

# Automated Traffic Signal Performance Measures

City of Gainesville Initiatives  
Jeffery Gordon, EI

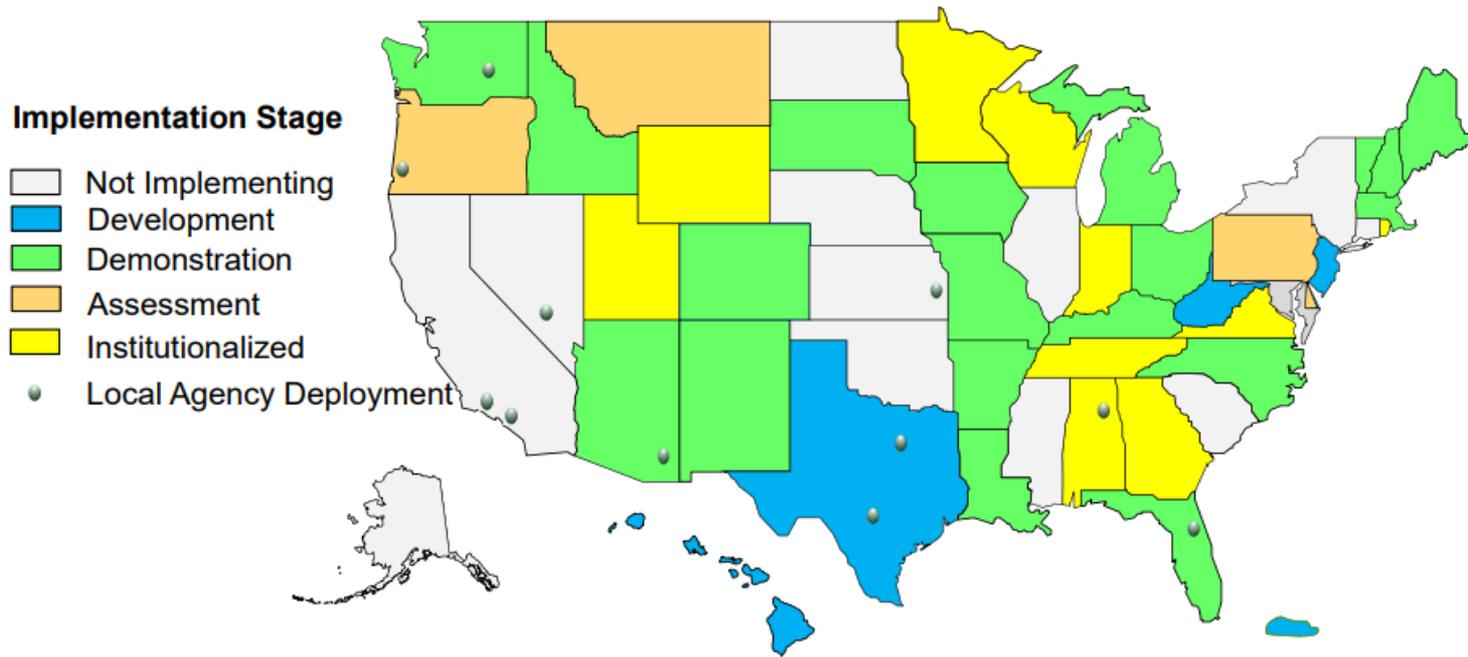


FSITE Annual Meeting  
October 30<sup>th</sup> - 31<sup>st</sup> 2018  
Coral Springs, FL

# What is ATSPM?

## Performance metrics for intersection operations

- Data driven performance measurements
- Collection of high resolution data
- Developed from the partnership of Indiana DOT and Purdue University
  - Utah DOT developed open-source platform



# City of Gainesville Traffic Operations

- **Maintains 236 traffic signals throughout Alachua County**
- **Connected by 105 miles of fiber optic cable**
  - Over 2,000 network nodes



# Iteris – VantageLive!

- **Powerful data collection for both engineers and planners**
- **Traffic data collection on demand**

## Advantages

- Leverages existing field hardware
- Interoperable with various controller vendors
- Cloud-based data storage
- Report generation
- Easy data access

