2013 1:30:18.5	82	6
6/27/2013 1:30:27.5	81	6
6/27/2013 1:30:30.4	8	8



Metrics



Approach Split Failure Database

Approach	Bin	Split Failures
1958	4/19/17 15:45	2
1959	4/19/17 15:45	0
1960	4/19/17 15:45	2
1961	4/19/17 15:45	0
1963	4/19/17 15:45	0
1964	4/19/17 15:45	0
1956	4/19/17 16:00	1



Approach Advance Sensor Database

Approach	Bin	AOG	AOY	AOR
1956	4/19/17 17:00	34	57	7
1957	4/19/17 17:00	107	199	28
1956	4/19/17 17:15	23	101	3
1957	4/19/17 17:15	222	212	25
1956	4/19/17 17:30	38	60	4
1957	4/19/17 17:30	257	138	18

15-min Bins



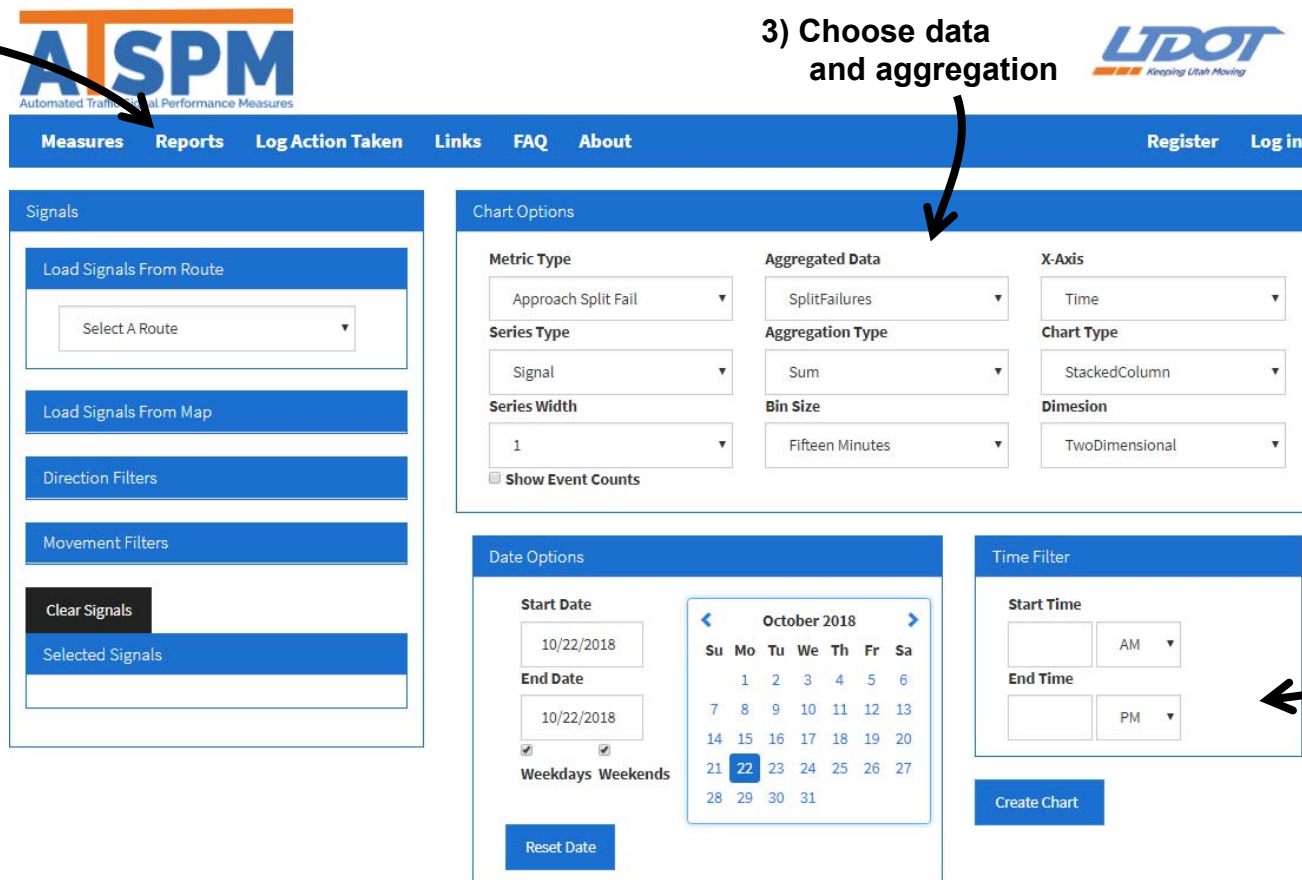
ATSPM Aggregate Reports

1) Find it in the Reports menu

2) Select a route or signal(s)

3) Choose data and aggregation

4) Modify date range and time filter

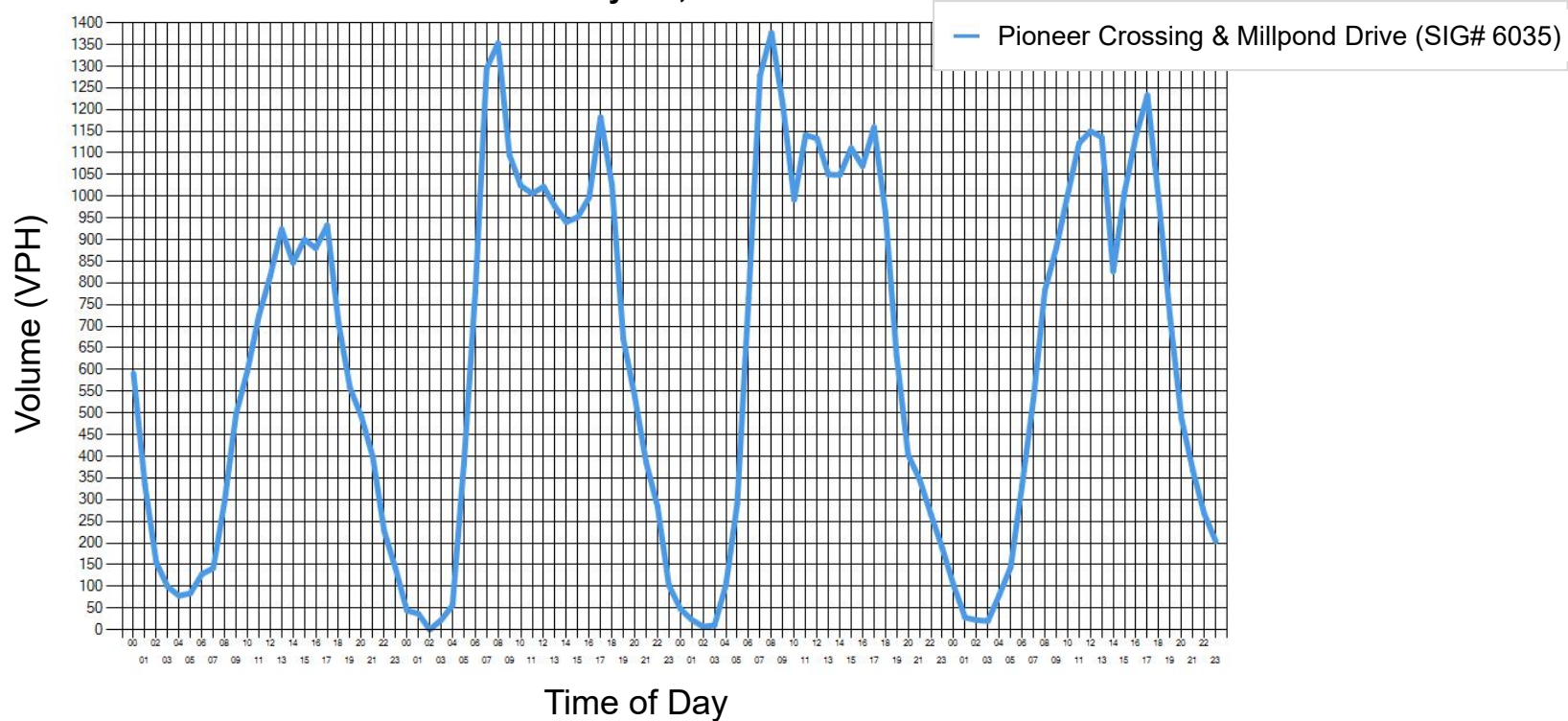


The screenshot displays the ATSPM web application interface. The top navigation bar includes links for Measures, Reports, Log Action Taken, Links, FAQ, and About. The Reports menu is highlighted. On the left, the 'Signals' section allows users to load signals from a route or map, with a 'Select A Route' dropdown. Below this are filters for Direction, Movement, and a 'Clear Signals' button. The 'Selected Signals' section is currently empty. The 'Chart Options' section on the right allows users to select a Metric Type (Approach Split Fail), Series Type (Signal), and Series Width (1). It also includes options for Aggregated Data (Split Failures), Aggregation Type (Sum), Bin Size (Fifteen Minutes), X-Axis (Time), Chart Type (Stacked Column), and Dimension (Two Dimensional). The 'Date Options' section shows a calendar for October 2018 with the date 10/22/2018 selected. The 'Time Filter' section allows users to specify a Start Time and End Time. A 'Create Chart' button is located at the bottom right.

Aggregate Database & Reporting

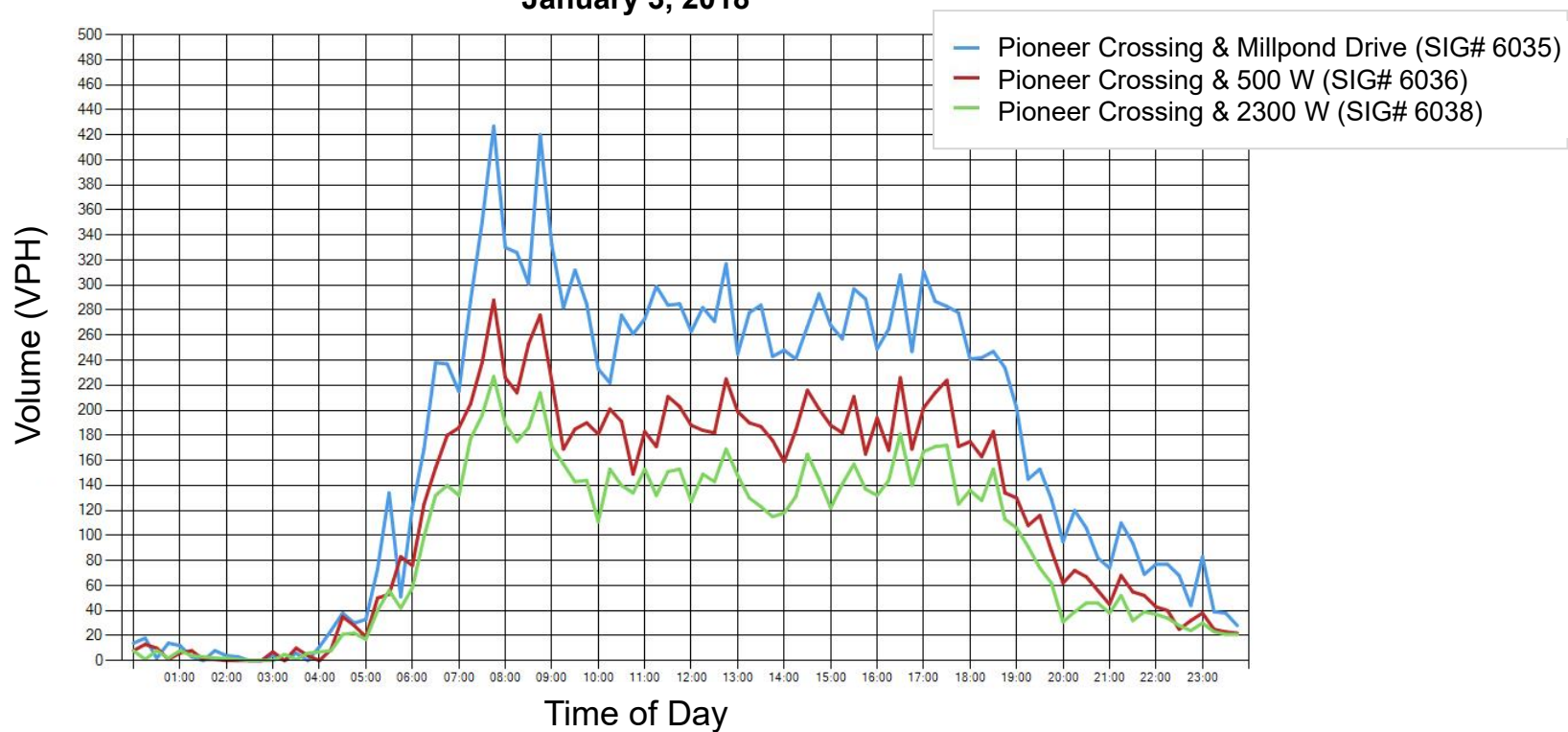
Hourly Volume

January 1-4, 2018



Aggregate Database & Reporting

Hourly Volume
January 3, 2018



Raw Data Export



Log in required



Measures Reports Log Action Taken Links FAQ Admin About

Hello jamiemackey@utah.gov! Log off

Signal Selection

Signal ID

7220

Select

Foothill Drive @ 1300 South

Select a signal

Filter Event Codes & Parameters.
Leave blank for all.

