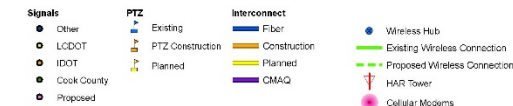# Lake County PASSAGE

- **ATMS Platform**
    - Website: www.lakecountypassage.com
    - IOS & Android Apps
- **Over 400 CCTV cameras installed**
- **Connection to over 600 traffic signals (county, state & local)**
- **PCMS, travel times, incident events, HAR**
    - Electronic communications with local police
    - TMC staffed Monday – Friday from 6:00AM – 7:00PM
- **Member of the TravelMidwest.com Group**

Lake County Traffic Signal Network

- **~750 traffic signals in Lake County**
  - State, county & local traffic signals
  - Over fiber, wireless & cellular communications
- **Cloud-based ATSPM system**
- **Central traffic signal software**
- **Integration with our customized ATMS**
- **Previous operational strategy: SCAT Studies**
  - SCAT: Signal Coordination And Timing

Lake County PASSAGE
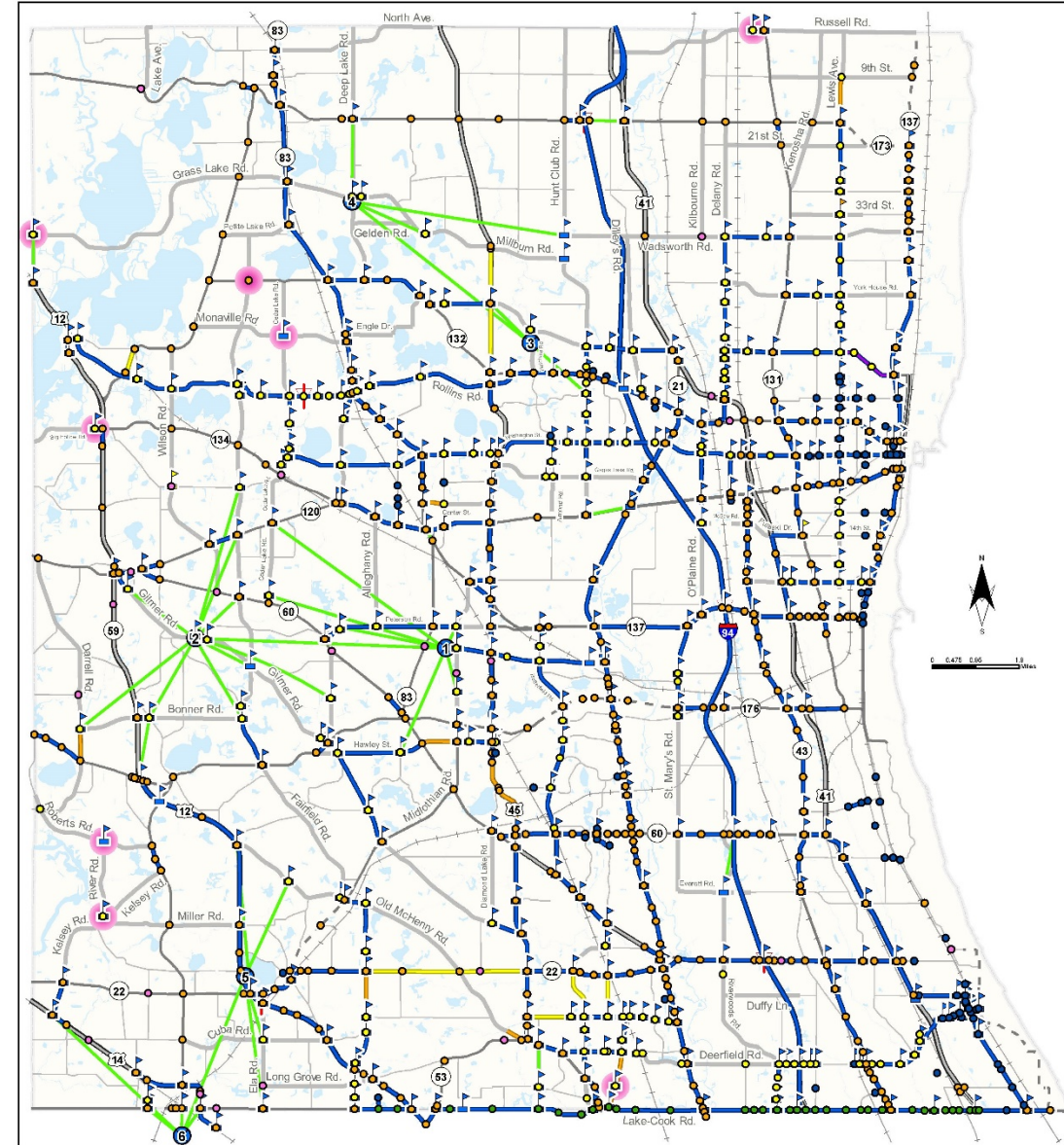
Crowdsourced Data

Waze Travel Times

- **Starting Point**
  - Agreement approval
  - Adding travel time routes in Waze
  - Archiving the data
  - Alerting system