## Disadvantages

- Time intensive setup
- Minor hardware changes

# Iteris – VantageLive!

## Vehicles - Yesterday

Top 5 Intersections By Volume

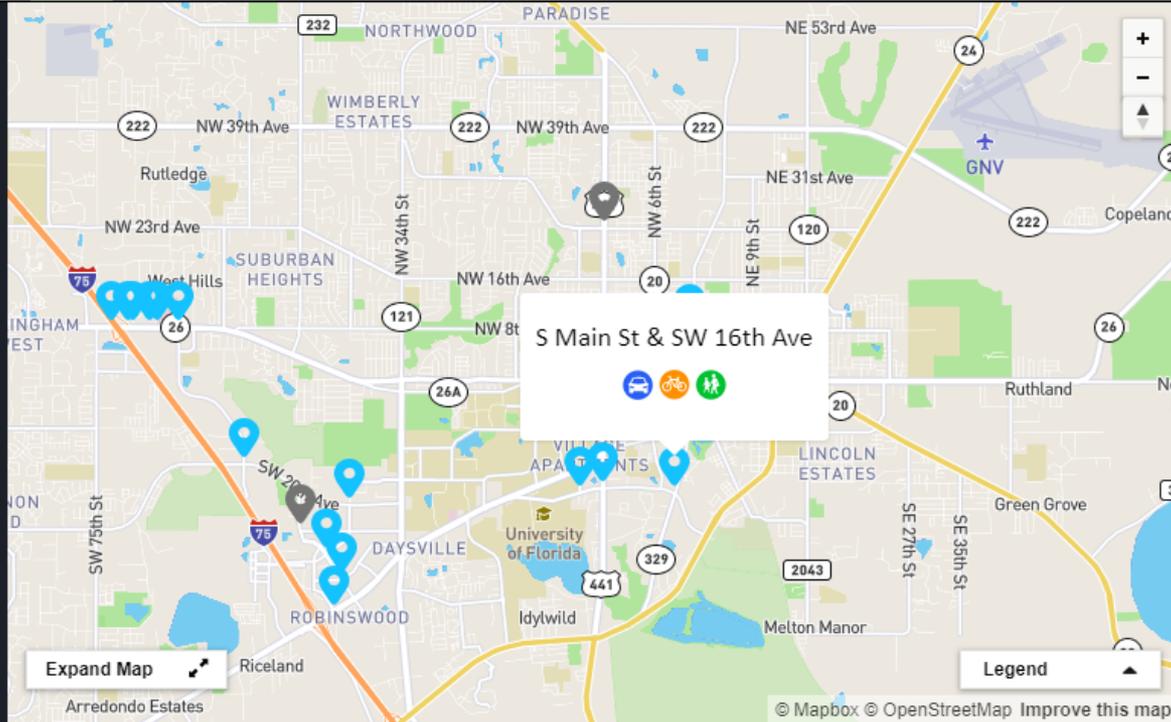
Intersection	Volume
Newberry & NW 69t...	58,365
Newberry & 175 Wes...	58,088
Newberry & NW 62n...	56,781
Newberry & Oaks Mall	51,687
Newberry & NW 66t...	50,572

Top 5 Approaches By Volume

Intersection	Dir	Volume
Newberry & 175...	WB	29,804
Newberry & N...	EB	28,265
Newberry & N...	WB	26,541
Newberry & 175...	EB	25,523
Newberry & 175...	EB	25,430

Top 5 Movements By Volume

Intersection	Dir	Move
Newberry & 17...	WB	T
Newberry & 17...	EB	T
Newberry & N...	EB	T
Newberry & Oa...	EB	T
Newberry & N...	WB	T



## Mode Share - Yesterday

Top 5 Intersections By Mode Share

Intersection	% Car	% Bicycle	% Pedestrian
S Main St and S...	90.1	2.4	7.5
SW 16th Ave & ...	95.6	0.5	3.9
Archer Rd & S...	95.6	n/a	4.4
S Main St & SW...	96.8	0.5	2.7
S Main St & SW...	98.4	0.2	1.4

## Bicycles - Yesterday

Top 5 Intersections By Volume

Intersection	Volume
SW 16th Ave & SW 1...	640
SW 20th Ave and SW...	455
S Main St and SE 2nd...	325
SW 16th Ave & SW 1...	141
Clark Butler Blvd & PL...	97