Signal List

Signal Map

Region

--Select Region--

Metric Type

--Select a Metric--



Event Codes

Comma Separated List

Event Parameters

Comma Separated List

Start Date

09/15/2018

12:00

AM

End Date

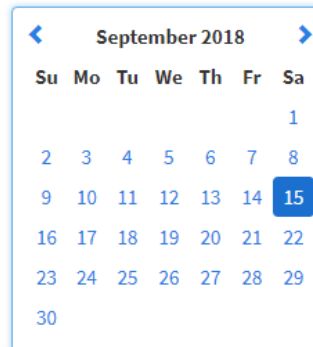
09/15/2018

11:59

PM

Reset Date

- Leave blank for all Event Codes/Event Parameters
- To filter on a list of codes/params, use comma and/or dash. E.g.: 1, 3, 6-8, 10
- [Indiana Hi Resolution Data Logger Enumerations](#)



Check filter does not exceed limit on # rows

Download

Check Record Count

Limit of allowed record count: 1048576

Your current request will generate 208362 records.

Raw Data Export

X35																				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1	Signal	Timestamp	Event C	Event F	Date				KS On per Day	KS Time per day										
2	6088	9/20/2018 9:49	171	1	43363			9/20/2018	7	1:53:45										
3	6088	9/20/2018 9:56	172	1	43363	0:07:10		9/21/2018	5	2:16:42										
4	6088	9/20/2018 9:56	171	1	43363			9/22/2018	0	0:00:00										
5	6088	9/20/2018 9:58	172	1	43363	0:01:27		9/23/2018	0	0:00:00										
6	6088	9/20/2018 10:53	171	1	43363			9/24/2018	8	1:16:05										
7	6088	9/20/2018 11:10	172	1	43363	0:17:11		9/25/2018	4	1:48:25										
8	6088	9/20/2018 12:01	171	1	43363			9/26/2018	5	2:04:12										
9	6088	9/20/2018 12:30	172	1	43363	0:28:30		9/27/2018	7	2:00:07										
10	6088	9/20/2018 14:11	171	1	43363			9/28/2018	6	2:11:46										
11	6088	9/20/2018 14:11	172	1	43363	0:00:07		9/29/2018	0	0:00:00										
12	6088	9/20/2018 14:12	171	1	43363			9/30/2018	0	0:00:00										
13	6088	9/20/2018 14:49	172	1	43363	0:36:52		10/1/2018	6	2:27:50										
14	6088	9/20/2018 15:24	171	1	43363			10/2/2018	6	2:18:53										
15	6088	9/20/2018 15:47	172	1	43363	0:22:28		10/3/2018	5	2:24:28										
16	6088	9/21/2018 7:40	171	1	43364			10/4/2018	4	1:24:25										
17	6088	9/21/2018 8:04	172	1	43364	0:24:10		10/5/2018	4	2:01:26										
18	6088	9/21/2018 8:46	171	1	43364			10/6/2018	0	0:00:00										
19	6088	9/21/2018 9:19	172	1	43364	0:32:59		10/7/2018	0	0:00:00										
20	6088	9/21/2018 12:01	171	1	43364			10/8/2018	3	2:29:16										
21	6088	9/21/2018 12:32	172	1	43364	0:31:49		10/9/2018	4	2:37:04										
22	6088	9/21/2018 14:12	171	1	43364			10/10/2018	4	1:49:59										
23	6088	9/21/2018 14:37	172	1	43364	0:24:47		10/11/2018	4	2:26:38										
24	6088	9/21/2018 15:33	171	1	43364			10/12/2018	6	2:14:57										
25	6088	9/21/2018 15:56	172	1	43364	0:22:57														
26	6088	9/24/2018 7:38	171	1	43367															
27	6088	9/24/2018 8:10	172	1	43367	0:32:13														

Key Switch Activations per Day

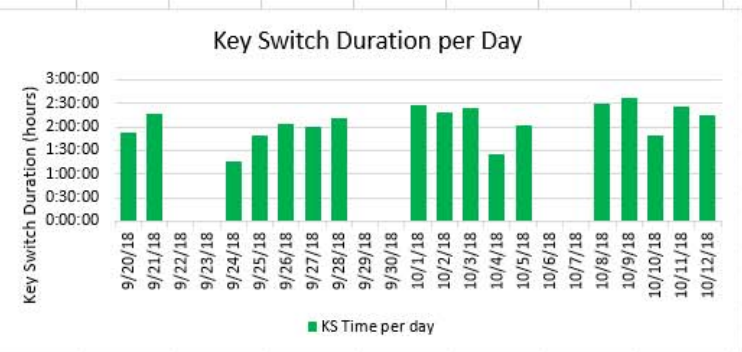
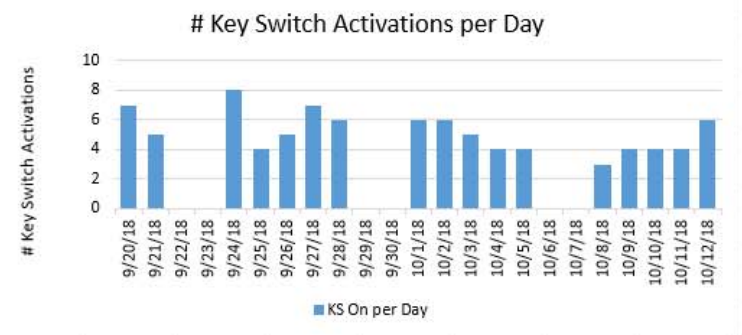
Date	# Key Switch Activations
9/20/18	7
9/21/18	5
9/22/18	0
9/23/18	0
9/24/18	8
9/25/18	4
9/26/18	5
9/27/18	7
9/28/18	6
9/29/18	0
9/30/18	0
10/1/18	6
10/2/18	6
10/3/18	5
10/4/18	4
10/5/18	4
10/6/18	0
10/7/18	0
10/8/18	3
10/9/18	4
10/10/18	4
10/11/18	4
10/12/18	6

■ KS On per Day

Key Switch Duration per Day

Date	Key Switch Duration (hours)
9/20/18	1:53:45
9/21/18	2:16:42
9/22/18	0:00:00
9/23/18	0:00:00
9/24/18	1:16:05
9/25/18	1:48:25
9/26/18	2:04:12
9/27/18	2:00:07
9/28/18	2:11:46
9/29/18	0:00:00
9/30/18	0:00:00
10/1/18	2:27:50
10/2/18	2:18:53
10/3/18	2:24:28
10/4/18	1:24:25
10/5/18	2:01:26
10/6/18	0:00:00
10/7/18	0:00:00
10/8/18	0:32:59
10/9/18	2:29:16
10/10/18	2:37:04
10/11/18	1:49:59
10/12/18	2:26:38

■ KS Time per day



Database Archive



[Measures](#)
[Reports](#)
[Log Action Taken](#)
[Links](#)
[FAQ](#)
[Admin](#)
[About](#)

Hello jamiemackey@utah.gov! [Log off](#)

Edit

Database Archive Settings

Enable Database Archive ☐

Signal Selection

Signal ID

Press Enter to select signal

Signal Id	Signal Description	Remove
6086	6086 - SR-68 (Redwood Rd) 2100 North(Lehi)	X
7219	7219 - Foothill Drive Sunnyside	X
7220	7220 - Foothill Drive 1300 South	X
7503	7503 - Foothill Drive 2100 East	X
7509	7509 - Rosecrest Rd Mountain View (SR-85) NB	X
7510	7510 - Rosecrest Rd Mountain View (SR-85) SB	X
8279	8279 - SR-63 (Bryce Cyn) Center St	X

ATSPM Application: Approach Count

Traffic Studies

- Counts and trends
- Signal Warrants
- Growth

Traffic Impacts

- Weather
- Events, School, Holiday
- Construction & Maintenance

Construction & Maintenance

- Lane closures
- Performance targets

Performance Evaluation

- Capacity analysis
- Lane utilization

Planning

- Model calibration

Signal Timing Optimization

- Split allocation
- Daily schedule

Approach Volume Detection



Image courtesy of Wavetronix

Approach Volume Detection

Wavetronix Matrix

- Lane-by-lane counts at stop bar
- Up to 15% undercount



Wavetronix Advance

- Approach counts ~400 ft from stop bar
- Up to 20% undercount



Wavetronix Sensor Count Accuracy



Report No. UT-15.14

**CALIBRATION OF AUTOMATIC
PERFORMANCE MEASURES –
SPEED AND VOLUME DATA:
VOLUME 1, EVALUATION OF THE
ACCURACY OF TRAFFIC VOLUME
COUNTS COLLECTED BY
MICROWAVE SENSORS**

Prepared For:

Utah Department of Transportation
Research Division

Submitted By:

Brigham Young University
Department of Civil and Environmental
Engineering

Authored By:

Mitsuru Saito, Ph.D., P.E.
David Keall'i Chang, EIT
Grant G. Schultz, Ph.D., P.E., PTOE

**Final Report
September 2015**



Report No. UT-16.05

**CALIBRATION OF AUTOMATIC
PERFORMANCE MEASURES –
SPEED AND VOLUME DATA:
VOLUME 2, EVALUATION OF THE
ACCURACY OF APPROACH VOLUME
COUNTS AND SPEEDS COLLECTED
BY MICROWAVE SENSORS**

Prepared For:

Utah Department of Transportation
Research Division

Submitted By:

Brigham Young University
Department of Civil and Environmental
Engineering

Authored By:

Mitsuru Saito, Ph.D., P.E.
Gregory H. Sanchez, EIT
Grant G. Schultz, Ph.D., P.E., PTOE

