

# Using Data Streams to Provide Motorist Aid Services in Real Time

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# What we do

- Road and Bridge Maintenance
- Structures Maintenance
- Tollway Maintenance
- Facilities Maintenance
- ITS Maintenance



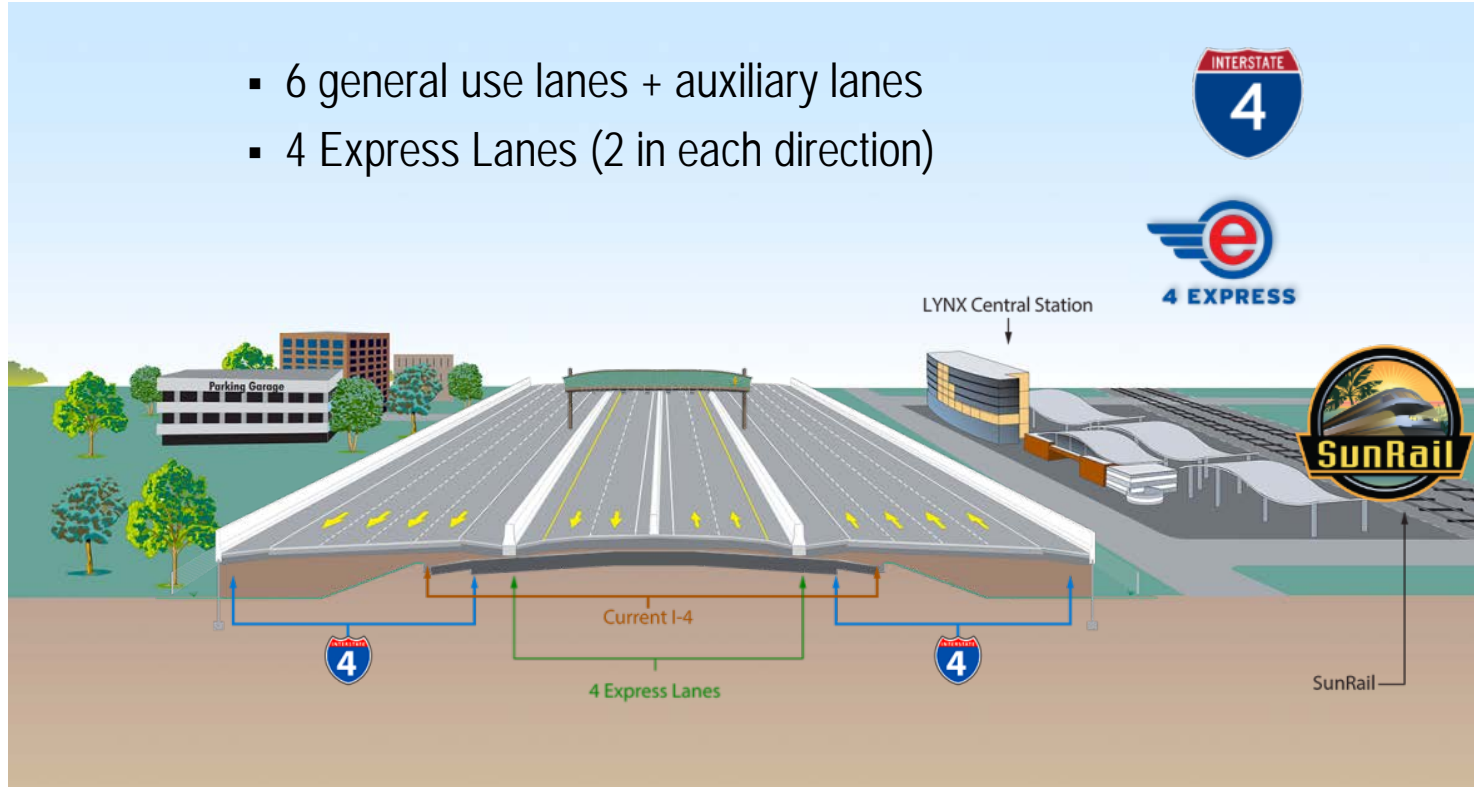
# I-4 Interstate Today

- Designed and constructed in 1960s
- 73 miles from Polk/Osceola line to I-95
- More than 1.5 million daily vehicle trips
- 58% is commuter traffic
- Orlando is the 14th most congested U.S. city
- I-4 Ultimate project limits see up to 200,000 trips per day



