Connected Corridors
Face-to-Face Meeting

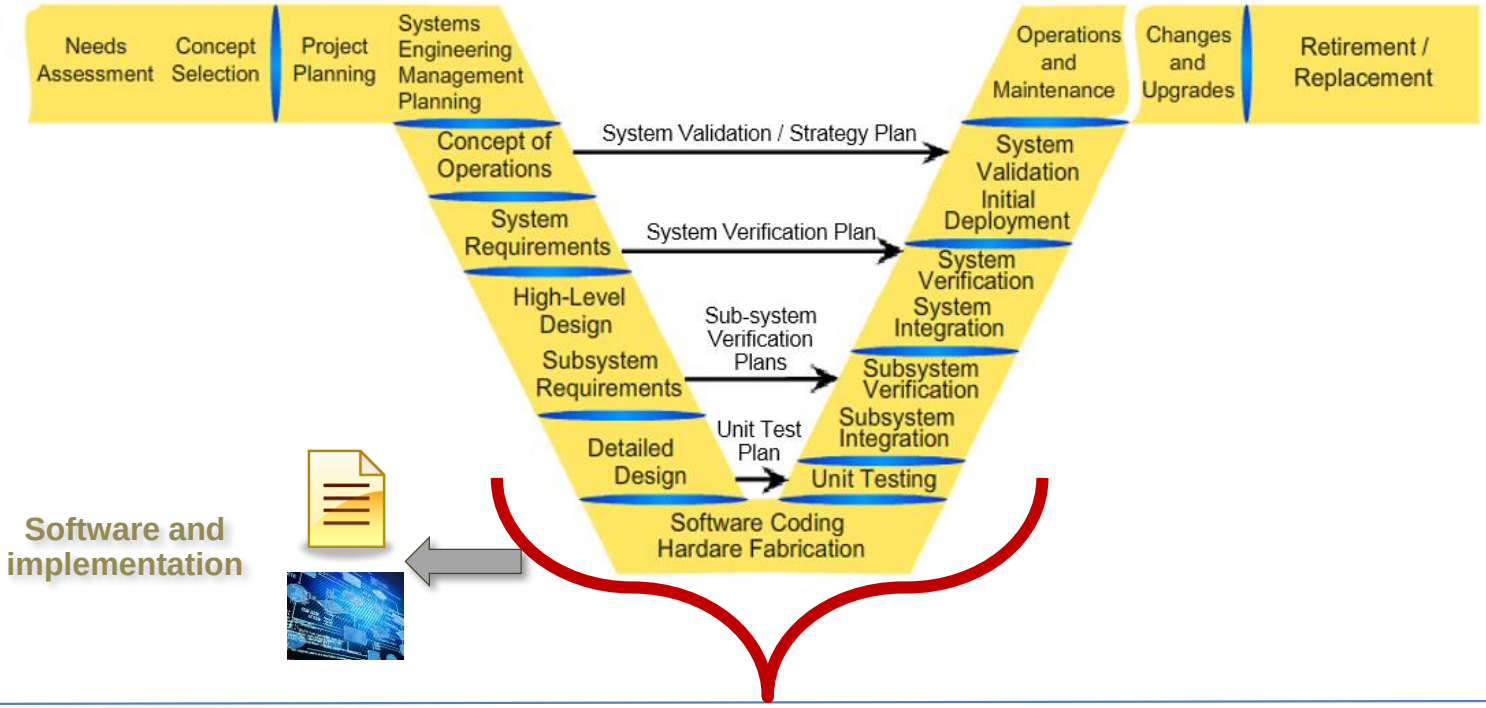
Tuesday, May 22nd , 2018
1:30 – 3:30 pm
Arcadia