Waze JSON Feed

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Waze Travel Times

- **Why did we chose to continue with Waze?**
  - Free with our partnership
  - Low maintenance: Waze owns and modifies the travel time algorithms
  - Accuracy
    - Quantitative: Waze vs. Bluetooth
    - Qualitative: CCTV observations, PCMS displays
    - Outliers: Train Crossings
  - Low storage requirements
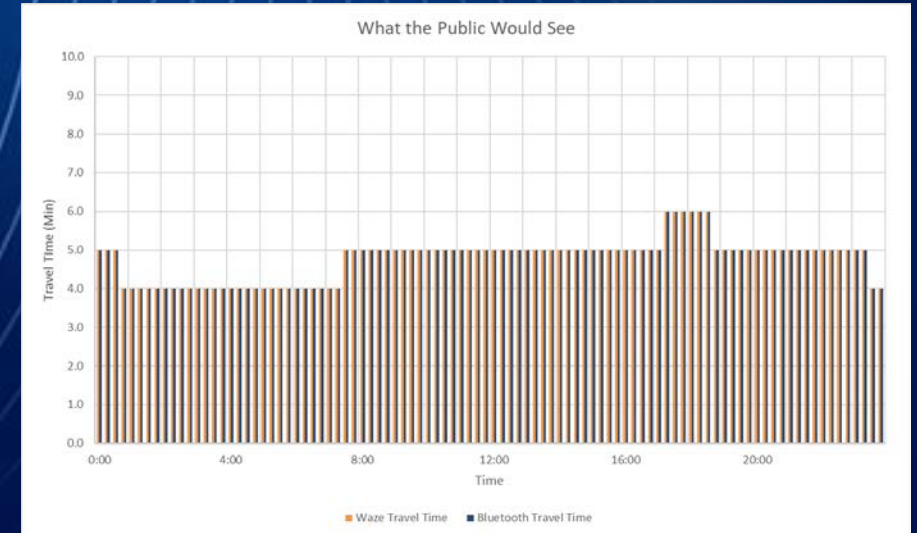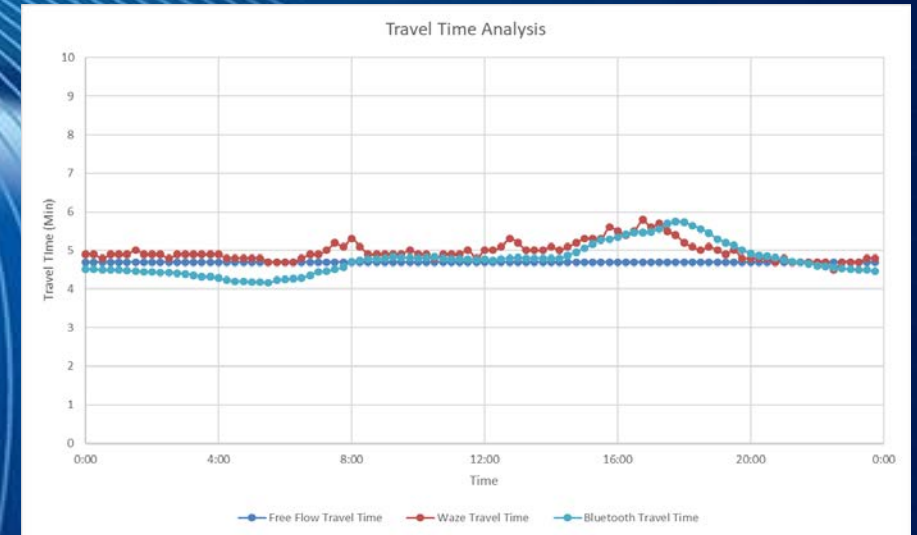
Waze Travel Times

- **Uses for Travel Times**
  - Advanced Transportation Management System (ATMS)
    - Alerting
    - Website Posting
    - PCMS
    - Weather/travel time traffic signal responsive
  - Automated Traffic Signal Performance Measures (ATSPM)
  - LCDOT Project Selection Process

Snow Day!
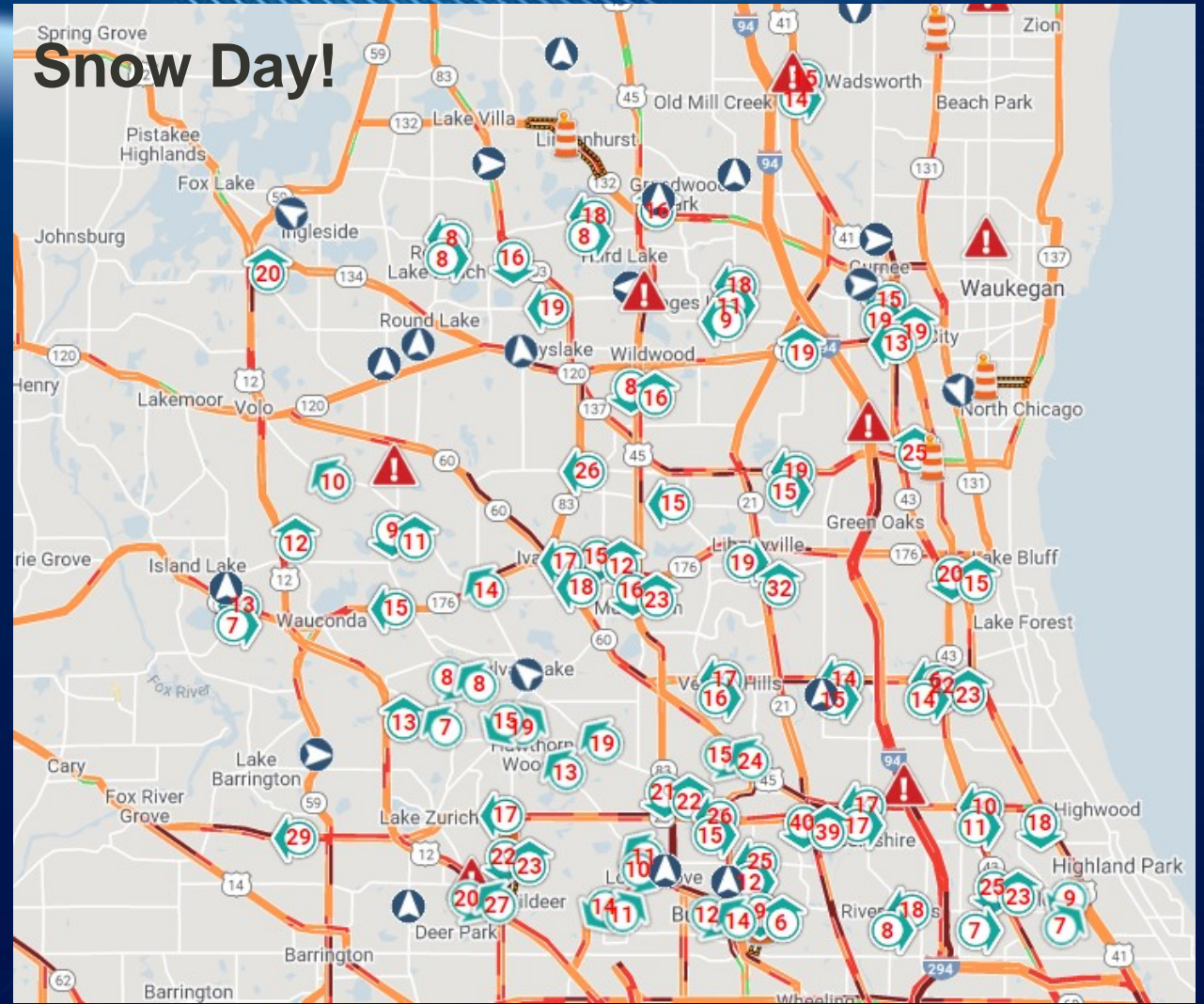
What are Automated Traffic Signal Performance Measures (ATSPMs)?

