Connected Corridors
Face-to-Face Meeting

Tuesday, January 29th , 2019
1:30 – 3:30 pm
Duarte

Agenda

- **1:30 - 2:00 – Program Review – Joe**
- **2:00 - 2:15 – Call for projects update - Ning**
- **2:15 - 3:20 – Kapsch presentation and work in progress**
- **3:20 - 3:30 – Closing**
  - Next Meeting at LA County – Tuesday March 12th
  - (County, Arcadia, Caltrans, Pasadena, Monrovia, Duarte)

Monica Kress

- Deputy Division Chief for Mobility
  - Caltrans Headquarters
  - Division of Traffic Operations
- Monica has a BS in Electrical Engineering and Computer Science from UC Davis
- She has worked at Caltrans since 1991
- Her current focus is on “moving people and goods” by utilizing transportation system management and new technologies

Connected Newsletter

Connected

Winter 2019

A Biannual Newsletter for Connected Corridors Stakeholders

MOU Signed!

On November 16th, 2018, a major project milestone was reached when the Memorandum of Understanding (MOU) for the I-210 CC Pilot was signed by all core stakeholders. The core stakeholders include Caltrans, the Cities of Arcadia, Duarte, Monrovia, and Pasadena, Los Angeles County, and Los Angeles Metropolitan Transportation Authority on behalf of RIITS (Regional Integration of Intelligent Transportation Systems).

The MOU outlines the roles and responsibilities of the seven agencies as they work together to manage and operate the Connected Corridors project. Last Fall, stakeholders began to discuss the growing need of having a signed MOU so that each agency could agree on the deployment of both response plans and associated ITS equipment.

In partnership with PATH, Caltrans District Traffic Management Office Chief Mort Fahrtash drafted the document and met with the individual stakeholders to refine the terms of the MOU. Some of the responsibilities the MOU outlines include each agencies commitment to:

- Share real-time transportation data
- Maintain the health of their jurisdiction's signal systems and sensors to support high-quality reporting
- Review and approve incident response plans and reroute strategies
- Permit and facilitate the installation and operation of new and/or upgraded equipment procured by Caltrans
- Work together in the development of proposed coordinated timing plans for use during incidents for all signals on agreed upon reroutes
- Populate the road closure system with their events and activities
- Attend regular stakeholder meetings and provide input on updates to the system and its supporting networks

Additionally, Caltrans District 7 commits to maintaining

❍ Continued on page 5

Congratulations to Ali Zaghari at Caltrans District 7. Ali was recently selected as the National Operations Center of Excellence's (NOCoE) 2019 TSMO Champion.

Major Milestones

The development team has recently reached several significant and critical milestones. These include:

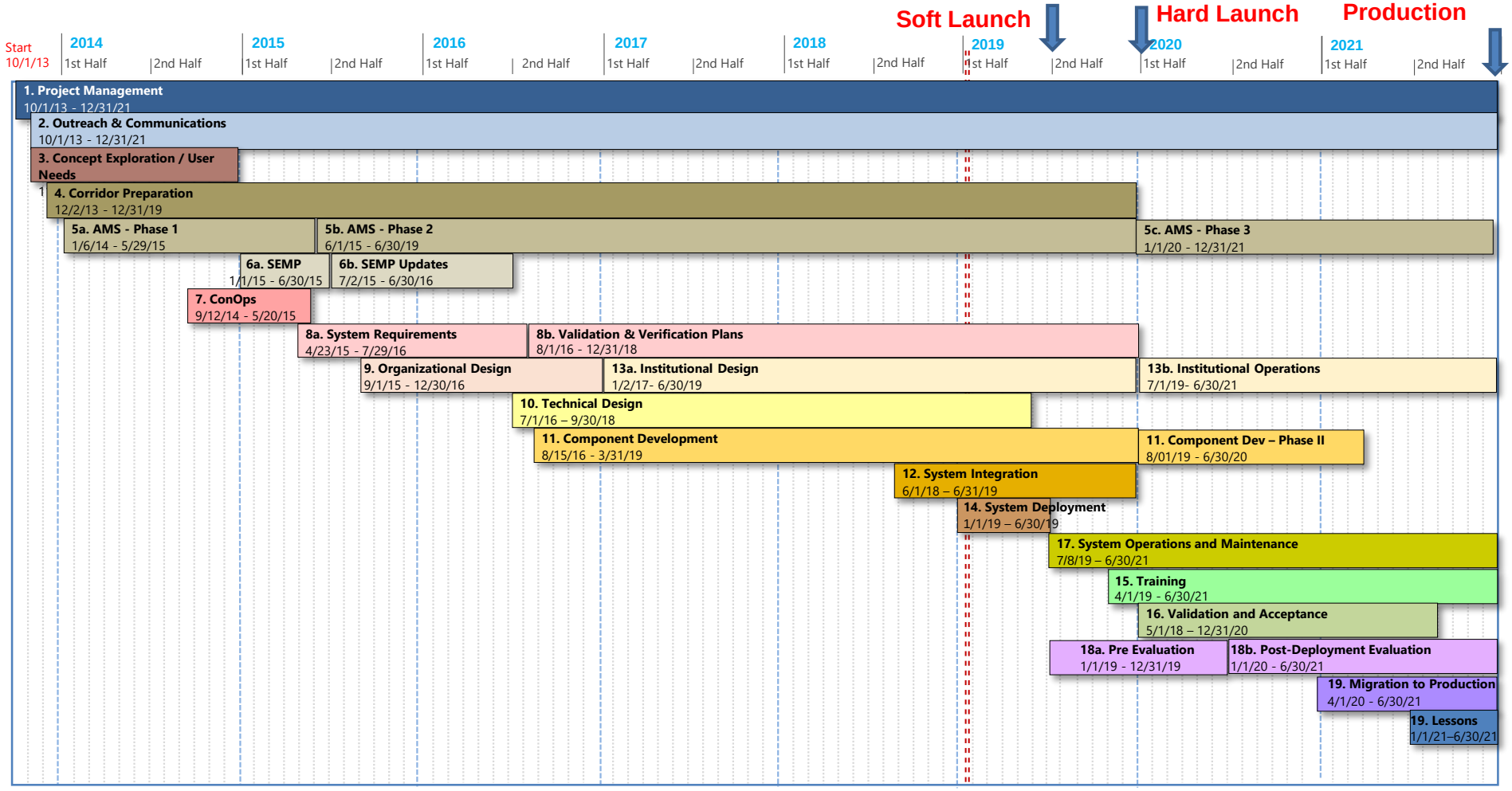
1. Established connectivity with Arcadia and received Arcadia intersection data using the new Transcore/C2C interface.
2. Established connectivity with Caltrans ATMS and began integration work with the Parsons/C2C interface.
3. Completed development of the automated deployment function for the secure AWS environment. This allows us to deploy the entire system within an AWS virtual private cloud within a few hours, as well as deploy changes as they are developed and tested.
4. Completed development of the software, tools, and methods used to operate within a secure, private Caltrans networking space within the AWS cloud. This was particularly difficult to achieve and deserves a special thank you to our AWS and D7 partners who helped us make this milestone.

