



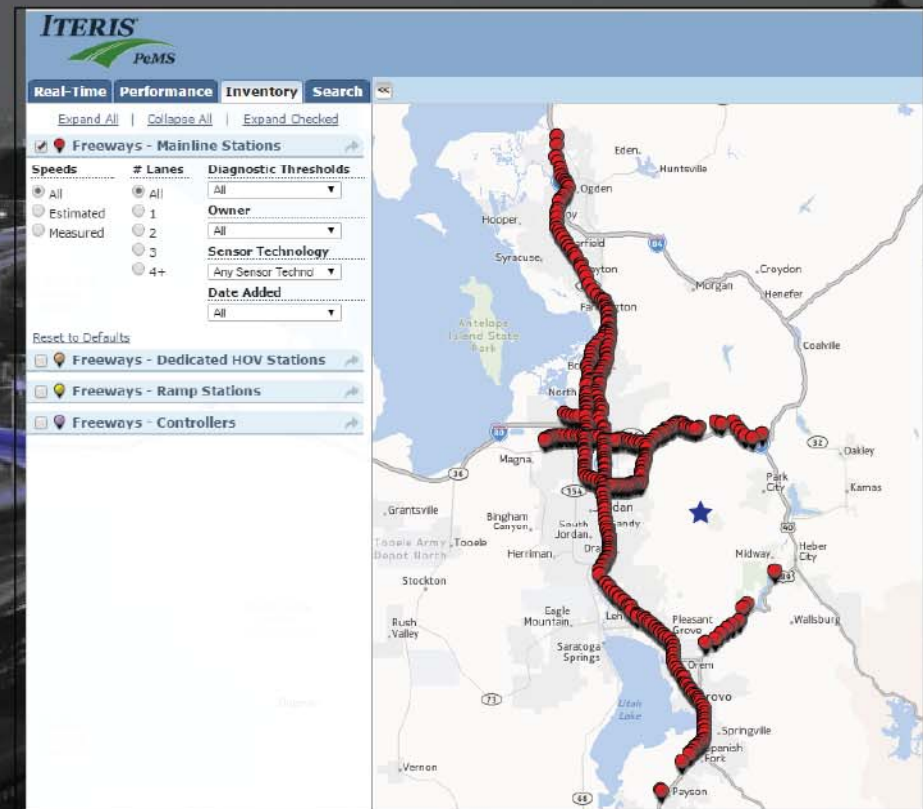
# **MAKING DECISIONS BASED ON DATA**

*Kelly Burns, P.E.  
Grant Farnsworth, P.E.*

## **AUTOMATED FREEWAY PERFORMANCE METRICS**



# UDOT'S FREEWAY DETECTION SYSTEM



# UDOT'S FREEWAY DETECTION SYSTEM

*Configured on PeMS*

- 1,272 Stations
- 3,070 Detectors
  - 94% Operational
- Types of Detection
  - Wavetronix SSM 105, 125, 126
  - Inductive loops
  - Sensys pucks
  - Microloops

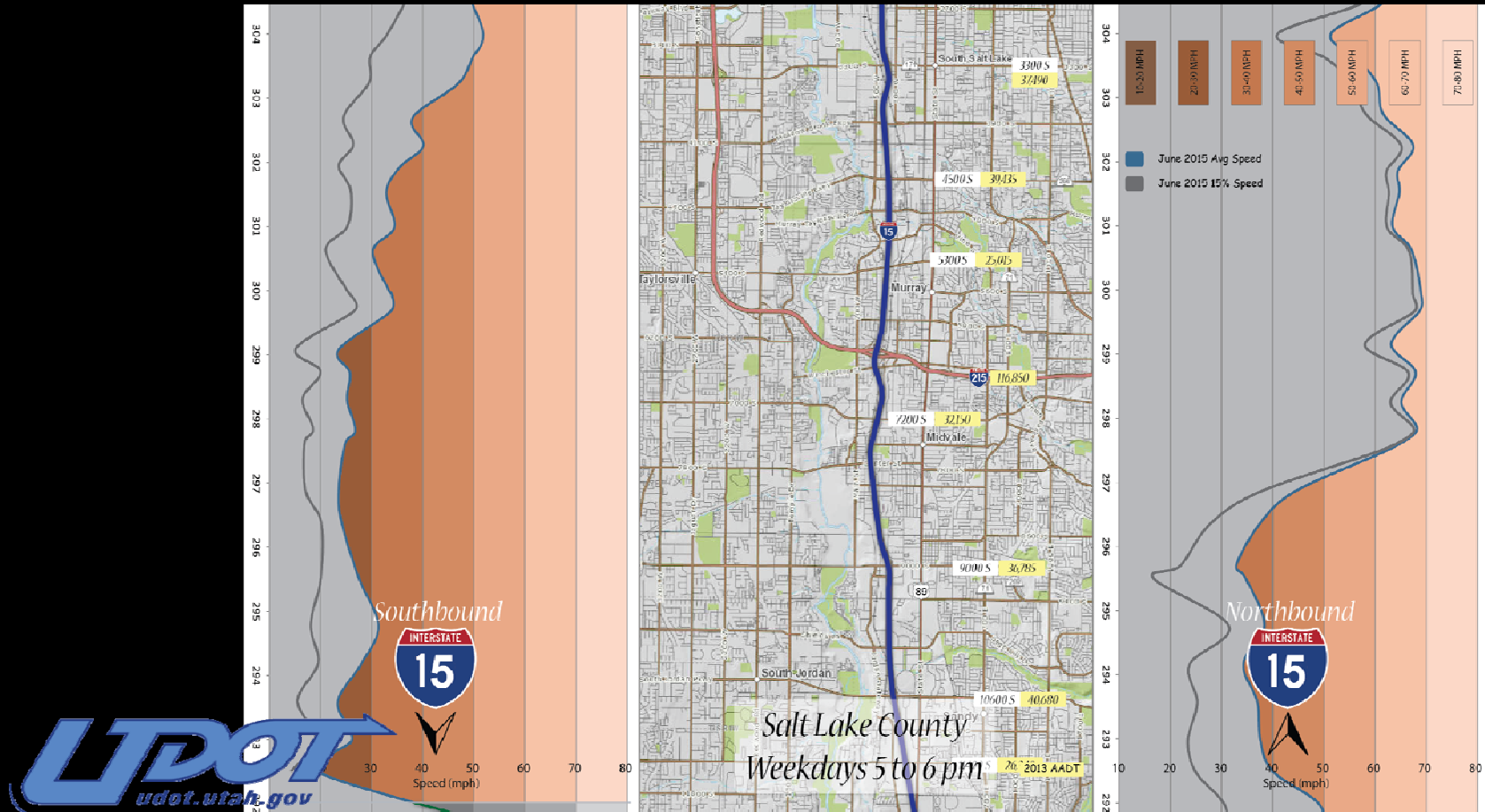
# UDOT'S FREEWAY

## *Performance Measures*

- Project Concept Phase
  - Comparison of overall freeway performance
  - Objective data vs. perception
  - Data driven decisions
- Initial Freeway Performance Measures
  - Speed Report
  - Driving Experience
  - Travel time
  - Time Lapse
  - Mobility Cake