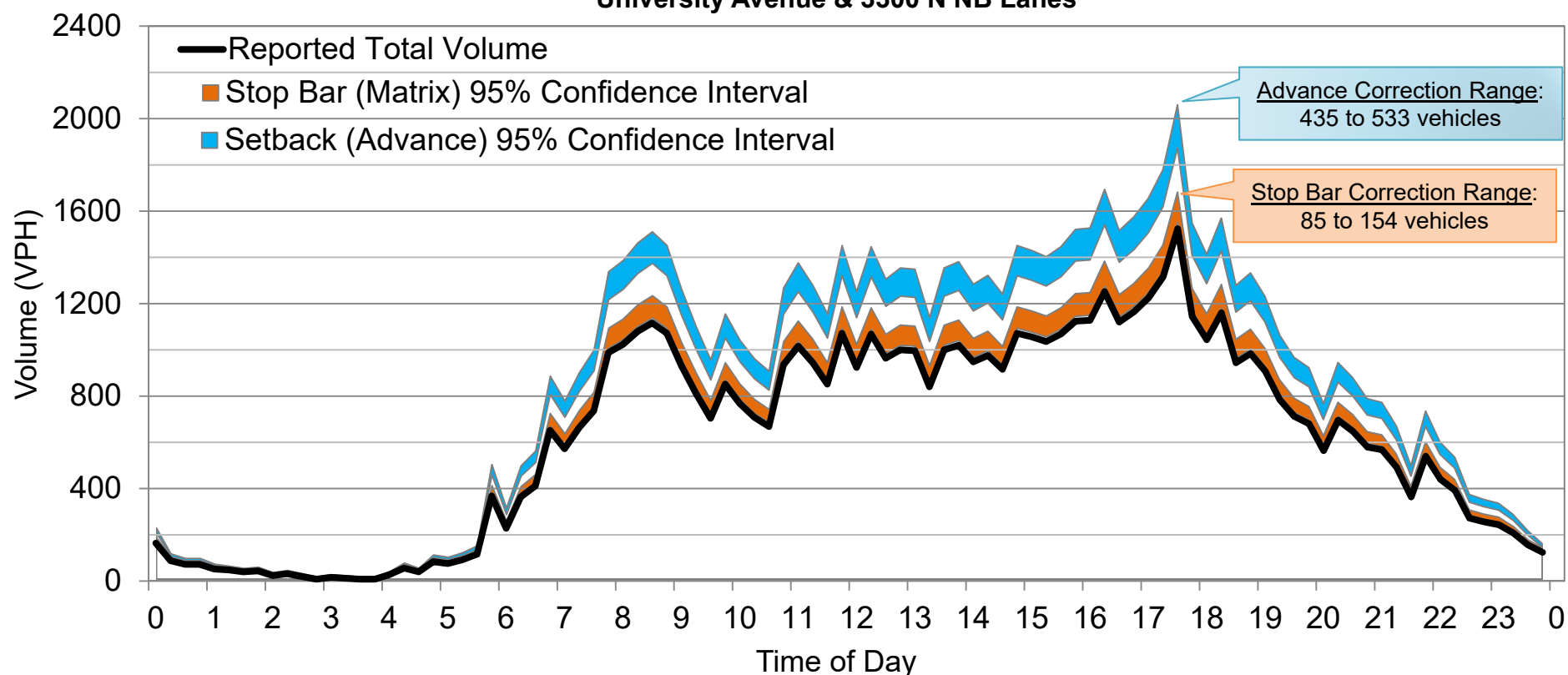
**Final Report
May 2016**

<https://www.udot.utah.gov/main/uconowner.gf?n=26445305298673985>

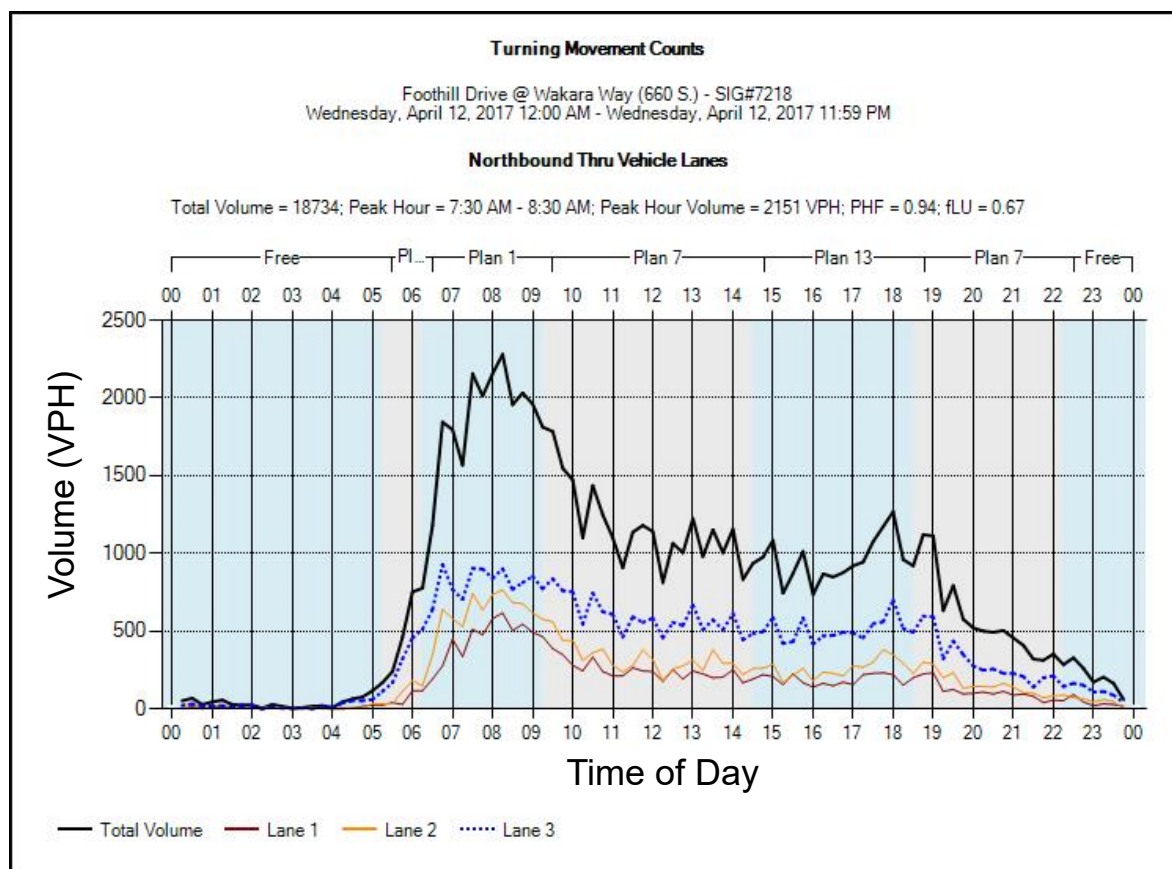
<https://www.udot.utah.gov/main/uconowner.gf?n=28384521790001597>

Approach Volume Accuracy - Example

Approach Volume
University Avenue & 3300 N NB Lanes



Turning Movement Count Chart



Turning Movement Count Data Table

	Vehicle														
	Eastbound			Westbound			Northbound				Southbound				Vehicle Total
	L	R	Total	L	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	18	29	47	202	181	383	2	217	50	269	51	468	9	528	1227
4:15 PM	7	35	42	188	186	374	4	212	40	256	59	415	4	478	1150
4:30 PM	13	37	50	206	165	371	9	219	36	264	67	479	6	552	1237
4:45 PM	10	20	30	202	188	390	7	230	36	273	64	483	7	554	1247
5:00 PM	7	17	24	214	192	406	4	236	42	282	53	423	4	480	1192
5:15 PM	5	19	24	187	163	350	5	269	44	318	46	478	10	534	1226
5:30 PM	7	21	28	163	149	312	7	293	40	340	49	415	9	473	1153
5:45 PM	9	11	20	122	124	246	5	317	45	367	51	382	4	437	1070
Total	76	189	265	1484	1348	2832	43	1993	333	2369	440	3543	53	4036	9502

	Peak Hour (PHF = 0.98)														
	Eastbound			Westbound			Northbound				Southbound				Vehicle Total
	L	R	Total	L	R	Total	L	T	R	Total	L	T	R	Total	
4:30 PM - 5:30 PM	35	93	128	809	708	1517	25	954	158	1137	230	1863	27	2120	4902

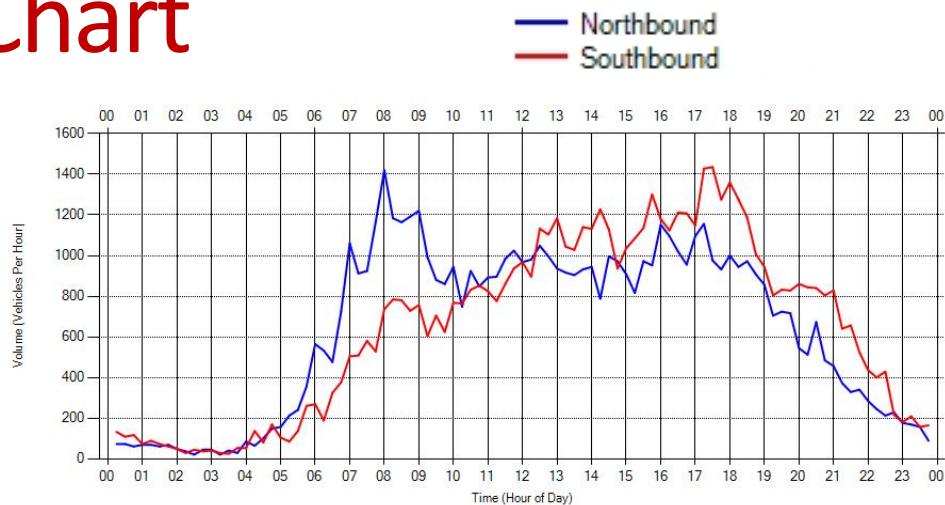
Approach Volume Chart

Approach Volume

University Avenue @ East Bay Boulevard - SIG#6402
Wednesday, May 17, 2017 12:00 AM - Wednesday, May 17, 2017 11:59 PM

Northbound and Southbound Approaches

Wavetronix Matrix at stop bar



Approach Volume

University Avenue @ East Bay Boulevard - SIG#6402
Wednesday, May 17, 2017 12:00 AM - Wednesday, May 17, 2017 11:59 PM