# Interstate Tomorrow

- 6 general use lanes + auxiliary lanes
- 4 Express Lanes (2 in each direction)



# Maintenance Evolution Story

- 30 Years ago
  - MMS – for most agencies was a manual, time consuming process
  - Required supervisors to know exactly what work was needed and where.
  - Difficult to track productivity or cost of work items
- Fast Forward to today
  - Most public agencies have not moved forward very much
  - Private sector partners are utilizing technology and systems as the driver
  - Enhance Connectivity
  - Cloud Storage
  - Mobile device usage.

# Before E-maintenance

- Manual work identification
  - Delay of reporting maintenance activities into the system
  - Inconsistent and inaccurate data reported
  - Problems not resolved timely due to delay of data not being passed to appropriate people
  
- Manual work reporting
  - Work accomplished reporting is based on client reporting requirements
  - Inaccurate data leads to misinformed decisions
  - Difficult to maintain continuous improvement

CREW LEADER: Joe Williams

WEATHER: \_\_\_\_\_

TEMPERATURE: \_\_\_\_\_

SAFETY EQUIPMENT	YES	NO	N/A
HARD HAT			
VEST			
SHOES			
GLOVES			
EYE PROTECTION			
EAR PROTECTION			
SEAT BELT			
FIRST AID KIT			
FIRE EXTINGUISHER			
OTHER			

TRAFFIC CONTROL	YES	NO	N/A
SIGNS			
WORK ZONE LENGTH			
FLAGGERS			
CONES/ DRUMS			
ARROW BOARDS			
SIGHT DISTANCE			
OTHER			

TOOLS AND EQUIPMENT	YES	NO	N/A
RIGHT FOR JOB			
SAFE CONDITIONS			

TYPE OF WORK: Pressure Cleaning

PAY PERIOD: \_\_\_\_\_

LOCATION(S): SR 406 / 528 417 ACT # 1008 Pressure Clean

528 Pressure wash paved slope under 528 at Via Flora

528 Pressure wash paved slope under 528 at Destroykiler Dr.

528 Pressure wash paved slope under 528 at Conway Road

GENERAL COMMENTS: Place all the proper safety signs out for your work area. Use your personal safety equipment required for the job (vest, hat, gloves, etc.)

\* Be Sure to calculate production for each activity properly and complete attached paper work

SOP'S DISCUSSED: \_\_\_\_\_

PERSONNEL	EQUIPMENT			WO #: 828 Via Fl   528 Destroyer   828 Conway						HOURS		SIGN
	NAME	TITLE CODE	DESCRIPTION	CLASS CODE	ACTIV #	1008	1008	1008	1008	1008	1008	
Joe Williams	CL	1/2 Ton		208								
Sergio Lorenze	Lab	Pressure washer		1400								
		Bucket Truck		801								
		1/2 Ton		107								
WORK ACCOMPLISHED:				YES	NO	PARTIAL	TOTAL HOURS:					
							WORK UNITS:					

DAILY LOG OF OPERATIONS: \_\_\_\_\_

MATERIAL(S) USED: \_\_\_\_\_

# I-4 Ultimate Project Challenges

- Provide real time, up to date data of maintenance activities
- Being transparent with our client

## Work Order Details

WO#: 37398

Incident Date: 7/5/2016 2:31:00 PM

Location: 14

Activity: 000526: GUARDRAIL REPAIR Completed: 7/8/2016 12:00:00 AM

### Discovery



### Work Complete



Welcome, ICAC1

## Data Filter Options

WO  CSR

Work Order #:

County:

Facility:

Activity:

Begin:

End:

Begin MM:

End MM:

Keywords:

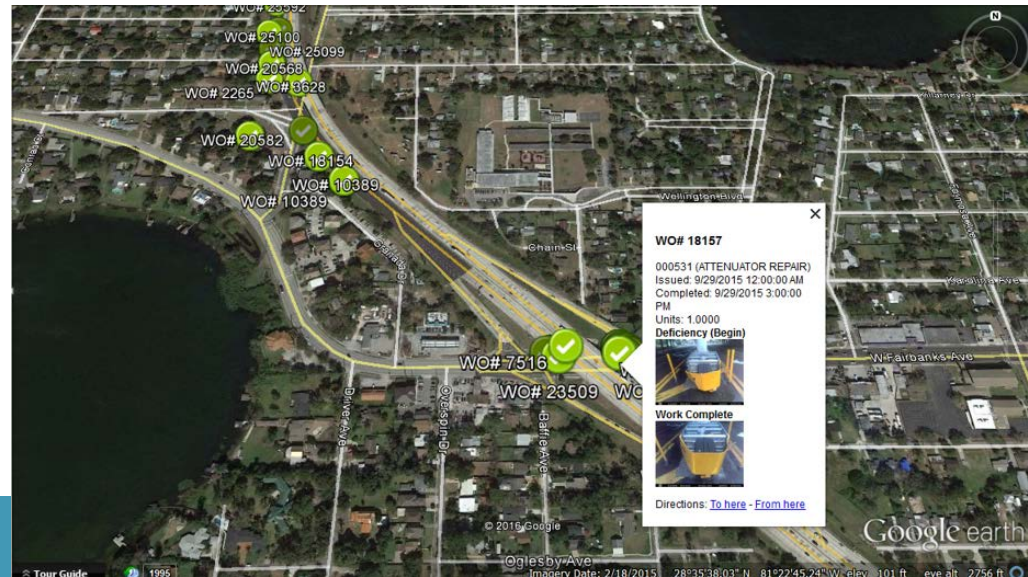


Note: TAT "L" prefix = late items. "E" prefix = early items.

WO Num	Incident Date	Location	DS	Work Performed	Min	Activity Code	Activity Desc	Deficiency	Date Date	Date Complete	TAT (min)	Photo Count	
28770	3/2/2016 3:21:00 AM	14	E	(Drive up) Signal 16- Tire/ left shoulder. RR. 557 Joseph 10-97 @ 3:21 am.	74.00 to 74.00	000975	DEBRIS REMOVAL (CLEAR ZONE ONLY)	CLEAR ZONE OBSTRUCTION REMOVAL	3/2/2016 3:51:00 AM	3/2/2016 3:21:00 AM	E-30	0	<a href="#">View Photo</a>
28770	3/2/2016 3:21:00 AM	14	E		74.00 to 74.00	000987	TRAFFIC CONTROL (INCIDENT RESPONSE ONLY)	INCIDENT EMERGENCY RESPONSE	3/2/2016 3:51:00 AM	3/2/2016 3:21:00 AM	E-30	0	<a href="#">View Photo</a>
28771	3/2/2016 3:24:00 AM	14	E	(RTMC Sam) Signal 16 Unknown/ Unknown shoulder. RR. 555 Earl 10-51 @ 3:24 am/ 10-97 @ 3:38 am. Updated RTMC Sam.	80.00 to 80.00	000975	DEBRIS REMOVAL (CLEAR ZONE ONLY)	CLEAR ZONE OBSTRUCTION REMOVAL	3/2/2016 3:54:00 AM	3/2/2016 3:38:00 AM	E-16	0	<a href="#">View Photo</a>
28771	3/2/2016 3:24:00 AM	14	E		80.00 to 80.00	000987	TRAFFIC CONTROL (INCIDENT RESPONSE ONLY)	INCIDENT EMERGENCY RESPONSE	3/2/2016 3:54:00 AM	3/2/2016 3:38:00 AM	E-16	0	<a href="#">View Photo</a>
28772	3/2/2016 3:17:00 AM	14	E	No assist	92.00 to 92.00	000987	TRAFFIC CONTROL	INCIDENT EMERGENCY RESPONSE RTMC NOTIFICATION	3/2/2016 3:32:00 AM	3/2/2016 3:18:00 AM	E-14	0	<a href="#">View Photo</a>
28772	3/2/2016 3:17:00 AM	14	E	(RTMC Sam) SSignal 76- Black Jaguar/ right shoulder. RR. 553 Dary 110-51 @ 3:17 am/ 10-97 @ 3:30 am. Updated RTMC Sam.	92.00 to 92.00	000987	TRAFFIC CONTROL (INCIDENT RESPONSE ONLY)	INCIDENT EMERGENCY RESPONSE	3/2/2016 3:47:00 AM	3/2/2016 3:30:00 AM	E-17	0	<a href="#">View Photo</a>
28773	3/2/2016 4:49:00 AM	14	E	(Drive up) Signal 76- Ford Pick up/ right shoulder. RR. 558 Stachis 10-97 @ 4:49am.	95.00 to 95.00	000987	TRAFFIC CONTROL (INCIDENT RESPONSE ONLY)	INCIDENT EMERGENCY RESPONSE	3/2/2016 5:19:00 AM	3/2/2016 4:49:00 AM	E-30	0	<a href="#">View Photo</a>
28774	3/2/2016 6:48:00 AM	14	W	(RTMC Alex) Signal 76- Black Ford/ right shoulder. RR. 552 Rafael 10-51 @ 6:48am/ 10-97 @	78.00 to 78.00	000987	TRAFFIC CONTROL	INCIDENT EMERGENCY	3/2/2016 7:18:00	3/2/2016 6:57:00 AM	E-21	0	<a href="#">View Photo</a>