Agenda

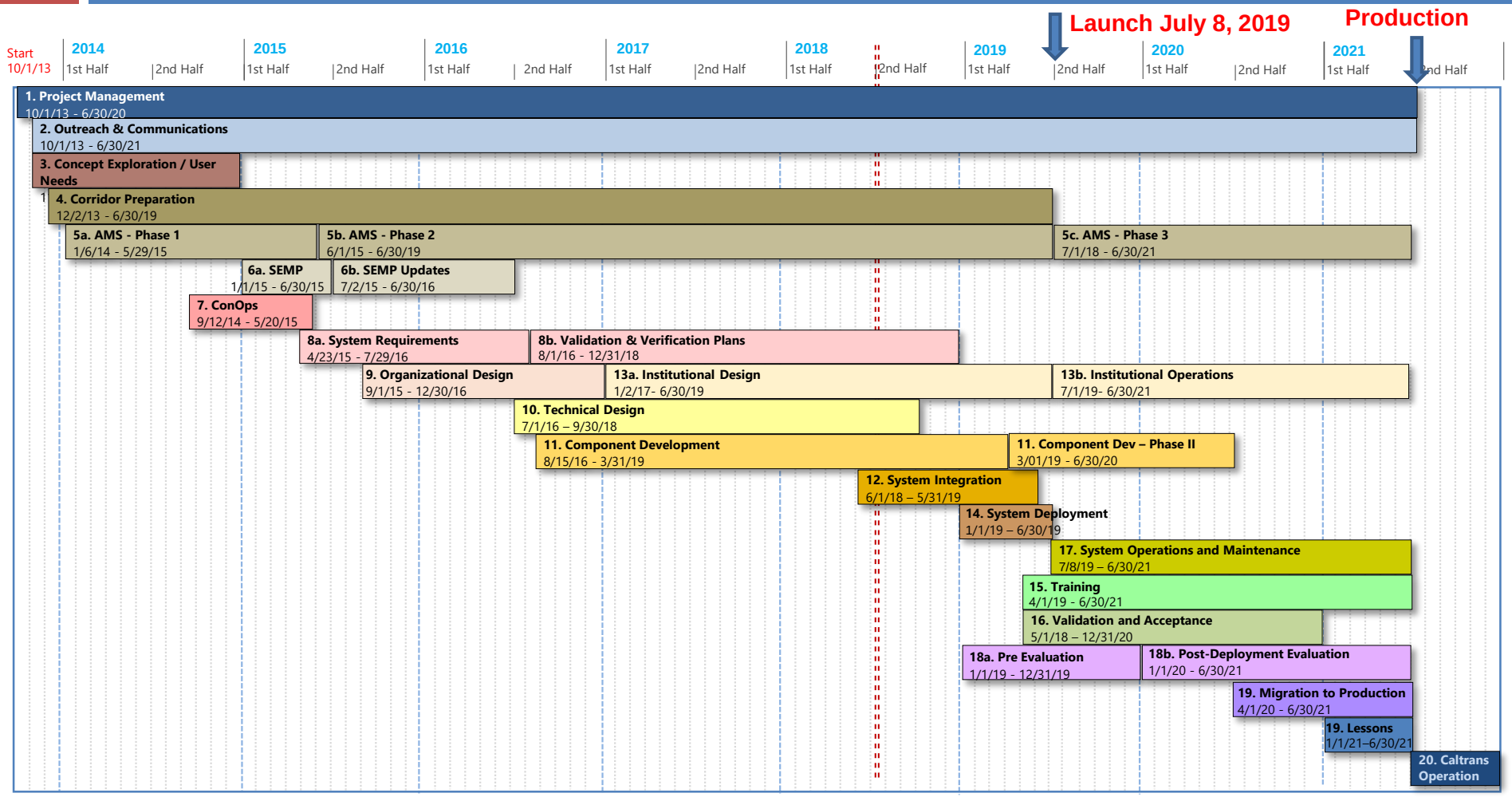
- 1:30-1:50 - Summary of program - Joe
- 1:50-2:00 – MOU - Mort
- 2:00-2:10 – Update on communications - Kali
- 2:10-2:20 – Call for Projects update – Parsons
- 2:20-2:30 – Cal Poly Presentation
- 2:30-3:30 – Telegra Presentation - Branko
- 3:30 – Closing
  - Next Meeting at LA County – Tuesday August 28th

Systems Engineering Next Steps

- Design Documents – Details of interfaces and implementations
- Hardware/Software – Building the system
- Integration – Subsystems will come on line this year



Updated Schedule



Summary

Signal Flush Plan Summary (July 16, 2018)

- **649 Recommended Signal Flush Plans out of ~670 total**
  - Utilize existing AM or PM peak plans
  - Select cycle duration: 105, 120, 135, or 150 sec
  - Adjust force off, max green, offset

- **All major 34 EB routes coded**

- **33 WB routes coded out of 37 total**

Roadway State Estimation

- **Arterial Data Management**
  - Both real-time (via IEN) and historical (via Arcadia TCS server) data feeds are well maintained.
  - An arterial performance website (demo) is currently running in the AWS cloud to monitor the sensor performance.
- **Arterial Traffic Estimation**
  - Starting in August, the arterial estimation and model loading framework will be tested with field data.
- **Freeway Traffic Estimation**
  - In the following one or two months, efforts will be devoted to getting the right network and data inputs in order to debug and fix the issues in the current model.

TMDD Interfaces to Data Hub

- **Traffic Control Systems**
  - TransCore – Arcadia and Caltrans
    - Going well
    - Installation in Arcadia now scheduled for later this month
    - Installation at Caltrans to be scheduled
    - There is some additional work that will need to be done after installation
  - McCain - Pasadena
    - Next meeting is to review requirements.
  - Kimley Horn – LA County, Monrovia and Duarte
    - We have agreed upon the basic requirements

- **ATMS – Caltrans (CMS Signs, Ramps)**
  - On track for a July delivery
  - We are focusing on ensuring we can accurately characterize an incident
  - Parsons and PATH will begin testing out the interface with Telegra in the August/September timeframe

COTS (Purple Box) - ICMS

- **Telegra**
  - Presenting today
  - Participating in testing of ATMS interfaces
- **Kapsch**
  - Development effort is underway
  - Working on providing them with our network at this point
- **Parsons**
  - TBD

