

VTrans Highway Division Operations & Safety Bureau



Joshua Schultz, PE
Operations & Safety Bureau Director

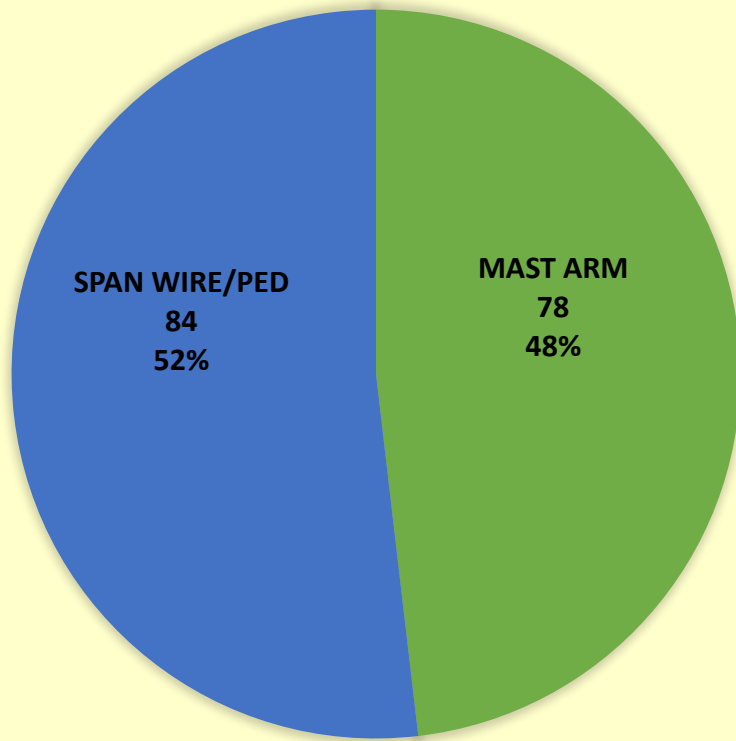


ATSPM

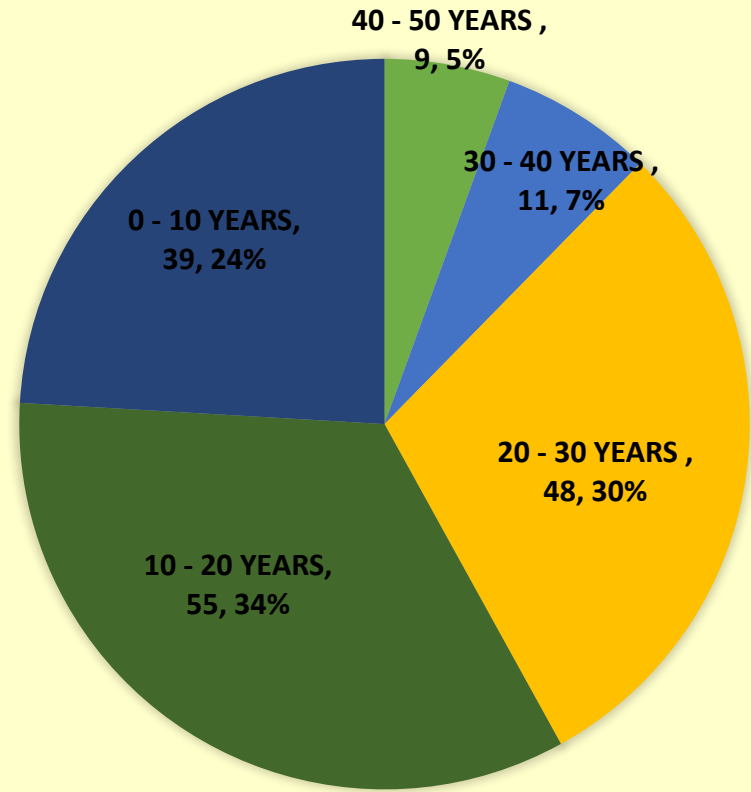
- Let the signal controllers & vehicle detection work for you.
- “Why Model what you can Measure?”
 - Utah DOT’s Mark Taylor