These four milestone achievements are critical steps to a successful launch and have resulted from a lot of hard work from many different partners, including Caltrans HQ & District 7, Arcadia, LA County, LA Metro, RIITS, Parsons, Transcore, AWS personnel, and the CC staff. Thanks to everyone who made these critical steps successful.

- MOU Signed
- Major Milestones
- Ali Selected as TSM&O Champion
- Monica's Bio
- Ken's Bio
- Rupinder's Bio
- Rules, Estimation, Prediction
- Center to Center (C2C) Update

- Note that the USDOT has shown interest in the Rules article

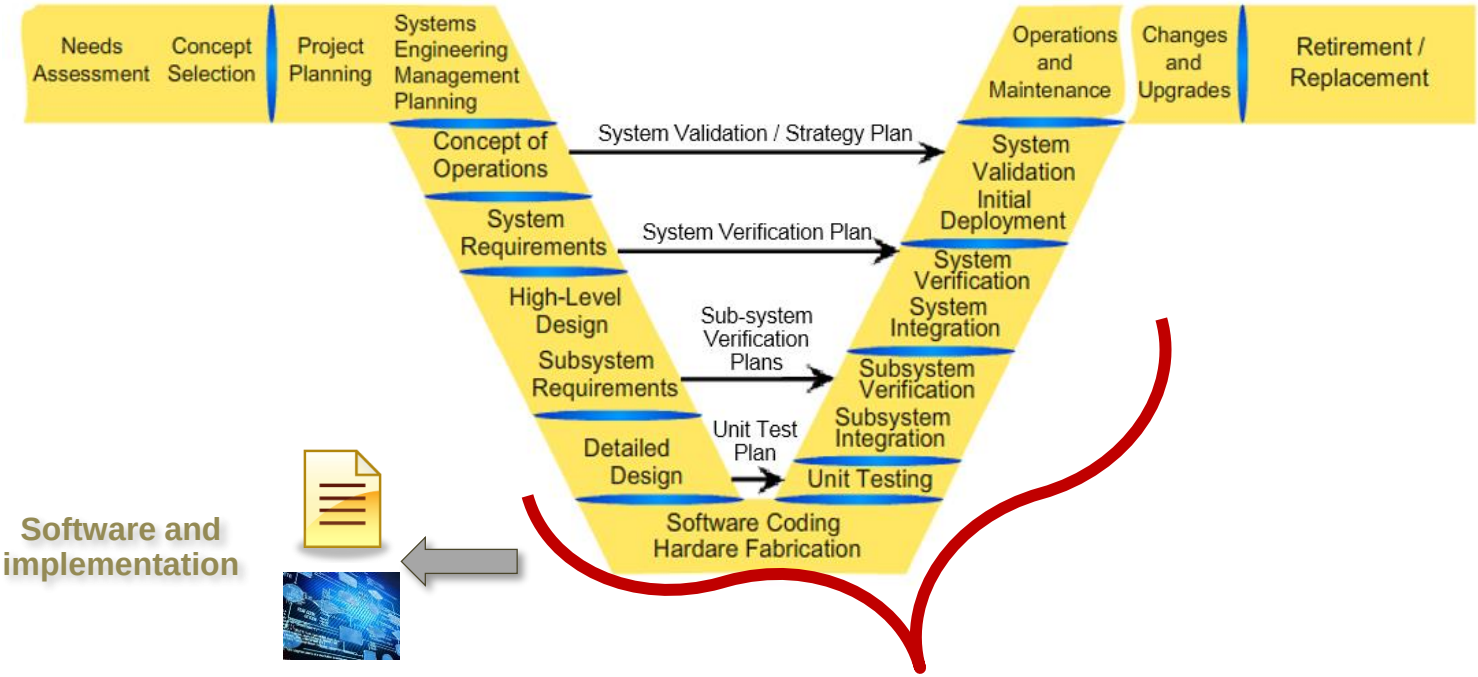
Schedule



Caltrans Metro SCAG SGVCOG Foothill Transit PATH

Systems Engineering Next Steps

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



Summary

Freeway Data Quality – Excellent!

- **Core I-210 sensor availability goals achieved for 5 straight weeks**

Freeway Section	Direction	Sensor Availability Percentage	Sensor Availability Target	Proposed New Target Date	Accomplished
I-605 PM 22.93 - 28	North	84.5%	90%	1/30/2019	
	South	83.9%	90%	1/30/2019	
I-210 PM 25 - 43.25	East	92.0%	90%	1/30/2019	12/1/2018
	West	92.4%	90%	1/30/2019	12/22/2018
SR-134 PM 11.4 - 13.5	East	96.3%	90%	1/30/2019	1/22/2019
	West	96.6%	90%	1/30/2019	1/22/2019
I-210 PM 22.6 - 25	East	13.9%	90%	5/1/2019	
	West	15.9%	90%	5/1/2019	

Signal Plans and DSS Review

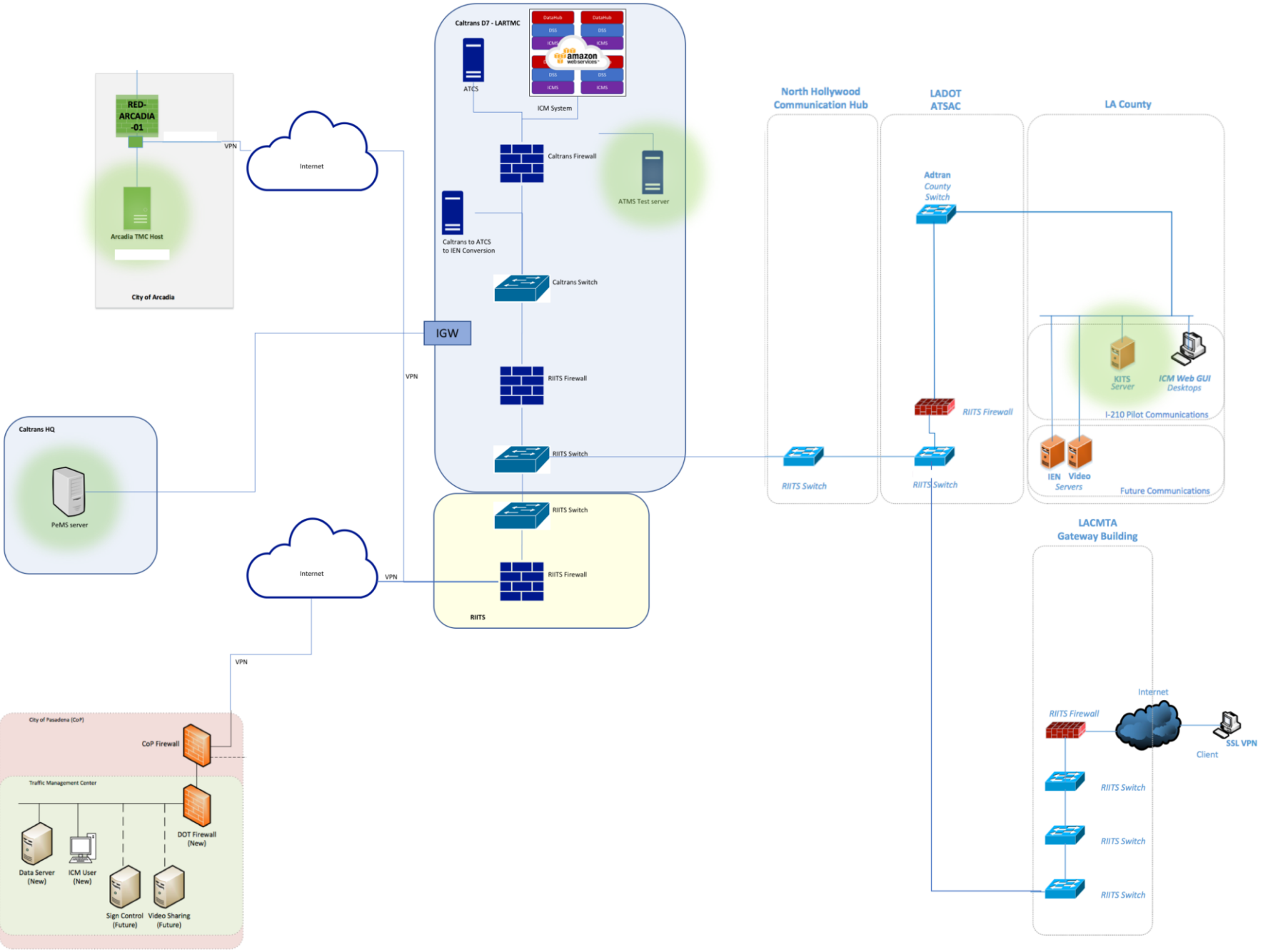
- **Pasadena Signal Plan Review & Approval**
  - Flush plans for most of Corson, Maple, and Walnut-Foothill routes submitted for review
- **Caltrans Signal Plan Review & Approval**
  - Flush plans and space-time diagrams on Baldwin@Foothill submitted for review
  - On going discussions with Samson from Caltrans
- **Arcadia Signal Plan Review & Approval**
  - Flush plans for part of Huntington route entered into D4 database format