Systems Development and Integration

- **ICM Core System High Level Design v1.1 complete**
- **Working on network translations and incident characterization across systems**
- **Building interfaces and workflows**
  - Transcore, McCain, Kimley-Horne – requirements/design
  - Parsons CT ATMS – Acceptance test
- **Corridor Management Systems**
  - Telegra to begin integration work with CT ATMS in August
  - Working to define how to coordinate/migrate vendors through dev/test/integration/production environments
- **Data Hub – Baseline Ramp, Signs, Intersection pipelines in test**
- **DSS – Response Plan Management v0.1 nearly complete**

MOU
Mort

Communications Kali

Communication

- Amazon Cloud to/from Caltrans – Working Well
- VPN connection to Arcadia in place
- Pasadena and RIITS have agreed upon basic network design
- Discussion underway with LA County
- Kali to discuss later in the presentation

Call for Projects
Parsons

Environmental Impact Evaluation & Open Data Systems (ODS) Development for I-210 Connected Corridor Pilot Project

Xinkai Wu, Ph.D.; Xudong Jia, Ph.D., PE; Allen Chen, PE

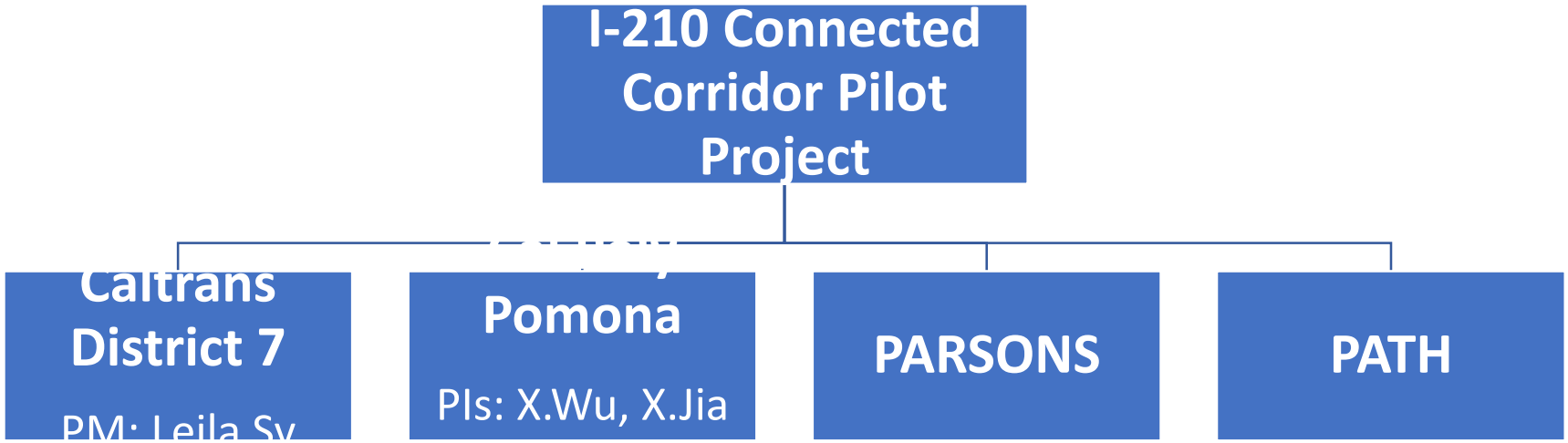
July 17, 2018

Background: I-210 Connected Corridor (CC) Pilot Project

- Connected Corridors
  - Statewide program looking at all opportunities to move people and goods in the most efficient manner
  - Focused on transportation corridors in order to ensure the greatest gains in operational performance
  - Includes freeways, arterials, transit, parking, travel demand strategies, agency collaboration, and more

- I-210 Pilot
  - In the San Gabriel Valley – northeast of LA – is the first Connected Corridors deployment. The Pilot started approximately four years ago.

Organization Structure



CPP Three Major Tasks

- Task 1: **Environmental Impact Evaluation**
  - **Approach:** The research team will be conducting a before-after study to monitor the air quality improvement around the I210 connected corridor area. This will include identifying the products, selecting deployment locations, deploying environmental stations, collecting data, analyzing data, and preparing evaluation reports.

- Task 2: **Open Data System (ODS) Development for Foothill Transit**
  - **Approach:** This task aims to develop a pilot data exchange platform, i.e. ODS, to connect I-210's ICM system and Foothill transit operation system. ODS will provide data exchange services between agencies that follow different protocols. In this project, ODS is designed to transfer Caltrans' real-time ICM response plan, which follows TMDD3.03(d) protocol, and a data format following Foothill Transit's Orbital operation system.

- Task 3: **Extend the Open Data System (ODS) to the Pasadena Transit**
  - **Approach**: This task is to further extend the ODS to the Pasadena Transit. In this task, ODS is be used to transfer Caltrans' real-time ICM response plan, which follows TMDD3.03(d) protocol, to a data format following Pasadena Transit's operation system.