Northbound and Southbound Approaches

Wavetronix Advance located 400ft. upstream of the stop bar

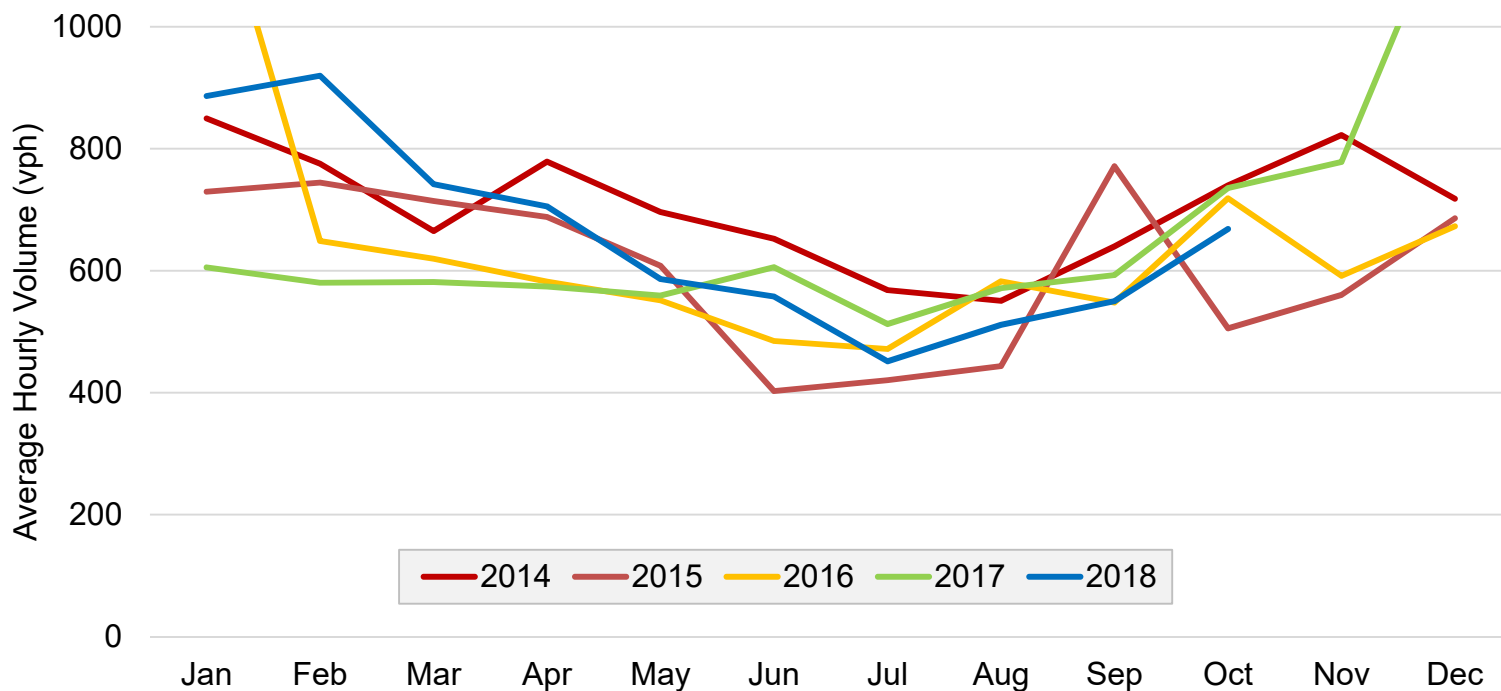


Approach Volume Data Table

Metric	Value
Peak Hour	5:00 PM - 6:00 PM
K Factor	0.079
Peak Hour Volume	2395
Peak Hour Factor	0.927
Total Volume	30443
-	-
Northbound Peak Hour	7:45 AM - 8:45 AM
Northbound Peak Hour D Factor	0.623
Northbound Peak Hour K Factor	0.066
Northbound Peak Hour Volume	1250
Northbound Peak Hour Factor	0.863
Northbound Total Volume	15052
-	-
Southbound Peak Hour	5:00 PM - 6:00 PM
Southbound Peak Hour D Factor	0.575
Southbound Peak Hour K Factor	0.079
Southbound Peak Hour Volume	1376
Southbound Peak Hour Factor	0.958
Southbound Total Volume	15391

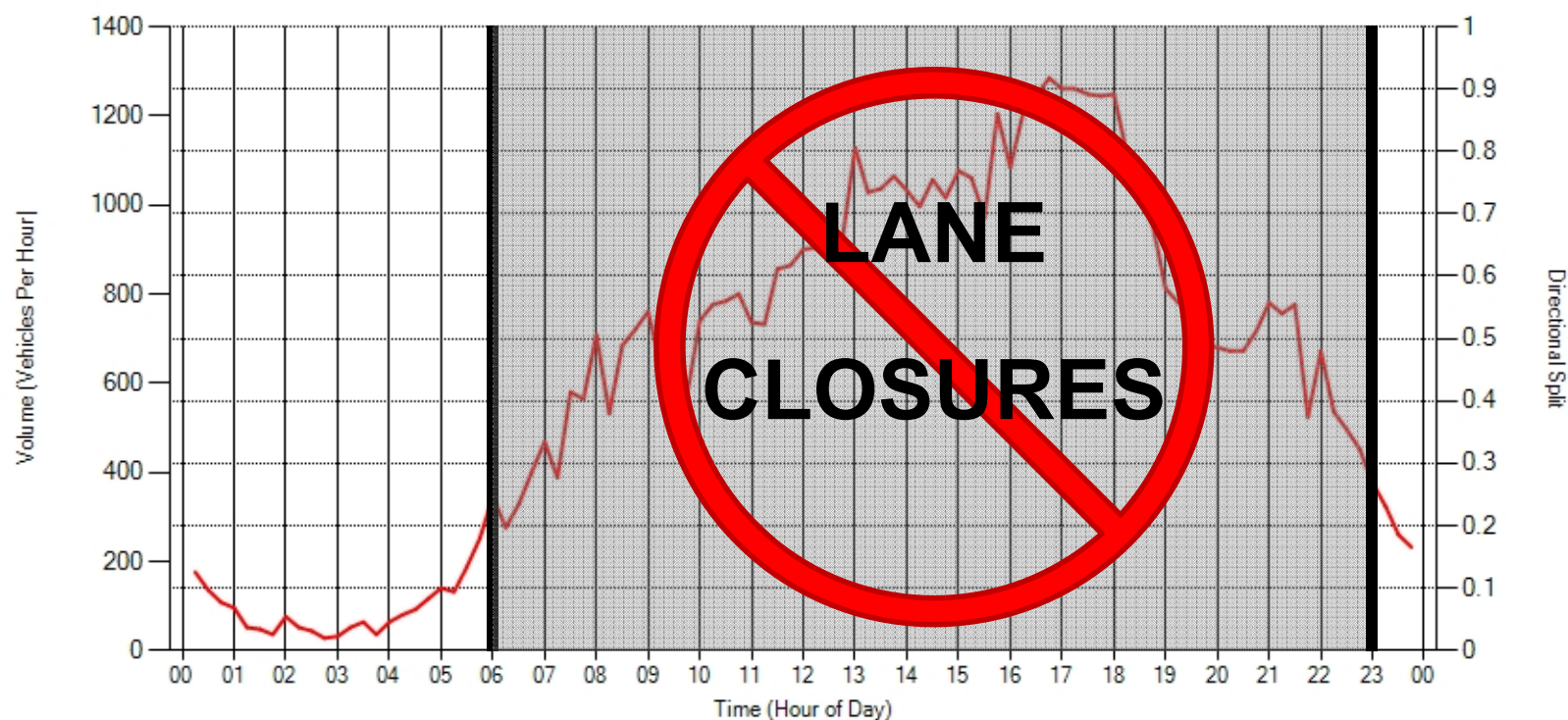
Aggregate Data Example

Monthly Volume
5 p.m. to 6 p.m.
Southbound
SR-36 and Erda Way



Allow Lane Closures

Volume report for University Avenue East Bay Boulevard on the Northbound and Southbound approaches.
7/7/2016 12:00:00 AM - 7/7/2016 11:59:00 PM - Using Advanced Detection



ATSPM Application: Approach Speed

Traffic Studies

- Speeds

Performance Evaluation

- Overcapacity periods
- Corridor evaluation and comparison
- Trends

Traffic Impacts

- Weather
- Events, School, Holiday
- Construction & Maintenance

Planning

- Model calibration

Signal Timing Optimization

- Clearance Interval calculations
- Link travel times

Approach Speed

Wavetronix
SmartSensor
Advance

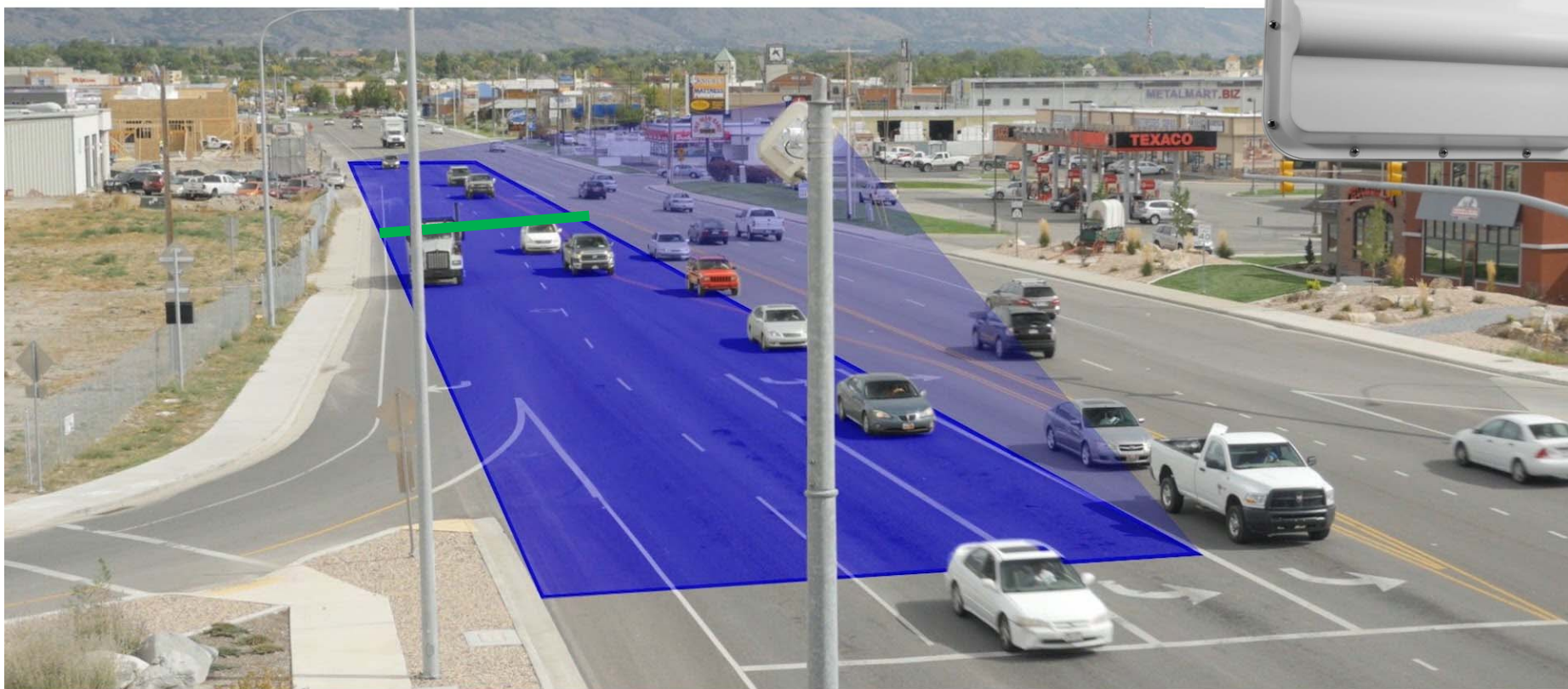
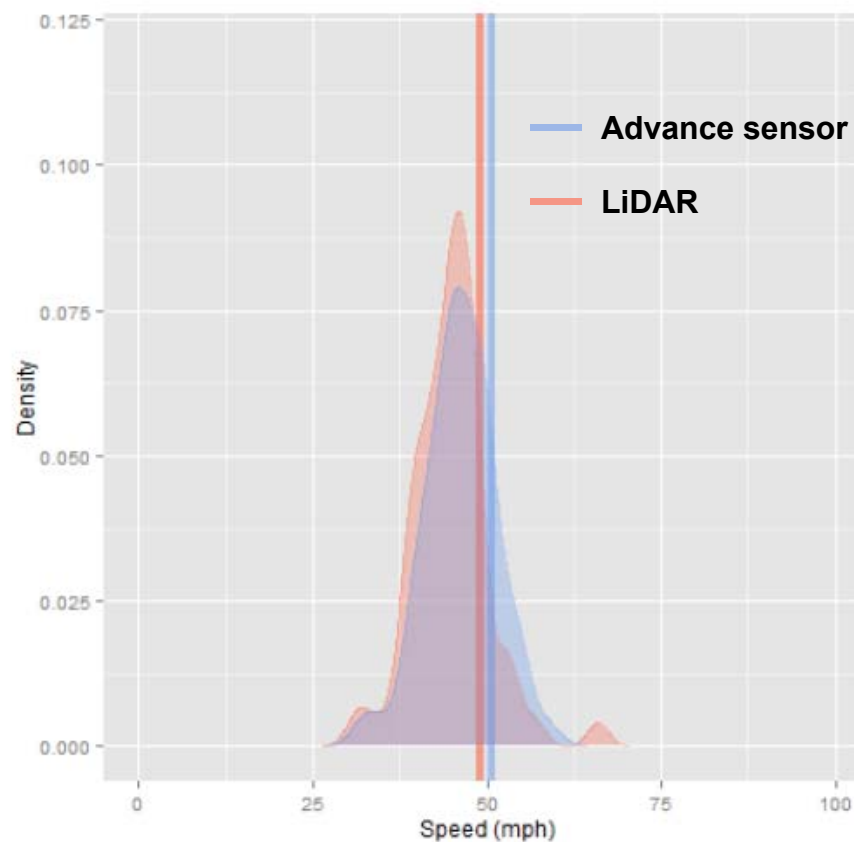