VTrans Traffic Signal Structures

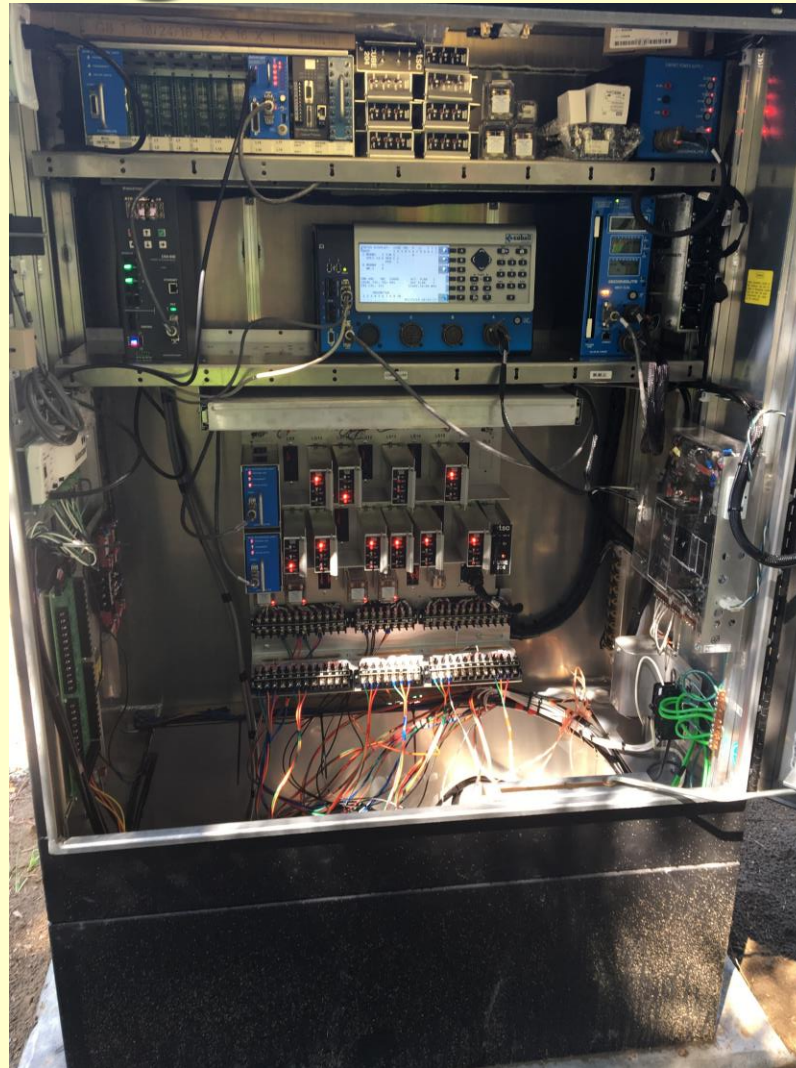
TRAFFIC SIGNAL STRUCTURE TYPE



TRAFFIC SIGNAL STRUCTURE AGE



Traffic Signal Control Cabinet



VTrans ATSPMs



Measures Reports Log Action Taken Links FAQ About

Register Log in

Signal

Signal Selection

Signal ID
 Vt Route 100 @ Bishop Marshall

Signal List

Signal Map

Region:

Metric Type:

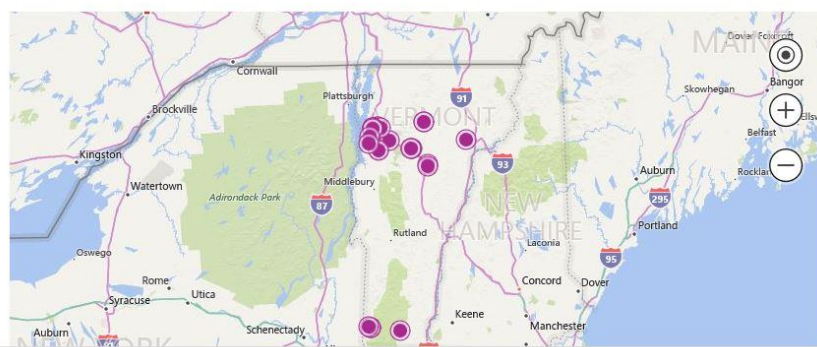


Chart Selection

- Metrics List**
- Purdue Phase Termination
 - Split Monitor**
 - Pedestrian Delay
 - Preemption Details
 - Purdue Coordination Diagram
 - Approach Volume
 - Approach Delay
 - Arrivals On Red
 - Approach Speed
 - Purdue Split Failure