- **Adds data logging capability to traffic signal infrastructure**

- **Incorporates data analysis**

ATSPM benefits* include:

- **Increased Safety -** by reducing traffic congestion

- **Target Maintenance -** by providing actionable information

- **Improved Operations -** active performance monitoring lets agencies address problems before they become complaints

*Source: FHWA Every Day Counts 4 Initiative
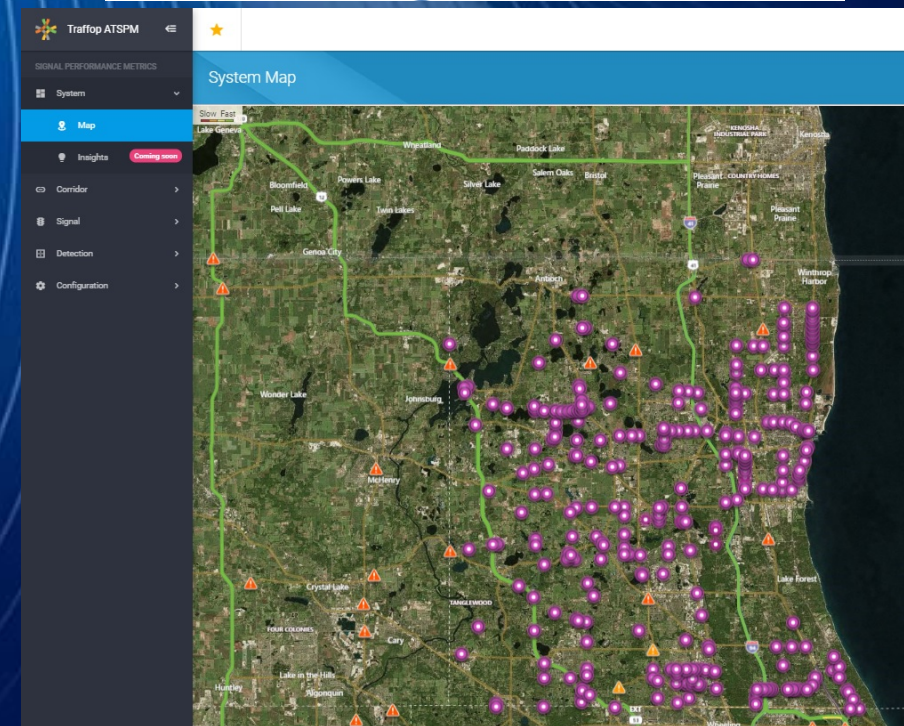
Crowdsourced Data & ATSPMs

