



# Connected Corridors Face-to-Face Meeting

Tuesday, January 28<sup>th</sup>, 2020

1:30 – 3:30 pm

Caltrans TMC

January 28<sup>th</sup>  
2020



# Agenda

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- **1:30 - 2:00 – Program Review**
- **2:00 - 2:20 – Call for Projects Update**
- **2:20 – 2:40 – Kapsch update**
- **2:40 – 3:15 – DSS Test Launch Update**
- **3:15 – 3:20 – Closing**
  - ▣ Next Meeting at LA County – Tuesday March 10<sup>th</sup>
  - ▣ (Monrovia, Duarte, LA Metro, Caltrans, County, Arcadia, Pasadena)



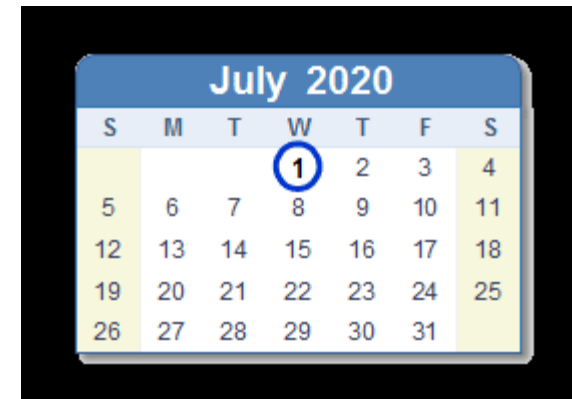
# Joe, that's me, will retire later this year!!!

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- **I have decided to retire this summer – Yes!**
  - ▣ My last day will be July 1<sup>st</sup>
  - ▣ I will be around until mid May
- **Zema, Brian and Anthony (with Tom's support) will be sharing my responsibilities**
  - ▣ You are in good hands



- **We will have the DSS working locally**
- **And be prepared for the ITS World Congress**



# Zema Katsnelson – Technical Project Manager, UC Berkeley PATH

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- **Results-focused portfolio, program and project management professional.**
- **Strong enterprise business knowledge and working experience with multiple large, medium and small companies and lines of business.**
- **Certified Project Management Professional (PMI PMP), licensed California Professional Engineer, Ph.D. in Technical Sciences.**
- **In his spare time, enjoys travel, hiking, history and sports.**



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# I-210 Overall Summary

# New Schedule – Till Launch (Page 1 of 2)

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- **ATMS Incident Management to Production** – January 2019
- **Complete Call for Projects Procurement!!** – **January 2020**
- **Deploy DSS Test System** – March 2020
- **Complete Deployment/Release Hardening** – **March 2020**
- **Complete ATMS Modifications** – **April 2020**
- **Prediction running in the cloud** – **June 2020**
- **Complete McCain C2C** – **June 2020**
- **Loop Data Received from ATMS** – **July 2020**
- **Rules Engine running in the cloud** – **September 2020**
- **All ITS Elements Installed in Field** – **September 2020**



# New Schedule – Till Launch (Page 2 of 2)

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- ☐ **Integrate Lane Closure System** – September 2020
- ☐ **All data (sans signs) being received** – October 2020
- ☐ **Estimation running in Cloud** – December 2020
- ☐ **Complete C2C Sign Interfaces** – December 2020
- ☐ **Performance Management System Available** – December 2020
- ☐ **Complete Version 1.0 System Release** – January 2021
- ☐ **System Test and Validation** – February/April 2021
- ☐ **Before Study** – March to April 2021
- ☐ **Launch Pilot** – April 2021