# Client Interchange

- Web based portal for client to view status of work efforts
  - Customer Service Requests (CSR's)
  - Work Orders with Geocoded coordinates
  - Google Earth KML reporting
- Real time updates and project management alerts
- Accessible from web or mobile devices





# OnRamp

- Scalability is a core priority in our custom, proprietary OnRamp application
- Capability and resources to customize and meet contract requirements quickly
- Mobile platform is the cornerstone
  - Device agnostic
  - Mobile workplace keeps employees out of the office for administrative functions
    - “keep more eyes on the road”



# Mobile Data Collection

## Benefits of Mobile Applications

- Collect, load, and share real time data
- GPS tagging
- Multi-media – collect attribute data and upload photos and videos
- Increased reporting accuracy and increased production
- Transparency
- Publish in Real Time

## Big Data – What's Next?

- Data visualization reporting and dashboards
- Convey data in a universal manner
- Identify areas in need of improvement
- Data analysis to plan maintenance to extend asset useful life

# OnRamp Work Orders

- Strict Performance Measures
- Manage timeliness requirements for all work orders
- Alerts prompt work orders that are due for completion
- Track work orders to depict continuous flow of work order activity
- Track production and costs for all components
  - Subcontractor costs
  - Labor, equipment, materials, 3<sup>rd</sup> party reimbursement
- Third-party module to track incident response, repair, and claims collection process

Work Auth

000526: GUARDRAIL REPAIR in HILLSBOROUGH on I-4 on I-4 W

Upload Qty: 1

# Upload Image Type

1: Choose File No file chosen

Upload

Uploaded Images by activity and type:

Discovery Photos

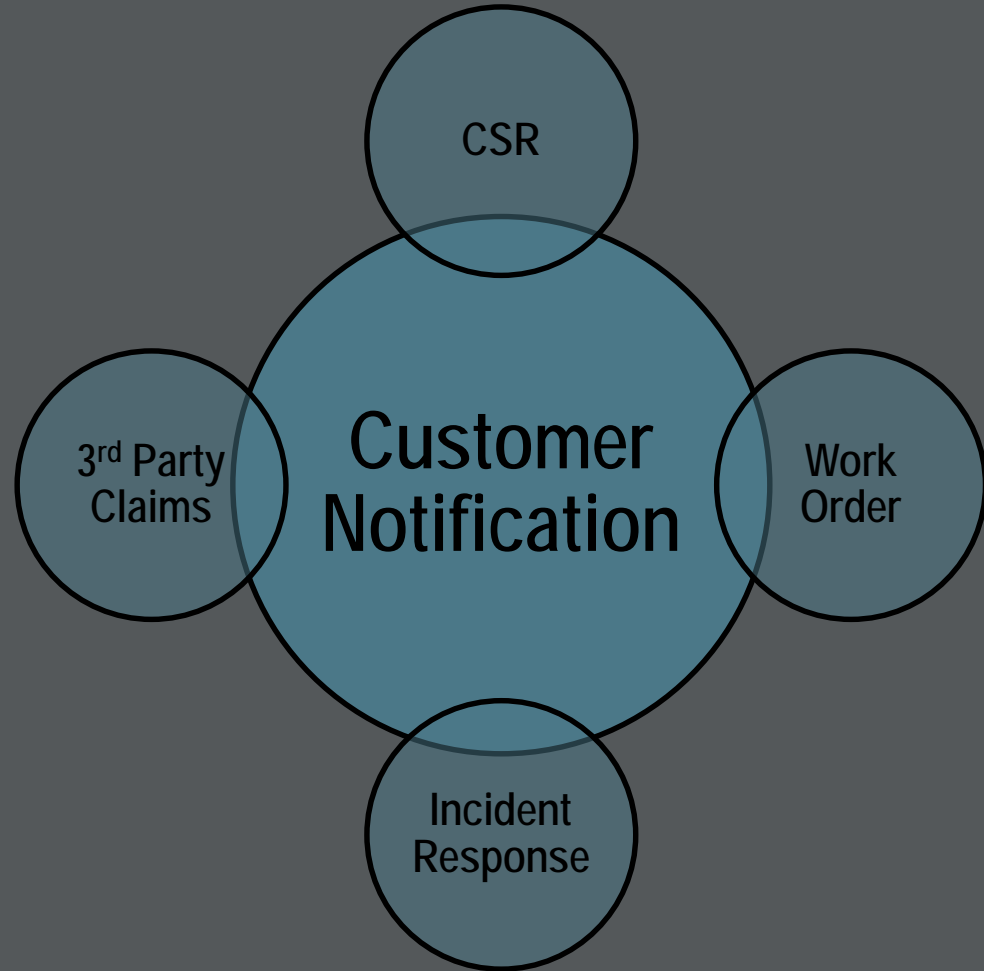


N 27.993017 W 82.369225 GPS status : Active 2016/02/25 13:37:57 (UTC)



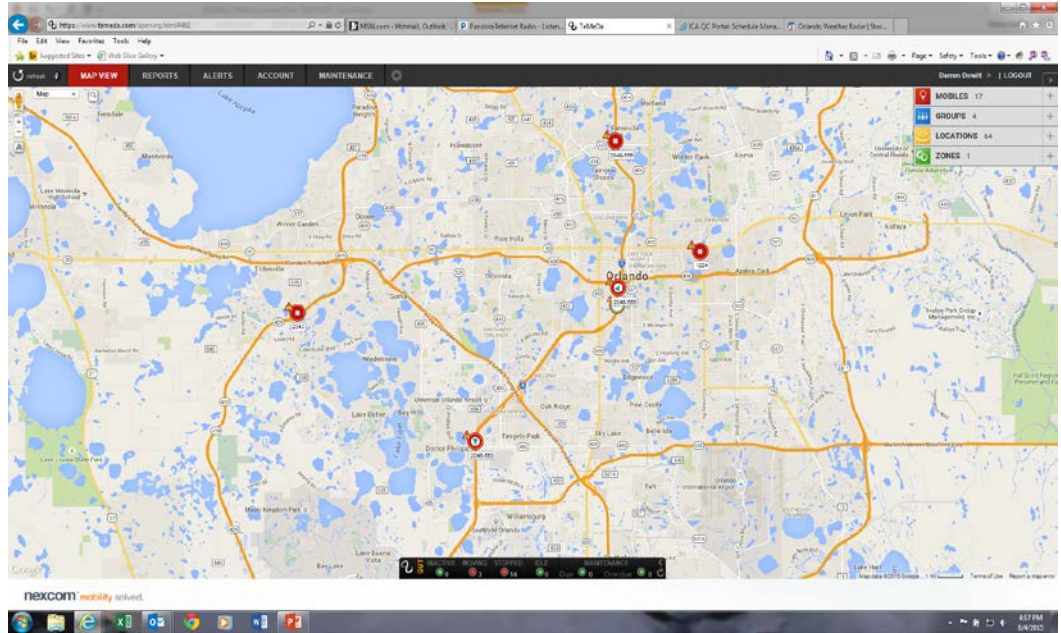
# Customer Service Requests

- Initial intake of tracking requests for all notifications
  - KPM's applied to CSR's for follow up to customer based on timeframes
- Automatic creation and linking of work order
  - Captures incident response, asset damage, and 3<sup>rd</sup> party claim process



