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Regional Integration of Intelligent Transportation Systems (RIITS) Los Angeles Metro

LA Metro - Southern California Regional Big Data Solution

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Los Angeles Statistics

Statistics

- 18.7M – Population in greater LA
- 88 Cities
- 21,737 maintained roadway miles
- 22 transit agencies
- 3600 buses during peak period
- 30 AV Car Manufacturers
- 3rd Busiest Airport
- 2nd Busiest Seaport
- 1st in congestion

Sports

- Entertainment Capital
- Two Baseball Teams
- Two Hockey Teams
- Two Basketball Teams
- Two Pro Football Teams
- Two NCAA Football Teams

LA Big Data Project aka. RIITS - Four (4) Basic Functions

Data Fusion

Real-time Data hub for 125 agencies and data sources

Cloud Environment

SoCal Regional Archived Data Management and Performance Measurement System

RIITS

Big Data Analytics

Tableau and Google Analytics/Urban Engines (Static and Moving Data, e.g. Connected Vehicles)

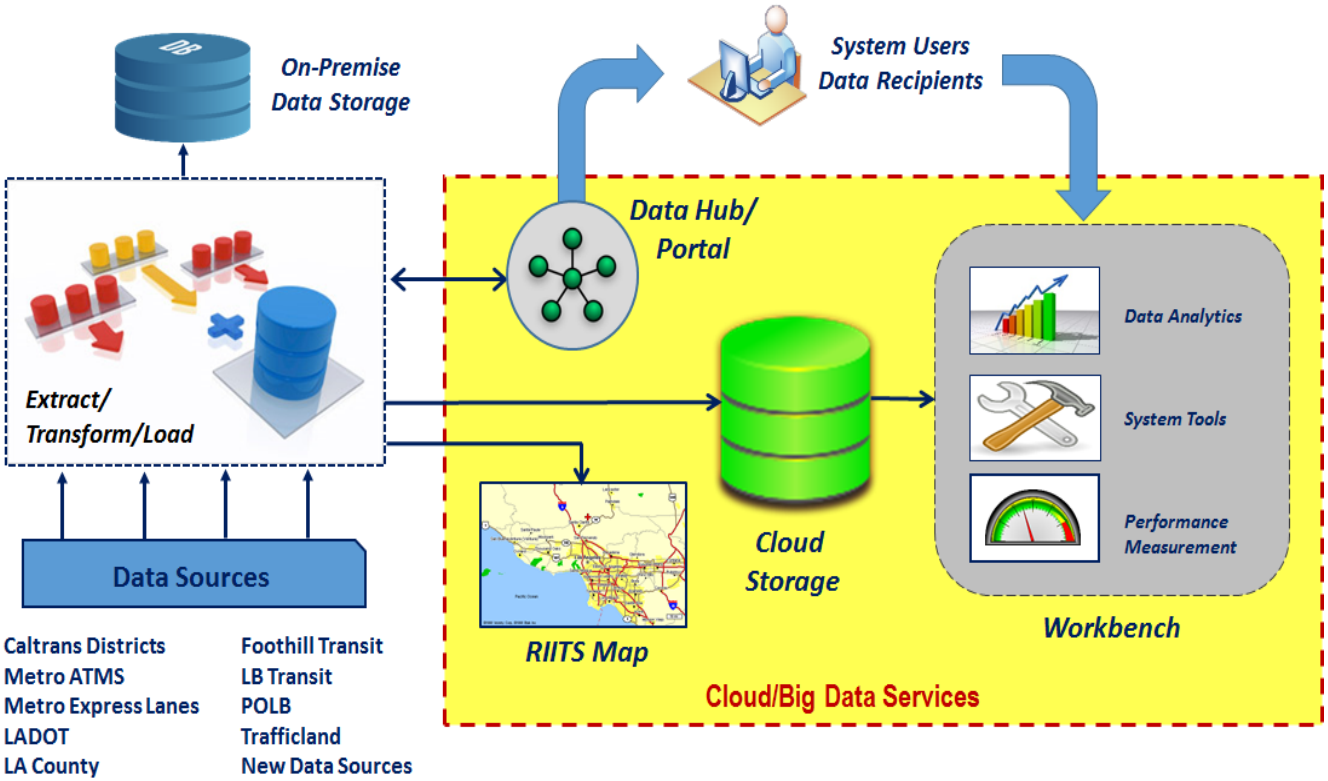
Multitenant Web Hosting