Schedule

Tasks	Sub-Tasks	Year 1				Year 2				Year 3			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Task 1: Env. Impact Evaluation	1.1. Installation												
	1.2. Data Collection												
	1.3. Eva. Report												
	1.4. Maintenance												
Task 2: ODS Develop. & Foothill	2.1. ODS development												
	2.2. Connect to Foothill												
	2.3. Interface Develop.												
	2.4. System Test & Improv.												
Task 3: Extend ODS to PAS Transit	3.1. Extend to PAS Transit												
	3.2. Interface Develop												
	3.3. System Test & Improv.												

Task 1: Environmental Impact Evaluation

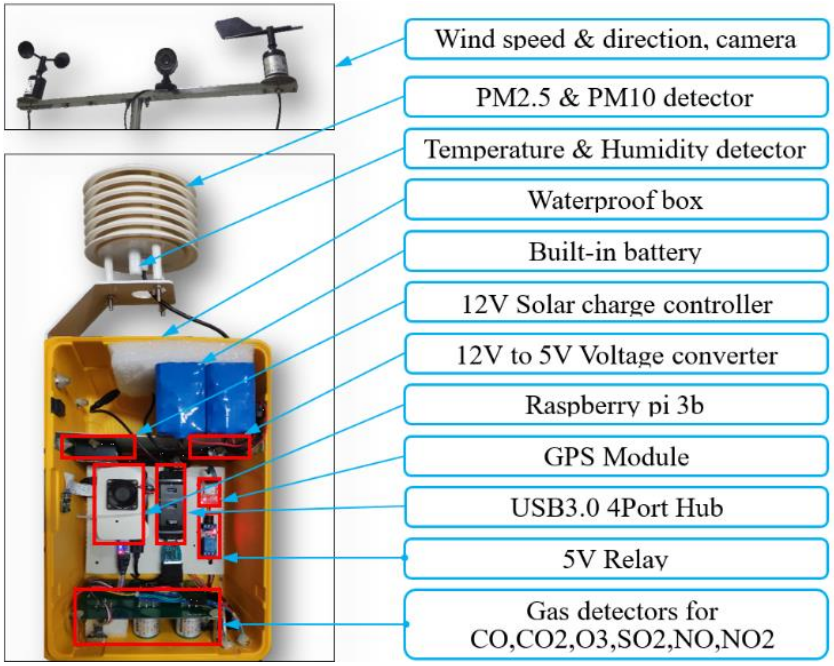
Task Needs

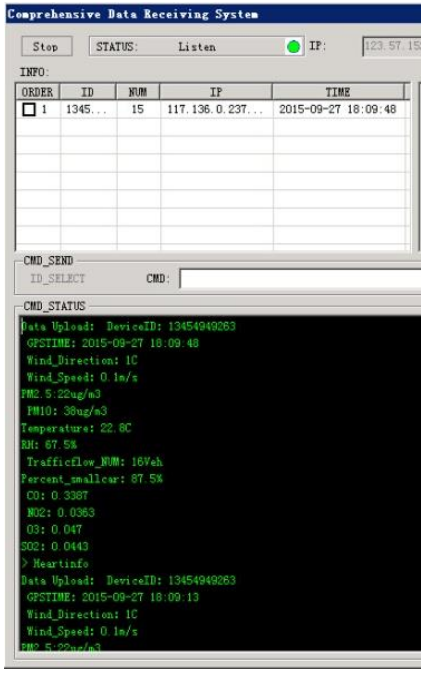
- To evaluate the air quality before and after the deployment of the CC project, the project needs to collect high frequency data including:
  - Toxic gases (CO, NO, NO2, O3, SO2, CO2);
  - Particulates (PM1, PM2.5, PM10);
  - Meteorological data (temperature and relative humidity); and
  - Potential traffic data (traffic flow, vehicle types, speed, etc.).
- Other specific features include:
  - Allow remote access for customized data collection and configuration through Linux system;
  - Support 3G/4G cellular communication through multiple carriers;
  - Low power usage;
  - Support to use solar panel power;
  - An integrated device that supports data collection and transmission;
  - Portable;
  - Provide ready-to-mount for easy implementation;
  - Provide a camera for field condition monitoring;
  - Provide unique feature of traffic data collection (optional); and
  - Low-cost.