Response Plan Generation

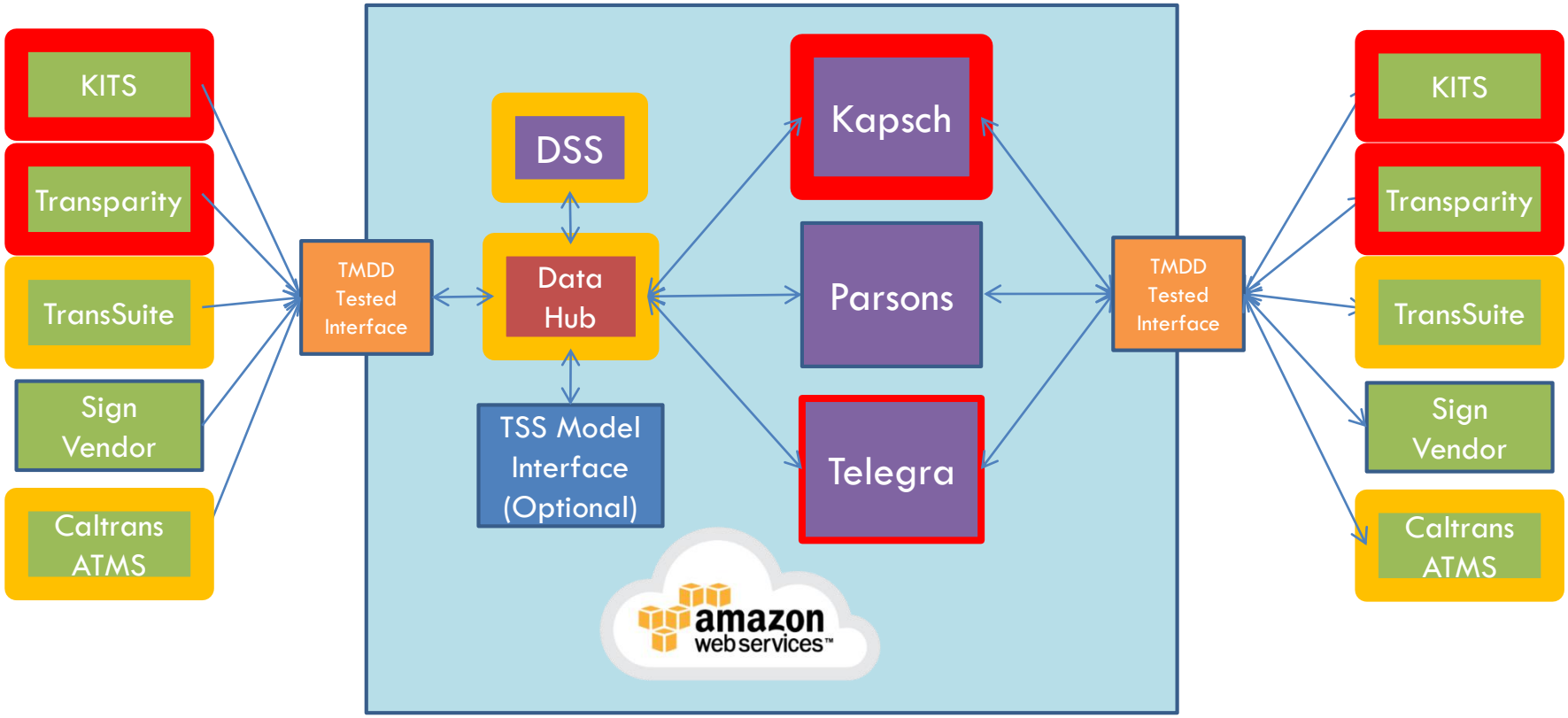
- Mike Jenkinson (HQ) visited Berkeley for a detailed response plan generation review.
- We implemented the first RP scoring criterion: differentiating plans by benefit & impact, with time of day and day of week sensitivity.
- We designed the threshold check – based on anticipated queue growth – for whether or not a freeway incident merits a DSS response. This is now being coded.
- We are initiating discussions with stakeholders on how trucks should be handled during an incident

C2C Networking

- Very close on establishing connectivity between LA County and Caltrans
- Network configuration is in progress to support end-to-end communications between the ICM system and City of Pasadena via the RIITS fiber connection.
- We have requested additional D7/RIITS firewall and NAT configurations to support increasing numbers of stakeholder and AWS endpoints that are coming on-line.
- We are agreeing on final management and responsibilities for the network configuration
- Kali – Would you like to add any points?