# SPEED REPORT



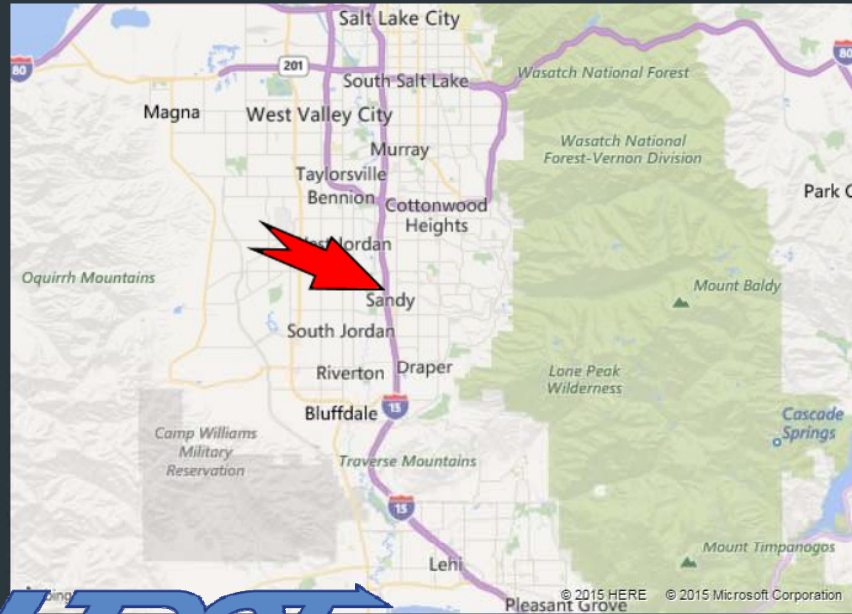
# AUTOMATED SPEED REPORT

## Mileposts

Start Milepost: 307.24

End Milepost: 277.71

Show Stations



## Speed Graph

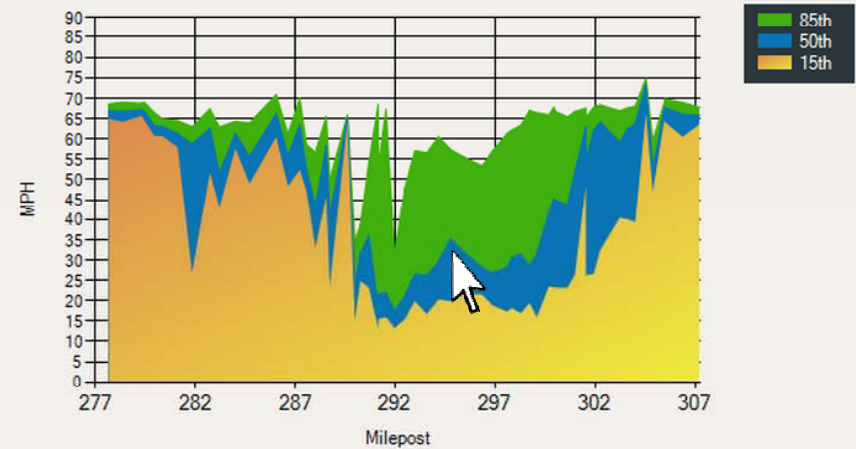
RunReport

Speed Report

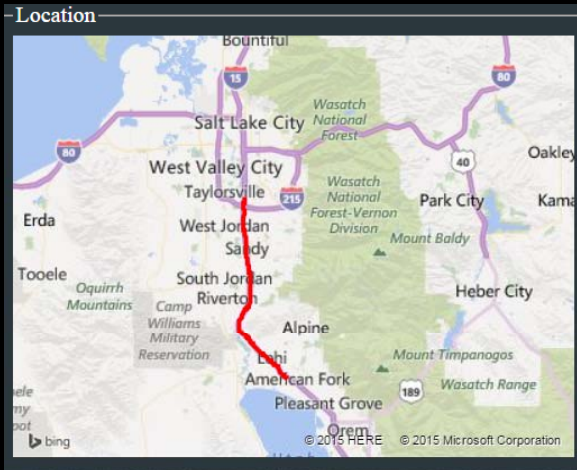


## Speed Report: I-15

Dates: 6/1/2015 - 8/5/2015 Time: 5:00 PM - 6:00 PM Days: Tuesday, Wednesday, Thursday  
Direction: Southbound