Image courtesy of Wavetronix

Approach Volume & Speed

- Speed Accuracy ± 2 mph.
 - Good enough for engineering purposes
- Speeds on chart:
 - 15 sec. after start of green to start of the yellow
 - >5 mph



Approach Volume & Speed

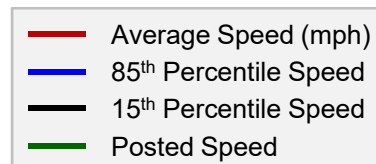
- Detector Distance from Stopbar $\approx$ 400 ft
- >5 mph
- Speeds are displayed 15 sec. after start of green to start of the yellow.
- Speed Accuracy ± 2 mph.
 - Good enough for engineering purposes



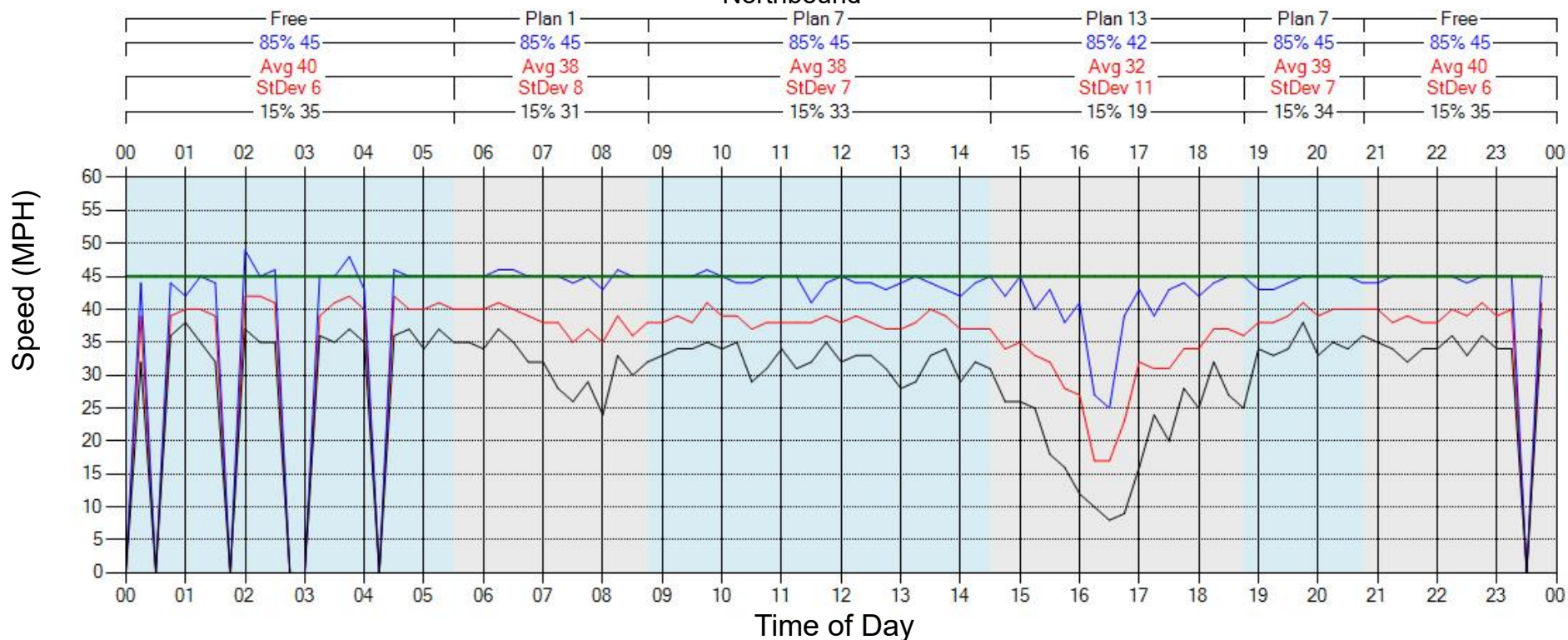
Image courtesy of Wavetronix

Metric: Approach Speed

Approach Speed
SR-126 & 5700 S, Roy - SIG#5088



Northbound



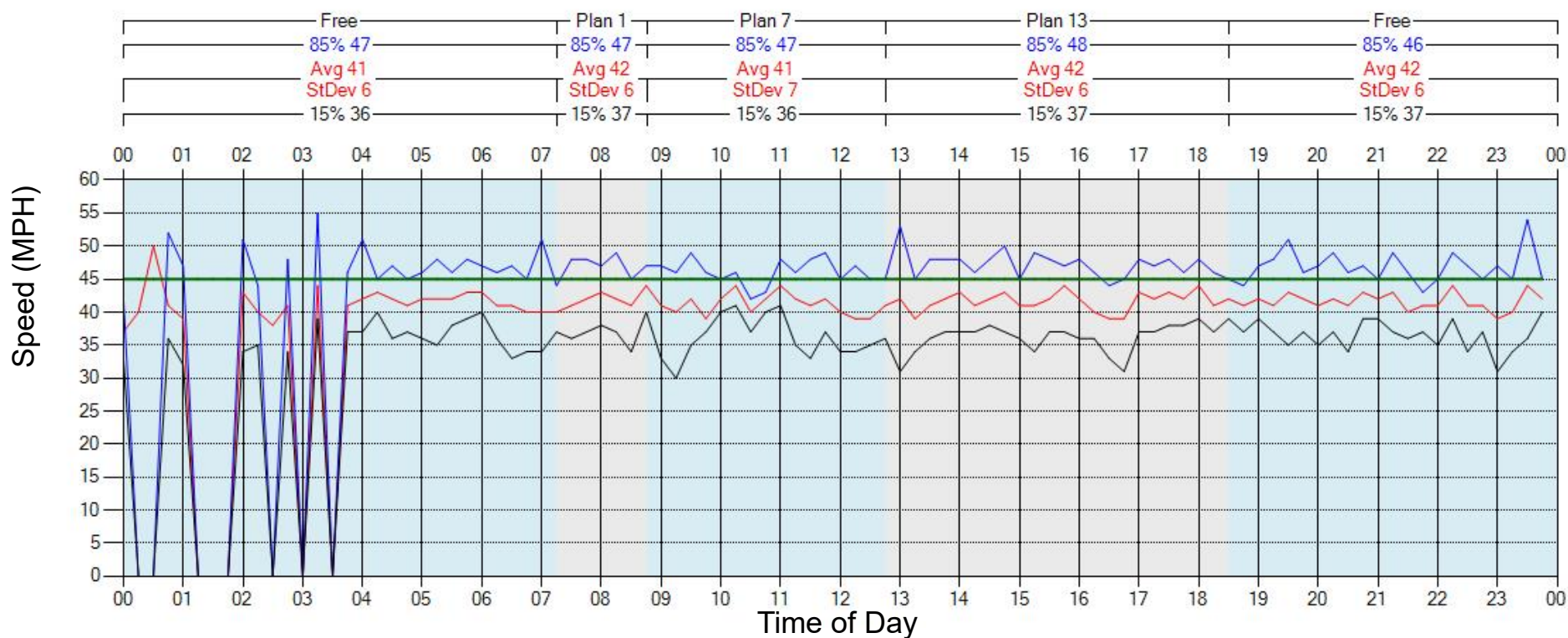
Metric: Approach Speed

Approach Speed

Bluff St & 700 South, St. George - SIG#8111

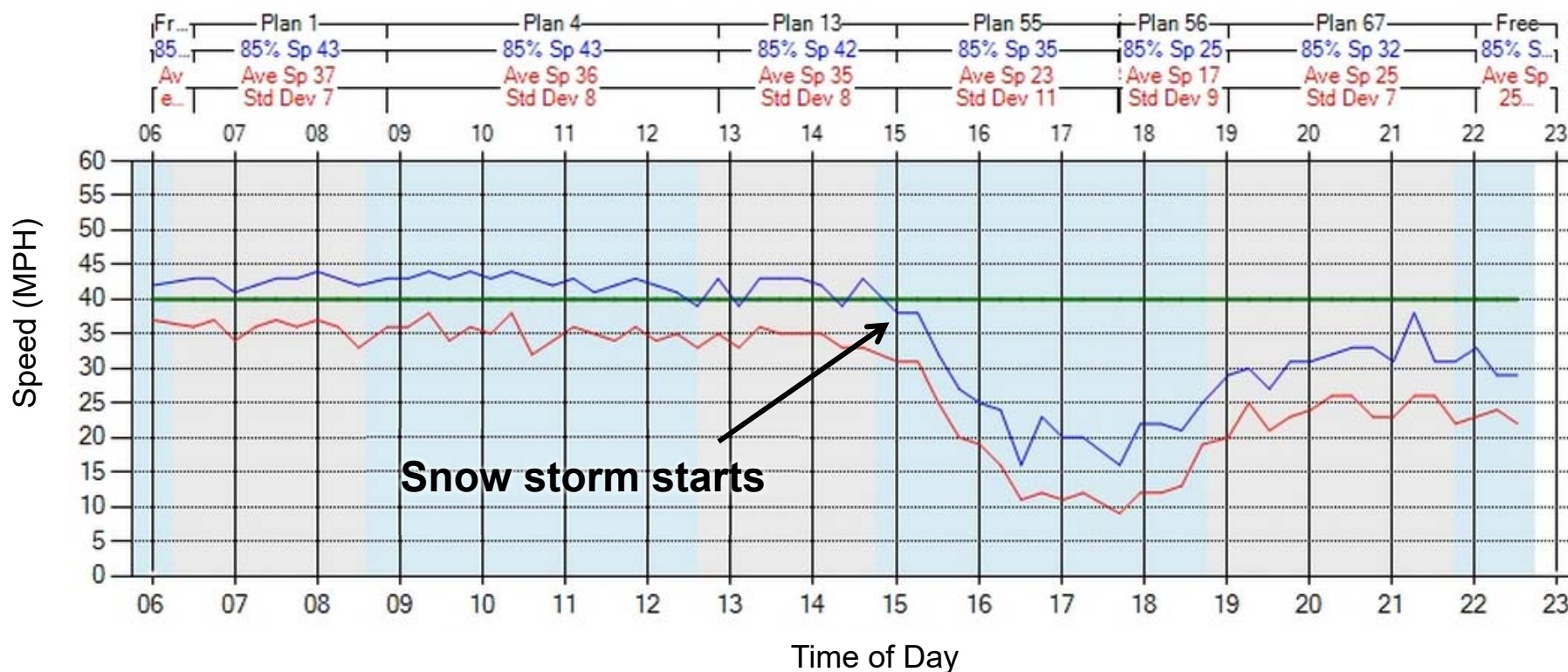
Southbound

- Average Speed (mph)
- 85th Percentile Speed
- 15th Percentile Speed
- Posted Speed