Caltrans D7 - LARTMC
DataHub
DataHub
DSS
DSS
ICMS
ICMS
DSS
DSS
ICMS
ICMS
ATCS
ICM System
Caltrans Firewall
ATMS Test server
Caltrans to ATCS to IEN Conversion
Caltrans Switch
IGW
RIITS Firewall
RIITS Switch
RIITS Switch
RIITS Firewall
RIITS
RED-ARCADIA-01
Arcadia TMC Host
City of Arcadia
VPN
Internet
VPN
Internet
VPN
Caltrans HQ
PeMS server
North Hollywood Communication Hub
RIITS Switch
LADOT ATSAC
Adtran County Switch
RIITS Firewall
RIITS Switch
LA County
KITS Server
ICM Web GUI Desktops
I-210 Pilot Communications
IEN Servers
Video
Future Communications
LACMTA Gateway Building
Internet
RIITS Firewall
SSL VPN Client
RIITS Switch
RIITS Switch
RIITS Switch
City of Pasadena (CoP)
CoP Firewall
Traffic Management Center
DOT Firewall (New)
Data Server (New)
ICM User (New)
Sign Control (Future)
Video Sharing (Future)

C2C Interface Implementations - Status



TMDD Interfaces to Data Hub

- **Traffic Control Systems**
  - TransCore – Arcadia and Caltrans
    - Installed in Arcadia, planned for install in Caltrans in February
    - We are now reading data from Arcadia
    - We have identified certain data and reliability issues
  - McCain - Pasadena
    - In development, install in April
  - Kimley Horn – LA County, Monrovia and Duarte
    - In development, install in April
    - As soon as we have connectivity to the LA County server we can start testing

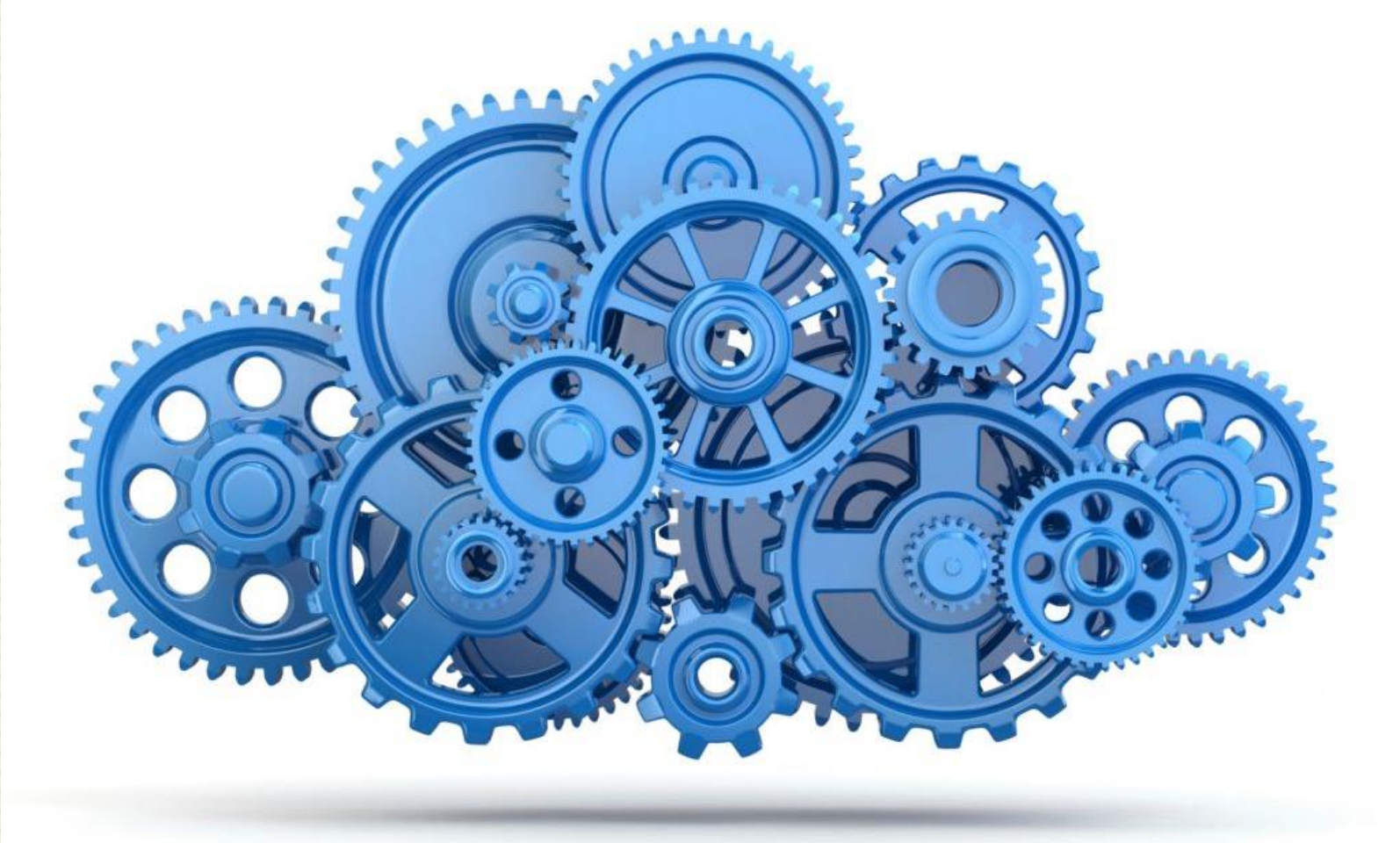
- **ATMS – Caltrans (CMS Signs, Ramps)**
  - We are testing out the interface and have read data
  - We have identified some updates that are needed
  - Parsons is now preforming updates to the ATMS and we will restart our testing when those are completed

Systems Development and Integration

- **Cloud Infrastructure**
  - Cloud Automation is working. D7 private network dev and test environments have replaced PATH's public accessible deployments.
  - Added cloud-based system configuration to support automation
  - Adding improvements for automation of credentials
- **DSS**
  - Continued working on response plan generation and workflow orchestration between DSS, Datahub, and Corridor Management System.
    - Early version of termination plan

Systems Development and Integration

- **Data Hub**
  - Working on persistence of pipelines and replay capability
  - Finalizing endpoints for Corridor Management System integration
- **Corridor Management System**
  - Integration with Kapsch
  - Integration with Telegra Corridor Management System (with the ATMS) on hold – networking issues
- **Integration (Data Sources)**
  - Started integration with ATMS – identified some minor issues, will continue
  - Prepared requirements for ATMS update