# TRAVEL TIME

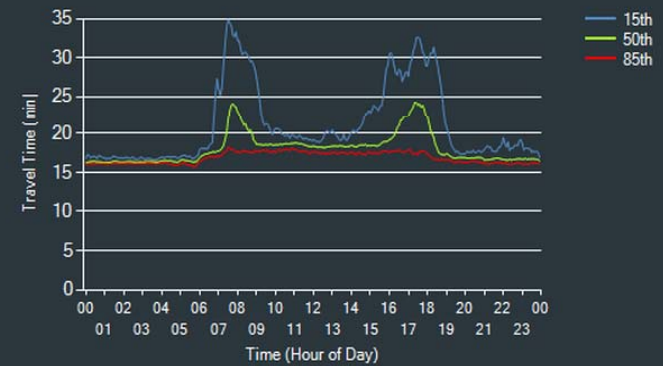


## Graph

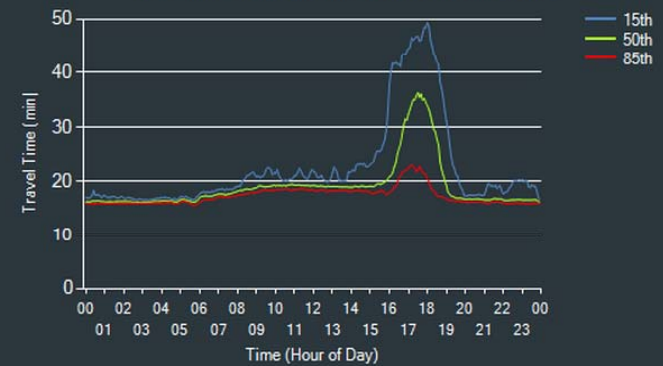
Run Report

## Travel Time

Travel Times: Northbound I-15 Lehi Main St to I-15 & I-215 S



Travel Times: Southbound I-15 & I-215 S to I-15 Lehi Main St

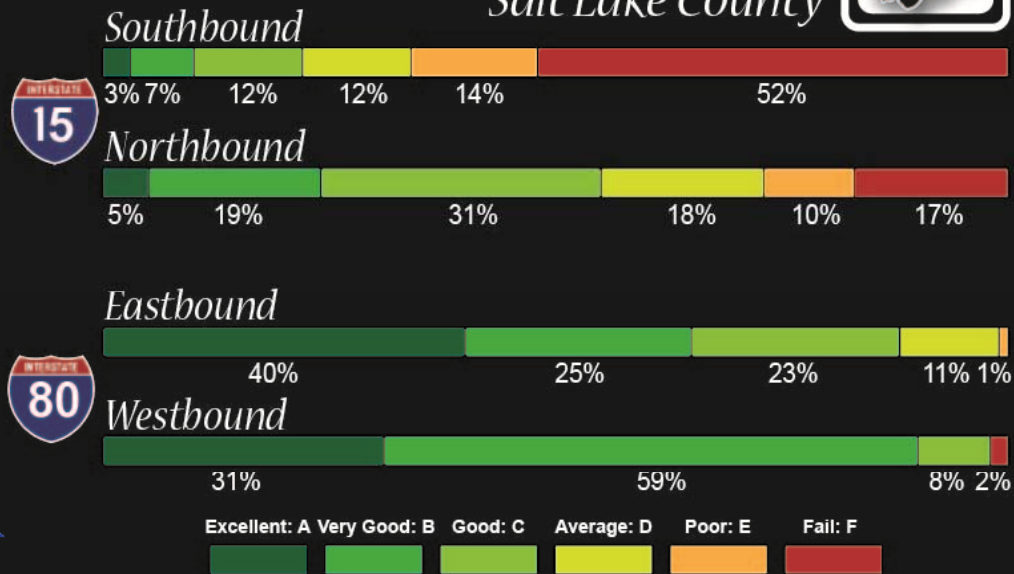


# UTAH DRIVING EXPERIENCE

## I-15 SB: SALT LAKE COUNTY

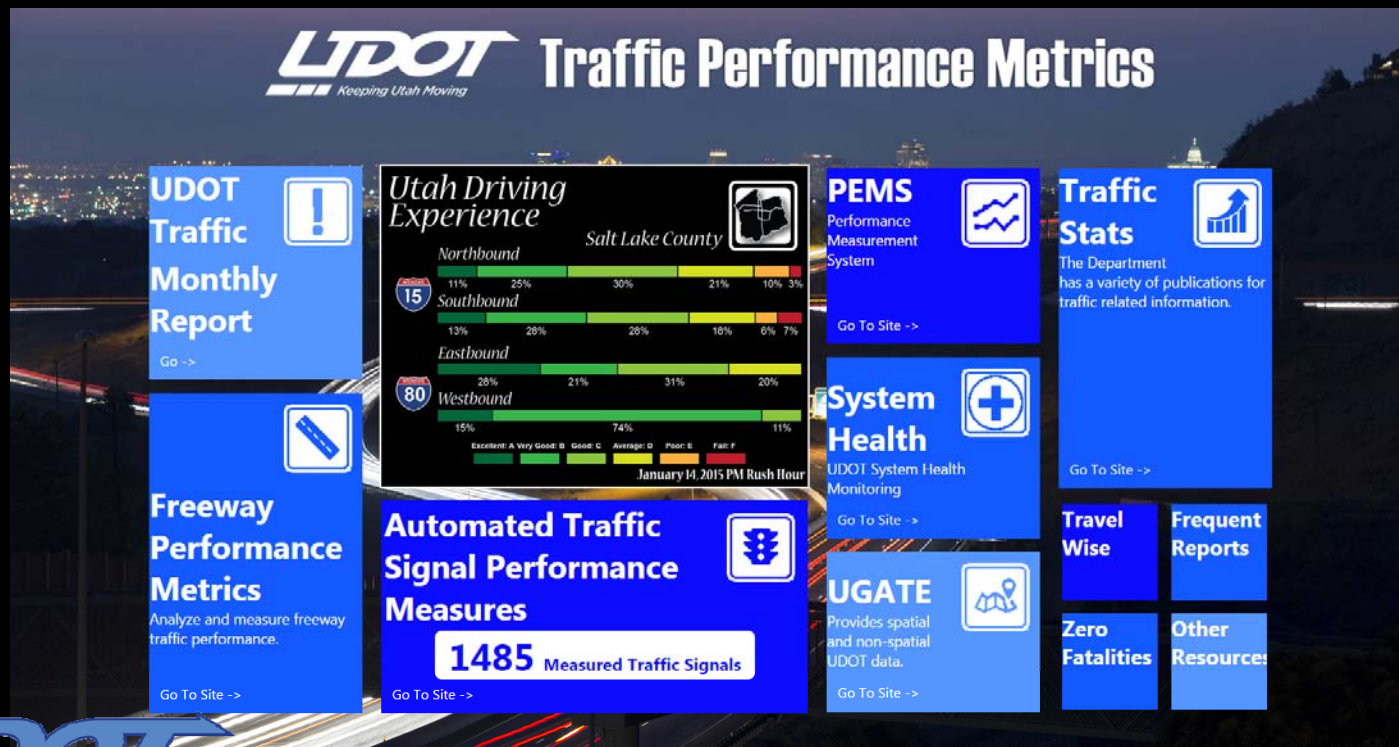
### Utah Driving Experience

Salt Lake County

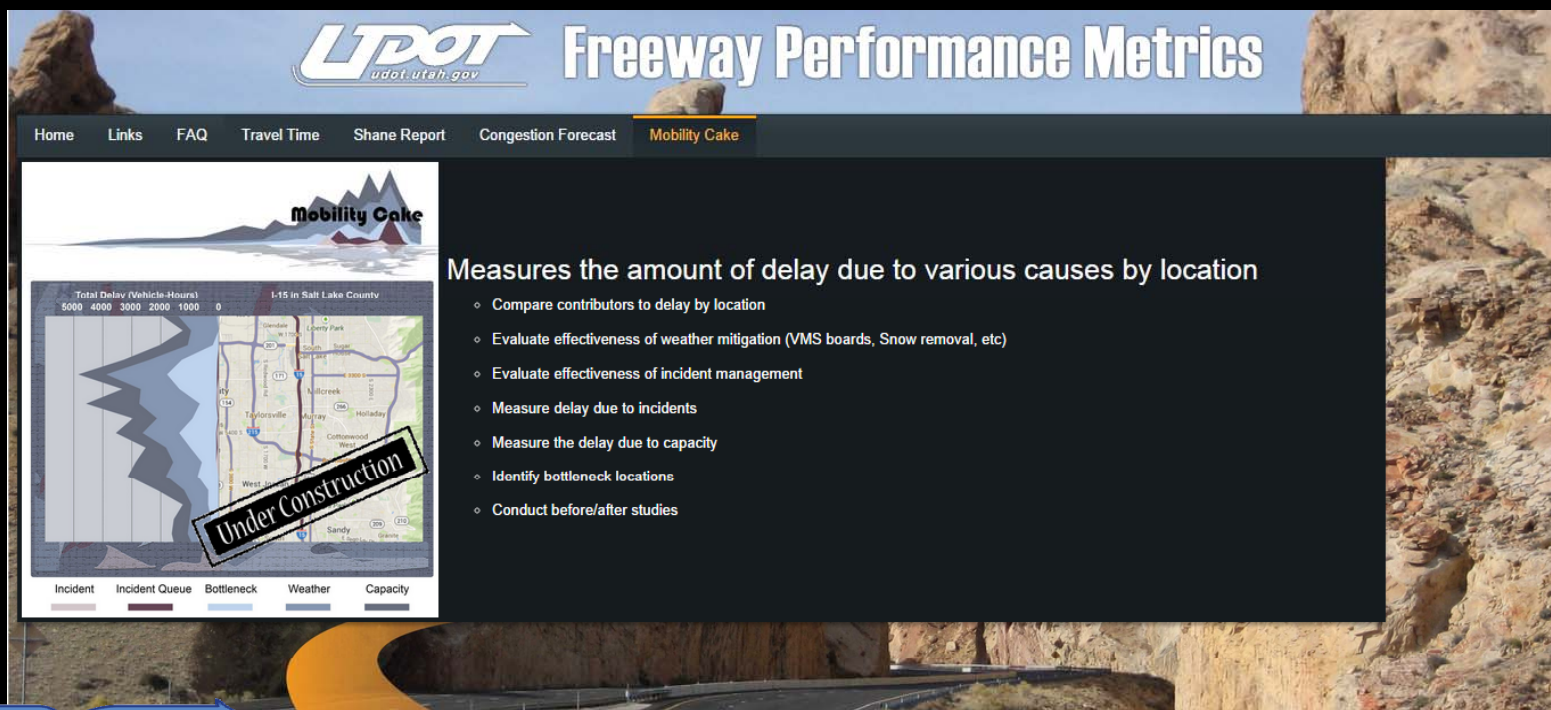


May 2015 PM Rush Hour (5-6 pm)