# New Schedule – Pilot Launch to Pilot Completion

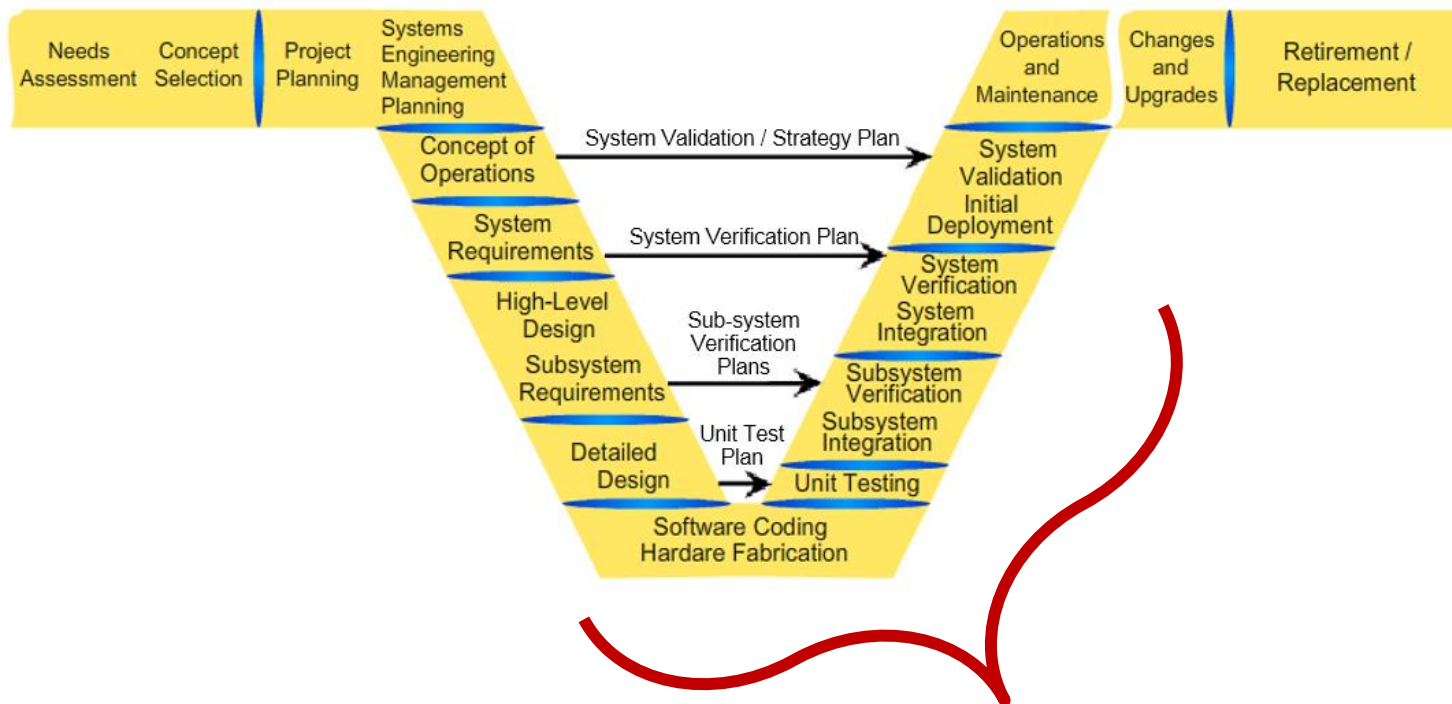
8

- ☐ **Before Study** – March to April 2021
- ☐ **Pilot Launch** – April 2021
- ☐ **Kapsch** – April 2021 – August 2021
- ☐ **Parsons** – August 2021 – December 2021
- ☐ **Interim Benefits Analysis** – Dec 2021
- ☐ **Telegra** – Dec 2021 – April 2022
- ☐ **After Study** – March to April 2022
- ☐ **Kapsch** – May 2022 – August 2022
- ☐ **Procurement of CMS system** – July 2022
- ☐ **Pilot complete** - September 2022



# Systems Engineering Status

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# DSS Test Launch - Goals for March 2020

10

- **Anthony to show demonstration later in presentation**
- **Expected outcomes**
  - ▣ Response plans and metrics for review by stakeholders
  - ▣ Metrics for use in benefits analysis
- **Functions running real-time 24/7**
  - ▣ Capture incidents and data on freeways and arterials
  - ▣ Requires ATMS in production and associated network updates
  - ▣ Requires working Kapsch CMS application
- **Response Plan generation on demand**
  - ▣ Response plan generation using rules engine, estimation and prediction
  - ▣ Historical and real-time modes