## Pedestrians - Yesterday

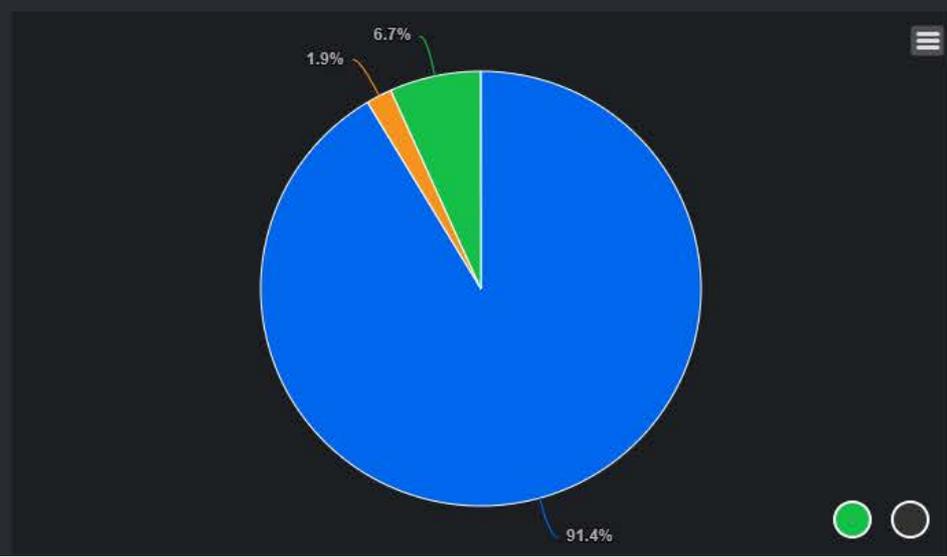
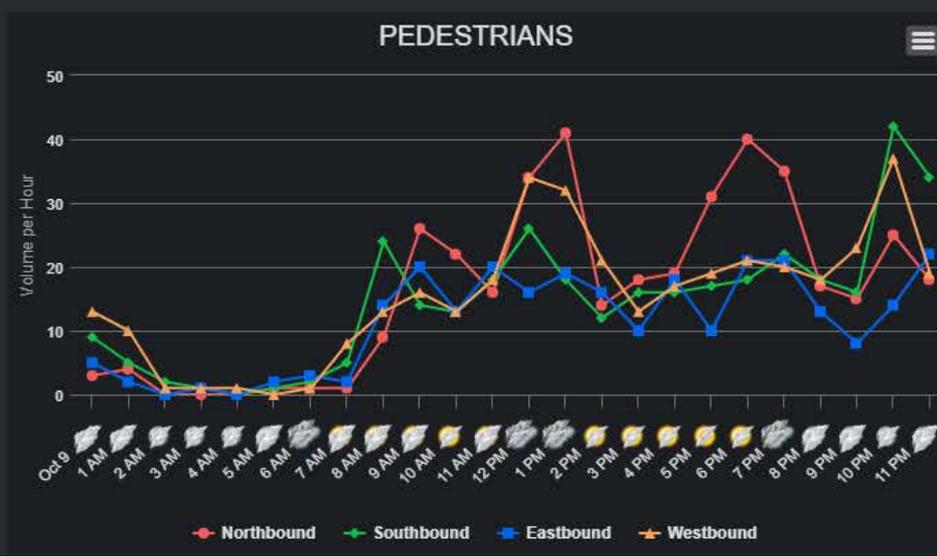
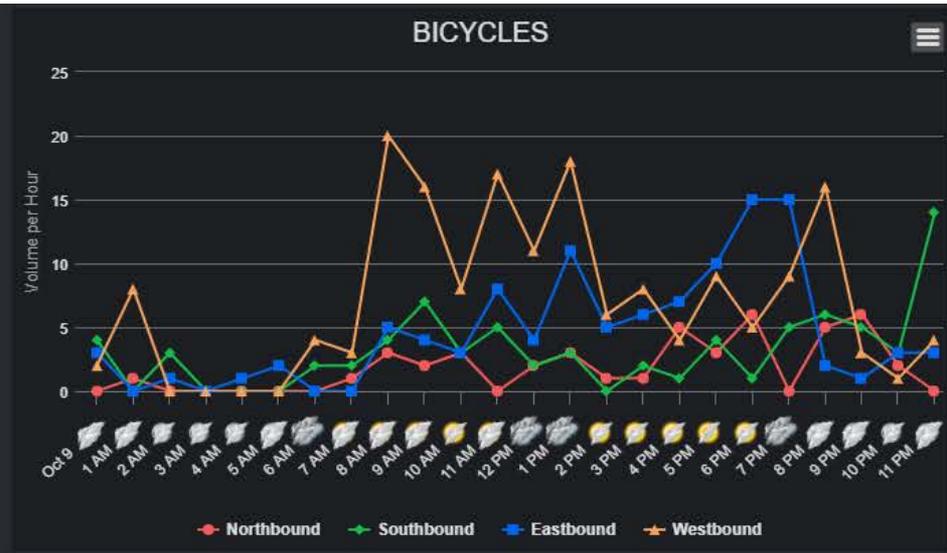
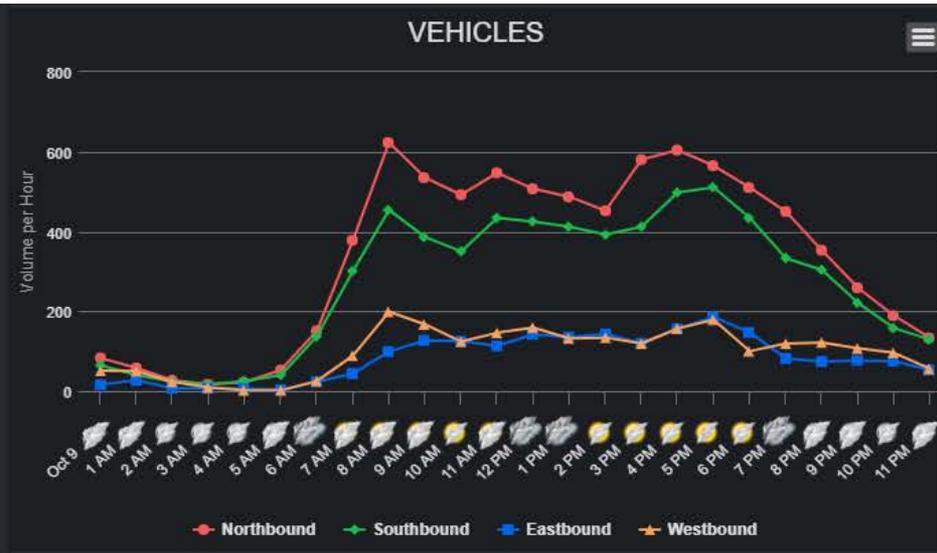
Top 5 Intersections By Volume

Intersection	Volume
S Main St and SE 2nd...	1,029
SW 16th Ave & SW 1...	1,014
S Main St & SW 4th A...	480
Newberry & NW 69t...	402