Integration

- **Cloud-based ATSPM system: Traffop**
- **Breaking up original Waze segments for traffic signal systems**
- **Consulting Waze for permission**
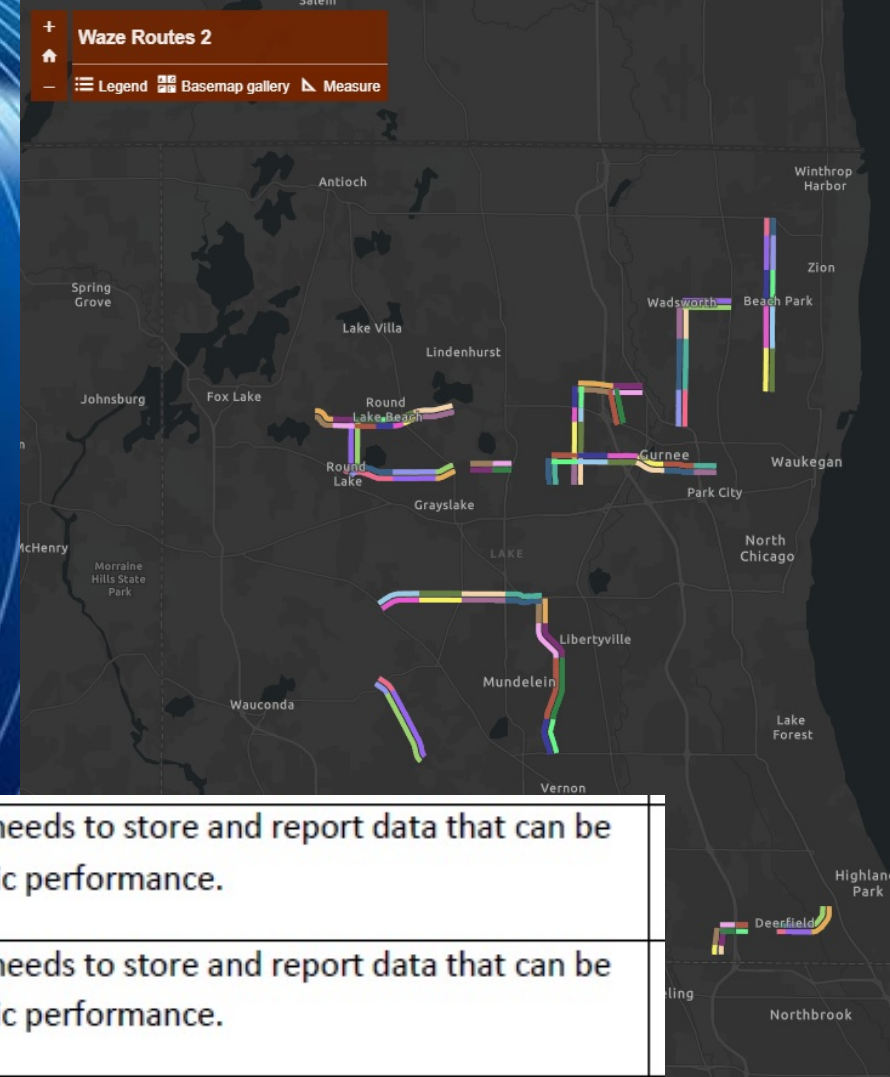
6.0-10	The ATSPM shall log travel times gathered by Waze through Lake County DOT's authorized API.	The system operator needs to store and report data that can be used to measure traffic performance.
6.0-11	The ATSPM shall be capable of generating travel time reports and charts.	The system operator needs to store and report data that can be used to measure traffic performance.

Crowdsourced Data & ATSPMs

ATSPM System

- **Corridor performance measure**
  - Travel time index
  - Planning time index
  - Average travel time
  - Congested time
  - Other traffic signal performance data
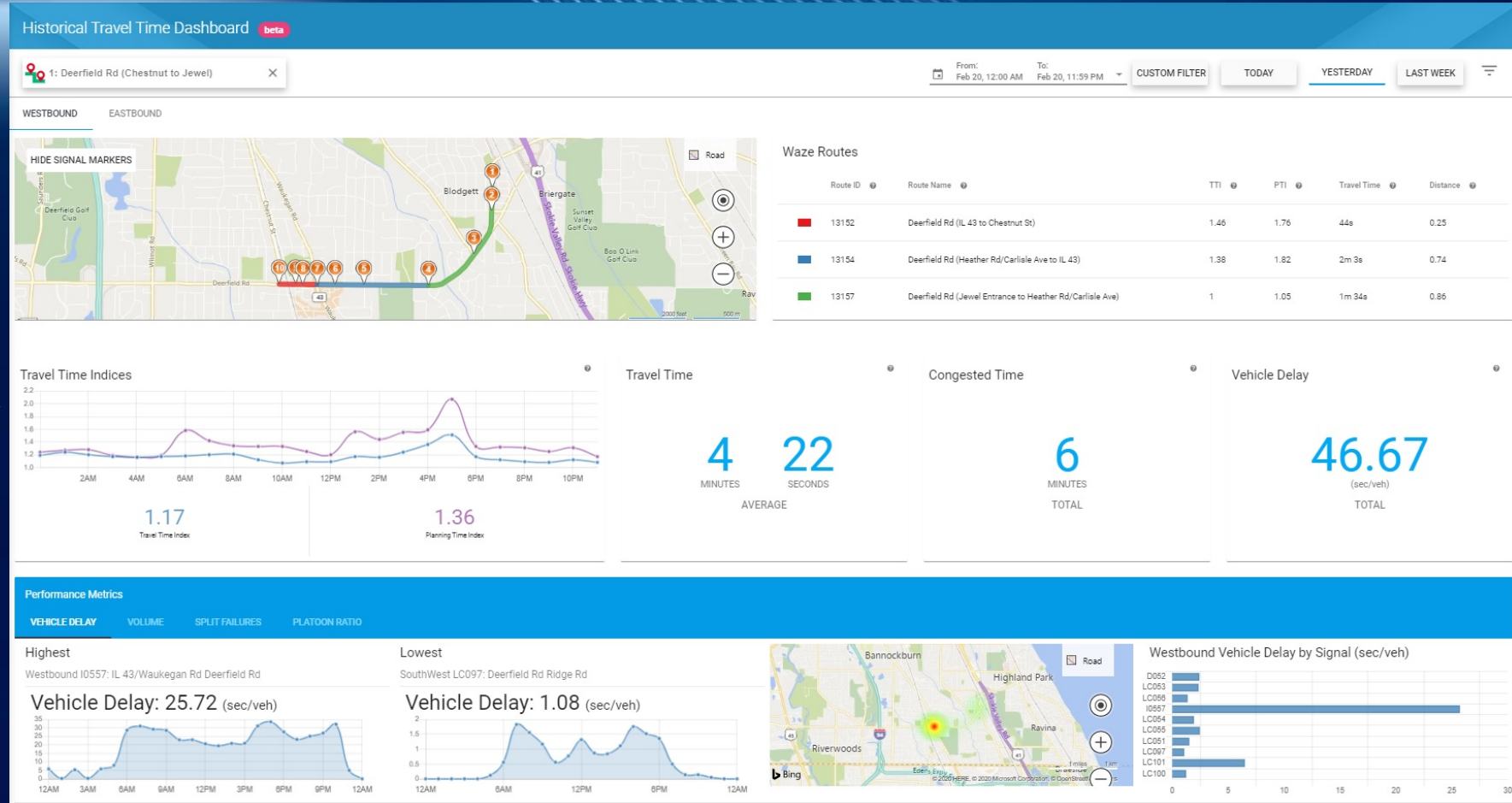
Crowdsourced Data & ATSPMs