All partners can create their own Websites

RIITS Goals and Objectives

- Facilitates collaboration and coordination of ***data exchange*** among transportation agencies
- ***Reduces time, cost and resources*** to manage data
- ***Capture historical data*** that can be used to analyze time (temporal), spatial trends and maximize historical, current, and future data visibility;
- Modern solution that ***integrates data modeling, solution system analytics, and visualization*** functions
- Supports ***dynamic scalability***, increases system manageability, reliability, interoperability, and extensibility;
- ***Seamless data integration*** and management
- Implemented ***without interrupting*** production operations;
- A solution that uses transportation **standards** wherever possible.

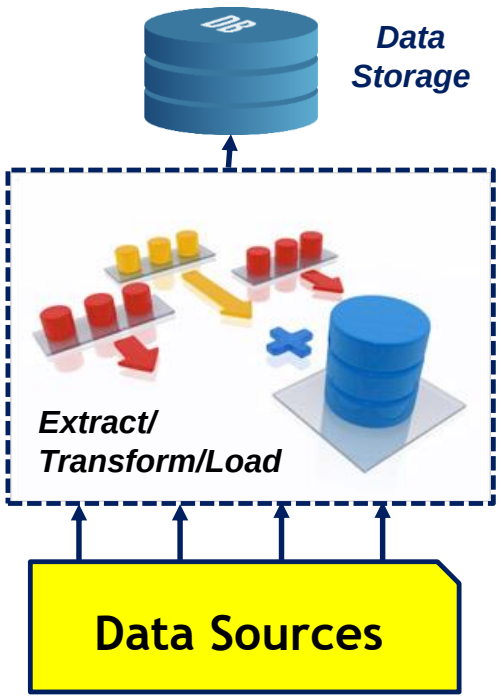
Los Angeles Big Data - Context Diagram



Extract-Transform-Load (ETL) – Data Fusion

Tools used to:

1. Extricate data from data sources
2. Clean, translate, transpose and join data
3. Inserts data into the target system, e.g. data warehouse