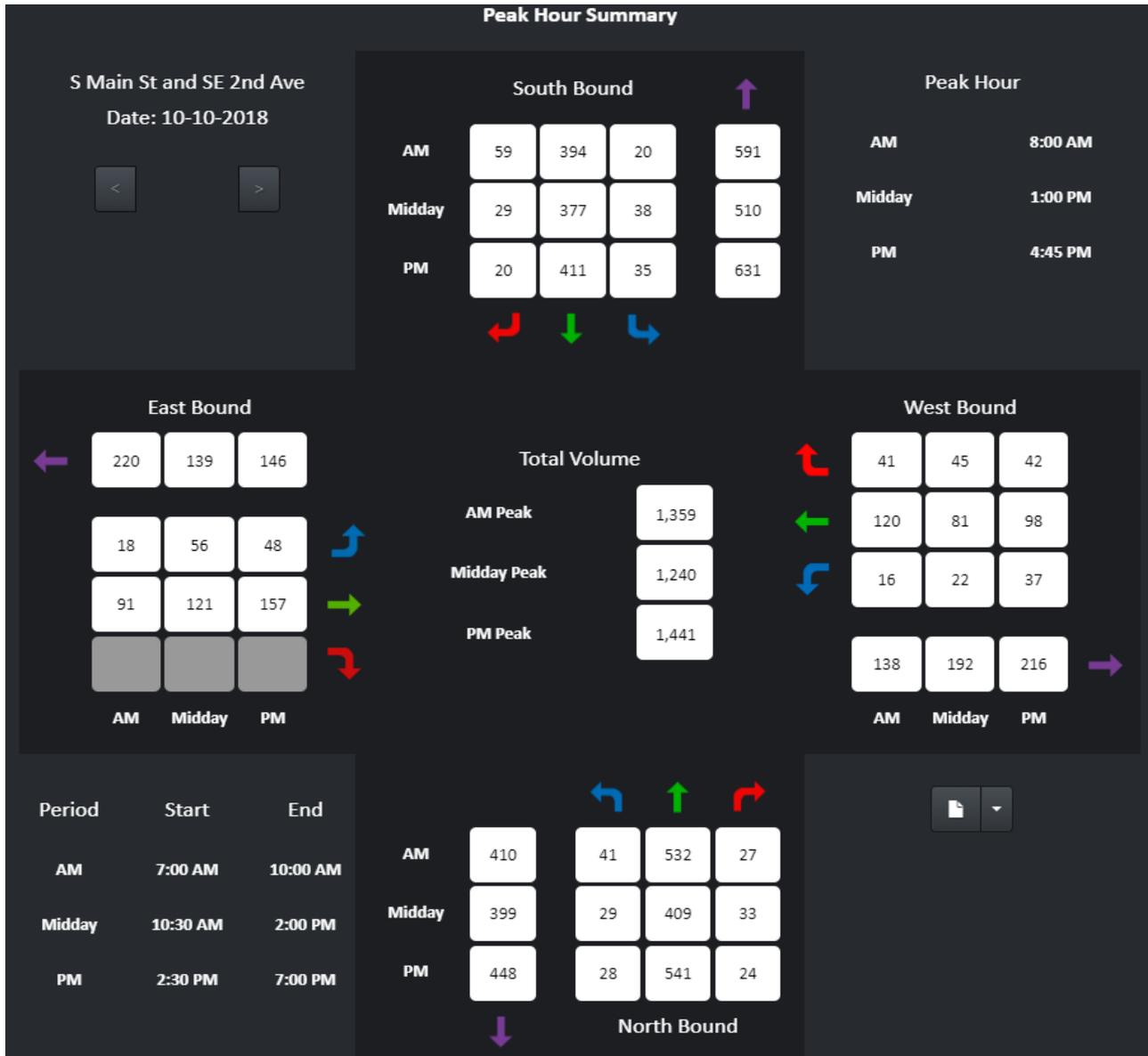
## System Status

Intersection	Communication	Standard Detection Mode
	Real-time as of 12:15pm	As of Yesterday
Archer Rd & SW 40th Blvd	■	100%
Clark Butler Blvd & Plaza Blvd	■	100%
Clark Butler Blvd & Windmeadows Blvd	■	100%
N. Main St & 8th Ave	■	100%

# Iteris – VantageLive!



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# Traffop - ATSPM



## Interactive data analytics

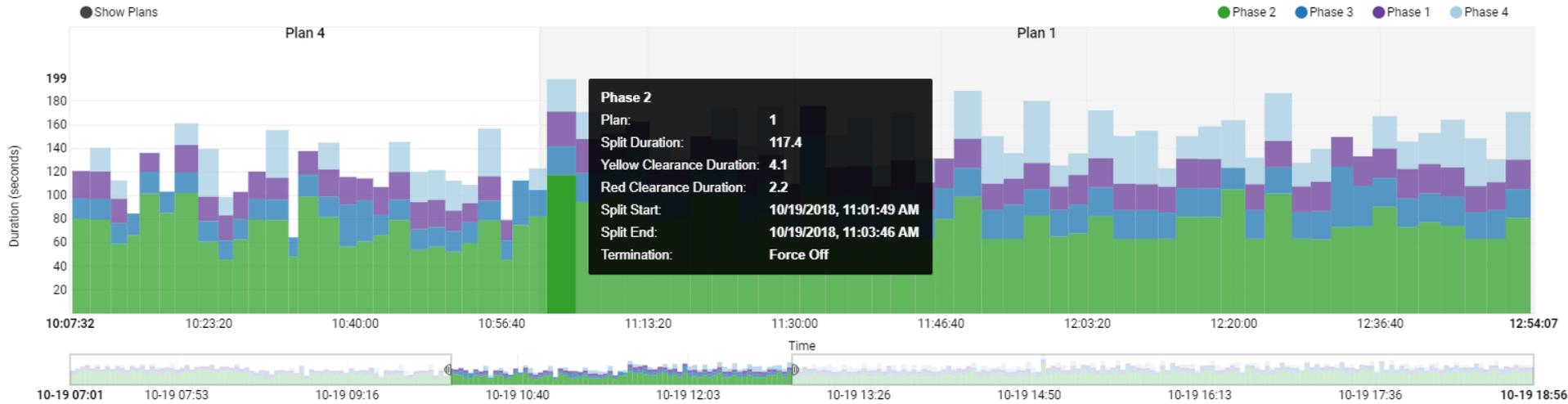
- Data collected from existing infrastructure
  - Minimal setup required
- Requires data logging features on controller hardware
  - Advanced transportation controller (ATC)
- Cloud-based data storage