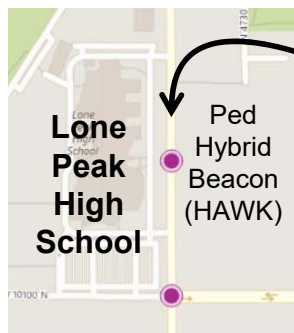
Metric: Approach Speed

Riverdale Rd & Shopko – Signal # 5008
Northbound – Thursday, January 10, 2013



ATSPM Applications: Active Transportation

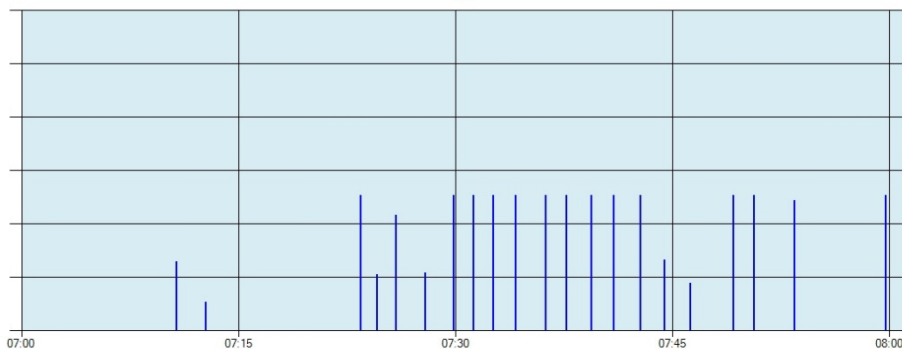
Optimizing for Pedestrian Delay & Safety



Uncoordinated actuated

Pedestrian Delay

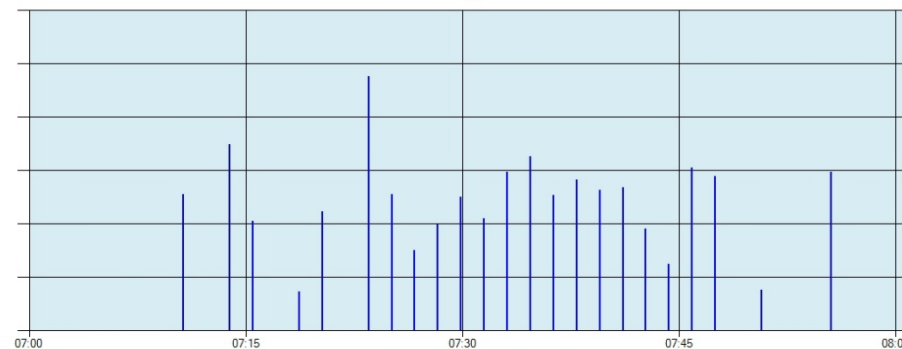
Lone Peak (HAWK) @ North County Blvd(Highland) - SIG#6062
Wednesday, August 29, 2018 7:00 AM - Wednesday, August 29, 2018 8:01 AM



Delay (sec)

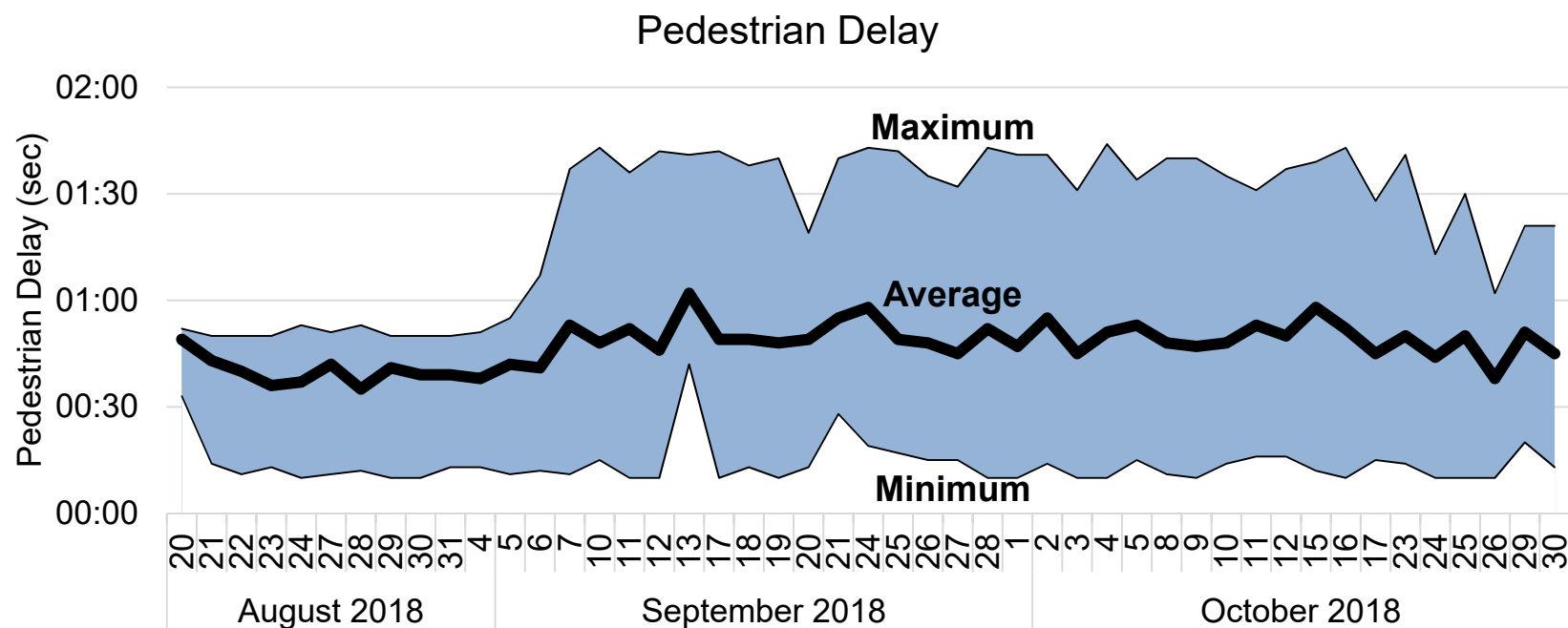
Pedestrian Delay

Lone Peak (HAWK) @ North County Blvd(Highland) - SIG#6062
Wednesday, October 10, 2018 7:00 AM - Wednesday, October 10, 2018 8:01 AM

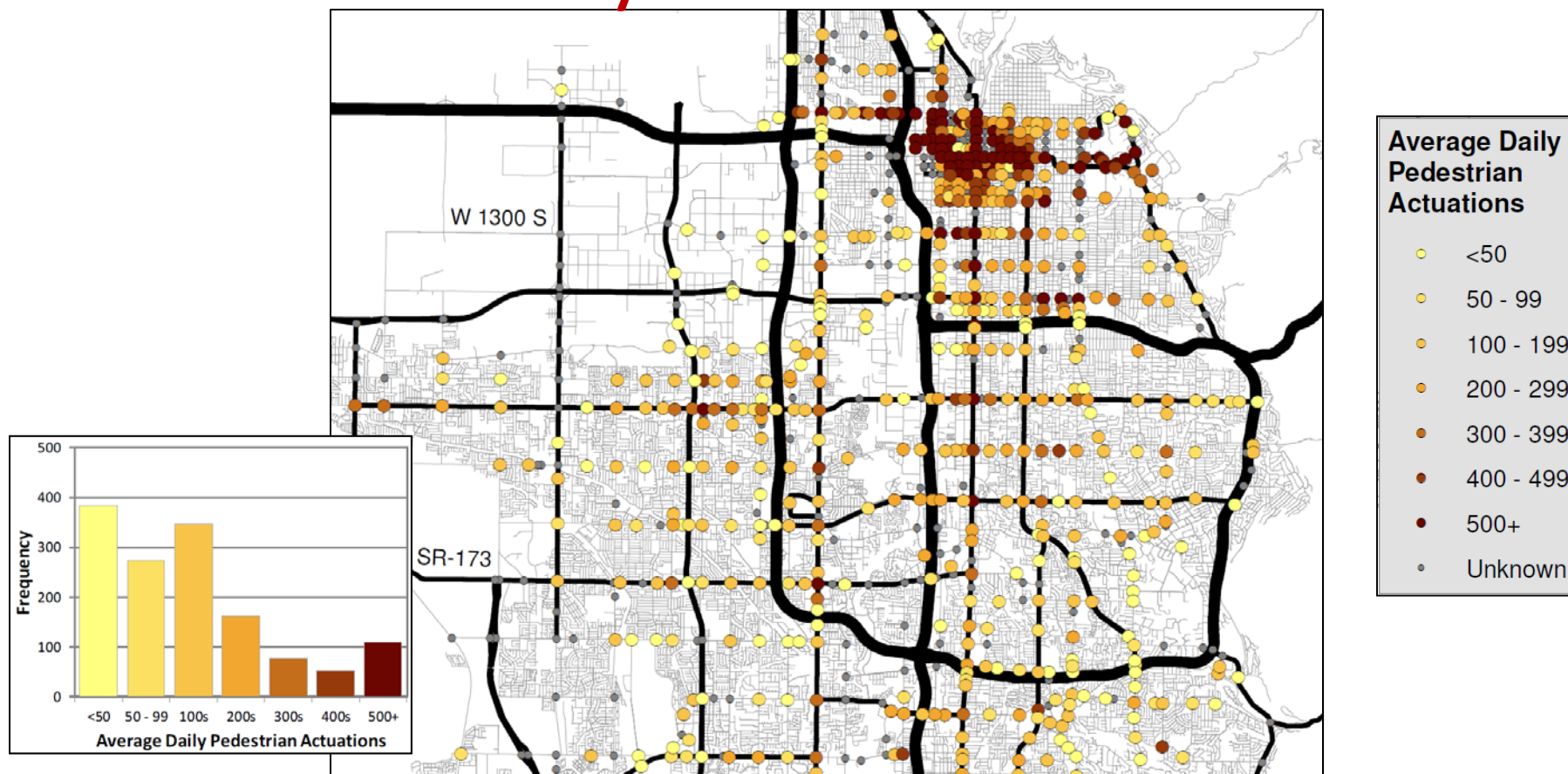


Coordinated

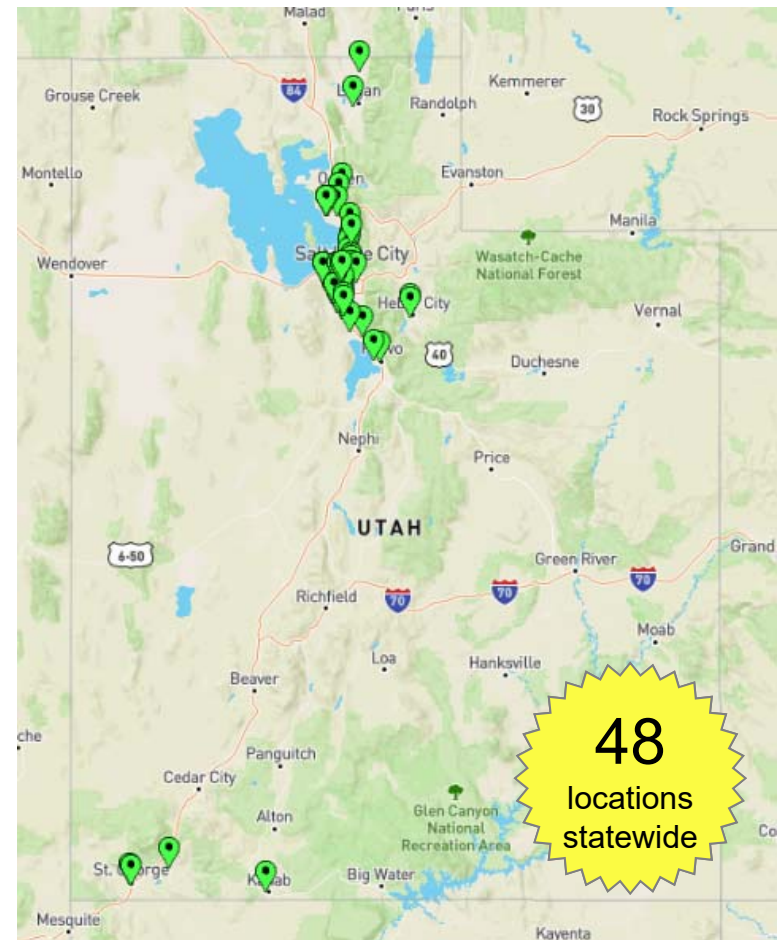
Optimizing for Pedestrian Delay & Safety