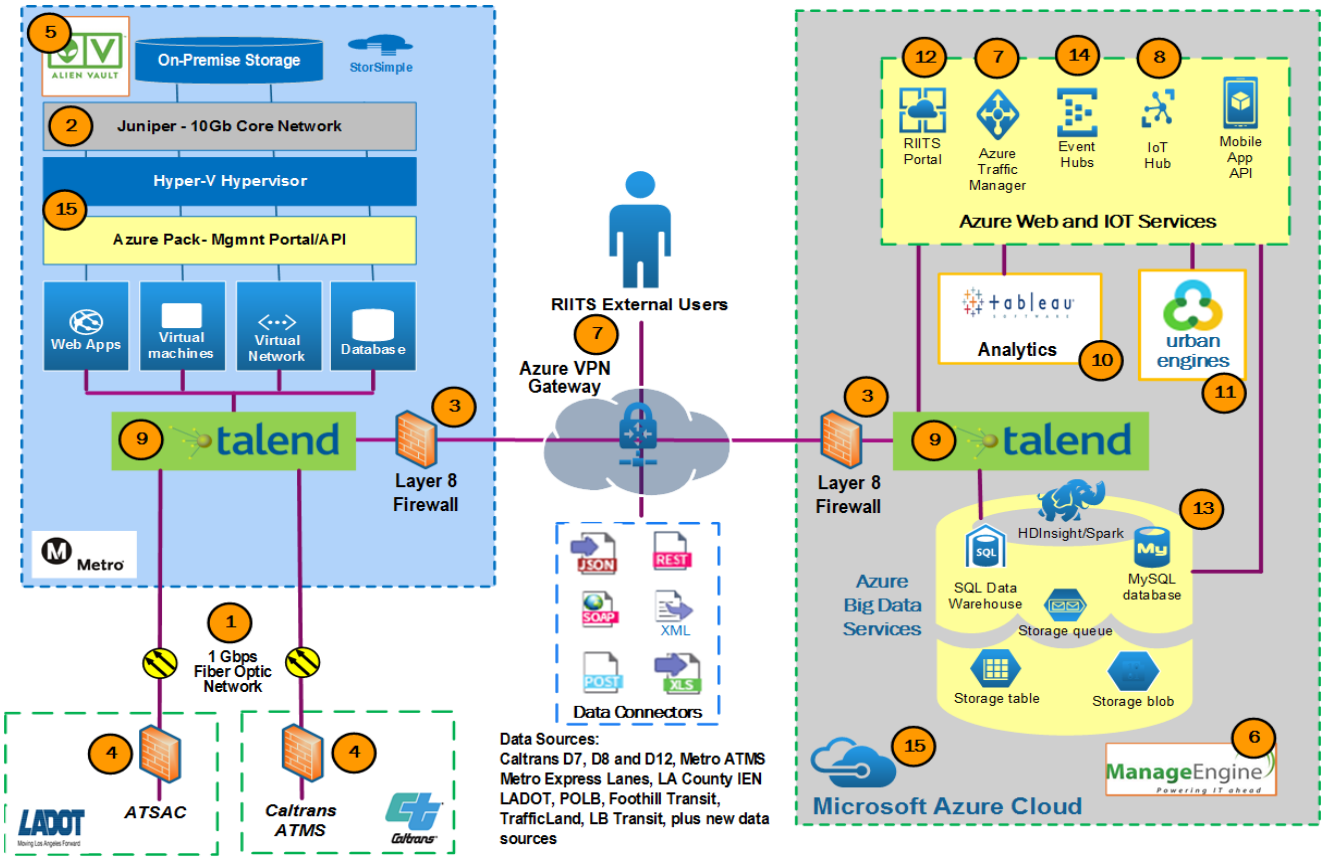


Current RIITS Data:

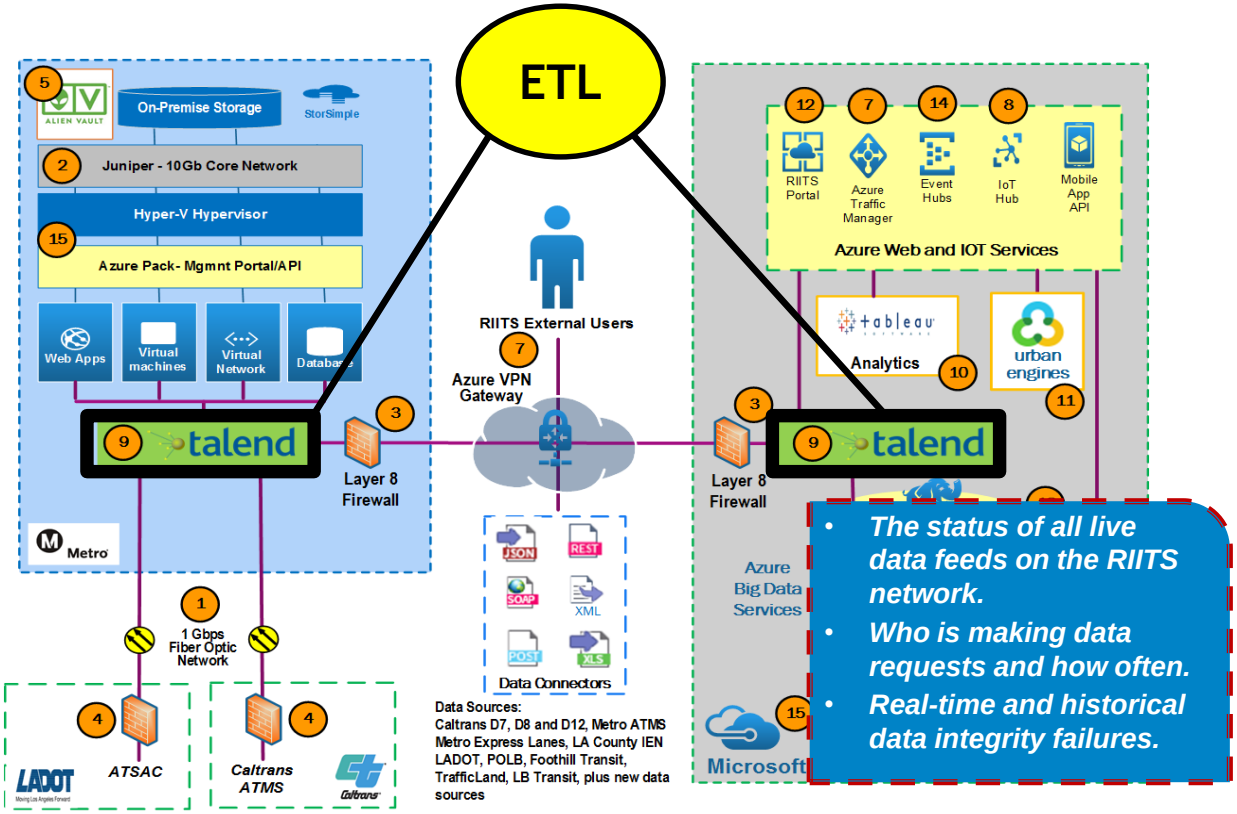
- 27,350 Vehicle Detectors
- 5585 events/day
- 13,873 Traffic Signals
- 1756 Transit Vehicles
- 350 CCTV Camera Images
- 5000+ Road Segments
- 10,335 Ramp Meters in OC, LA and IE