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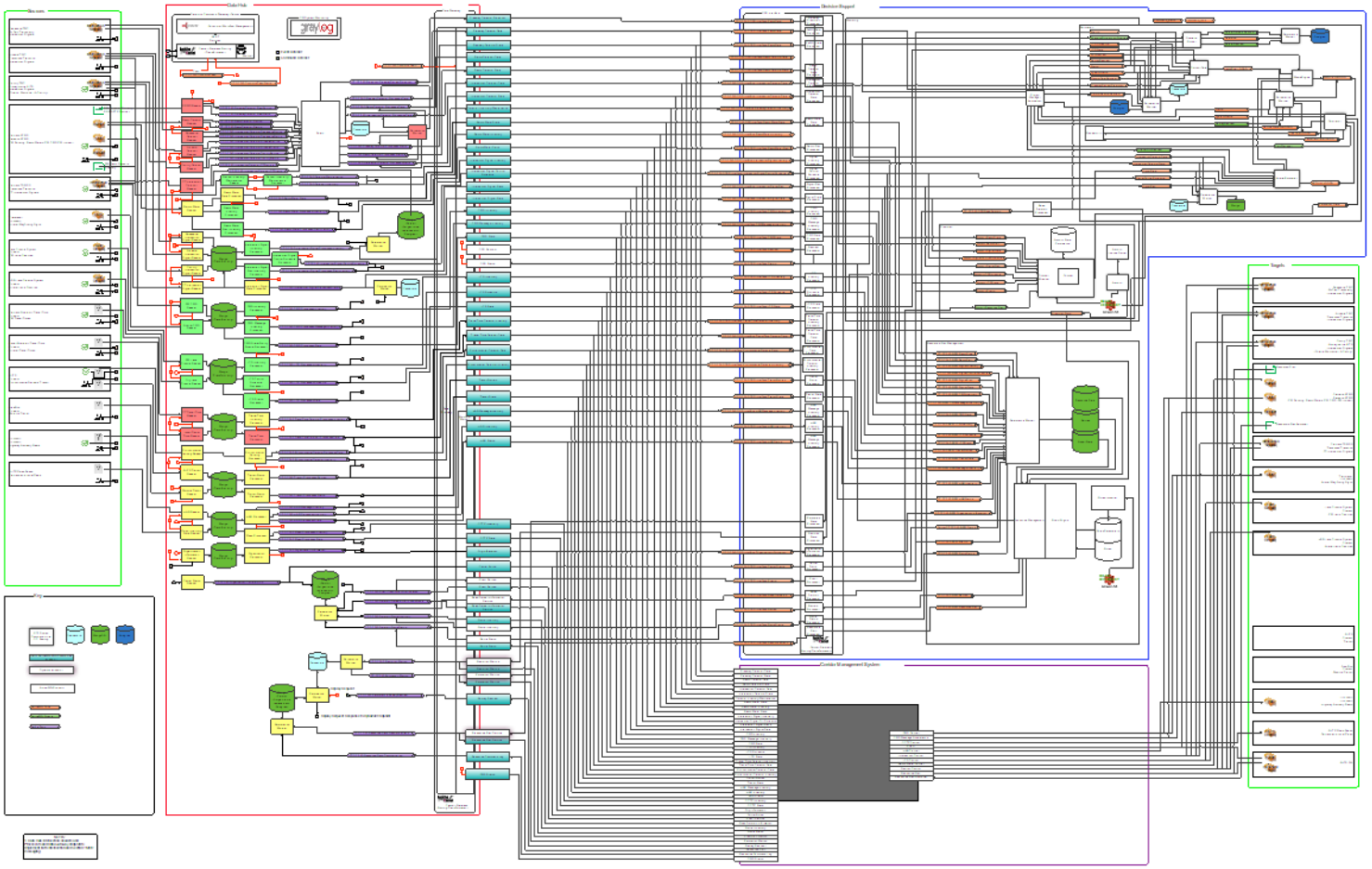
What is Cloud Automation and Why Do We Use It?

Our system is partitioned into instances



Cloud Automation – System Design

- **Up to 4 Virtual Private Clouds (VPCs) with Networking and Security (Dev, Test, Integration, Production)**
- **Data Hub and DSS**
  - >50 AWS EC2 instances (servers) sized dependent upon need
  - Spark ML and Clustered Computing, 3 Messaging Systems, 5 Databases
- **CMS**
  - Three Vendor Systems of Differing Configuration

What?

- Use AWS Tools to Automate Deployment – Dev, Test, Integration, Production
- Use AWS Tools to Automate Updates
- Automate Security Implementation
- Uses Pre-Defined Configuration Information
- A little over 2 hours from almost nothing to a full system ready to start

Why?

- Manual Deployment is time intensive
- Repeatable for other corridors – New corridors brought up with focus on corridor operations and functionality, not infrastructure
- More configurable and flexible – swapping out of components such as the Corridor Management System is easier
- Scalable – new pipelines for new data sources or increased load can be handled by just changing configuration and adding or altering running systems (more servers or bigger servers)
- Fast reaction time to change – No hardware to buy, install, operate
- Operating costs scale better – more infrastructure added for smaller incremental labor costs

I-210 Connected Corridors
Face-to-Face Meeting

Tuesday, January 29th, 2019
1:30 – 3:30 pm

Agenda

- I-210 CC Arterial Systems Improvement Project System Consulting Services – Scope
- Expected Timeline
- Status of 9 procurement package
- Next Steps

I-210 CONNECTED CORRIDORS ARTERIAL SYSTEMS IMPROVEMENT PROJECT SYSTEM CONSULTING SERVICES

SCOPE OF WORK

January 29, 2019

Project Objective

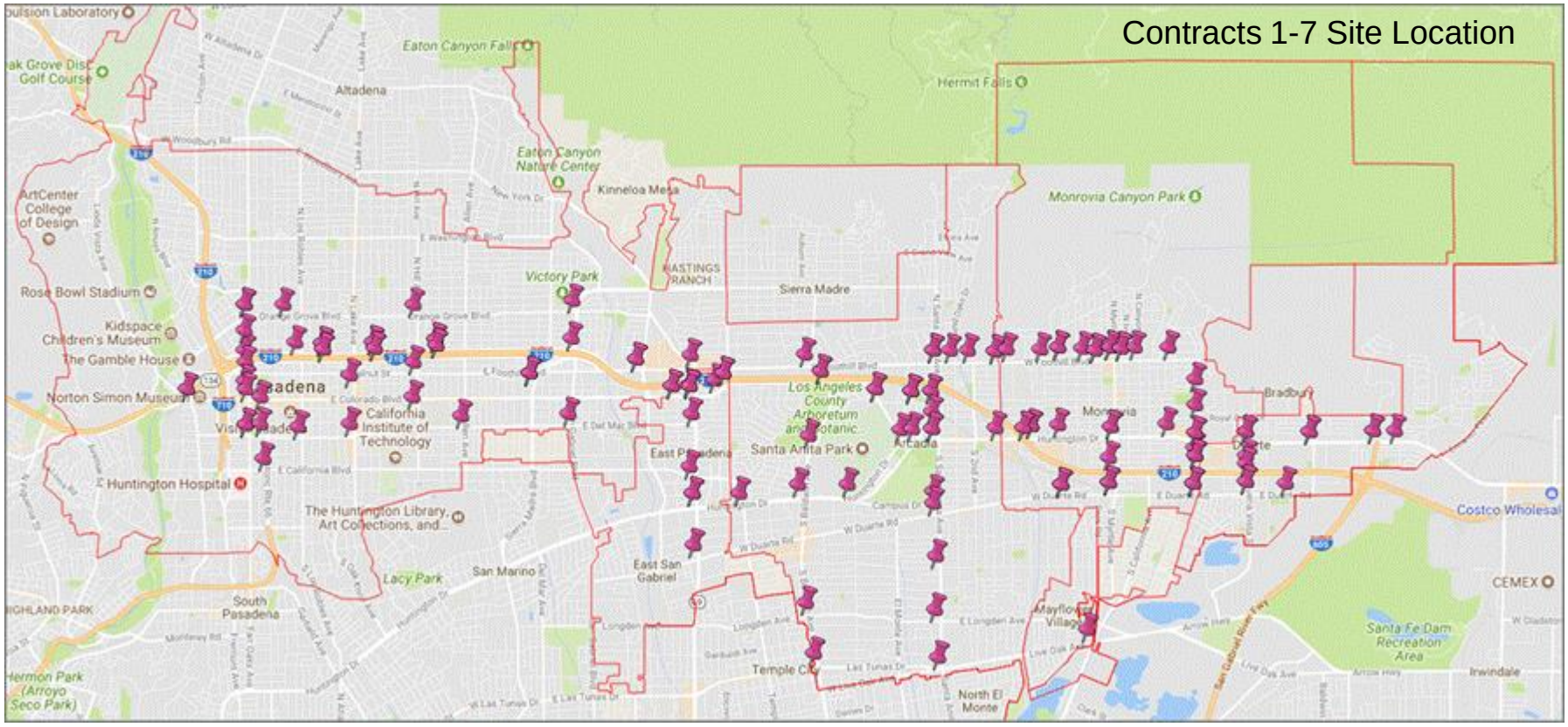
- Assist Caltrans D7 to manage and coordinate the execution of the 9 arterial ITS improvement projects