Signal Coordination & Timing (SCAT) Process

- **Collect turning movement counts**
- **Before/After travel time study**
- **Synchro traffic signal analysis**
- **Cost to benefit analysis**

1-2 Days   1-2 Weeks   Continuous

Data Collection

		Condition	Travel Time	Delay	Stops	Average Speed
AM PEAK	N/B	Pre-imp.*	380	44.7	1.3	35.1
		Post-imp.**	374	43.3	1.7	35.7
	S/B	Pre-imp.	620.3	287	5.7	21.5
		Post-imp.	356.7	28.7	1.0	37.4
MIDDAY PEAK	N/B	Pre-imp.	366.3	29.3	0.7	36.6
		Post-imp.	339.3	12	0.3	39.5
	S/B	Pre-imp.	369	34	1.0	36.1
		Post-imp	357.7	31.7	1.7	37.3
PM PEAK	N/B	Pre-imp.	484.7	148.3	2.3	27.6
		Post-imp.	448.3	116.3	2.0	29.8
	S/B	Pre-imp.	477.3	141	2.7	28
		Post-imp.	380.3	51	2.0	35.2

TABLE 1
SPEED/DELAY SUMMARY
Butterfield Rd. - (Allanson Rd. To IL 137)

*pre-implementation
**post-implementation

Cost Savings to Lake County

- **$17,300 over a 5-year period (removing SCAT contracts)**
- **Ability to conduct SCAT Studies more frequently**
  - 2015 SCAT Contract: Annual Benefit $4,382,629 (Benefit:Cost – 49:1)
  - 2016 SCAT Contract: Annual Benefit $3,141,414 (Benefit:Cost – 30:1)
  - 2018 SCAT Contract: Annual Benefit $2,486,700 (Benefit:Cost – 63:1)
  - 2019 SCAT Contract: Annual Benefit $552,885 (Benefit:Cost – 13:1)
- **Ability to report on improvements more frequently to Board members**

Crowdsourced Data & ATSPMs

Improving Traffic Signal Operations

- **Traffic incident – road closure**
  - Signal modifications

Signal Timing Changes
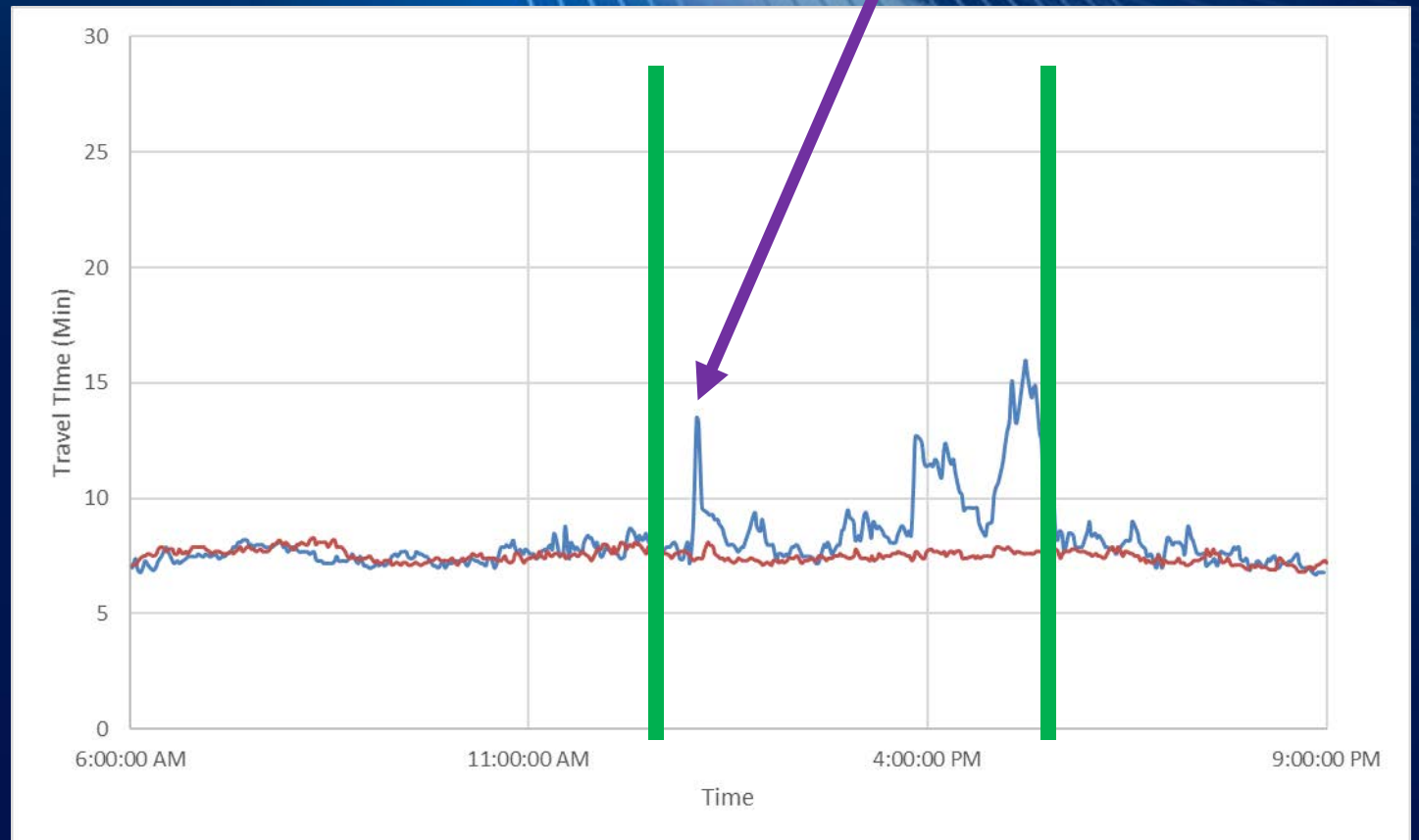
Crowdsourced Data & ATSPMs