- 125 Agencies/Systems Planned for integration

RIITS High Level Architecture



RIITS High Level Architecture



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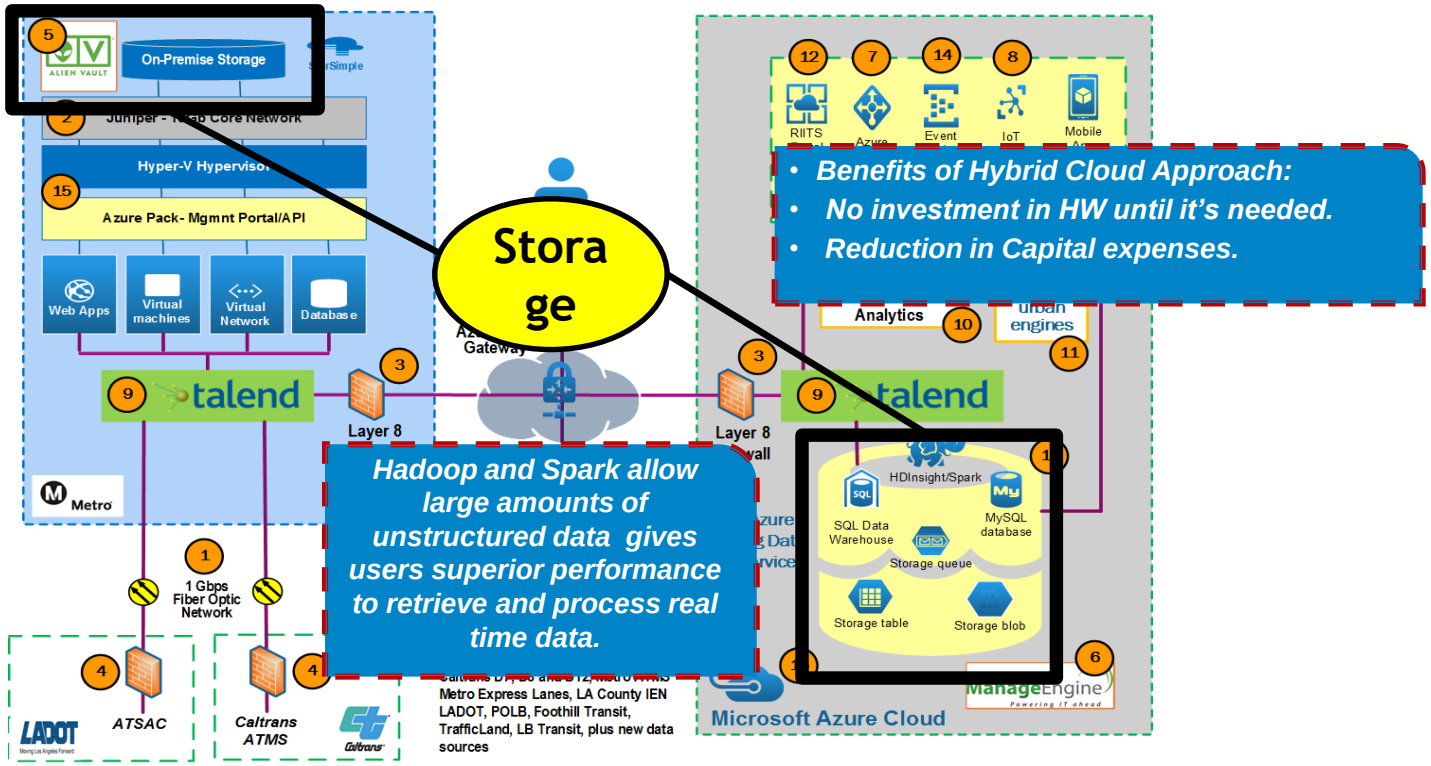
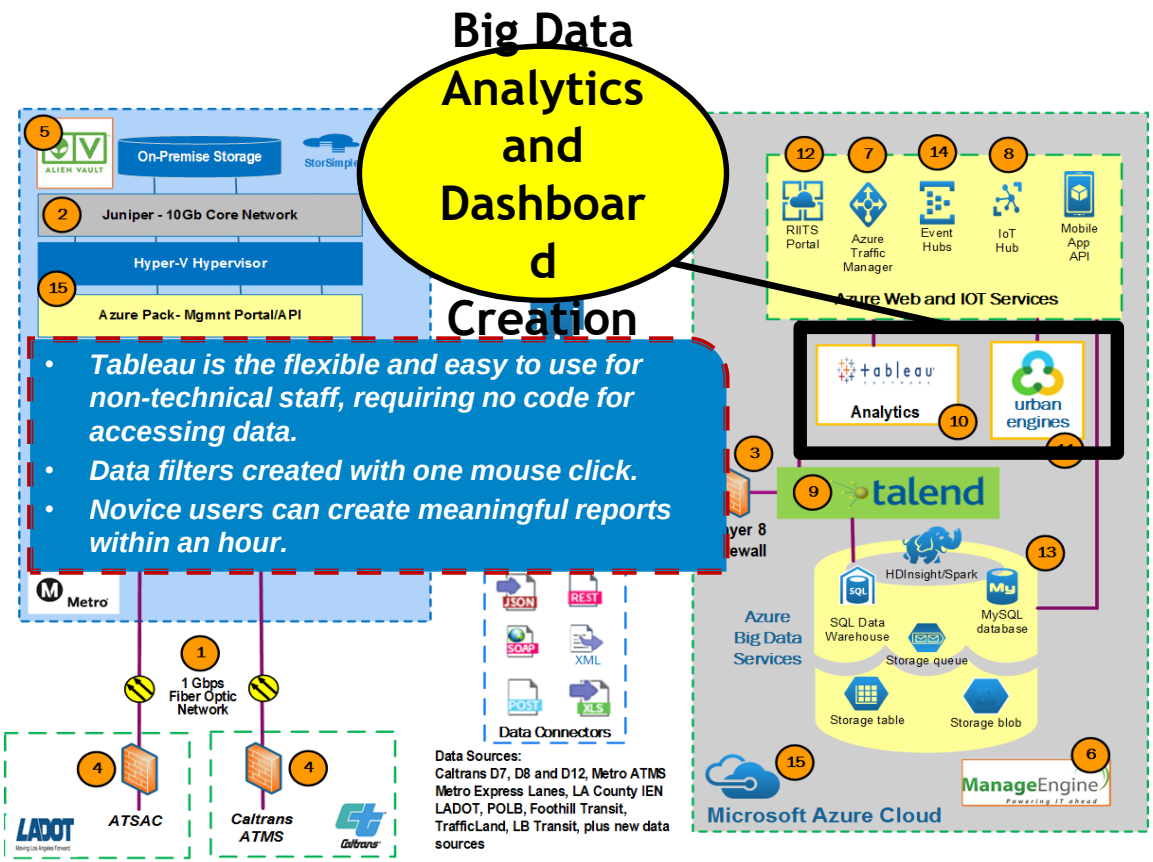
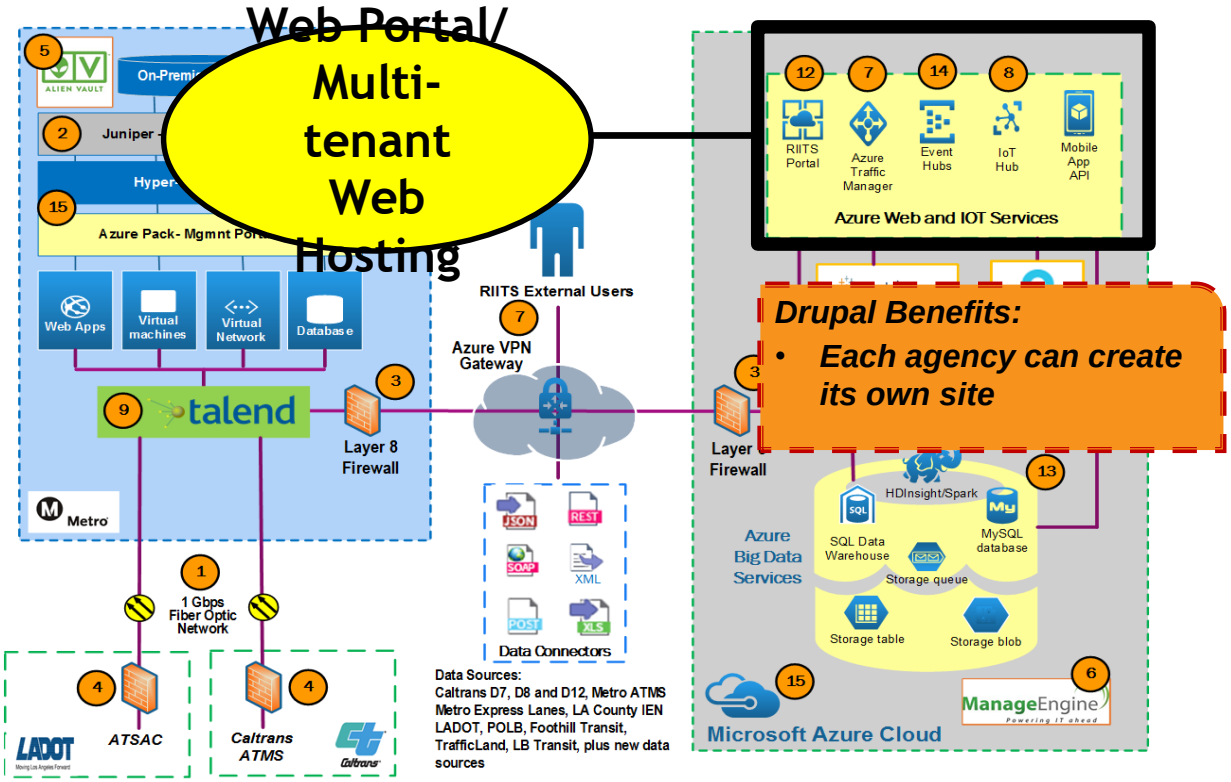