#	Package Description	Contract #	Contract Status
1	Bluetooth – Iteris Velocity	07A4470	Awarded, in Progress
2	Bluetooth – BlueToad	07A4477	Awarded, in Progress
3	New Controller Cabinets	07A4603	Bidder Q & A To be awarded in Jan-Feb 2019
4	Communication Upgrades	07A4479	Awarded, in Progress
5	Firmware/Timing Plan Updates/Controller Upgrades	07A4480	Awarded, in Progress
6	Video Detection System	07A4481	Awarded, in Progress
7	Data Communication Module and Video Detection Software Upgrade	07A4601	To be awarded in Feb 2019
8	Advanced Traveler Information Systems	N/A	Divided to 3 packages Being reviewed by DPAC
9	Environmental Stations with Air Quality Sensors and Open Data Systems	07A4388	Awarded, in Progress

Project Area

#	Package Description	Contract #	Metro & Caltrans	City of Pasadena	City of Arcadia	City of Monrovia	City of Duarte	LA County
1	Bluetooth – Iteris Velocity	07A4470	√		√			
2	Bluetooth – BlueToad	07A4477	√	√		√	√	√
3	New Controller Cabinets	07A4603	√	√	√			
4	Communication Upgrades	07A4479	√		√	√	√	√
5	Firmware/Timing Plan Updates/Controller Upgrades	07A4480	√	√	√	√		√
6	Video Detection System	07A4481	√	√	√	√	√	√
7	Data Communication Module and Video Detection Software Upgrade	07A4601	√	√	√	√	√	√
8	Advanced Traveler Information Systems	N/A	√	√	√	√	√	√
9	Environmental Stations with Air Quality Sensors and Open Data Systems (ODS)	07A4388	√					

Project Area (cont.)

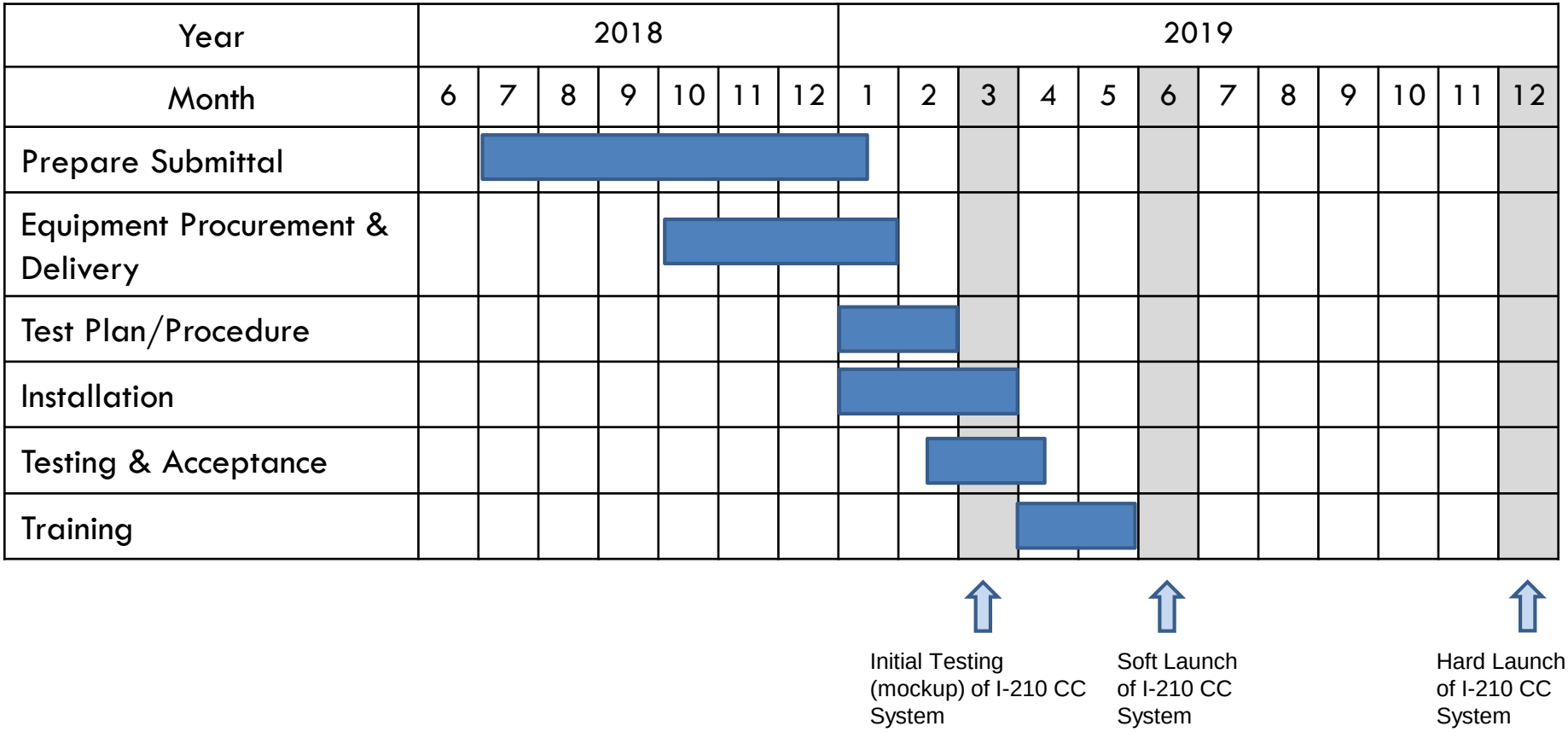


UPDATE ON

PACKAGES 1-9

January 29, 2019

Estimated Timeline



Update on 9 Packages

Pkg. #	Package Name	Contract #	Project Status
1	Bluetooth – Iteris Velocity	07A4470 PTM	• NTP: 7/10/2018 • Kick-off Meeting: 7/30/2018 • Submittal Approved: 8/16/2018 • Equipment ready, Permit Ready • Installation & Testing: Scheduled on 2/4 – 2/8/2019 (to be postponed) • Preparing Detailed Test Procedure • Expected to be completed: Mar 2019 (90%)

2	Bluetooth – BlueToad	07A4477 DBX	• NTP: 7/10/2018
			• Kick-off Meeting: 7/30/2018
			• Submittal Approved: 10/12/2018
			• Waiting for Stakeholders' Decision on the VM Server & IP Address
			• Current Schedule
			  • Configure Server: Jan-Feb, 2019
			  • BlueTOAD Spectra Unit Installation: Feb, 2019
			  • Acceptance Test Plan Completed: Feb – Mar, 2019
			  • Acceptance Test Report: Mar, 2019
			• Expected to be completed: Mar 2019 (80%)