Improving Traffic Signal Operations

- **Traffic incident – road closure**
  - No signal modifications
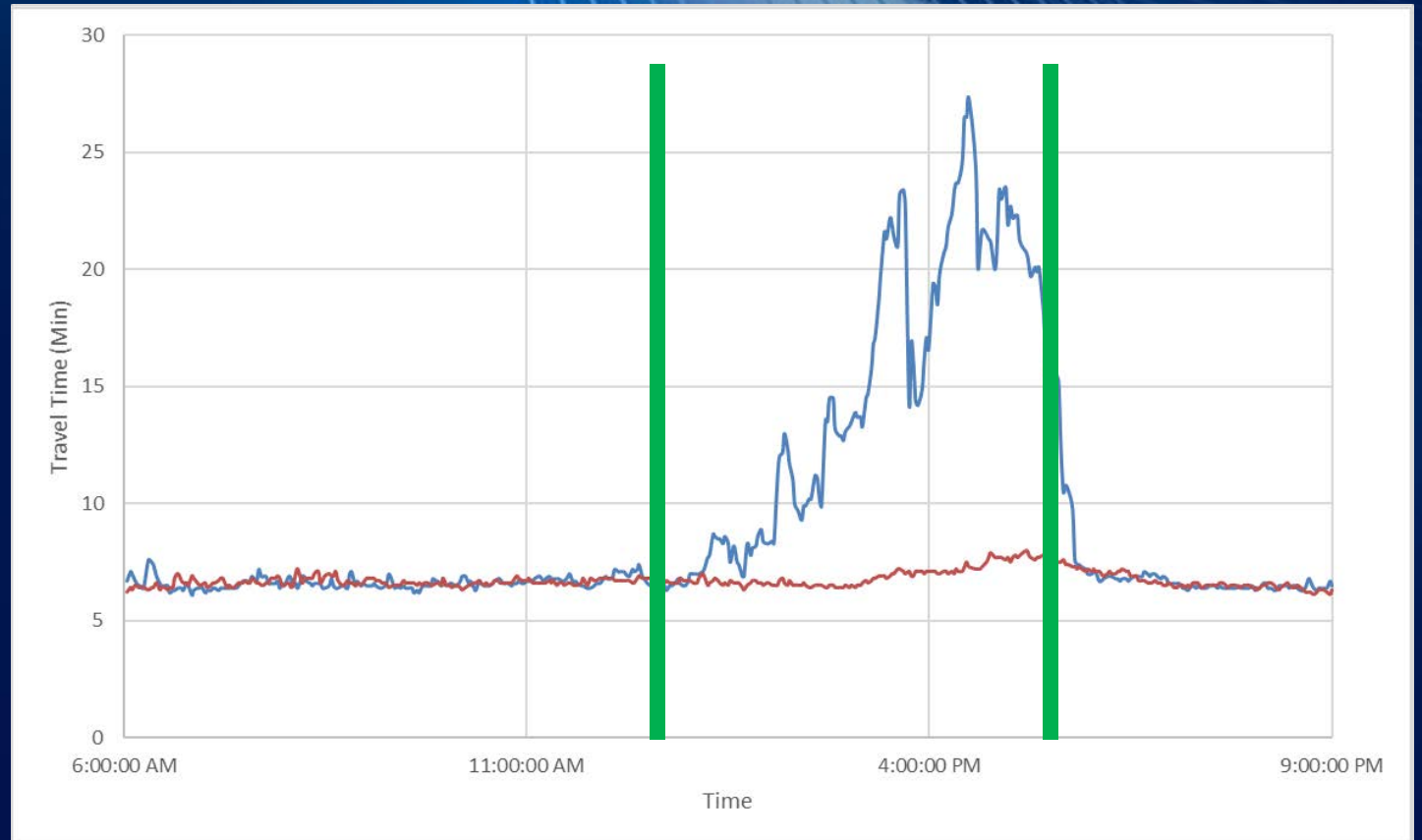
Project Selection

- **One component in selecting modernization and expansion projects**
- **Data driven; cost not a factor**
- **Weighted on four factors**
- **Based on LCDOT Strategic Plan**
- **System refined annually**