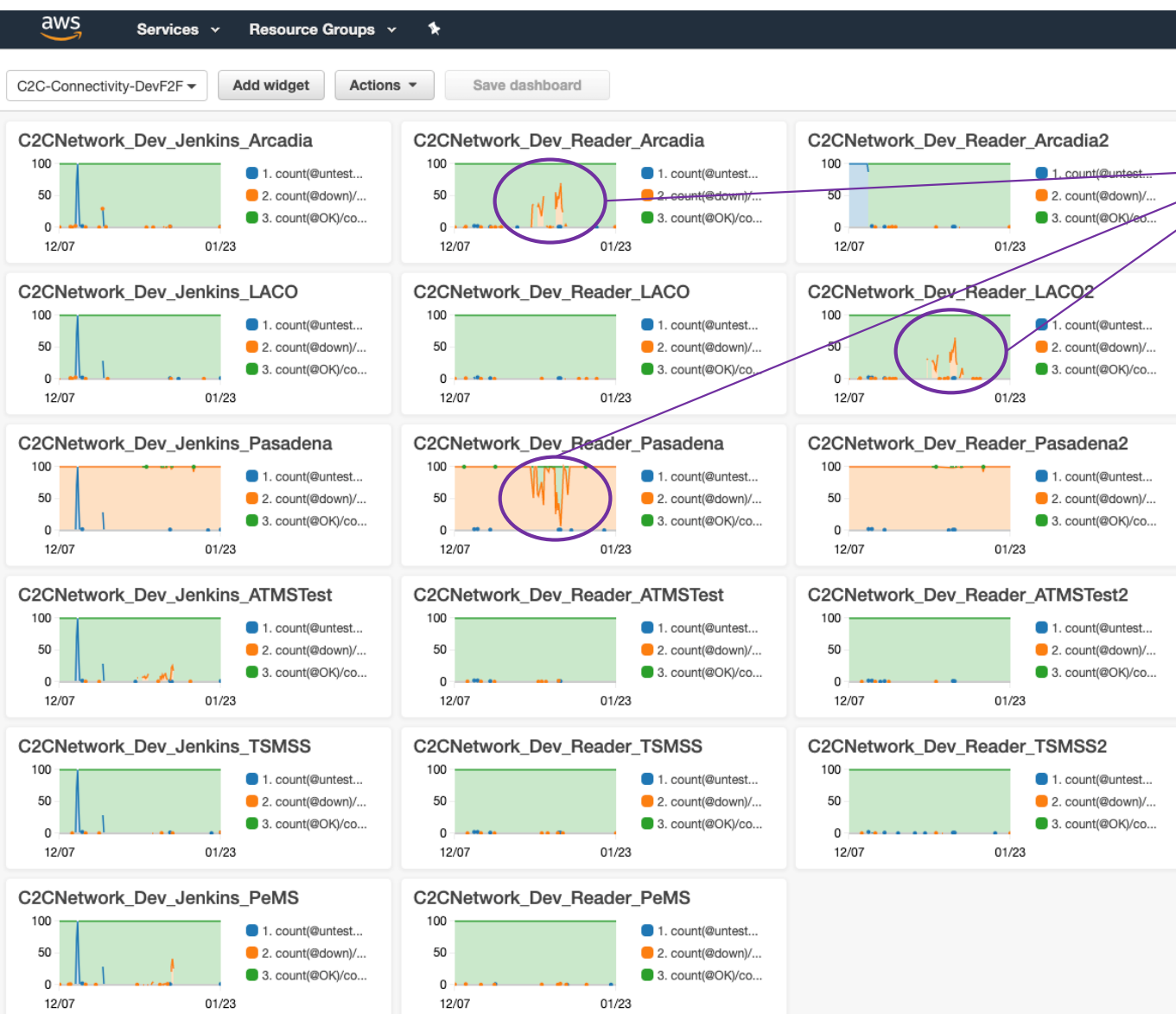
# Networking and Center to Center Connectivity

11

- **ICM User Secure System Access (via Kapsch application)**
  - ▣ Kevin has logged into the Kapsch system!
  - ▣ Next steps, starting to look at date, etc
  - ▣ Who would like to be next?
- **Networking and application configurations reconciled to support Kapsch application communication with ATMS Test server**
  - ▣ Will require testing and likely updates once ATMS moves to production
- **RIITS Support now receives automated notifications of any major C2C network outages via AWS monitor/alarm**
- **RIITS, D7 working together to acquire updated firewall/VPN and improved support**



# C2C Connectivity good since last Face-to-Face



- ☐ A transient “ghosting” event appeared
- ☐ No negative impact
- ☐ Continue to monitor