## City of Gainesville Pilot Project

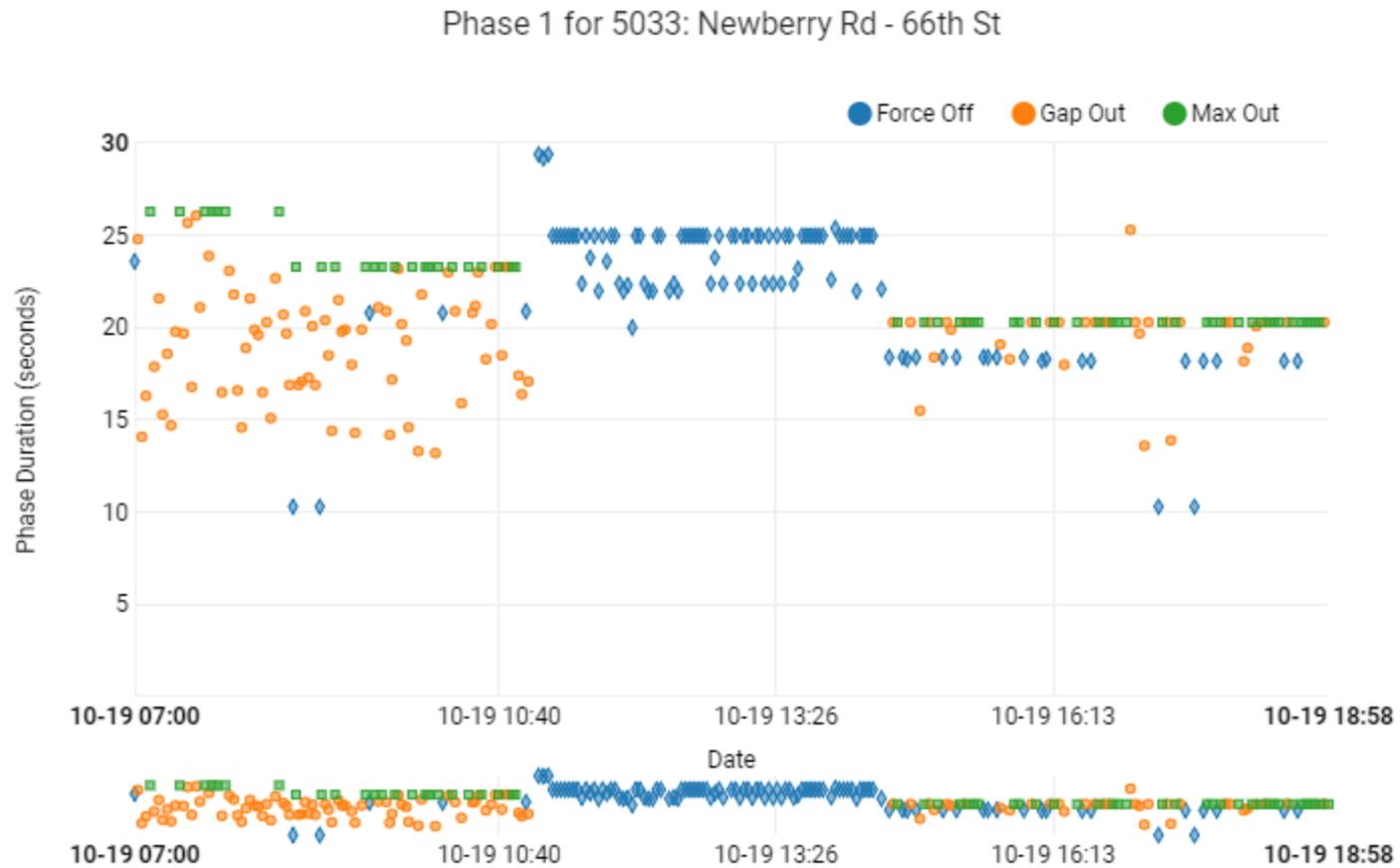
- Deployed at 16 intersections
  - Expand to 45 additional intersections this year