Split Monitor Options

Y-axis Max

Percentile Split

Show Plans

Show Ped Activity

Show Average Split

Show % Max Out/ForceOff

Show Percent GapOuts

Show Percent Skip

Date Selection

Start Date

End Date

September 2018

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

VTrans Internal Link; <http://aotatspm01v/atspm>

Purdue Phase Termination Chart

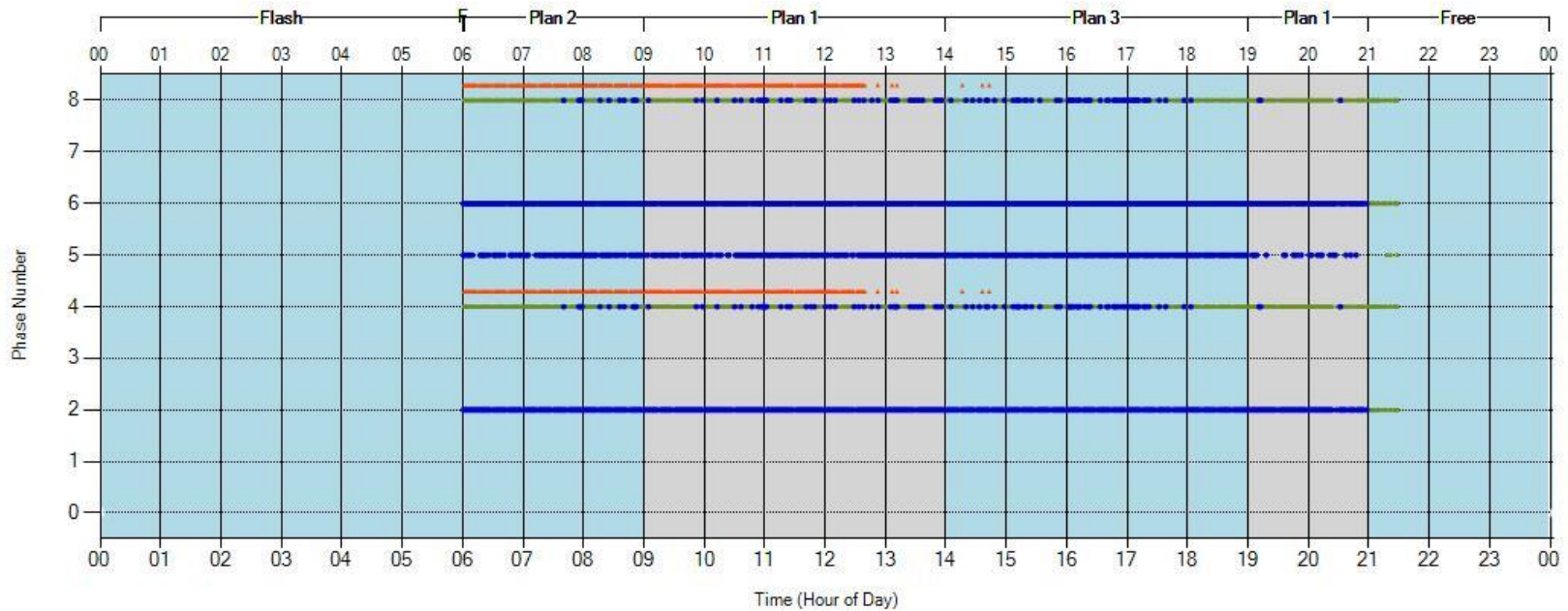
Chart Legend

■ Gap Out
 ■ Max Out
 ■ Force Off
 ■ Unknown
 ■ Ped Activity

Purdue Phase Termination

VT 7A @ Benmont Avenue - SIG#MS105
 Monday, December 3, 2018 12:00 AM - Monday, December 3, 2018 11:59 PM

Currently showing Force-Offs, Max-Outs and Gap-Outs with a consecutive occurrence of 1 or more.
 Pedestrian events are never filtered



Side Street Pedestrian Phase Calling all day, Signal Crew repair mid-day Monday.


Pedestrian Delay, Before Fix

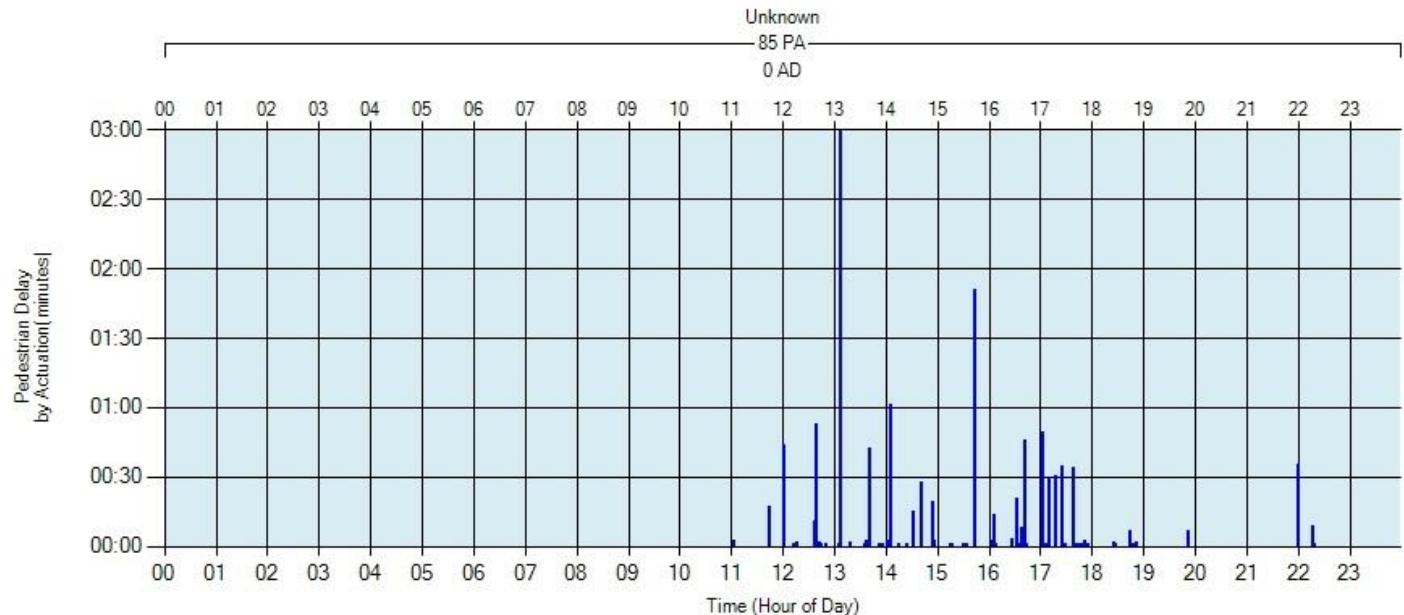
Pedestrian Delay

VT Route 100 @ VT Route 9 - SIG#MS118
 Sunday, November 4, 2018 12:00 AM - Sunday, November 4, 2018 11:59 PM

Phase 9

Ped Actuations(PA) = 85; Min Delay = 00:00; Max Delay = 10:29; Average Delay(AD) = 00:16

 Pedestrian Delay by Actuation



Gov. Scott's office received complaint regarding pedestrian button on at all times of day. My team had observed intersection multiple times and had not witnessed problem.