RIITS High Level Architecture



- *Tableau is the flexible and easy to use for non-technical staff, requiring no code for accessing data.*
- *Data filters created with one mouse click.*
- *Novice users can create meaningful reports within an hour.*

RIITS High Level Architecture



Drupal Benefits:

- ***Each agency can create its own site***

Big Data - Hadoop

- Open source, Java-based programming framework
- Supports the processing and storage of extremely large data sets in a distributed computing environment
- Handles thousands of terabytes of data
- Distributed file system which allows rapid data transfer rates

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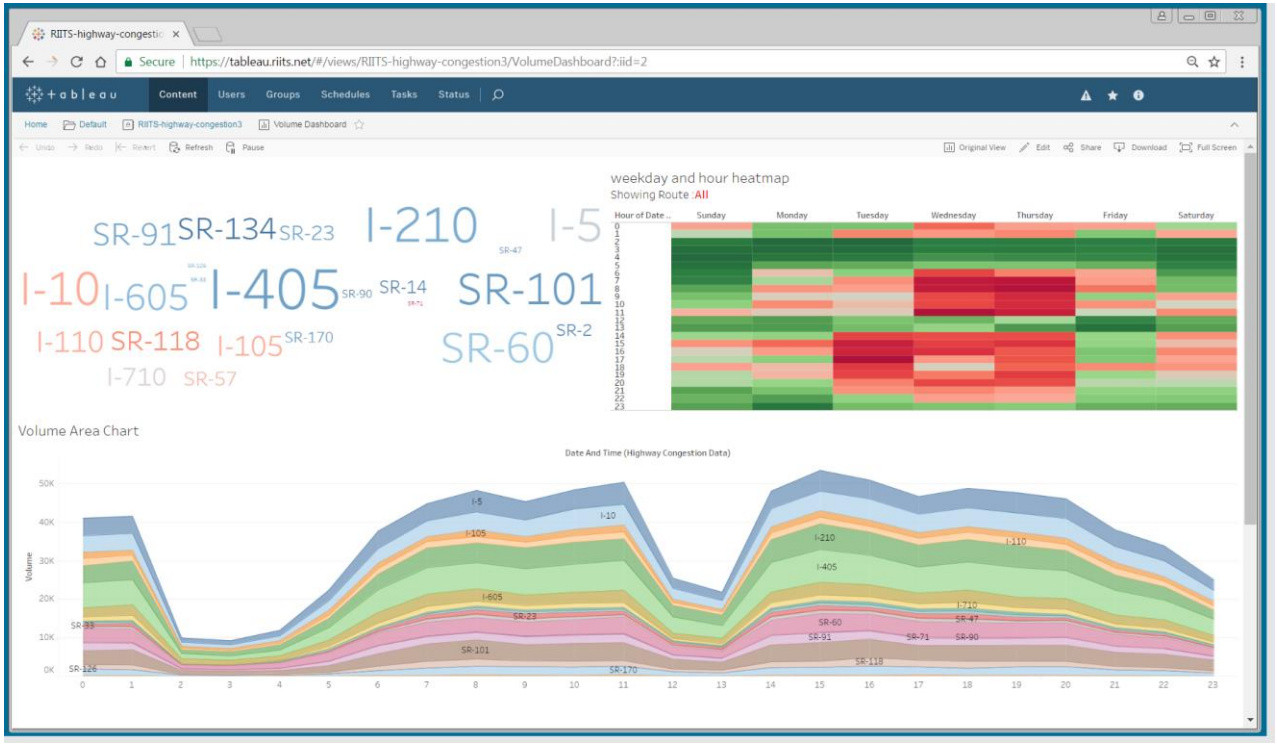
- 500 PB of data