Safety	Transportation Impact
Multi-Modal/ITS	Congestion
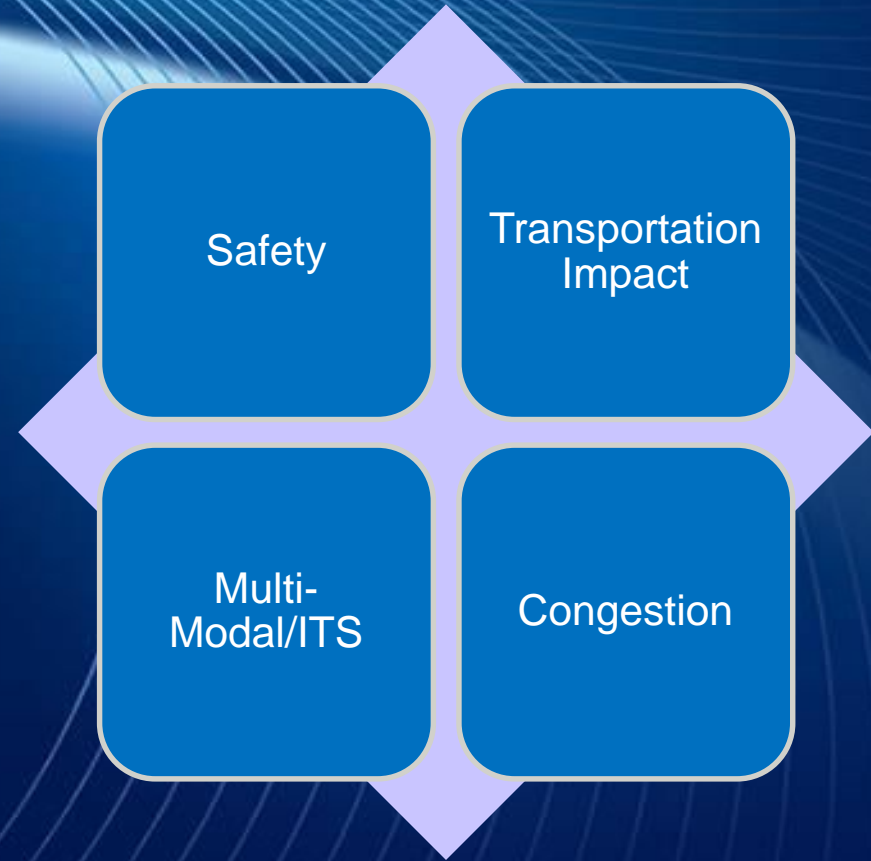
Project Selection

o Travel Time (1 Month Average)
  (Based on "typical" travel times - lower 10th Percentile)
  - 70% and Up   20 points
  - 50-69.9%   16 points
  - 30-49.9%   12 points
  - 15-29.9%   8 points
  - 5-14.9%   4 points
  - 4.9% and Below   0 points

Vision

Project Selection

Project/Location	From/At	To	Description	Score		Congestion	Current LOS	Over Capacity	Travel Time		Safety	Safety Tier	"K" Crashes	"A" Crashes		Multi-Modal	Transit Shed	New Bike Facility	Ped Improv.	NMT Connection	Inclusive Growth		Transportation Impact	Pavement Condition	Functional Classification	In Plan	SMC Flood Area		Construction Cost	Total Cost (Con*1.42)
Fairfield	IL 134		Intersection Expansion	122		42	30	0	12		25	20	0	5		30	10	0	10	0	10		25	5	5	10	5		$20,907,000	$29,687,940
Lewis	IL 120	14th Street	Reconstruct and Widen	89		19	10	5	4		20	10	0	10		30	10	0	10	0	10		20	15	5	0	0		$5,181,818	$7,358,182
Washington Street	IL 21		Intersection Expansion	121		36	20	0	16		55	40	15	0		20	10	0	0	0	0		10	0	10	0	0		$6,200,000	$8,804,000
Hawley Street	US 45	IL 176	Reconstruct and Widen	87		14	10	0	4		0	0	0	0		45	10	10	10	10	5		28	15	3	10	0		$8,000,000	$11,360,000
Fairfield	IL 60		Intersection Expansion	70		50	25	5	20		0	0	0	0		0	0	0	0	0	0		20	0	10	10	0		$6,000,000	$8,520,000
Gilmer Road	Hawley	IL 176	Widening	52		22	10	0	12		5	0	0	5		10	0	0	0	10	0		15	10	5	0	0		$4,776,000	$6,781,920
Washington Street	Atkinson		Intersection Improvement	74		9	5	0	4		35	30	0	5		20	10	0	10	0	0		10	5	5	0	0		$500,000	$710,000
Fairfield	Milton Road (East)		Intersection Improvement	17		12	0	0	12		0	0	0	0		0	0	0	0	0	0		5	0	5	0	0		$3,100,000	$4,402,000
Gages Lake Road	Almond Road	Hunt Club Road	Widening/ Turn Lanes	77		14	10	0	4		10	10	0	0		40	10	10	10	10	0		13	0	3	0	10		$2,637,885	$3,745,797
Deerfield Parkway	Barclay Boulevard		New Signals	47		12	0	0	12		10	0	0	0		20	0	0	0	0	0		5	0	5	0	0		$370,000	$525,400
Fairfield	Chardon		Intersection Improvement	25		20	0	0	20		0	0	0	0		0	0	0	0	0	0		5	0	5	0	0		$1,000,000	$1,420,000
Ela Rd	EJ&E Tracks		RR Underpass	60		25	0	5	20		0	0	0	0		20	0	10	10	0	0		15	0	10	0				$0
Hunt Club	Stearns School Rd	Il 132	Widening	88		38	25	5	8		15	10	0	5		20	10	0	10	0	0		15	0	5	10				$0
Grass Lake Rd	Gelden Rd		Intersection Improvement	68		8	0	0	8		10	10	0	0		30	0	10	10	10	0		20	10	5	0	5			$0
Kelsey Rd	Miller Rd/ River Rd		Intersection Improvement	73		28	20	0	8		30	30	0	0		10	0	0	10	0	0		5	0	5	0				$0
Fairfield Rd	Petite Lake Rd		Intersection Improvement	13		0	0	0	0		0	0	0	0		10	0	0	0	0	0		3	0	3	0	0			$0
Riverwoods	Duffy		Intersection Improvement	47		12	0	0	12		20	20	0	0		10	0	0	0	0	0		5	0	5	0	0			$0
Delany	US 41		Intersection Expansion	121		46	25	5	16		25	20	0	5		25	10	0	10	0	5		25	0	10	10	5			$0
Fairfield Rd	IL 60		Widening	162		47	30	5	12		40	30	0	10		45	10	10	10	10	5		30	5	5	10	10			$0
Butterfield	US 45		Intersection Improvement	58		18	10	0	8		0	0	0	0		25	10	0	10	0	5		15	0	5	10	0			$0
Peterson Rd	Harris	Butterfield	Widen/ Grade Separation	77		32	20	0	12		5	0	0	5		20	10	0	10	0	0		20	0	10	10	0			$0
Gilmer Road	Fish Lake Road		Intersection Improvement	63		8	0	0	8		40	40	0	0		10	0	0	10	0	0		5	0	5	0	0		$525,000	$745,500