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status
3	New Controller Cabinets	07A4603	• Disqualified: Bids came above the SB limit (314k). • Procurement Package revised per Stakeholder comments on Pkg. 5 • Has been re-advertised • Bid Due Date: Jan 10, 2019 • Expected to be awarded: Jan-Feb, 2019 • Expected to be completed: Jun-Jul, 2019
4	Communication Upgrades	07A4479 Kanaan Construction	• NTP: 7/13/2018 • Kick-off Meeting: 7/30/2018 • Stakeholder Review Comments Received on Revised Submittal • Expected to be completed: Mar 2019 (60%), May 2019 (90%)

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status
5	Firmware/Timing Plan Updates/Controller Upgrades	07A4480 CPE, Inc	• NTP: 7/17/2018 • Kick-off Meeting: 7/30/2018 • Submittal Reviewed and Required Equipment changed per Stakeholder Comment • Contractor has been given revised requirements on the controller configuration from all 3 jurisdictions • Contractor is coordinating with supplier (McCain) to estimate price change • Expected to be completed: Mar 2019 (70%), May 2019 (90%)

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status
6	Video Detection System	07A4481 Traffic Loops Crackfilling, Inc	•NTP: 7/10/2018 •Kick-off Meeting: 7/30/2018 •Submittal v3 being revised per stakeholder comments on v2 and to be re-submitted •10/9/2018: Conducted Site Survey •10/18/18: Submittal approved •Applied Permits (waiting for clearance for a few locations in Pasadena, others are ok) •Installation expected in Feb 2019 •Expected to be completed: Mar 2019 (80%), May 2019 (90%)
7	Data Communication Module and Video Detection Software Upgrade	07A4601	•Disqualified: Bids came above the SB limit (314k). •Resubmittal is being reviewed by DPAC for approval for re-advertisement •Expected to be awarded: Feb, 2019 •Expected to be completed: Jul, 2019

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status

8	Advanced Traveler Information Systems	N/A	• Divided to 3 packages:
			  • Static Sign Procurement
			  • DMS Procurement
			  • Integration
			• Expected to be awarded: TBD
			• Expected to be completed: TBD

9	Environmental Stations with Air Quality Sensors and Open Data Systems (ODS)	07A4388 Cal Poly Pomona	• NTP: 6/29/18 • Kick-off Meeting: 7/12/18 • CPP coordinated with Caltrans & Parsons to get test data in TMDD format from D7 ATMS Test Server to feed Open Data System; • 11/30/18: Coordination among CPP, PATH, Caltrans. PATH provided architecture diagrams, sample data set; Working with Caltrans on network connection • Feb 2019: Face-to-face meeting in Berkeley • Feb 2019: PATH to provide mockup CMS for testing • Expected to be completed: Jun, 2019 (90%)

Sign Question from Caltrans to Stakeholders

- We received recommendation from our functional unit here at Caltrans D7 about changing “Detour” to “Alternative” on the G78-1 sign.
- Are stakeholders OK with this?
- Can the lettering stay the same size and have Alternative fit?

Next Steps

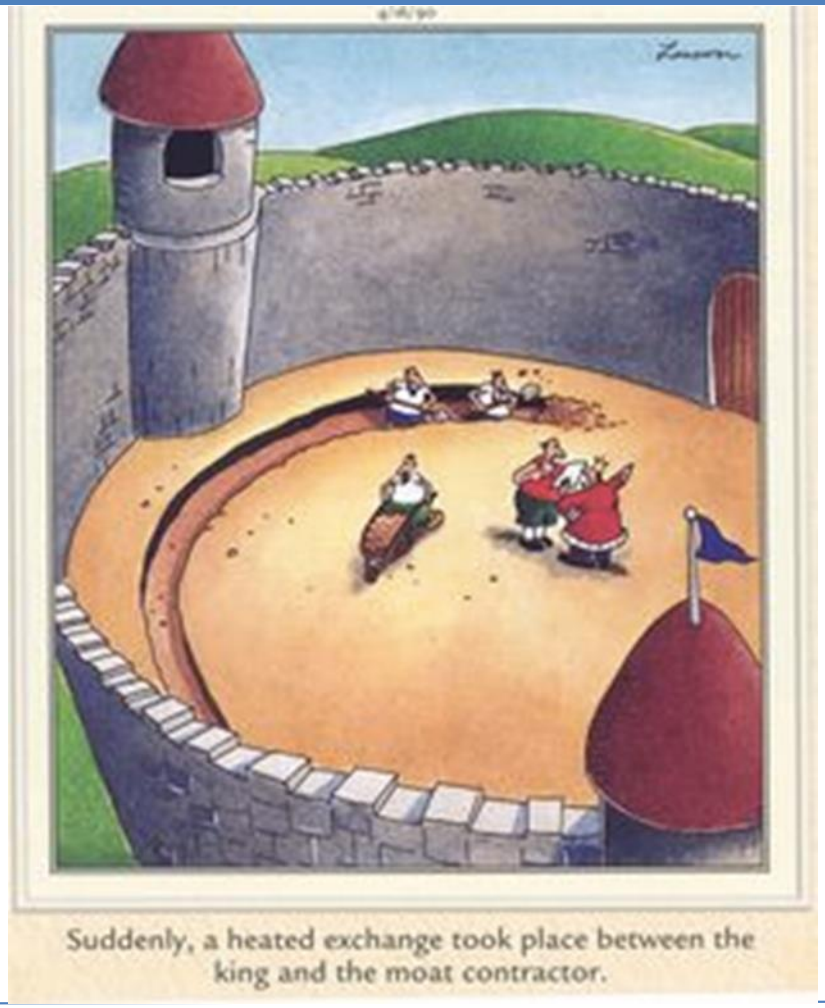
- Package 1: Detailed Test Plan/Procedure;
  Coordinate installation/testing schedule with Package 2;
- Package 2: Stakeholder coordination (server & IP address) – 1/31/19
- Package 3: Prepare for kick-off meeting after award
- Package 4: Support Contractor to understand stakeholder comments on revised submittal
- Package 5: Follow up on potential price change and revised submittal
- Package 6: Follow up on installation schedule
- Package 7: Prepare for kick-off meeting after award; PATH to provide timeline
- Package 8: Stakeholders – Decision on 4 off-ramps wayfinding signs (Caltrans)
  PATH – provide dimension information of MUTCD compliant static signs
- Package 9: Track development progress; support coordination

Thank You and Questions?