# TRAFFIC PERFORMANCE METRICS WEBSITE

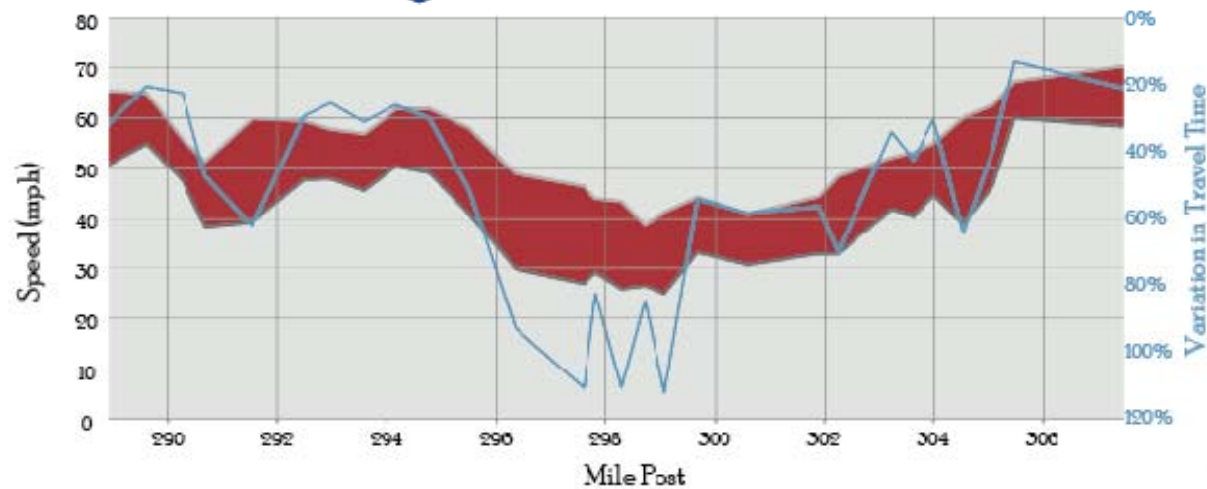


# UDOT FREEWAY PERFORMANCE MEASURES WEBSITE

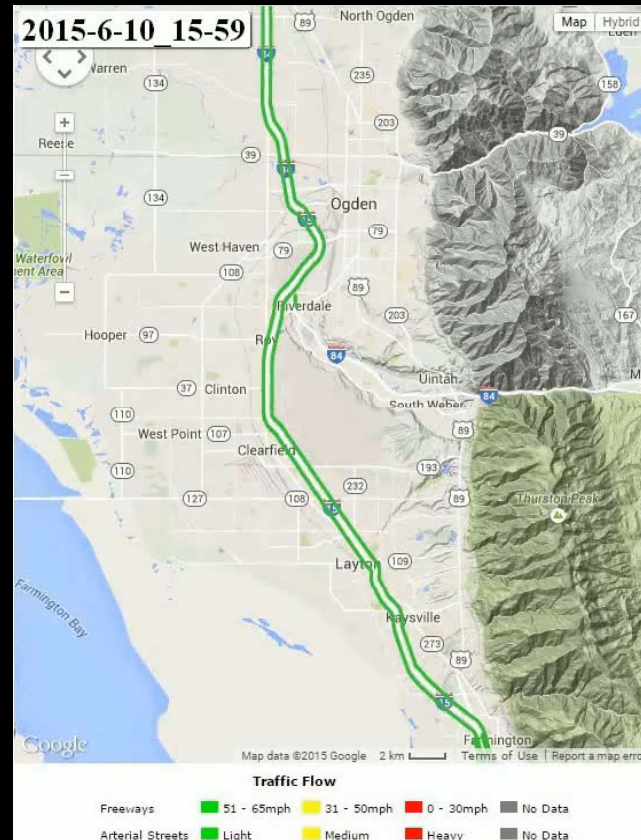


# RELIABILITY

## Southbound Mainline Reliability 5-6 PM



# TIME LAPSE VIDEO

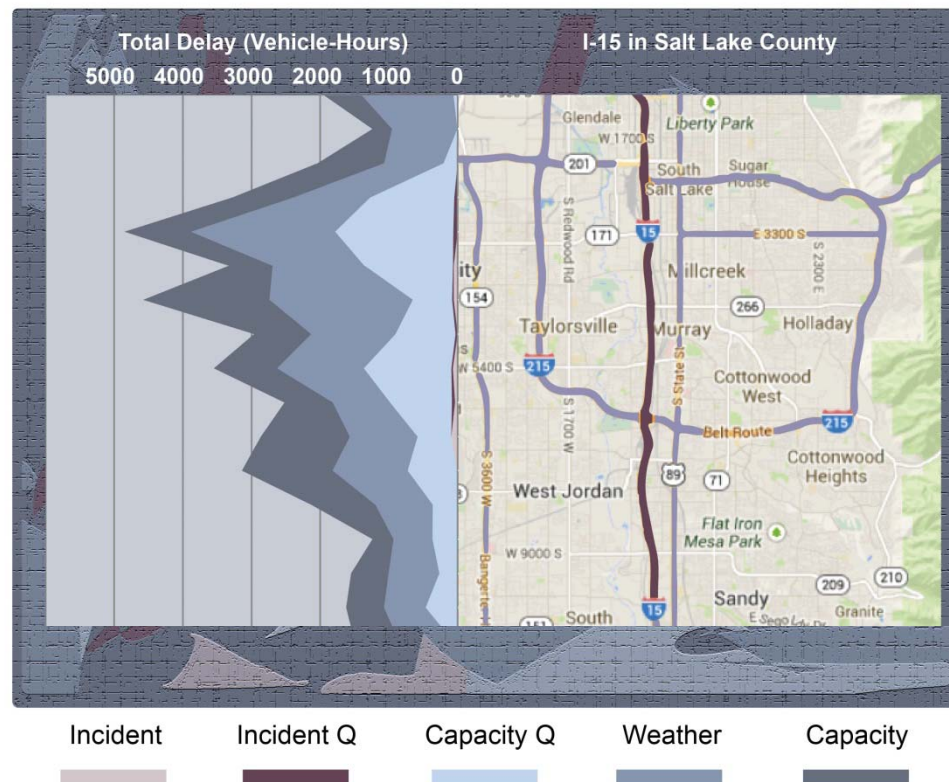


# MOBILITY CAKE

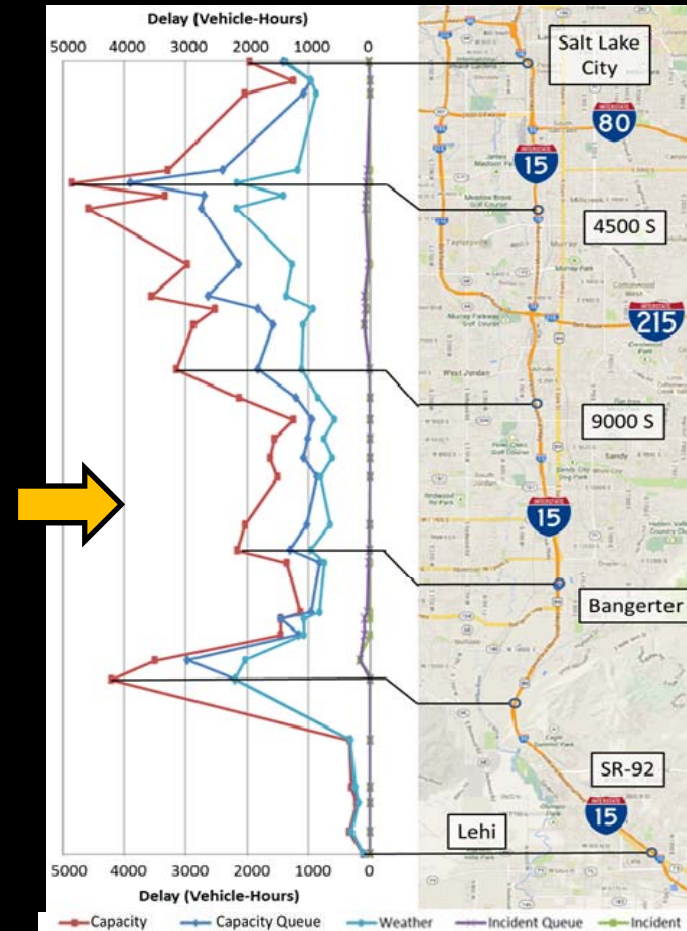
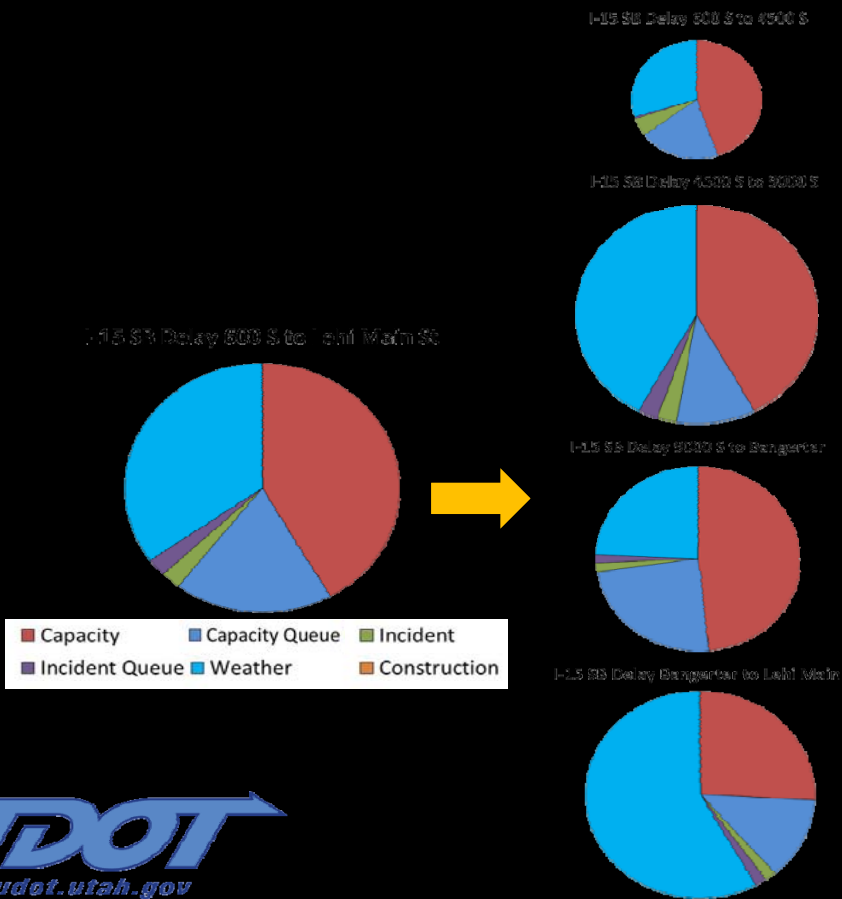
- Show the delay that can be attributed to the incidents, construction, and weather.
- Show where the delay is occurring on a corridor.
- Make assumptions that can be easily understood - don't be a black box algorithm.
- Leverage existing databases and ITS infrastructure