# Next steps in system monitoring

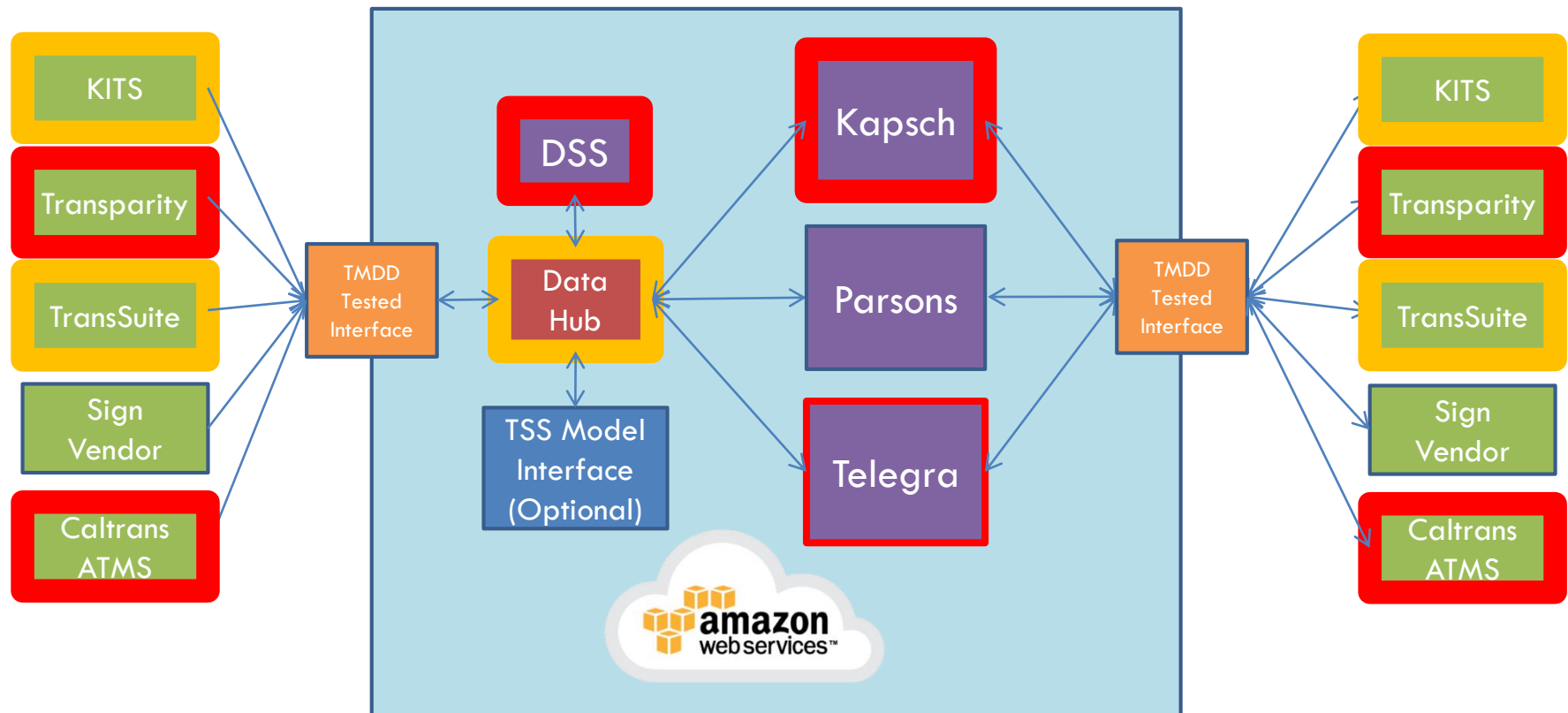
13

- **It is now time to expand our system monitoring ability to better monitor system devices, with a focus on controllers and associated communication networks**
- **We are working with Irvine Global Consulting on scoping and designing a solution**
- **We would like to meet with stakeholders to discuss potential solutions, ensure success and identify challenges**
- **We would like to setup these meeting within the next two weeks.**



# C2C Interface Implementations - Status

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# Systems Development and Integration

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## □ Priorities

### ▣ Production system initial stand-up

- Production environment is up without Corridor Management System.

### ▣ Improve system resiliency

- Began use of elastic load balancing with automatic recovery for data hub processors

### ▣ Improve release frequency – goal is new release to test every week

- Automating deployment of containerization strategy and AWS Elastic Container Service.
- Working to extend through other system components to improve developer speed, release quality, and system failure recovery time and resilience.
- Training developers on use of configuration and credentials services, and libraries to implement containerization strategy in other system components.