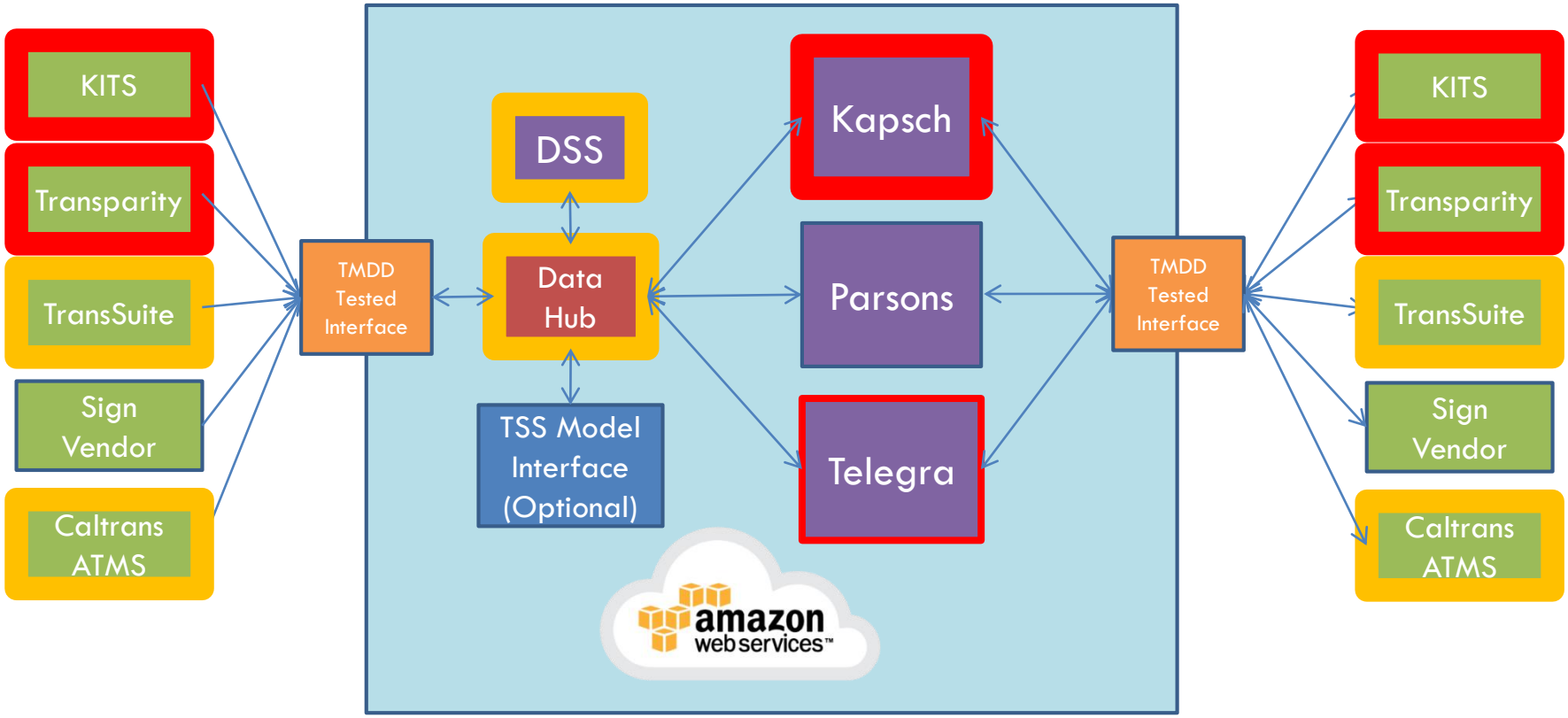
Kapsch Presentation and Work in Progress

A new process

- Kapsch is working on their system and would like to get ongoing feedback
- Kapsch will be demonstrating the developing product
- Please understand that this process means that not everything, at this point, will be completed or working as anticipated
- Minimize the amount of rework and misunderstandings



C2C Interface Implementations - Status



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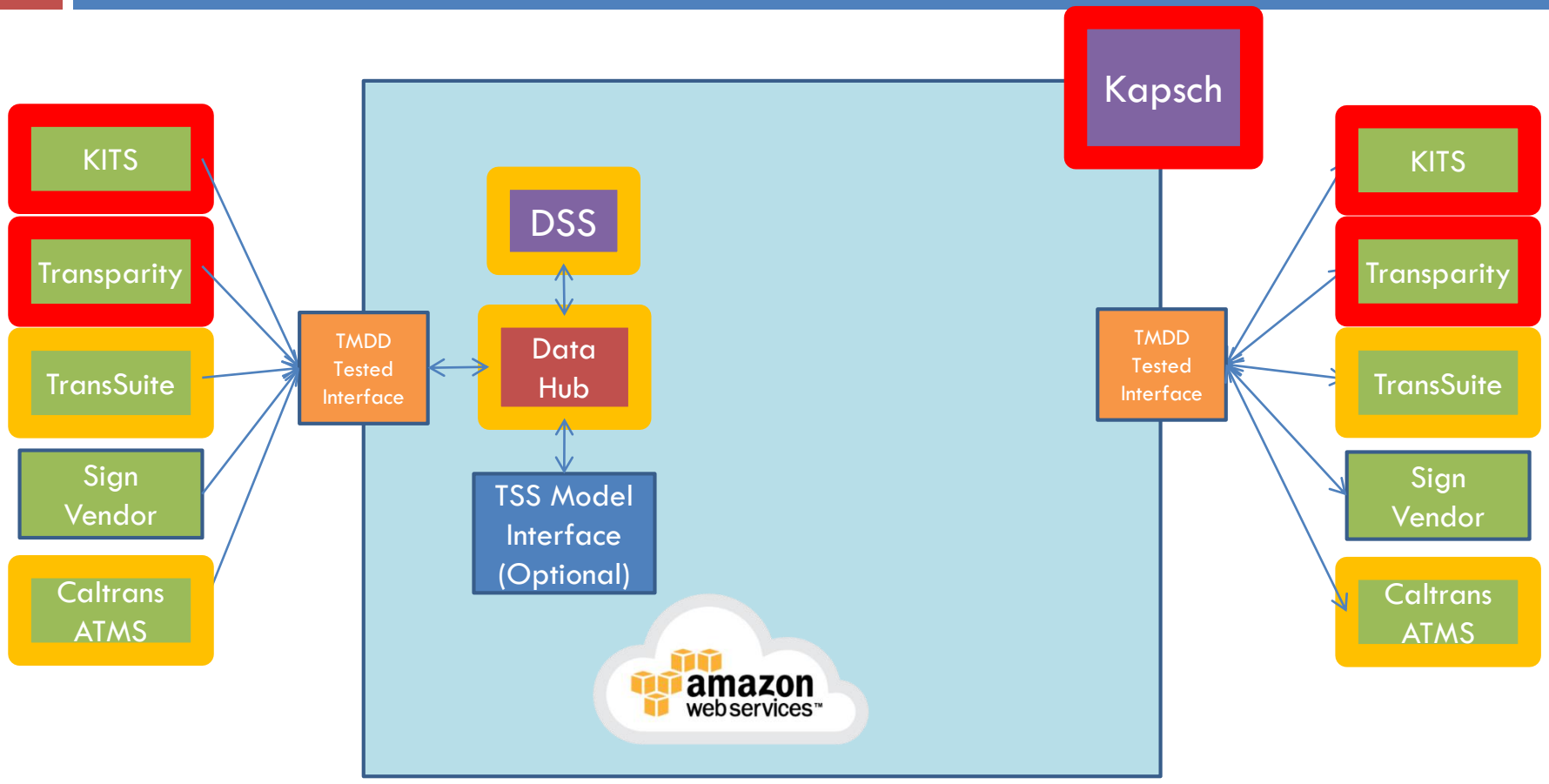

Thank You
and
Next Meeting
(Suggest Tuesday March 12th at LA County)