# Road Rangers and Dispatch Module

- TeMeDa AVL used for dispatching road rangers to scene
- CSR's in OnRamp set due date of arrival for all dispatch calls
- Alerts generated automatically to meet timeliness requirements
- If due date is missed, penalty automatically assessed and QC notified



# QA/QC

- Ensure quality in all work processes and support continuous process improvement
- Data validation techniques employed to ensure accurate data is being captured
- Random sampling queue batch job executes nightly at midnight and flags work orders for QC
  - QC manager reviews all work orders flagged for QC
- If performance criteria is not met, penalties are automatically assessed based on performance criteria



# Facility Inspections

- Perform inspections on any asset type in real time
  - Capture all element scores, photos, notes, deficiencies, and work required at the detailed level
  - Issue work orders directly from inspections
- Data collection for statistical analysis to identify work needs or capital improvement recommendations

The screenshot displays the ICA software interface. At the top, the H2R and ICA logos are visible, along with a 'Back to Info' button. The main section is titled 'Inspection' and contains the following details:

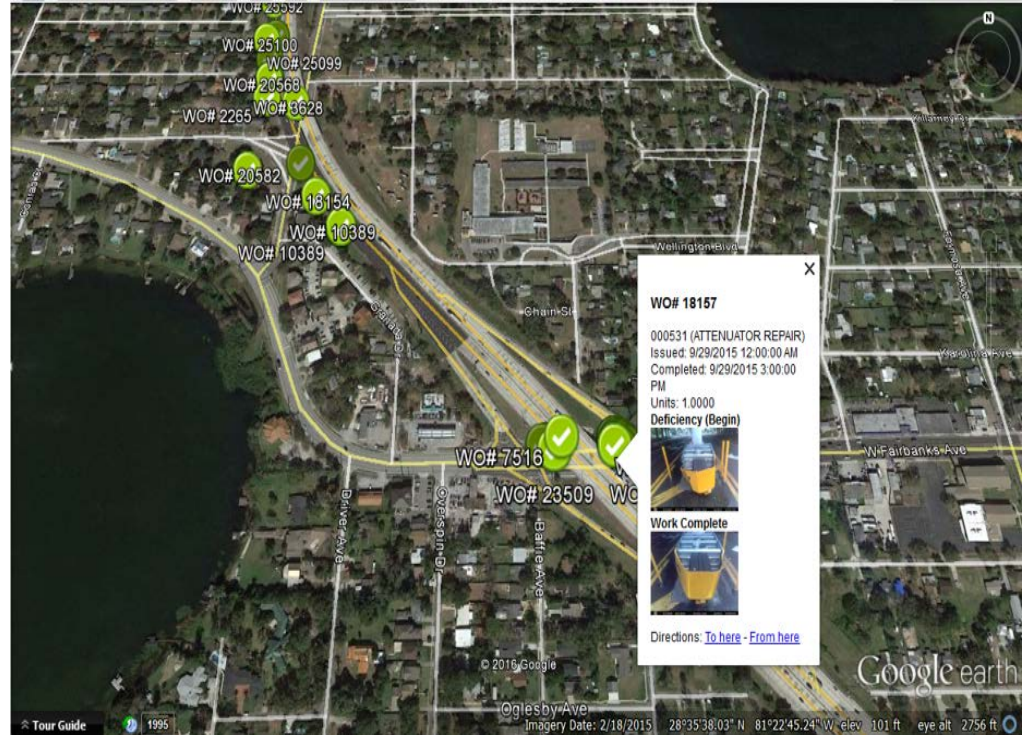
- Facility: 101N:WEIGH STATION-101 NORTH I-75 HAMILTON
- Inspection Date: 2/22/2016 8:06:00 PM
- FAMILY: 10 / 10
- BUILDINGS: 18.67 / 20
- Total Score: 95.3

Below this information is a table with columns for 'Element Name', 'Notes', 'Element Value', and 'Image Count and Capture'. The first row shows '2. Gutters/Down Spouts' with a value of 'N' and a count of '1'. A 'Manage' button is located to the right of this row.