# Traffop – Split Monitoring

Split Monitor Ring 1  
5033: Newberry Rd - 66th St

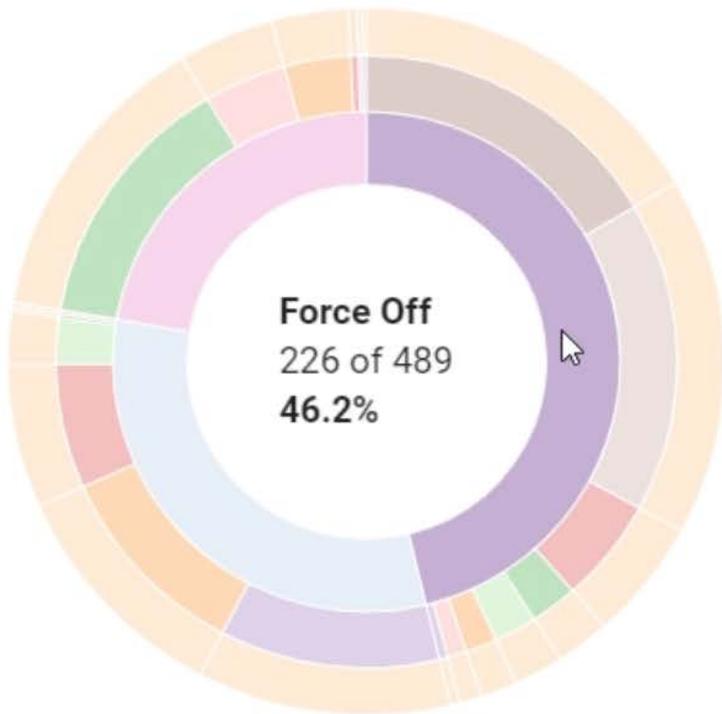


# Traffop - Split Monitoring



# Traffop – Phase Termination Diagram

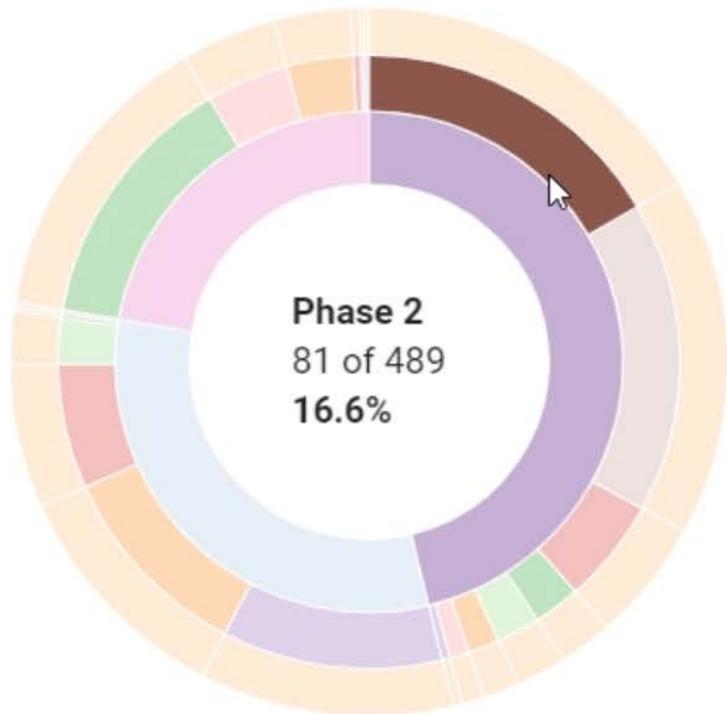
Phase Terminations



- Terminations
- Gap Out
- Phase 1
- Thursday
- Phase 3
- Phase 4
- Phase 5
- Phase 7
- Phase 8
- Force Off
- Phase 2
- Phase 6
- Max Out

# Traffop – Phase Termination Diagram

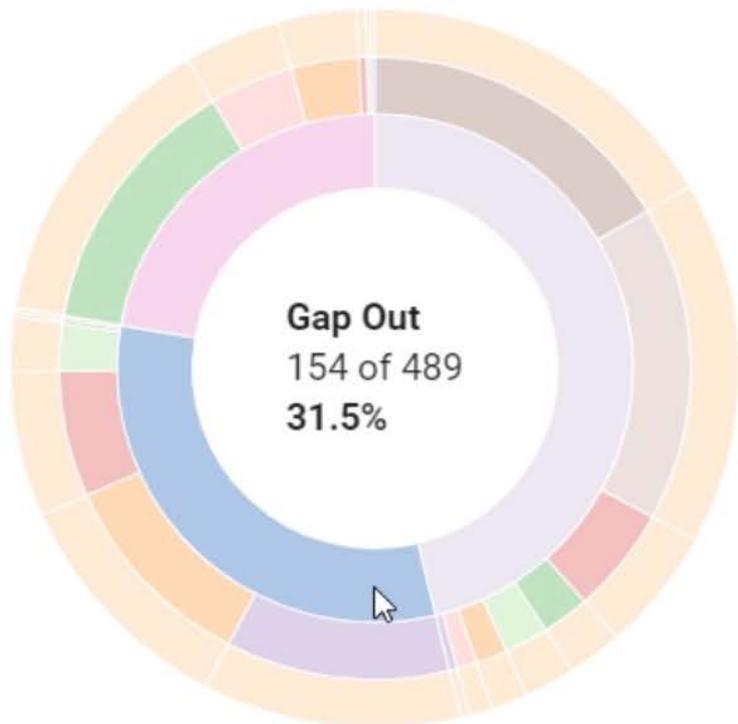
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# Traffop – Phase Termination Diagram