Pedestrian Delay, After Fix

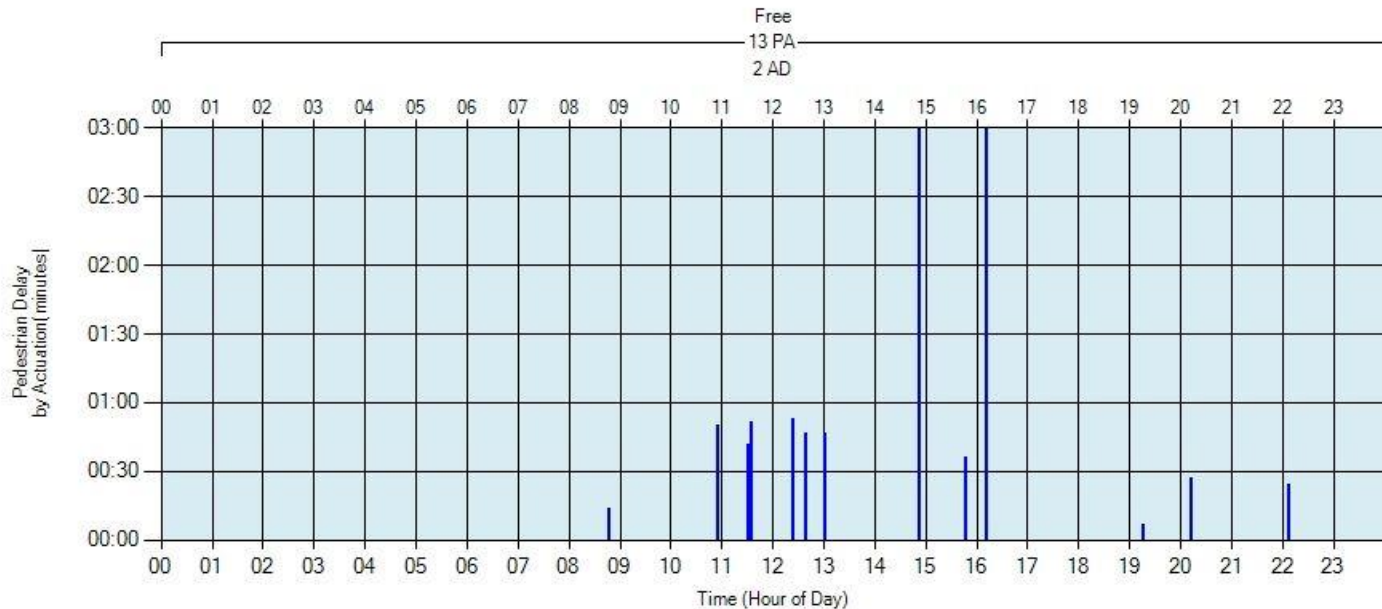
Pedestrian Delay

VT Route 100 @ VT Route 9 - SIG#MS118
 Sunday, December 2, 2018 12:00 AM - Sunday, December 2, 2018 11:59 PM

Phase 9

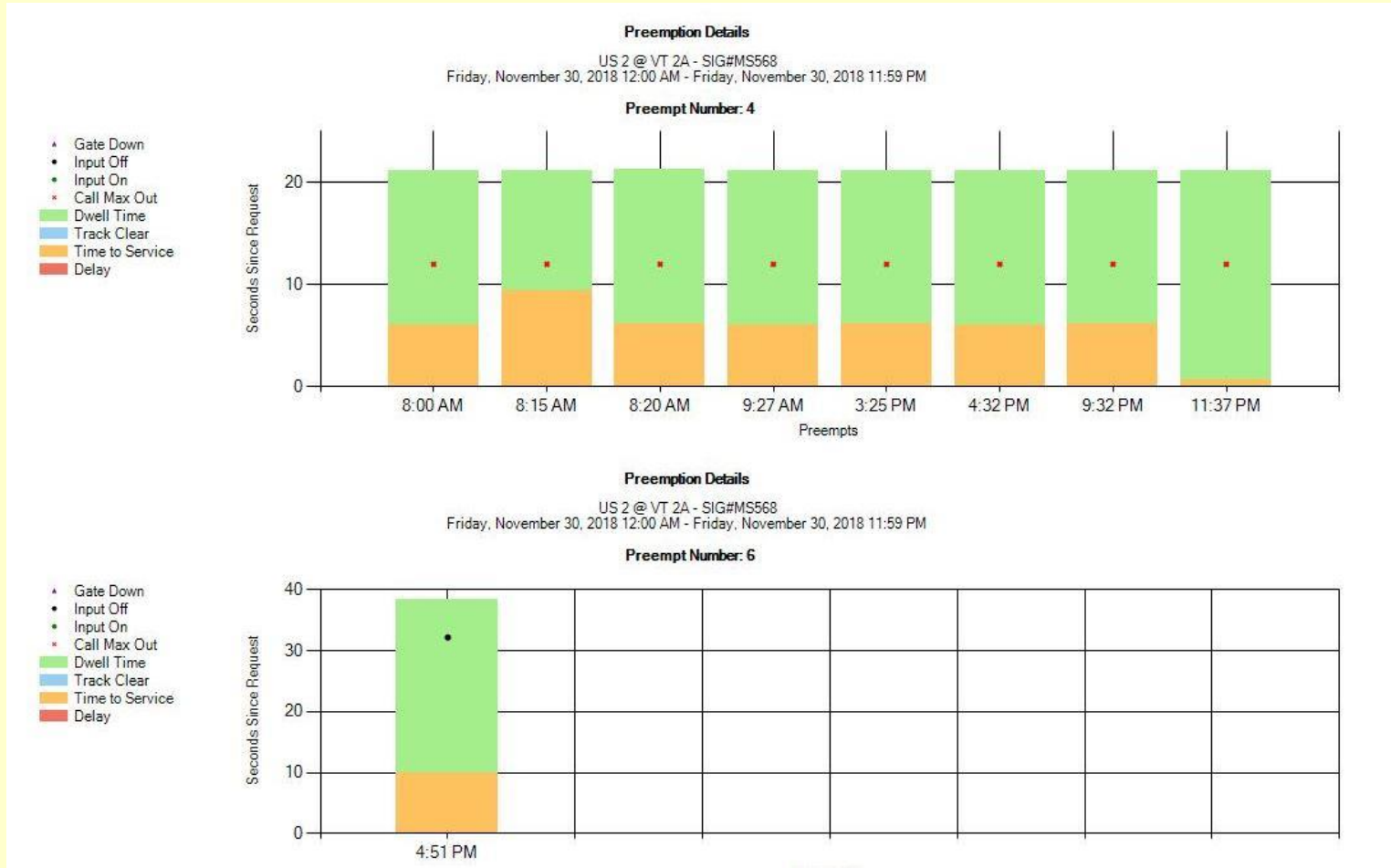
Ped Actuations(PA) = 13; Min Delay = 00:06; Max Delay = 11:18; Average Delay(AD) = 02:13

 Pedestrian Delay by Actuation



Pedestrian Actuations dropped from 85 down to 13 under similar conditions. Push Button wasn't stuck on all of the time, but was randomly failing which was difficult to observe with out ATSPM collecting 24/7 data.