# Systems Development and Integration

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## □ Priorities

### ▣ Support AMS efforts for February launch

- Continued implementation of estimation, prediction, rules launch
- Assisting AMS team to integrate estimation, prediction, and rules components
- Assisting to prepare for live incident capture and response plan development, connecting AMS estimation, prediction, and rules to live data pipelines.



# Systems Integration

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- **Pasadena**
  - ▣ Actively working with McCain on integration with Transparency test endpoint.
- **Arcadia/Caltrans**
  - ▣ Reviewing missing signal phase TMDD data with Transcore
- **Caltrans**
  - ▣ Plan to start reading TSMSS information
- **LA County**
  - ▣ Ongoing review of data and operation.

# Systems Integration

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## □ **ATMS**

- ▣ Continuing testing of changes to accommodate freeway and arterial incidents
- ▣ Continue to identify and correct issues
- ▣ Working on the deployment of the I-201 CC support & other modifications (event management & response plans) on the production server
- ▣ Next production deployment is today

## □ **Corridor Management System**

- ▣ Preparing for initial production deployment
- ▣ Testing Kapsch interface with ATMS for incident capture in integration environment prior to deploying corridor management system to production.

## □ **C2C for Dynamic Message Signs**

- ▣ Kickoff meeting held
- ▣ Brian will be the point person from PATH on these meetings





Metro



# I-210 Connected Corridors Face-to-Face Meeting

Room 106, LARTMC  
2901 West Broadway, Los Angeles, CA 90041  
Tuesday, January 28, 2020  
1:30 – 3:30 pm

Jan 28, 2020



# Agenda

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





Metro



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

## SCOPE OF WORK

Jan 28, 2020



# Project Objective

22

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

#	Package Description	Contract #	Contract Status
1	Bluetooth – Iteris Velocity	07A4470	Completed, Contract Closed
2	Bluetooth – BlueToad	07A4477	Awarded, in Progress
3	New Controller Cabinets	07A4761	Advertised on 9/26/19, to be awarded
4	Communication Upgrades	07A4479	Installation Completed
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	07A4755	Advertised on 1/2/20, to be awarded
8-1	DMS Procurement	07A4792-3	Awarded, in Progress
8-2	DMS Integration	07A4794	Awarded, in Progress
8-3	DMS & Static Sign Installation	N/A	To be handled by stakeholders
9	Environmental Stations with Air Quality Sensors and Open Data Systems	07A4388	Awarded, in Progress