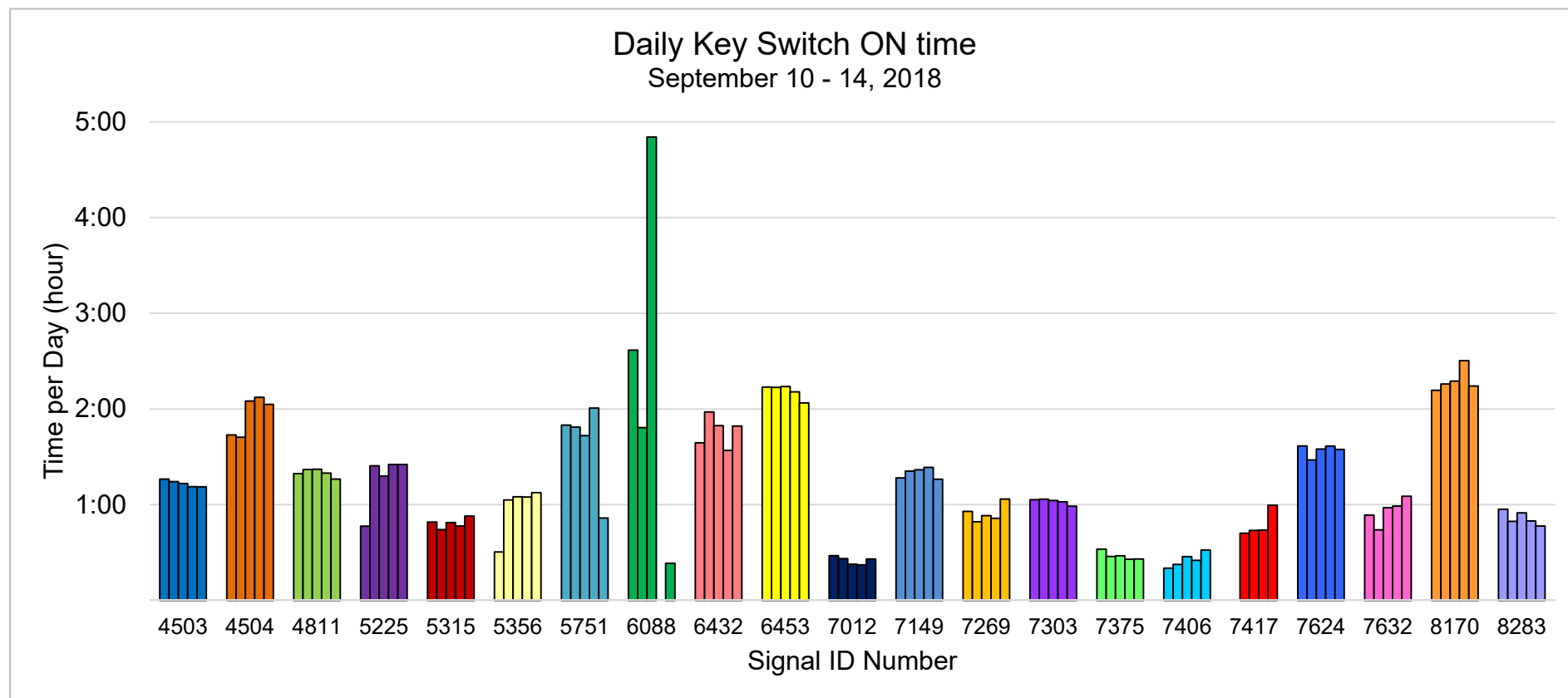
Pedestrian Activity



School Crossing Key Switch



School Crossing Key Switch



Future Development of ATSPMs

- Next version will provide:
 - Higher level dashboards
 - Aggregate data
 - Enhancements from open-source contributors
 - GDOT
 - PennDOT
 - Kittleson & Associates
 - Others



SYSTEM HEALTH ALERTS FOR PROACTIVE MAINTENANCE

UDOT Automated Traffic Signal Performance Measures

System Health Alerts

1

No SPM data: identifies signals with less than 500 records in the database between midnight and midnight the previous day

2

Too many max outs: identifies phases with more than 90% max outs in at least 50 activations between 1 a.m. and 5 a.m.

3

Too many force offs: identifies phases with more than 90% force offs in at least 50 activations between 1 a.m. and 5 a.m.

4

Too many ped calls: identifies phases with more than 200 pedestrian activations between 1 a.m. and 5 a.m.

5

Low PCD detector count: identifies phases with PCD detectors that have less than 100 vehicles counted between 5 p.m. and 6 p.m. the previous day.

SPM Alerts for 5/22/2016



SPMWatchdog@utah.gov

to marktaylor, me, signaldesk, shanejohnson, bryan.meenen, kbarnes, SWinters, tforbush, jay

--The following signals had too few records in the database:

4671 - 13400 South & 4500 West - Phase: 0 (Missing Records)

5701 - 500 South & 400 East (Btfl) - Phase: 0 (Missing Records)

--The following signals had too many force off occurrences:

1224 - North Temple & Main Street - Phase: 3 (Force Offs 97.6%)

7252 - 500 South & Main Street - Phase: 2 (Force Offs 100%)

7252 - 500 South & Main Street - Phase: 6 (Force Offs 100%)

--The following signals had too many max out occurrences:

1123 - Wolcott St & 100 South - Phase: 2 (Max Outs 100%)

1124 - Sunnyside (850 S) & Gaurdsman Way - Phase: 2 (Max Outs 100%)

1124 - Sunnyside (850 S) & Gaurdsman Way - Phase: 6 (Max Outs 100%)

4024 - 7000 South (Fort Union) & 1300 East - Phase: 7 (Max Outs 92.6%)

4029 - 7200 South & 700 East - Phase: 1 (Max Outs 100%)

4103 - 4680 South (Murray-Holladay) & 2320 East (Holladay) - Phase: 5 (Max Outs 100%)

4118 - 6200 South & 3655 West (Dixie) - Phase: 2 (Max Outs 100%)

4511 - 4100 South & 3200 West - Phase: 4 (Max Outs 100%)

4820 - 4835 South & 2700 West - Phase: 2 (Max Outs 100%)

5063 - Lincoln & 24th - Phase: 4 (Max Outs 100%)

5063 - Lincoln & 24th - Phase: 8 (Max Outs 100%)

5080 - Washington & Adams - Phase: 5 (Max Outs 100%)

5170 - 200 N (Kaysville) & Main St. - Phase: 4 (Max Outs 100%)

5305 - Main St. & 200 North (Logan) - Phase: 7 (Max Outs 96.2%)

5900 - 900 W. (Kays Dr.) & 200 North, (Kaysville) - Phase: 4 (Max Outs 90.4%)

6035 - Pioneer Crossing & Millpond Drive - Phase: 8 (Max Outs 91.9%)

6608 - 100 West & 100 North - Phase: 8 (Max Outs 98.5%)

7107 - Redwood Road & 4700 South - Phase: 5 (Max Outs 93.2%)

--The following signals had unusually low detector hits:

5134 - SR-193 (700 S) & I-15 NB (Clearfield) - Phase: 2 (Has Unusually Low Counts.) 48

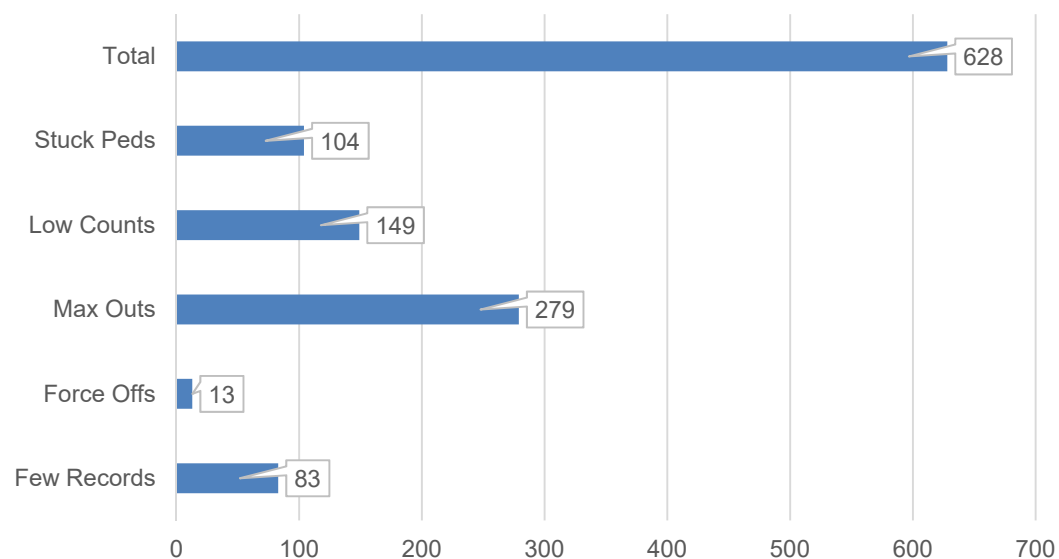
7061 - Pioneer Hwy (SR 154) & 4100 South - Phase: 4 (Has Unusually Low Counts.)