Emergency Preemption



Preemption data can help identify issue, if multiple preempts happen during peak traffic.

Purdue Coordination Diagram

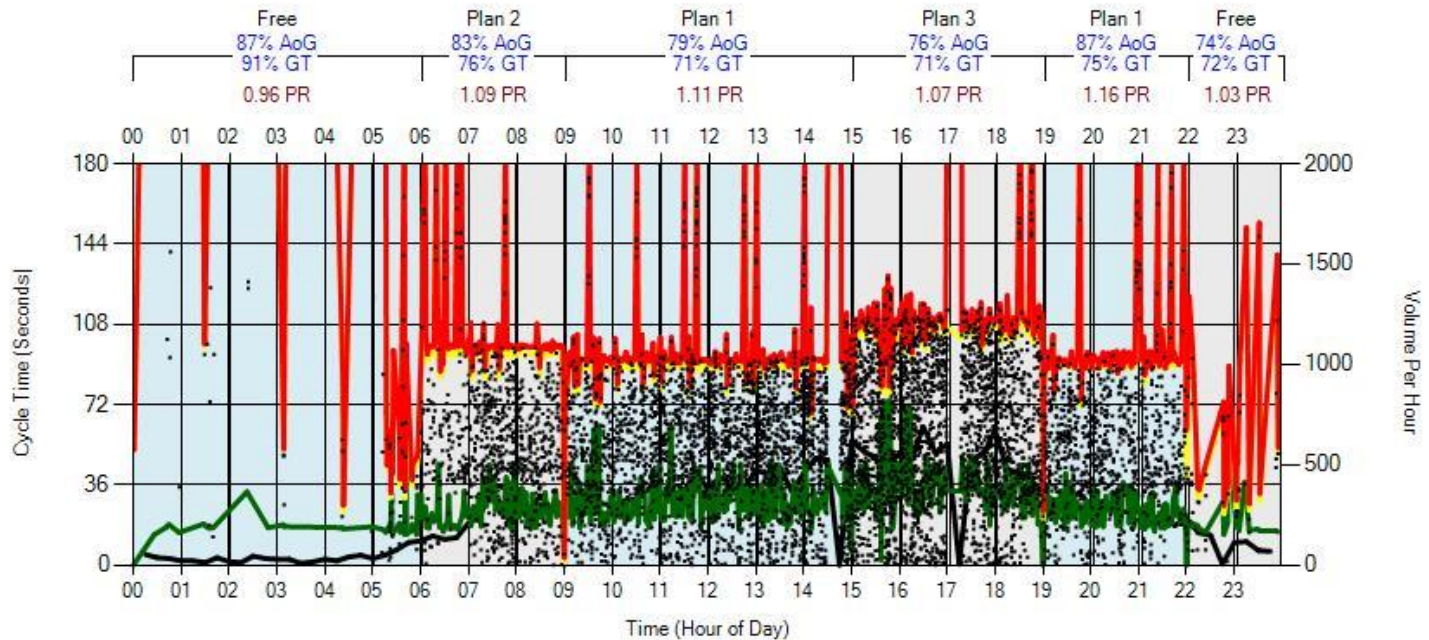
Purdue Coordination Diagram

VT 15 @ Billy Butler Dr. - SIG#MS555
 Friday, November 30, 2018 12:00 AM - Friday, November 30, 2018 11:59 PM
 Advanced detector located 350 ft. upstream of stop bar

Phase 2: Northbound

AoG = 80%

- Volume Per Hour
- Detector Activation
- Change to Green
- Change to Yellow
- Change to Red
- AoG - Arrival On Green
- GT - Green Time
- PR - Platoon Ratio