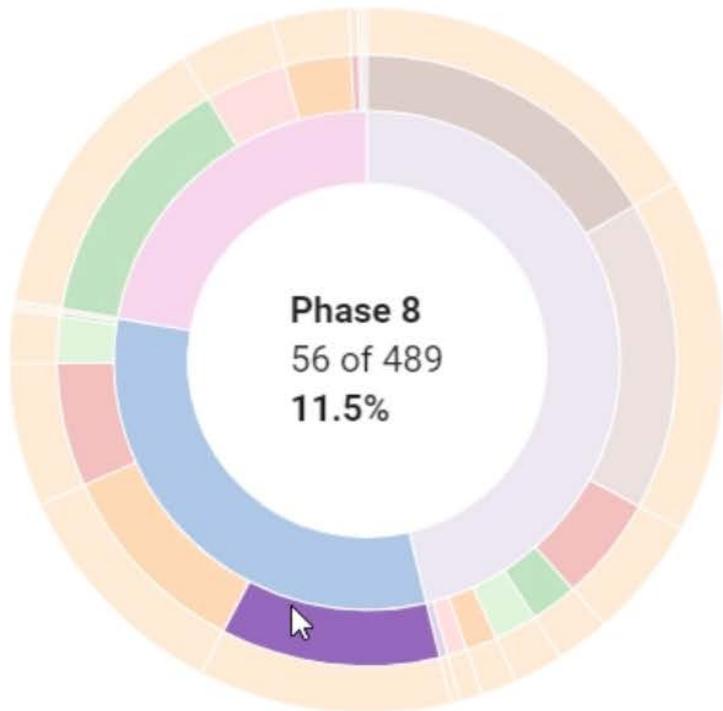
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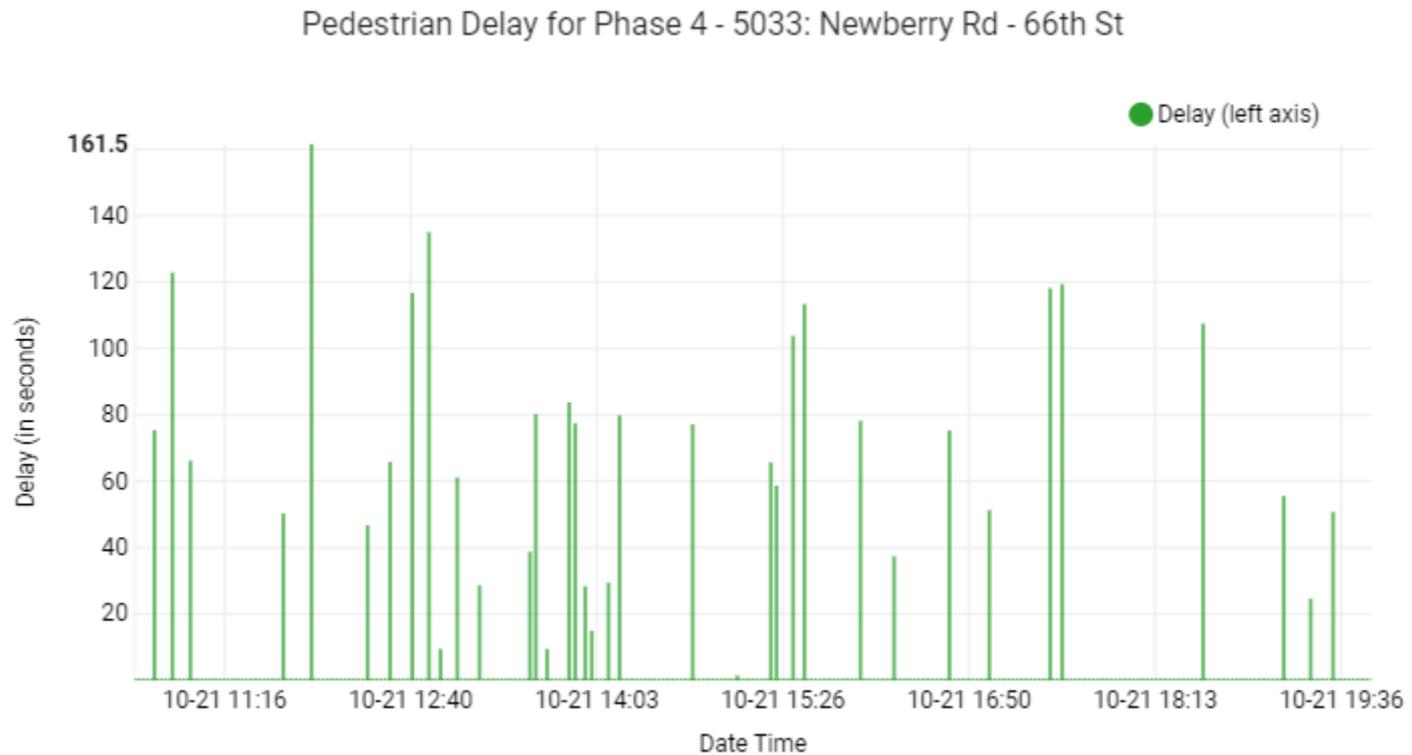
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Phase Terminations



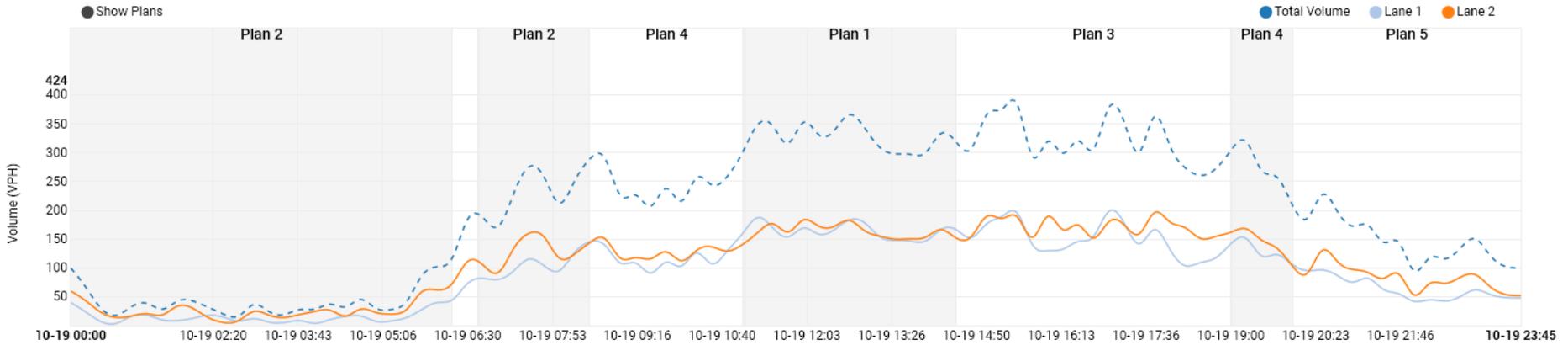
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# Traffop - Pedestrian Delay