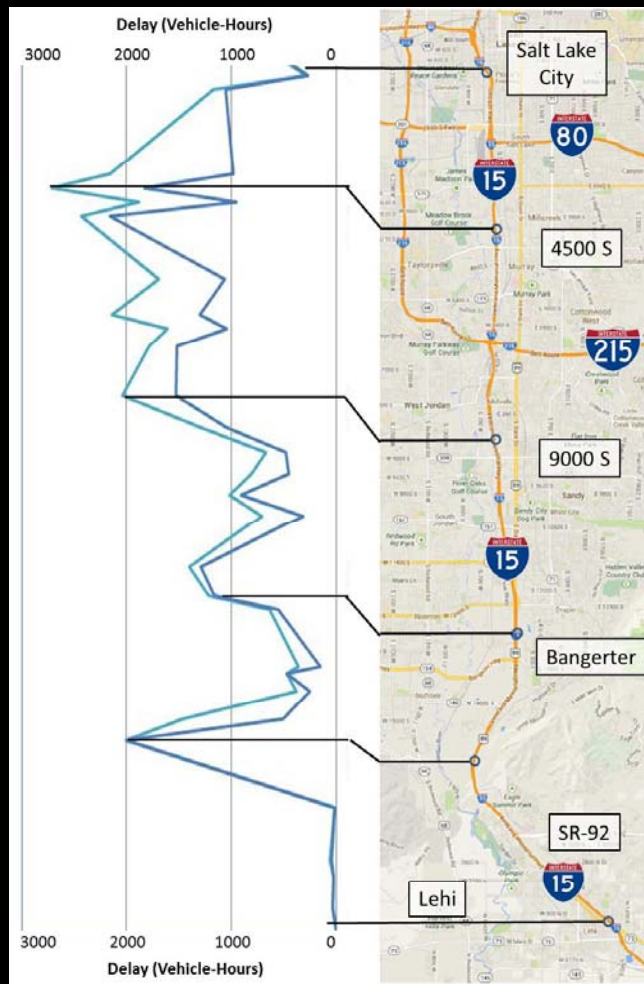


# Mobility Cake



# PROGRESSION OF MOBILITY CAKE



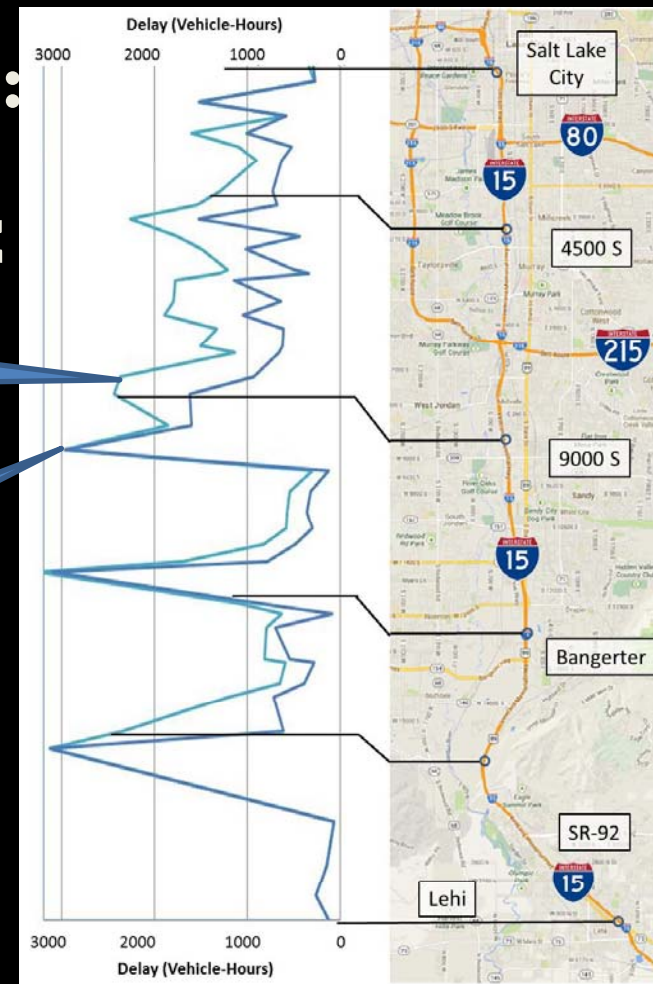


DECEMBER 2013

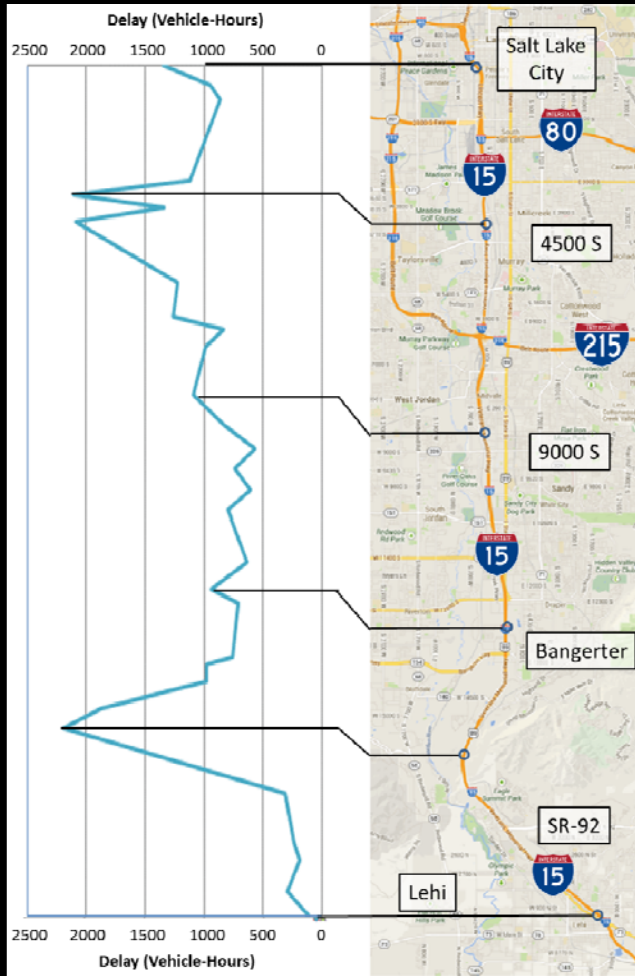
# MOBILITY CAKE: CAPACITY & CAPACITY QUEUE