Vehicles Have 80% chance of arriving on Green throughout 24 hour period

Approach Volume

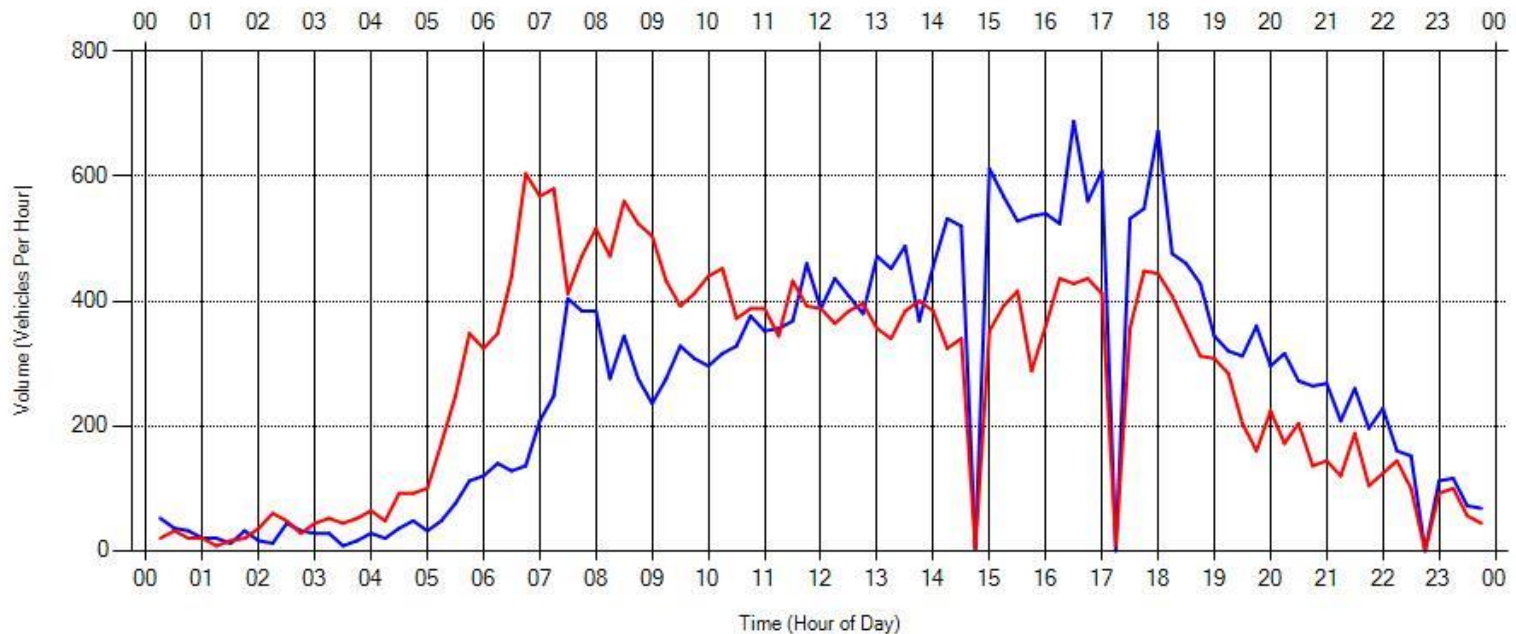
Approach Volume

VT 15 @ Billy Butler Dr. - SIG#MS555
 Friday, November 30, 2018 12:00 AM - Friday, November 30, 2018 11:59 PM

Northbound and Southbound Approaches

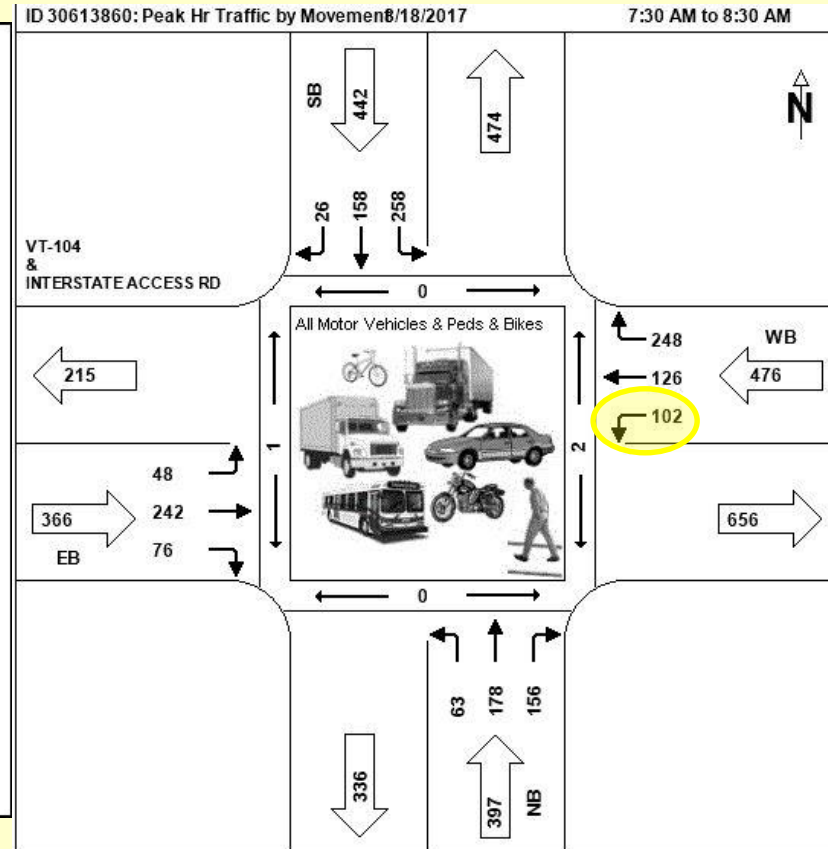
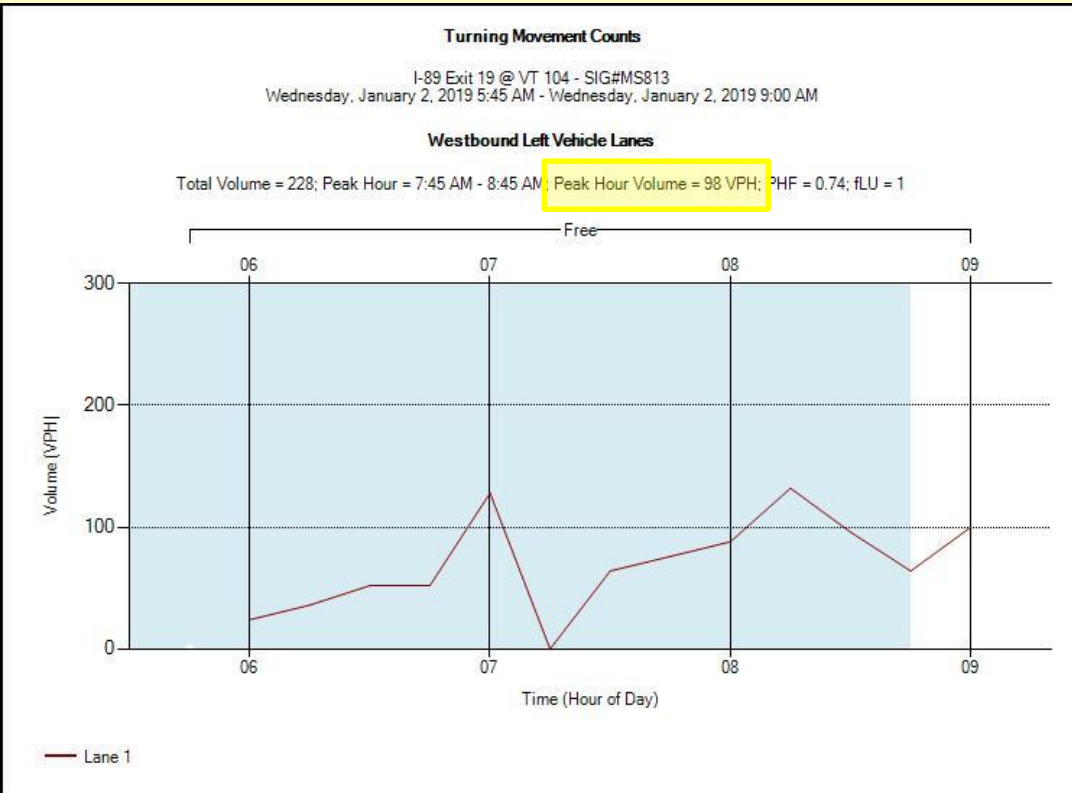
Wavetronix Advance located 350ft. upstream of the stop bar