iAQBox

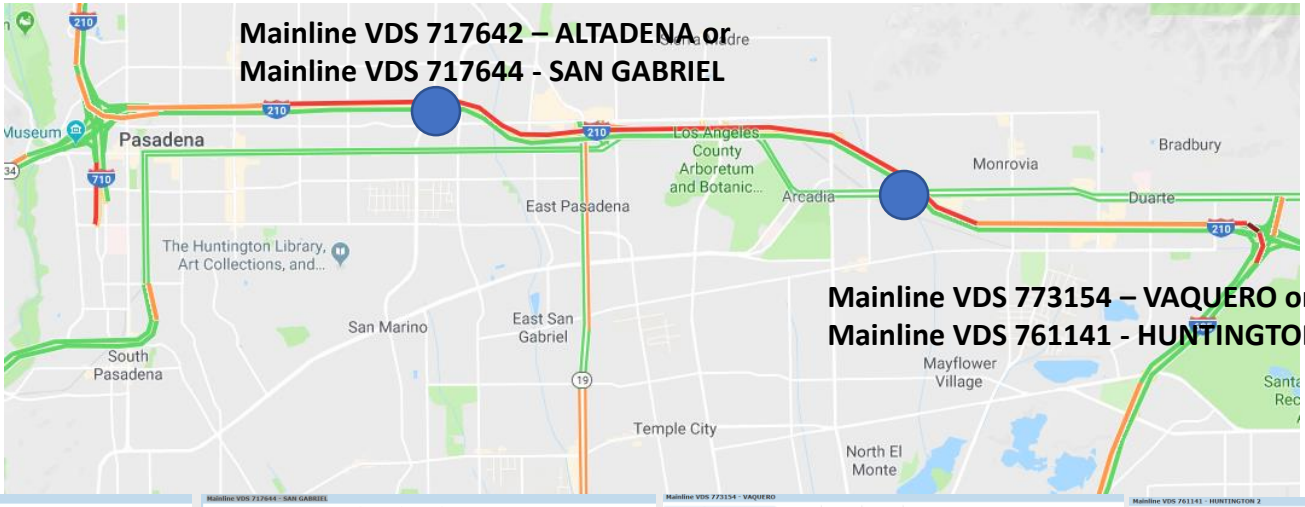
- iAQBox (intelligent Air Quality measure Box)
- A Roadside Air Quality Measurement Device, customized from CLR Analytics Inc.
- Fulfill all required functions
- Portable
- Low-cost
- Solar power supported