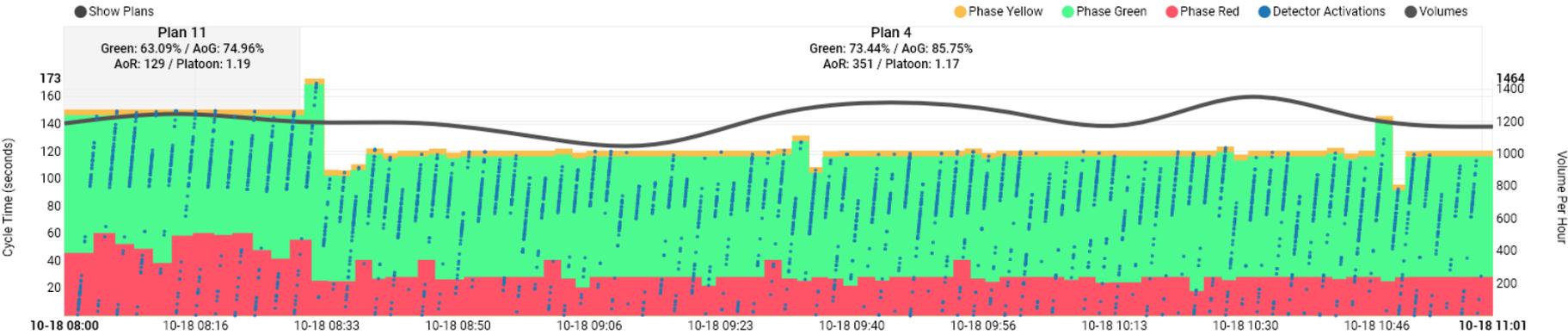
# Traffop – Turning Movement Counts

Turning Movement Counts for 5034: Newberry Rd - 62nd St  
Northbound Left Vehicle Lanes  
Total Volume = 4805; Peak Hour = 2:45 PM - 3:45 PM; Peak Hour Volume = 364 VPH; PHF = 0.86; fLU = 0.93



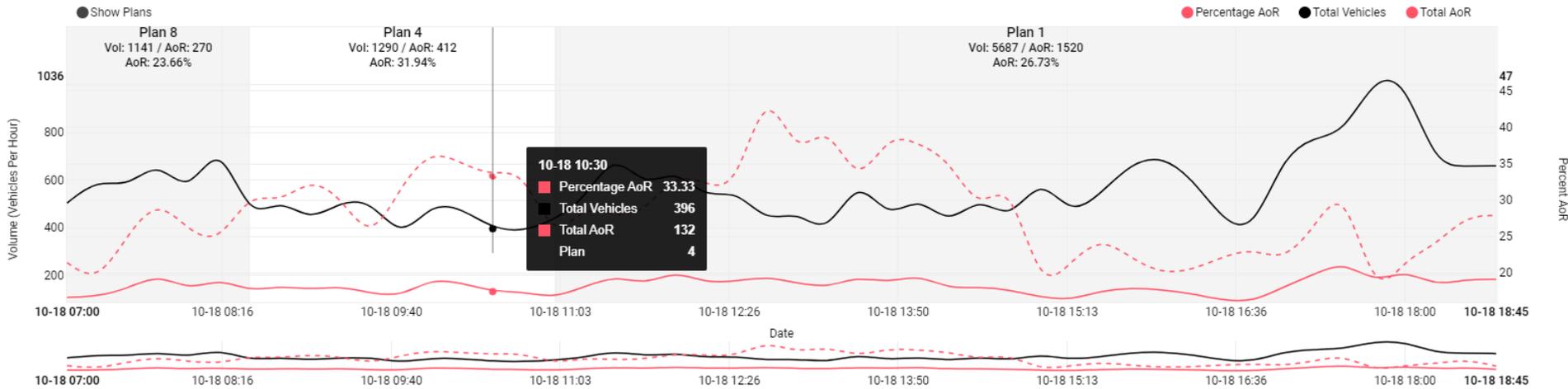
# Traffop - Purdue Coordination

Purdue Coordination Diagram  
5034: Newberry Rd - 62nd St - Westbound Thru - Protected Phase 2  
Percent Arrivals on Green: 84%  
Percent Green: 72% / Total AoG: 3016 / Total AoR: 480 / Platoon: 1.17



# Traffop - Arrivals on Red

Arrivals on Red  
5033: Newberry Rd - 66th St - Westbound Thru - Protected Phase 2  
Volume: 6772 / AoR: 1863 / AoR Percent: 27.51%



# Future Developments

## Partnering with University of Florida – Department of Computer Science

- Utilizing machine learning to develop signal behaviors
  - Traffop: measures individual signal performance
  - TrafficCast BlueTOAD: measures corridor travel times/performance
  - Iteris VantageLive!: traffic data collection

# Acknowledgements

## Gainesville ITS/TMS team



Emmanuel Posadas – Traffic operations manager

Dustin Thomas, Robert McCormick – TMS network team

Robert Schenck – Software service

Chris Dolan, Joe Crackle – Traffic signals team

## Partner organizations