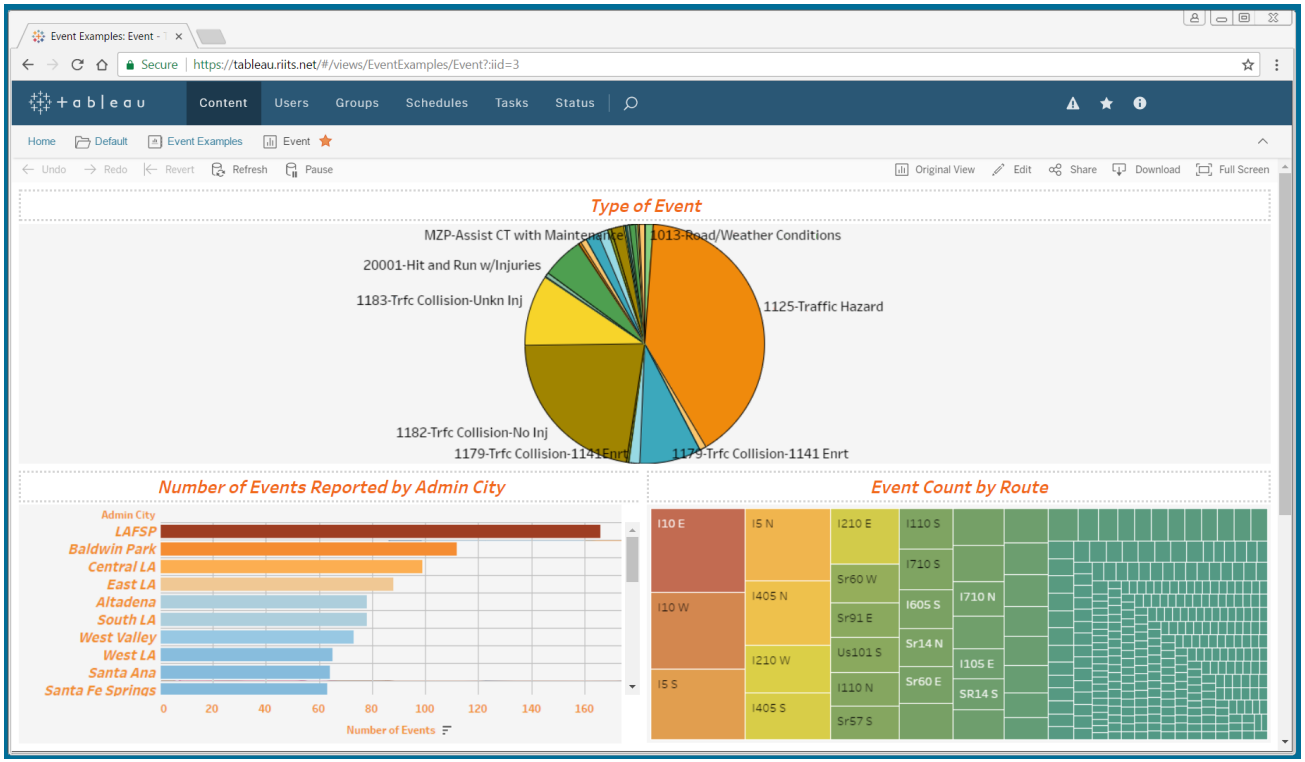
>50% use it

Big Data Analytics



Freeway Volumes

Big Data Analytics



Traffic Events

Thank You

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