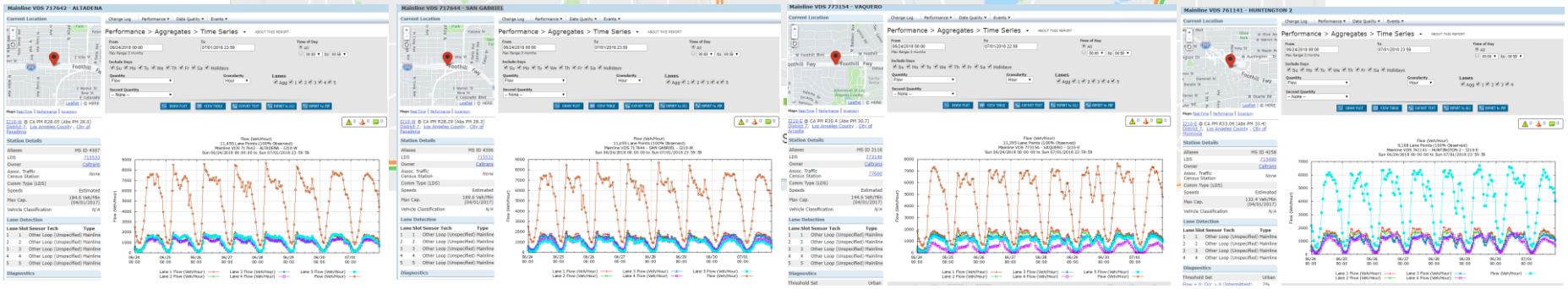
iAQBox: Overview





Installation Sites – Two Sites





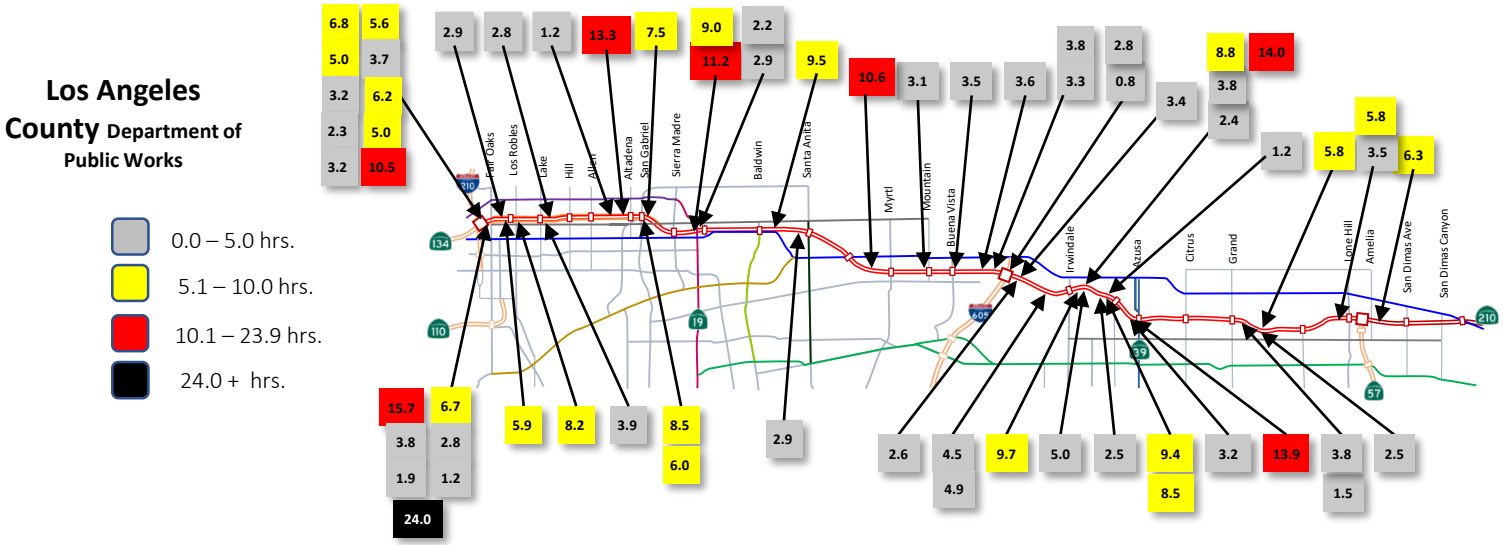
ODS

Tasks 2&3: Open Data System (ODS)

www.opendatasystem.com

Issues: Incidents & Events

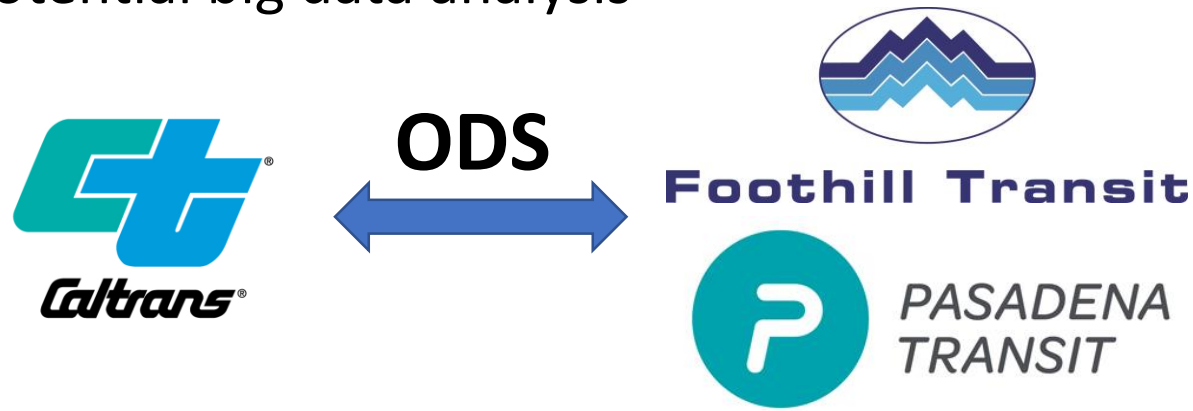
- **Incidents:** An unplanned reduction in capacity caused by accidents
- **Unscheduled Events:** Events unexpectedly such as a natural disaster or threat
- **Planned Events:** Planned changes to demand and possibly localized reductions in capacity



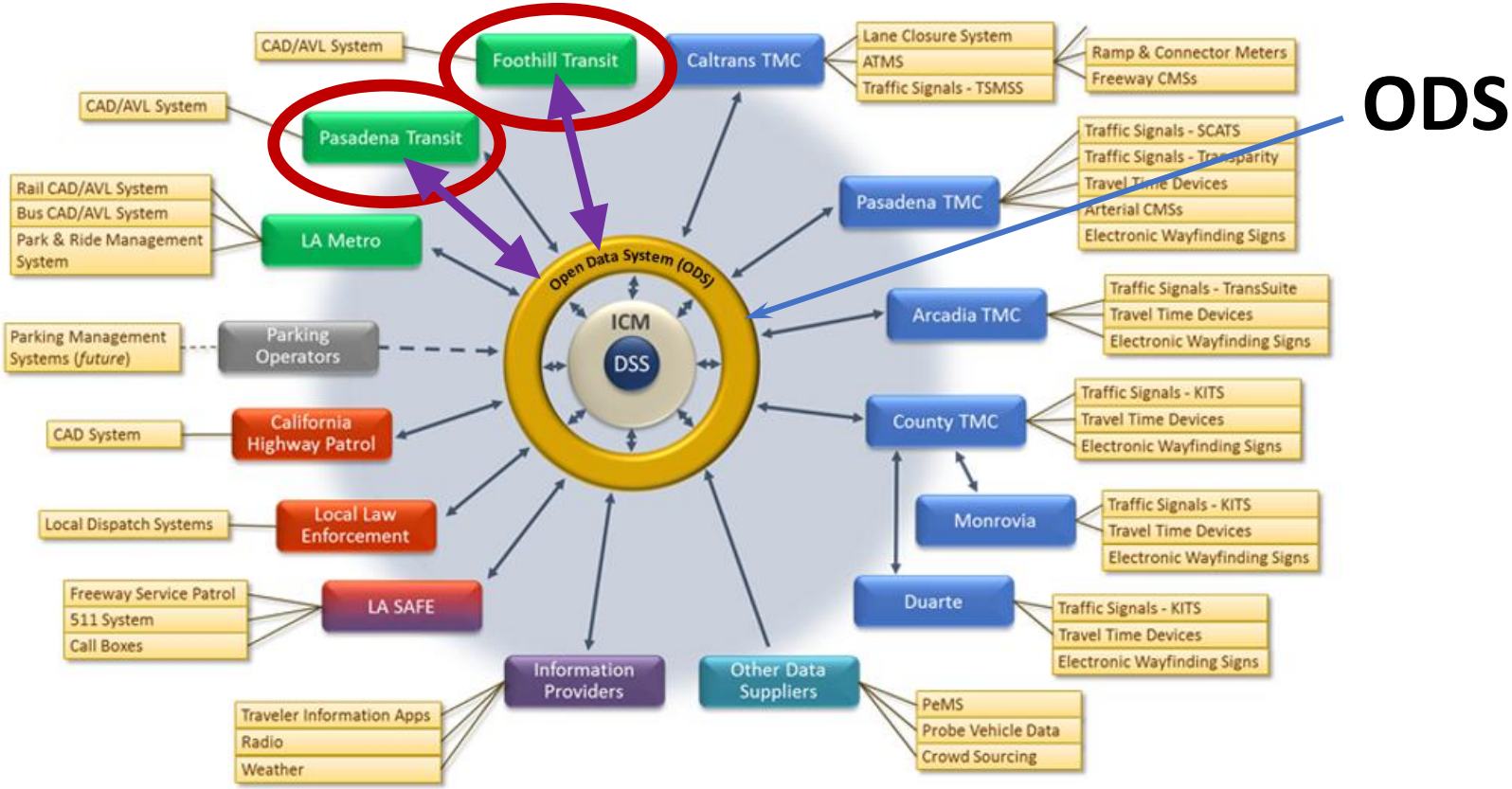
Major Incidents on I-210 (2009-2013): In 2013 a total of approximately 6,000 incidents were reported within the project limits. (500 per month)