— Northbound
 — Southbound



Show Typical Directional Peak Traffic, SB in AM & NB in PM.

Lane by Lane Turning Movement Count



Shows Left Turn Lane Turning Movement Count for AM Peak Hour of 98 vehicles, compared to MS2 data showing 102 vehicles manually counted on 8/18/2017.

Purdue Split Failure

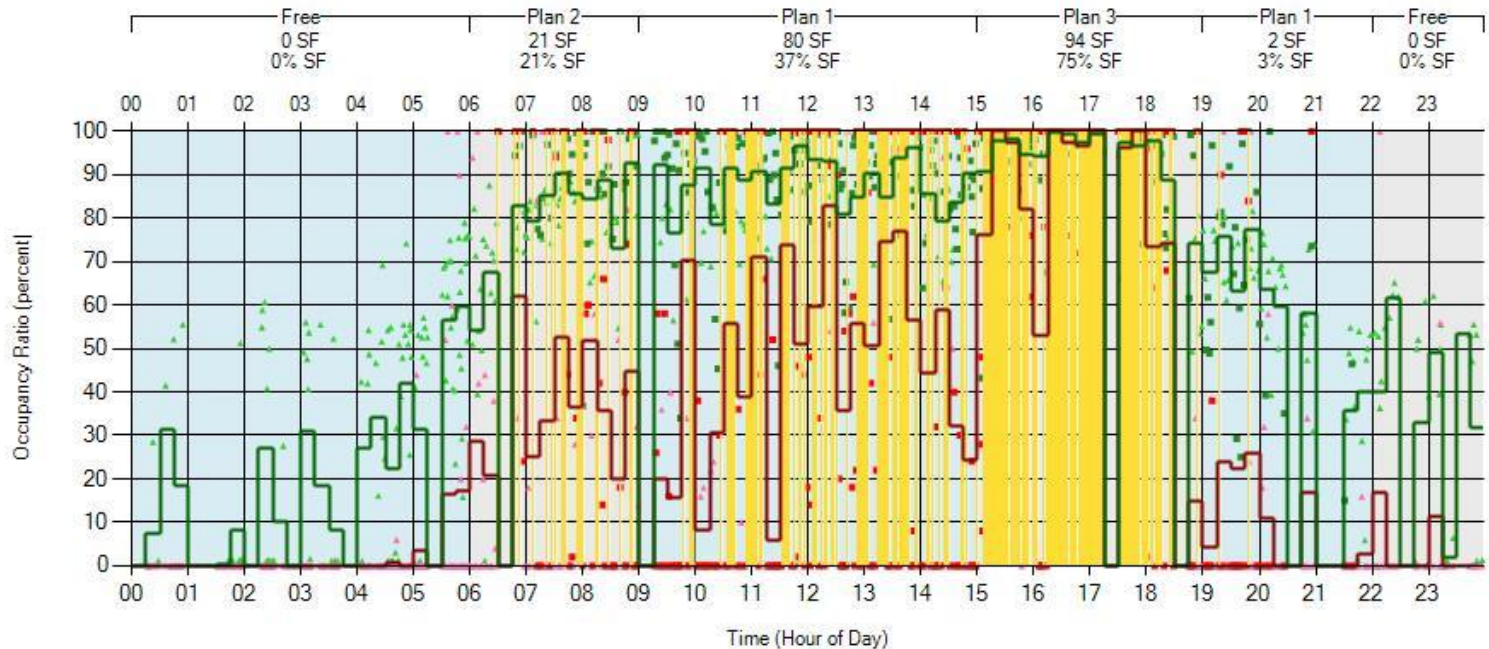
Purdue Split Failure

VT 2A @ Marshall Ave. - SIG#MS572
 Friday, November 30, 2018 12:00 AM - Friday, November 30, 2018 11:59 PM

Protected Phase 5: Northbound Left

Total Split Failures = 197

- SplitFail
- GOR - GapOut
- GOR - ForceOff
- ROR - GapOut
- ROR - ForceOff
- Avg. ROR
- Avg. GOR
- - - Percent Fails