Weather/Travel Time Responsive Signal System

- **As vehicle speeds of platoons decrease, traffic signal coordination parameters need to be updated**
- **Integration of multiple different data sources**
- **If there is an increased travel time along a traffic signal system (above a threshold), an event is created**
  - Operators can accept or reject
  - If accepted, pre-determined coordination settings are sent
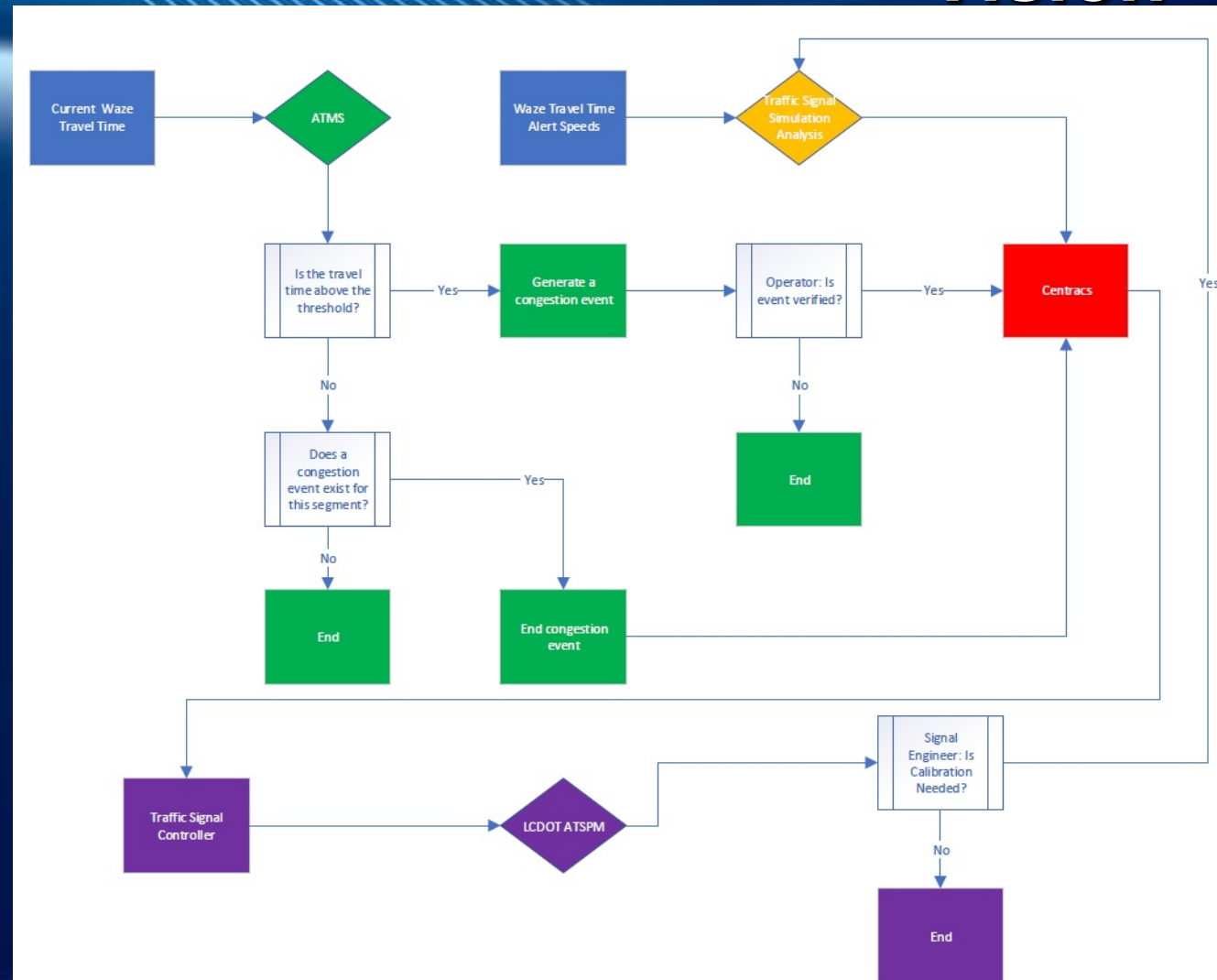
Questions?

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