Solution: An Open Data System (ODS)

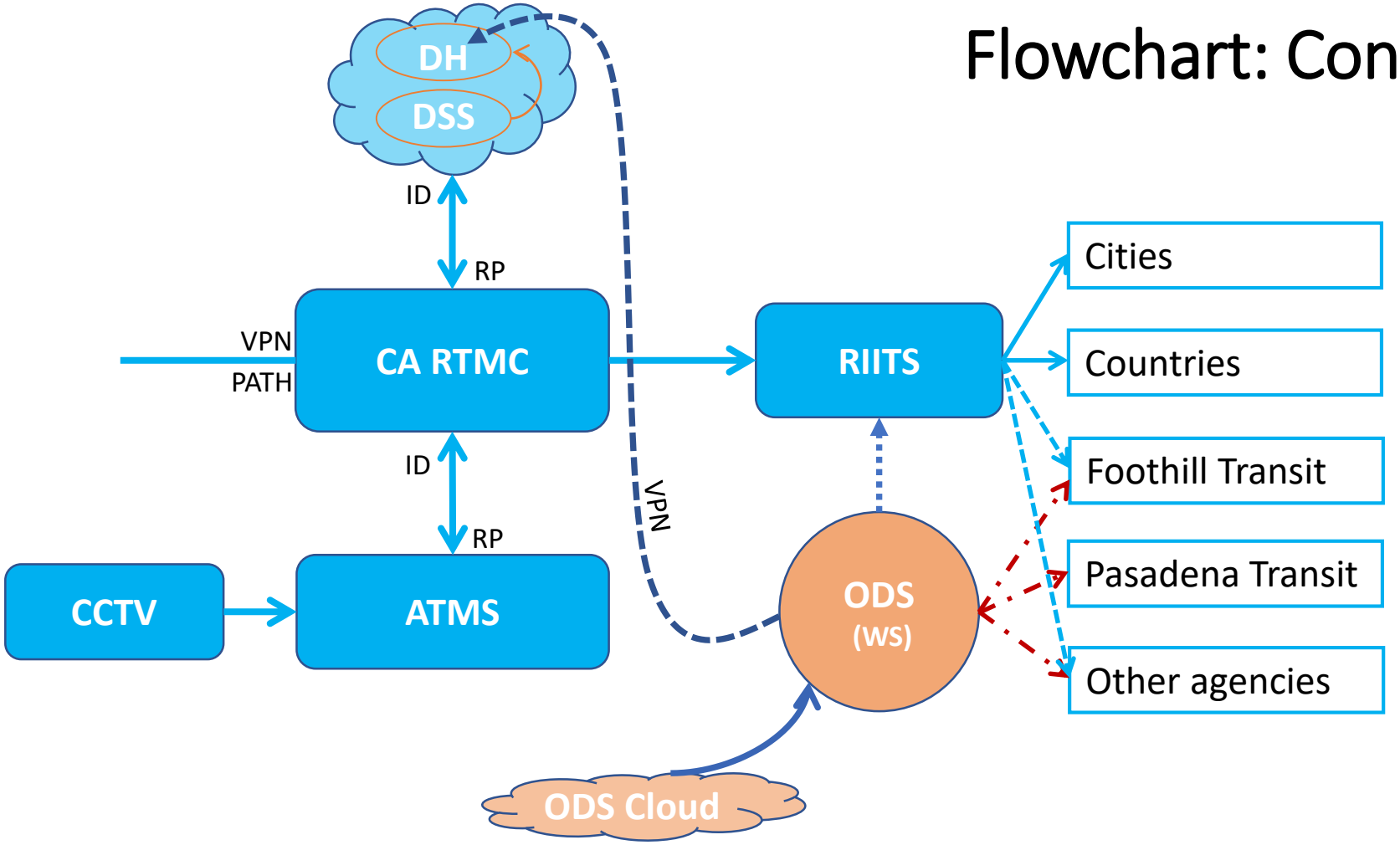
- Most opened database!
- Bridge Caltrans DSS with Foothill/Pasadena Transit by providing real-time incidents/events/detour messages
- Publish real-time information
- Support potential big data analysis