ATSPM Automated System Health Alerts – Detection

(January 1, 2018 to October 31, 2018)

- 628 Detector issues found within 10 months
 - Before public calls us to complain
- Average:
 - 15 detector issues per week

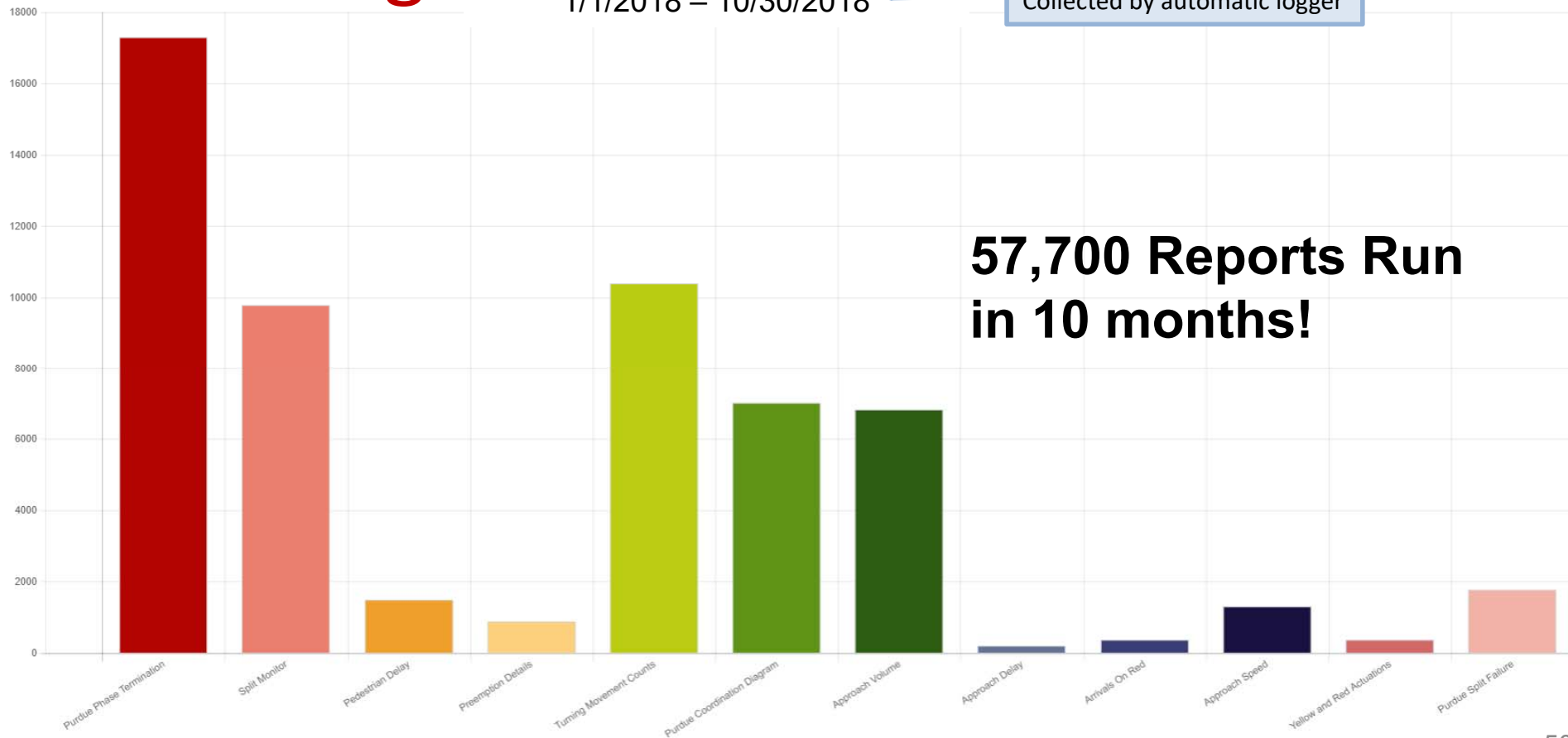
ATSPM Detector Issues - Automated
From: January 1, 2018 To October 31, 2018



Metric Usage

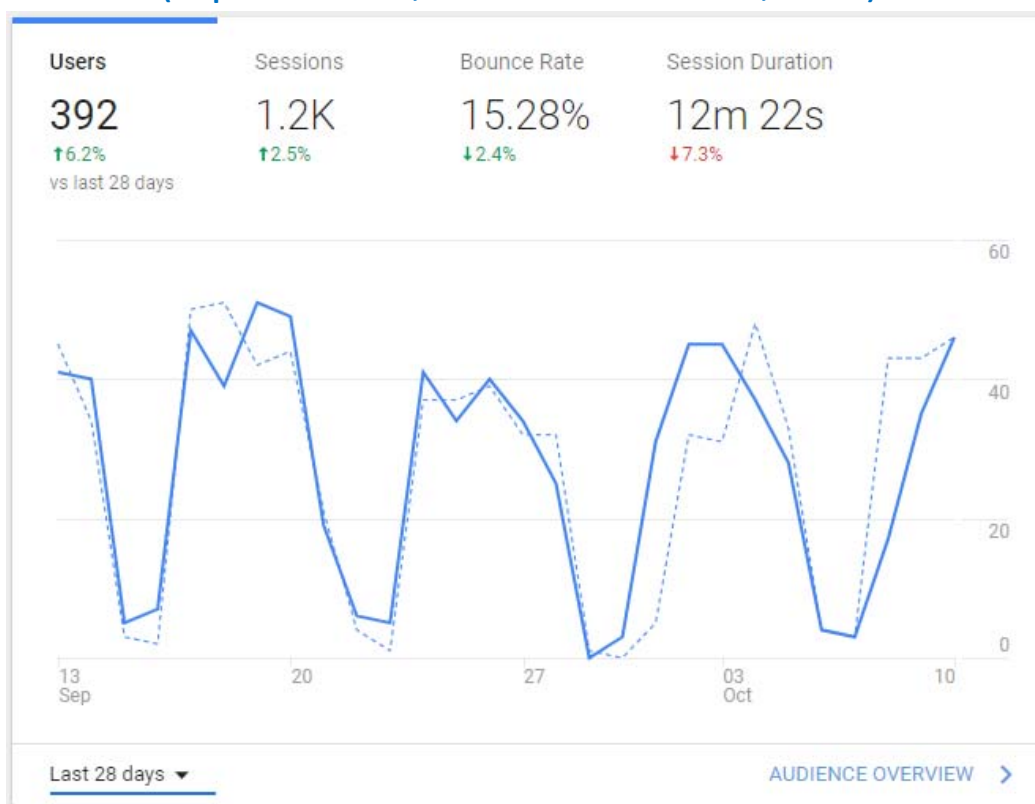
Metrics Run
1/1/2018 – 10/30/2018

Collected by automatic logger



Google Analytics – UDOT ATSPMs

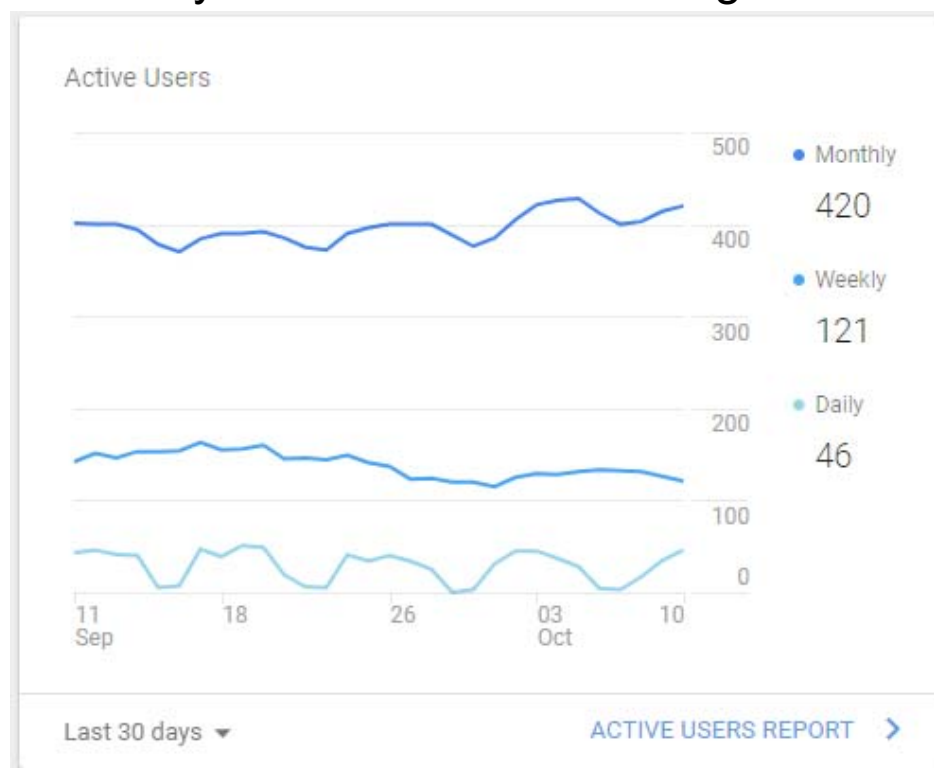
(September 13, 2018 to October 11, 2018)



Google Analytics – UDOT ATSPMs

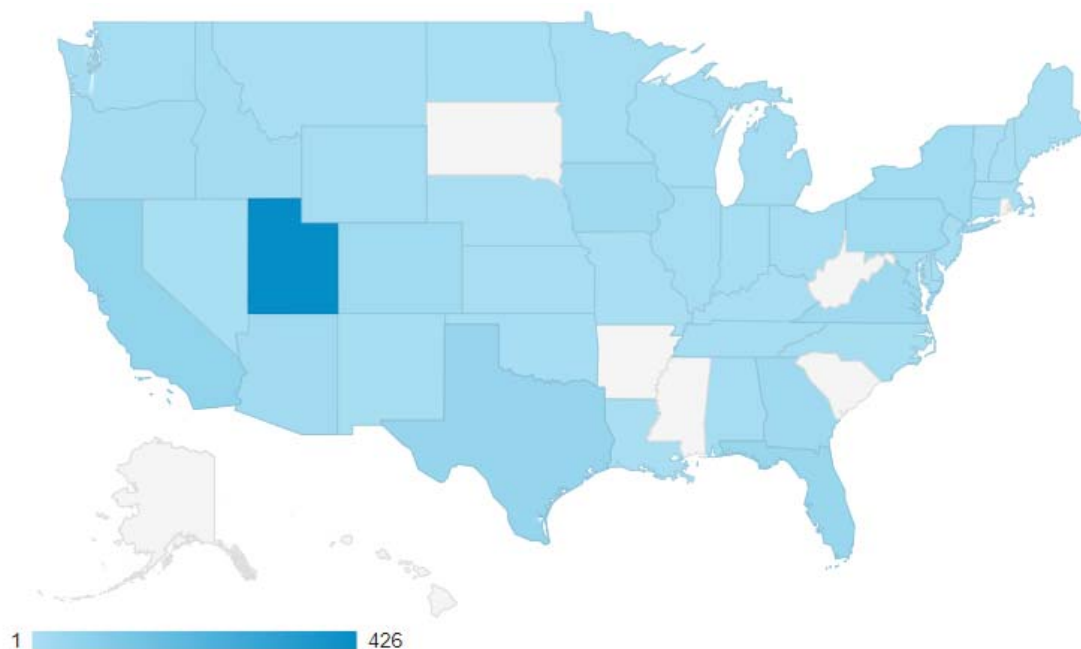
(September 13, 2018 to October 11, 2018)

How are your active users trending over time?



Google Analytics – UDOT ATSPMs

(July 1, 2018 to October 10, 2018)



Region ?	Acquisition
	Users ? ↓
	900 % of Total: 93.17% (966)
1. Utah	426 (44.61%)
2. California	60 (6.28%)
3. Texas	51 (5.34%)
4. Florida	45 (4.71%)
5. Virginia	28 (2.93%)
6. Georgia	27 (2.83%)
7. Iowa	26 (2.72%)
8. Colorado	24 (2.51%)
9. New York	24 (2.51%)
10. Pennsylvania	23 (2.41%)

More Information

Mark Taylor

UDOT Traffic Signal Operations Engineer
marktaylor@utah.gov

Jamie Mackey

UDOT Statewide Signal Engineer
jamiemackey@utah.gov

UDOT ATSPMs

ATSPM Website

<https://udottraffic.utah.gov/ATSPM>

Green Lights Commercial

<http://udot.utah.gov/greenlights>

FHWA's Open Source Application Development Portal (OSADP)

<https://www.itsforge.net>

ATSPM Forums

National Operations Center of Excellence (NOCoe)

<http://forum.transportationops.org/forum/5-traffic-signals/>

➤ General ATSPM topics

FHWA's Open Source Application Development Portal (OSADP)

<https://www.itsforge.net/forum/ATSPM>

➤ Questions regarding UDOT's ATSPM source code

60s Commercial – Green Lights

<http://udot.utah.gov/greenlights>



udottraffic.utah.gov/ATSPM

Mark Taylor
marktaylor@utah.gov

Jamie Mackey
jamiemackey@utah.gov