Shows NB Left onto Marshall Ave Maxing out 75% of the time during PM Peak

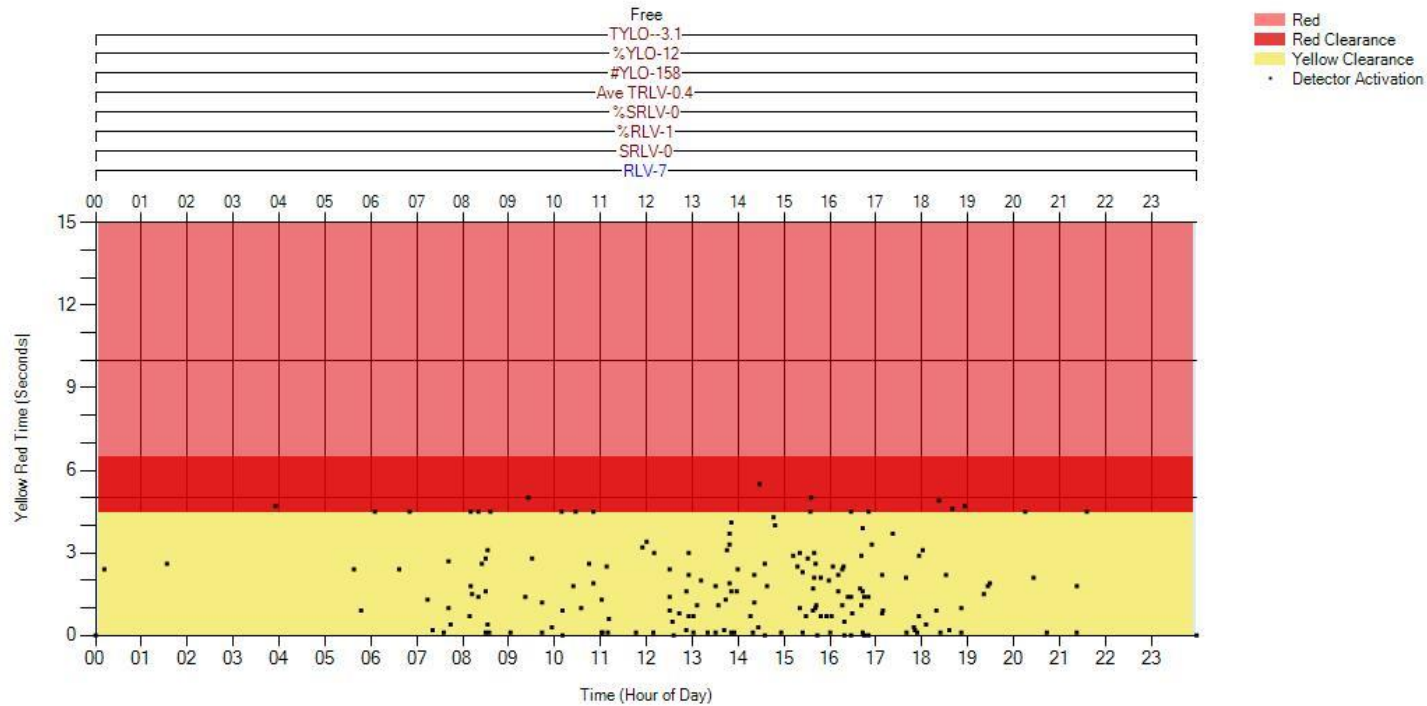
Yellow and Red Actuations

Yellow and Red Actuations

VT Route 62 @ Fisher Road - SIG#MS609
 Monday, December 31, 2018 12:00 AM - Monday, December 31, 2018 11:59 PM

Protected Phase 6: Northbound Thru

Total Violations = 7 (0%); Severe Violations = 0 (0%); Yellow Light Occurrences = 158 (0%)



Shows Red Light Runners over 15 mph during and after red phase

Shelburne-South Burlington NHG SGNL(51)

March 1, 2019

PATTI COBURN, PROJECT MANAGER, VTRANS











Project Location

US Route 7 Corridor

(17 signals)

Legend

-  VTrans Signal
-  Municipal Signal
-  Interstate Highway
-  US Highway
-  Vermont State Highway
-  Class 1 Town Highway

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus, USDA, USGS, AeroGRID, IGN, and the GIS User Community



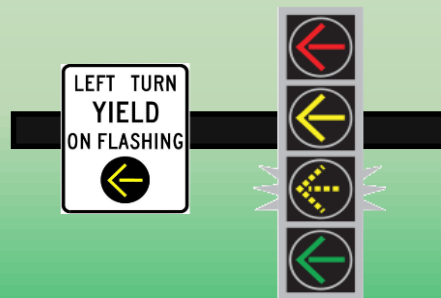
Project Definition

Signal Infrastructure required for ATSPMs

- Establish communications
- Bluetooth equipment (travel time)
- Advanced detection equipment
- Cameras
- Updated signal cabinets and controllers

Additional Corridor Needs

- Replace six aging spanwire signals
- Evaluate flashing yellow arrow for left turns





Modernizing Signal Equipment

Project Benefits

- Ability to monitor traffic and adjust signal timing remotely
- Automated alerts to signal technicians in the event of a system failure
- ATSPMs
- Replaces dated equipment
- Improved signal coordination
- Reduce delay for left turns

Budget

- Scoping cost estimate: \$2.7M
- Accelerated Innovation Deployment grant (CCRPC applicant)
\$1M federal funds

Schedule

- Project Definition (Spring 2019)
- Preliminary Engineering (2019-2021)
- Advertisement (Fall 2021)
- Construction (Summer 2022)