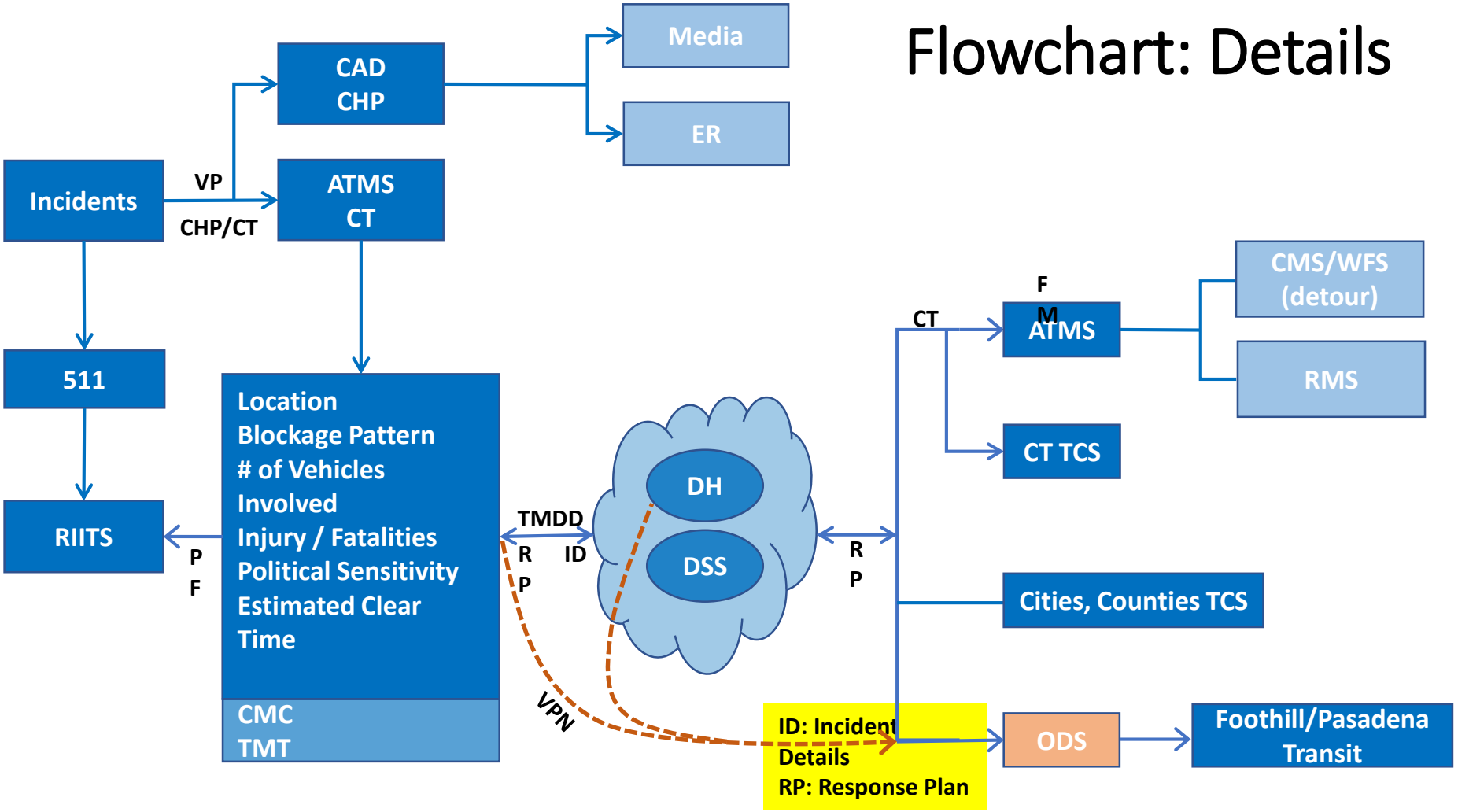
Architecture: DSS/ICM/ODS



Flowchart: Concept



Flowchart: Details



Thank You!
Questions?

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Telegra Product Demo

Branko Glad

Thank You
and
Next Meeting
(Suggest August 28th at LA County)