Delay from  
bottleneck

Bottleneck

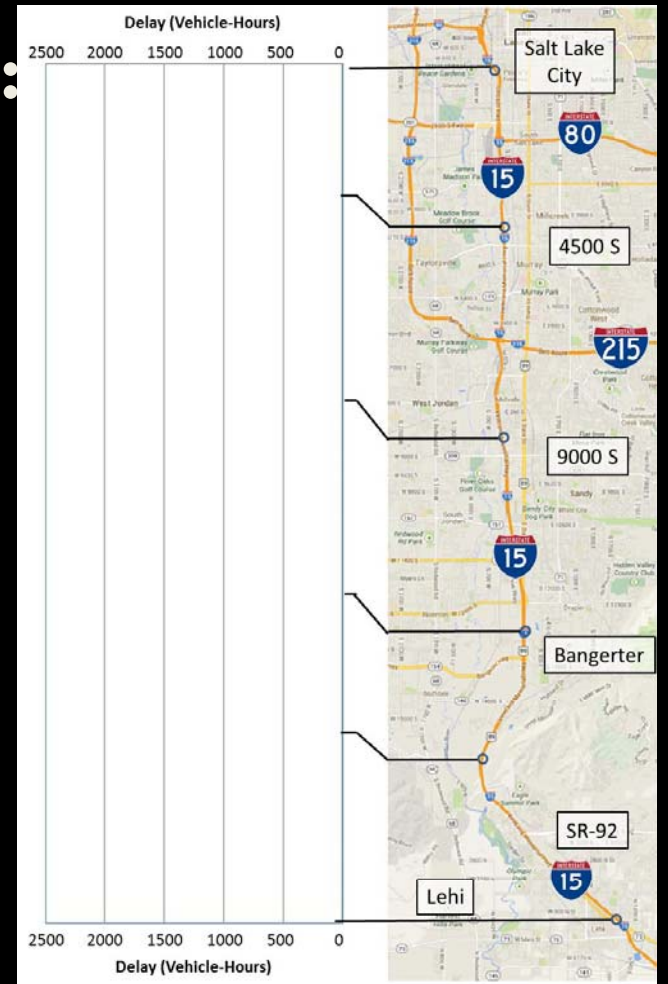


JULY 2014

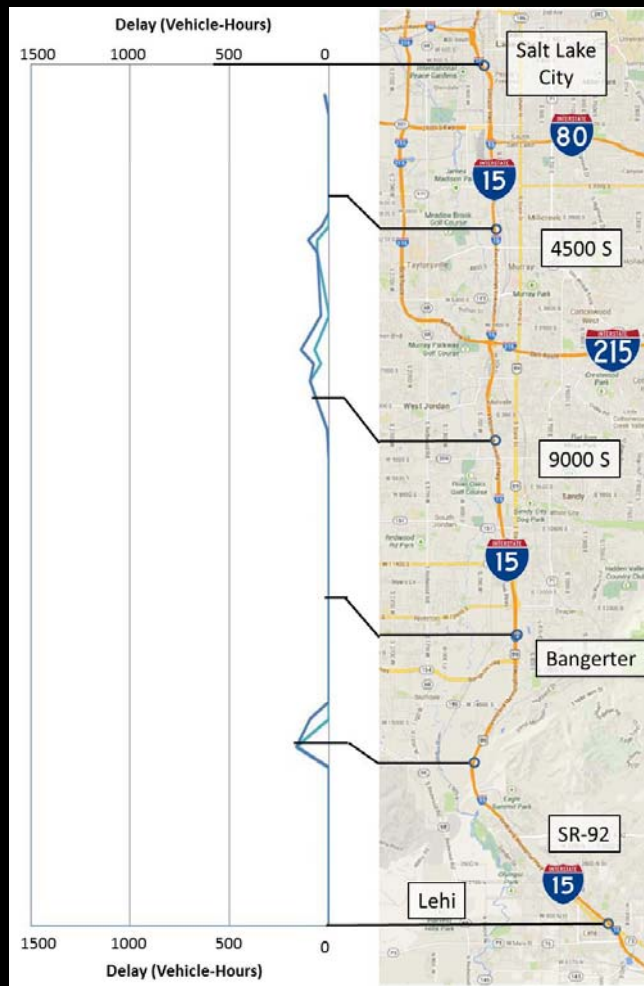


DECEMBER 2013

# MOBILITY CAKE: WEATHER



JULY 2014

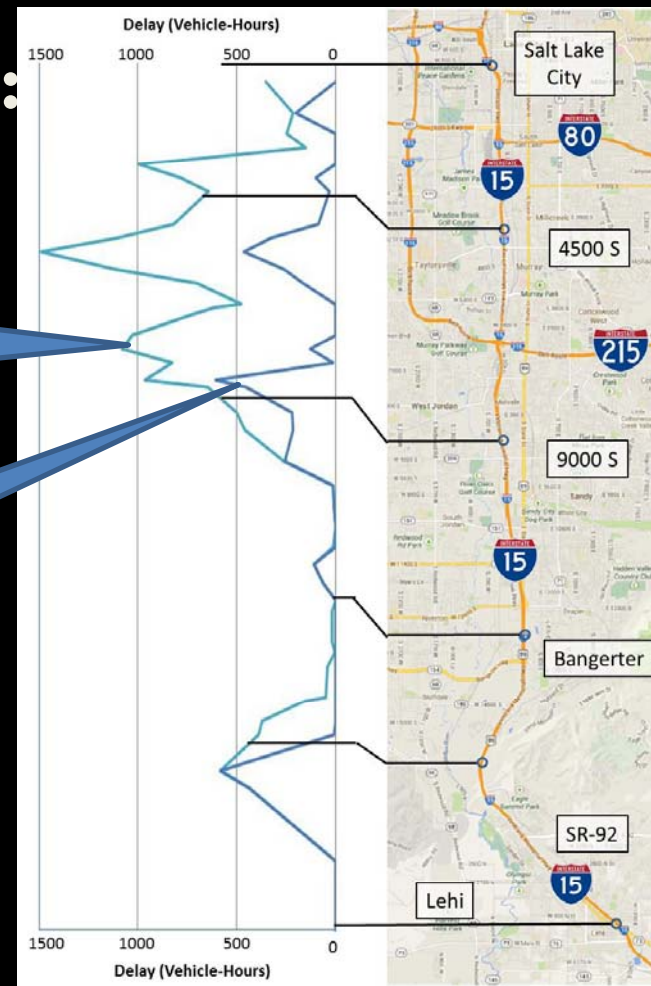


DECEMBER 2013

## MOBILITY CAKE: INCIDENTS & INCIDENT QUEUE

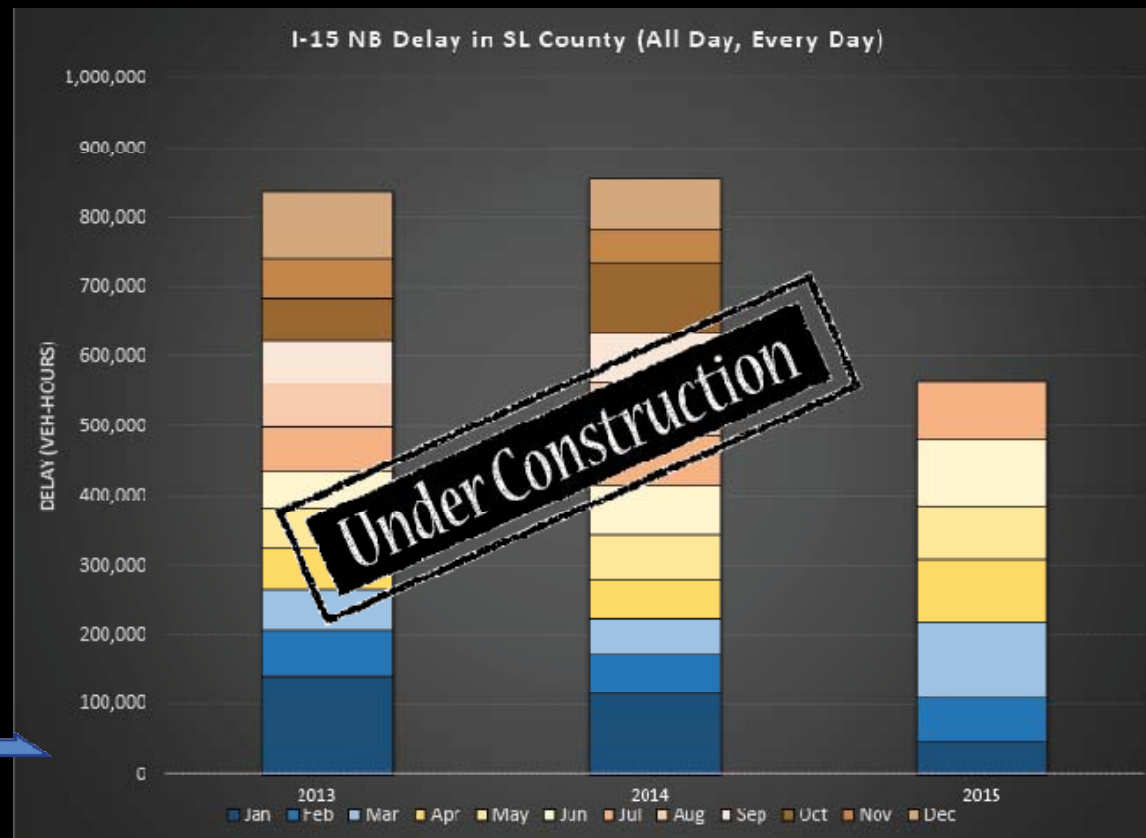
Delay upstream  
from incidents

Delay from  
incidents

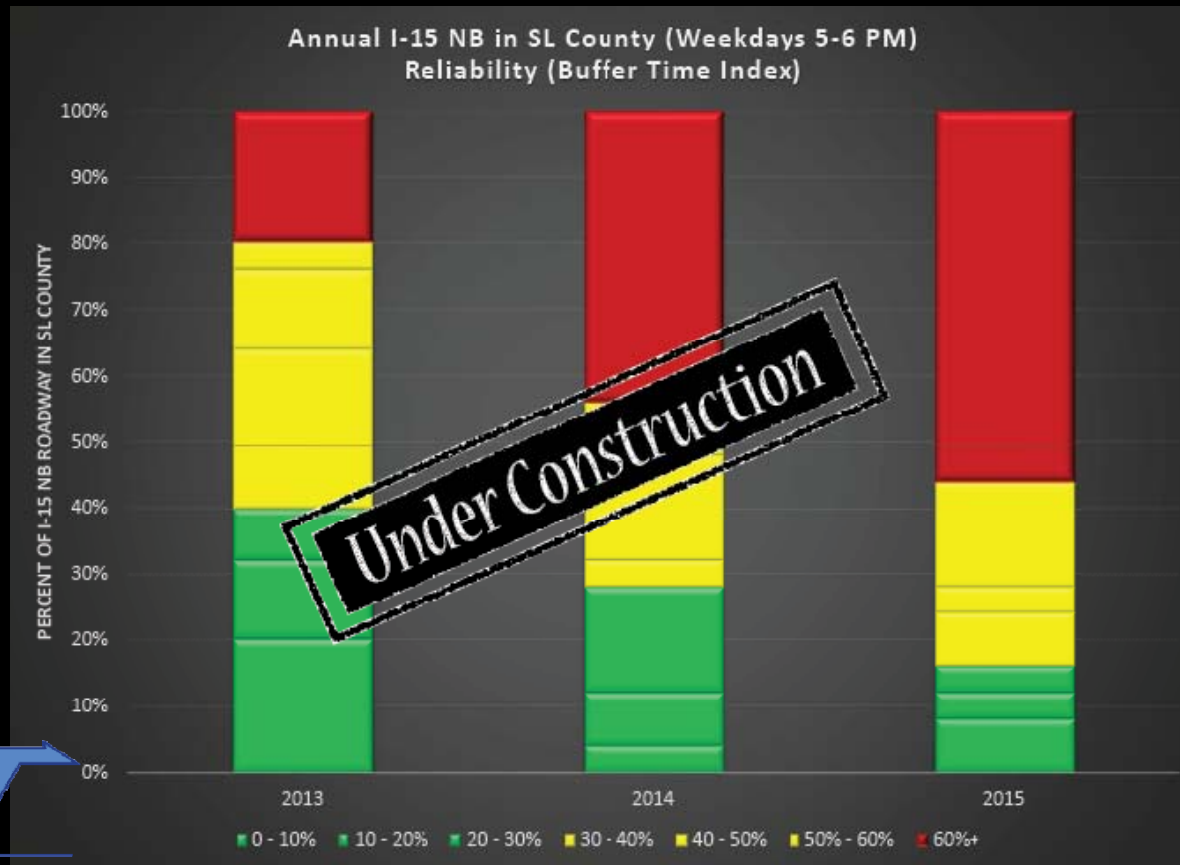


JULY 2014

# DELAY FOR SALT COUNTY

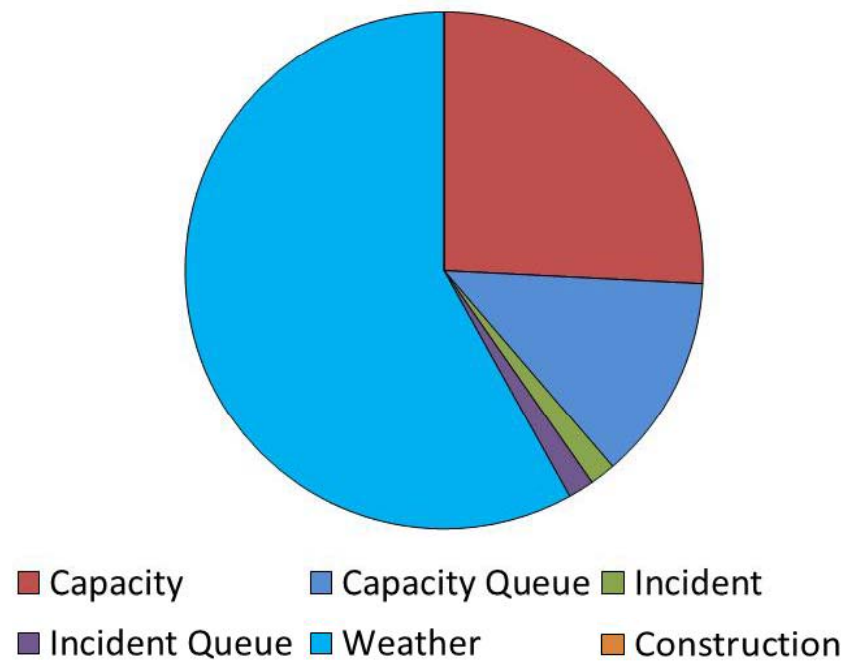


# RELIABILITY (BTI) GRAPH

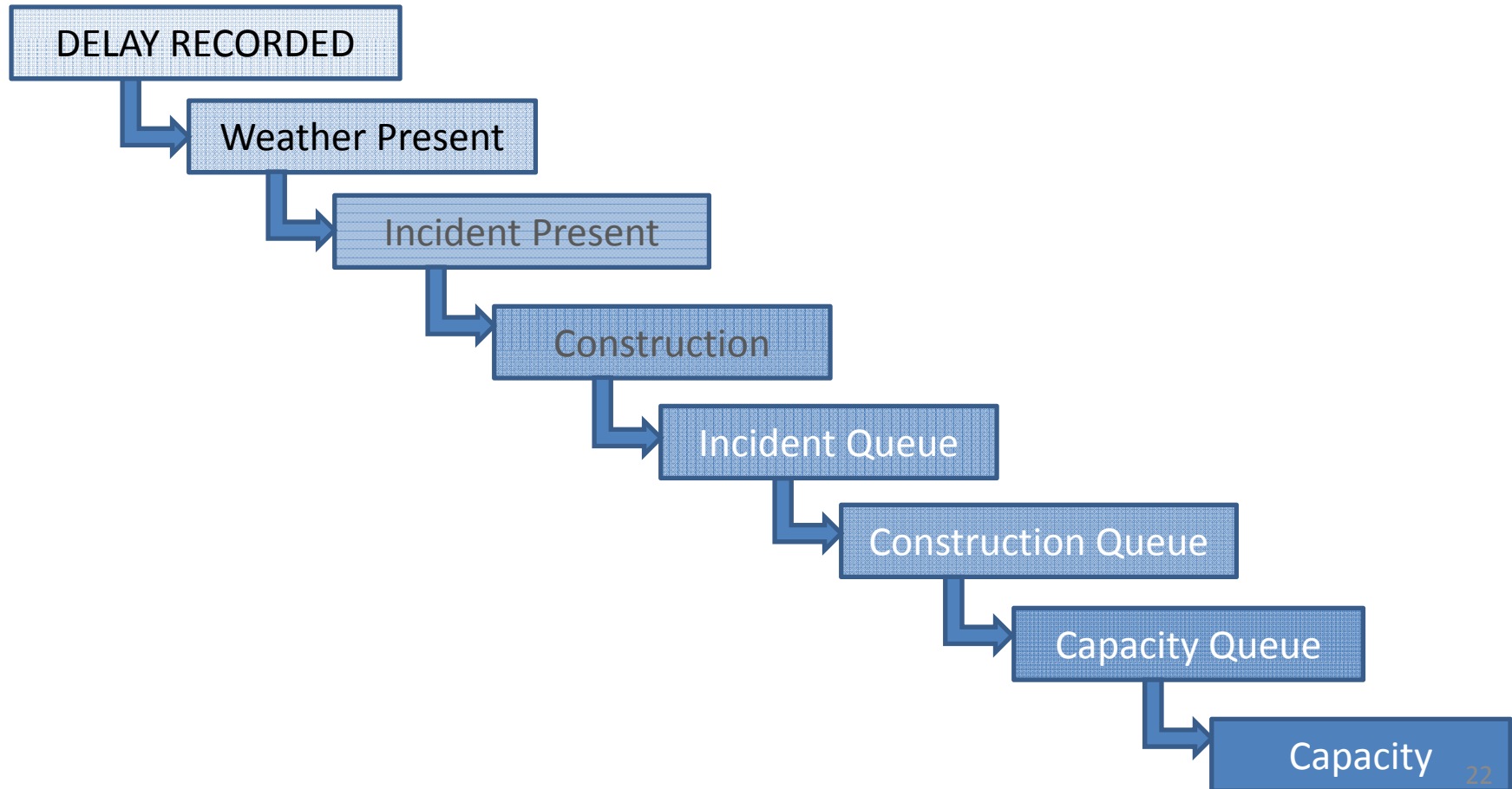


# Progression of the Mobility Cake

## I-15 SB Delay 600 S to Lehi Main St



# Delay Hierarchy

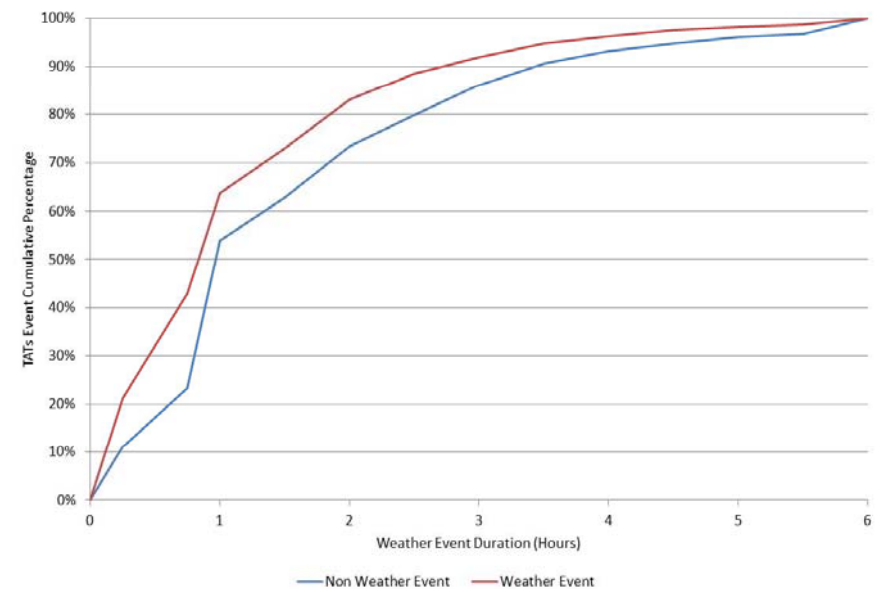