At the bottom of the screenshot, there is a 'Capture All' button and a section titled 'Inspection Photos'. Under this section, the element '2. Gutters/Down Spouts' is listed, and a photo titled '20140528\_150924.jpg on 02/22/2016' is displayed. The photo shows a close-up of a gutter system with a white downspout pipe.

# Data Analysis

By tracking and locating all work activities and work types on the project, we can show trends, work plan results and efforts, provide predictive models, and propose corrective action programs.





## Safety Analysis

- Geospatial data allows for analysis of safety trends over period of time
- Proximity reporting displays incidents within a few hundred feet

Time Span: February 2015 – December 2015

Damage Type:

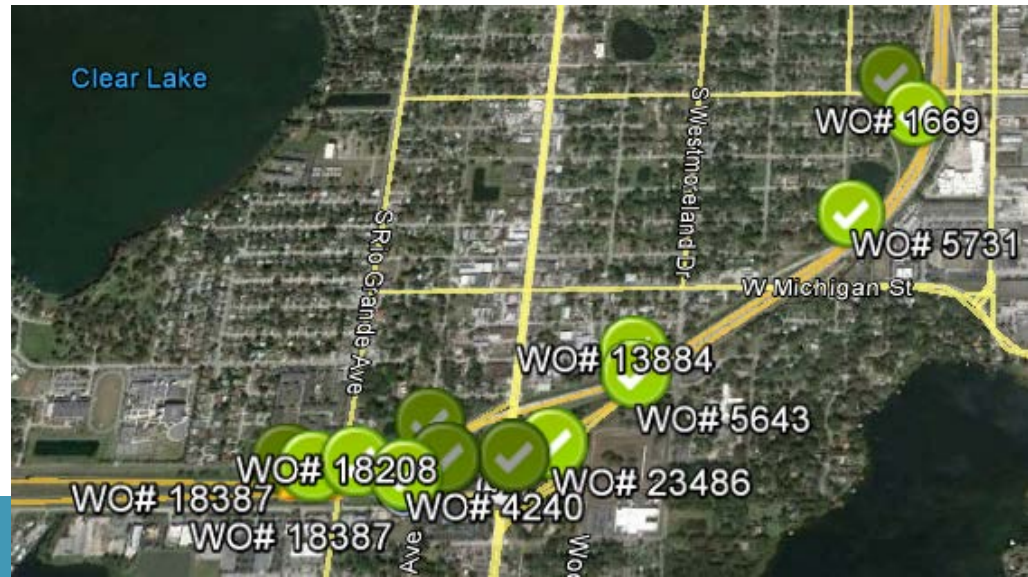
Guardrail: 272

Sign: 124

Attenuator repair: 56

Multiple delineator hit: 5

Fence repair: 131



# Incident Response Analysis

- Categorization of incident response types for workforce scheduling
- Types of road ranger assist review

SR 400/I-4 INCIDENT SUMMARY								
Time Period	* Disabled Vehicles	Abandoned Vehicle	Crashes/ Incidents	Debris	Road Work	Directions	GOA / No Assist	Total Incidents
Feb-15	670	96	332	109		44	350	1601
Mar-15	553	74	239	184		40	379	1469
Apr-15	600	54	232	216	3	1	291	1397
May-15	614	87	214	207	52	2	262	1438
Jun-15	658	111	237	50	44	0	399	1499
Jul-15	632	96	386	62	41	3	365	1585
Project-to-date								
Average /month	621	86	273	138	35	15	341	1498
PTD Total	3727	518	1640	828	140	90	2046	8989

# Work Activity Trends

- Life cycle costing
  - Track costs by activity, roadway, county, or facility
  - Currently studying the effect of Preventative Maintenance on Extension of Bridge Life
- Work expectations
- Client reporting
  - 70 standard CSR, work order, costing reports
- Client Interchange
  - HDR | ICA Interchange provides transparency to customer via web based solution for querying of open and completed work

# Questions

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