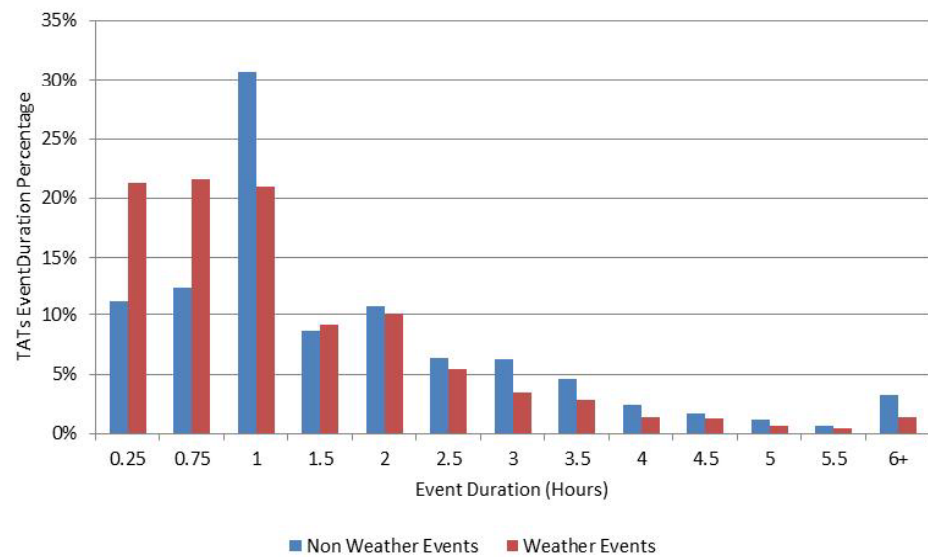


# Layers (Databases) in the Cake

- Delay – PeMS speed and volume data (5 min)
- Event Manager – Incidents
- Travel Advisory Telephone System (TATS) – Weather
- Lane Closure Log - Construction



# Weather Entry Duration



# Incident Record

**WELCOME:** Please roll over an icon or camera for more details. Zoom in for more cameras or icons.

Traffic Cameras Signs Incident Construction Lane Closure Weather

Map Hybrid



**115 NB @ 500 W US89 MP 318.1 BTF**



udot.utah.gov 04:21PM 02/05

Richfield

Main St SR118 SR120 @ 1300 S SR120 RFD

**Incidents**

**Details:** Crash I-15 AT MP 294 EST. CLEARANCE TIME: 5:13 PM  
**Last Updated:** 02/05/14 04:14 PM

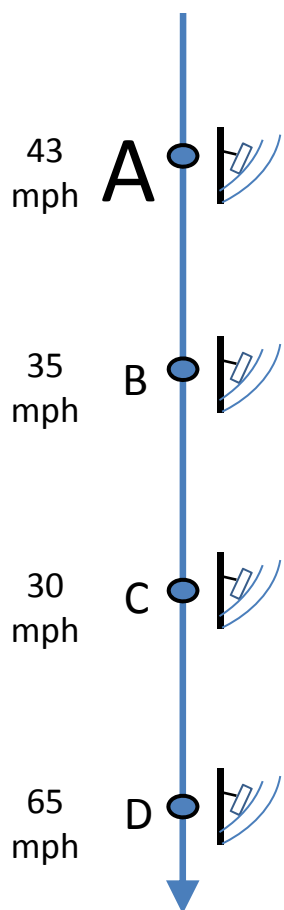
**Incident hazardous materials spill - 700 E at 4500 S**  
**Direction:** SB  
**Low (less than 5 minutes delays)**  
**Lanes Impacted:** 1  
**Estimated Duration:** 1 Hour(s)  
**Details:** HAZMAT 700 E AT 4500 S RIGHT LANE CLOSED EST. CLEARANCE TIME: 5:21 PM  
**Last Updated:** 02/05/14 04:23 PM

**Incident accident - I15 at MP 318**  
**Direction:** NB  
**Medium (5-15 minute delays)**  
**Lanes Impacted:** 1  
**Estimated Duration:** 1 Hour(s)  
**Details:** Crash I-15 AT MP 318 RIGHT LANE CLOSED 500 W ONRAMP, LEFT LANE CLOSED EST. CLEARANCE TIME: 4:59 PM  
**Last Updated:** 02/05/14 04:10 PM

8/14/2015

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# Incidents Flow Chart



8/14/2015