# Project Area

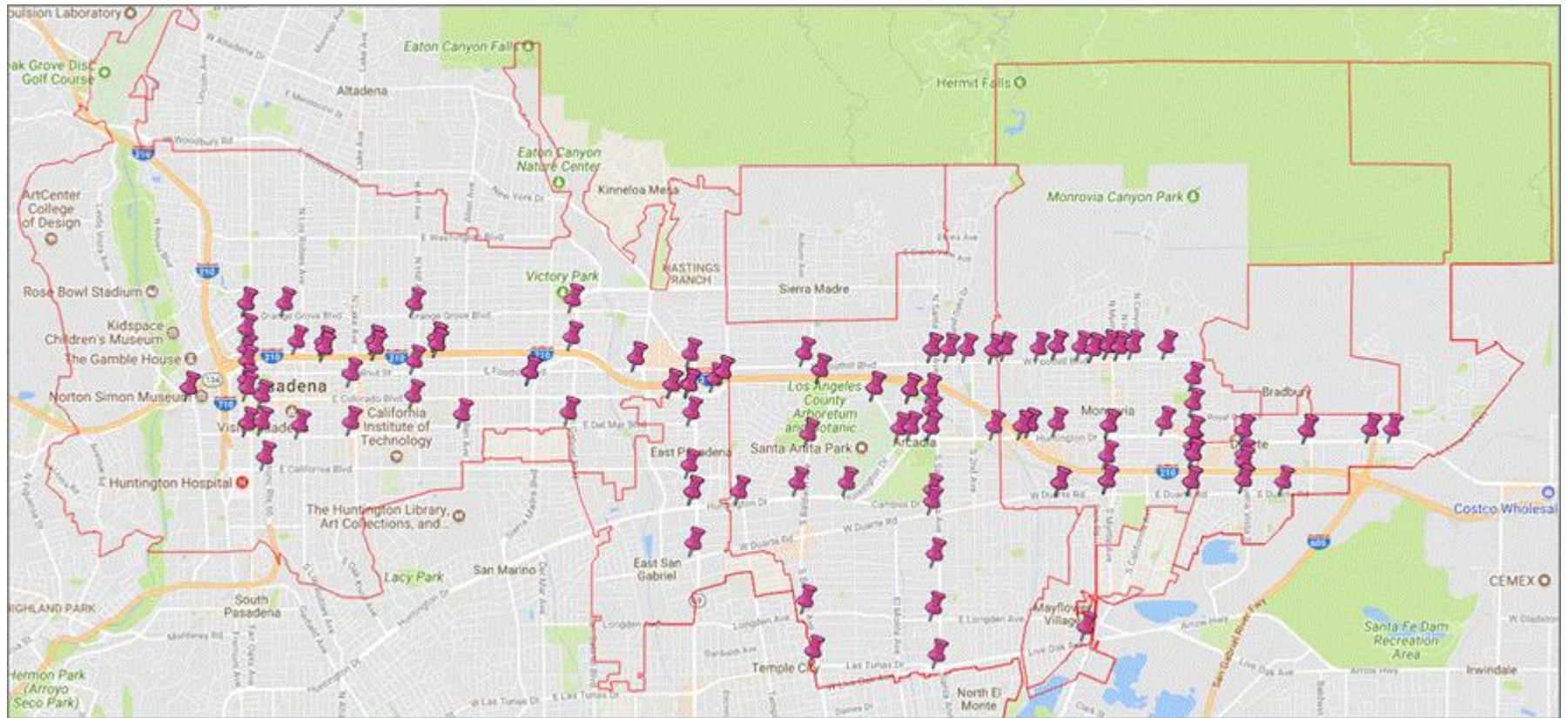
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#	Package Description	Contract #	Metro & Caltrans	City of Pasadena	City of Arcadia	City of Monrovia	City of Duarte	LA County
1	Bluetooth – Iteris Velocity	07A4470	√		√			
2	Bluetooth – BlueToad	07A4477	√	√		√	√	√
3	New Controller Cabinets	07A4603	√	√	√			
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	07A4755	√	√	√	√	√	√
8-1	DMS Procurement	07A4792-3	√	√				√
8-2	DMS Integration	07A4794	√	√				√
8-3	DMS Installation	N/A	√	√				√
9	Environmental Stations with Air Quality Sensors and Open Data Systems (ODS)	07A4388	√					



# Project Area (cont.)

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# UPDATE ON PACKAGES 1-9

Jan 28, 2020



# Target Timeline - P1, P2, P4, P6, P9

26

Year	2018							2019												2020	
Month	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
Prepare Submittal																					
Equipment Procurement & Delivery																					
Test Plan/Procedure																					
Installation																					
Testing & Acceptance																					
Training																					

I-210 CC: System Testing to begin in Jan 2020.

Soft Launch  
of I-210 CC  
System (Est.)



# Target Timeline - P3, P5, P7

27

Year	2019							2020											
Month	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Prepare Submittal																			
Equipment Procurement & Delivery																			
Test Plan/Procedure																			
Installation																			
Testing & Acceptance																			
Training																			

P3: Advertised, to be awarded  
P5: Material Submittal & Procurement Phase  
P7: Advertised, to be awarded

April 2021,  
Hard Launch  
of I-210 CC  
System (Est.)

# Target Timeline - P8 (8-1,8-2,8-3)

28

Year	2020												2021						
Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
DMS Procurement	■	■																	
DMS Delivery		■	■	■	■	■	■												
DMS Installation							■	■	■	■	■								
DMS Integration			■	■	■	■	■	■	■	■	■	■							
DMS System Testing								■	■	■	■	■	■	■					
Training														■	■				



DMS lead time: 16 weeks  
DMS Pole lead time: 18 weeks

April 2021, Hard Launch of I-210  
CC System (Est.)

# Package Status – Pkg # 1

29

Pkg. #	Pkg.	Contract #	Project Status
1	Bluetooth – Iteris Velocity	07A4470 PTM	<ul style="list-style-type: none"> <li>• NTP: 7/10/2018</li> <li>• Kick-off Meeting: 7/30/2018</li> <li>• Submittal Approved: 8/16/2018</li> <li>• Installation &amp; Testing Completed on 5/29 &amp; 5/30/2019</li> <li>• Accepted by Arcadia, Documents Submitted</li> <li>• Completed</li> </ul>



# Package Status – Pkg # 2

30

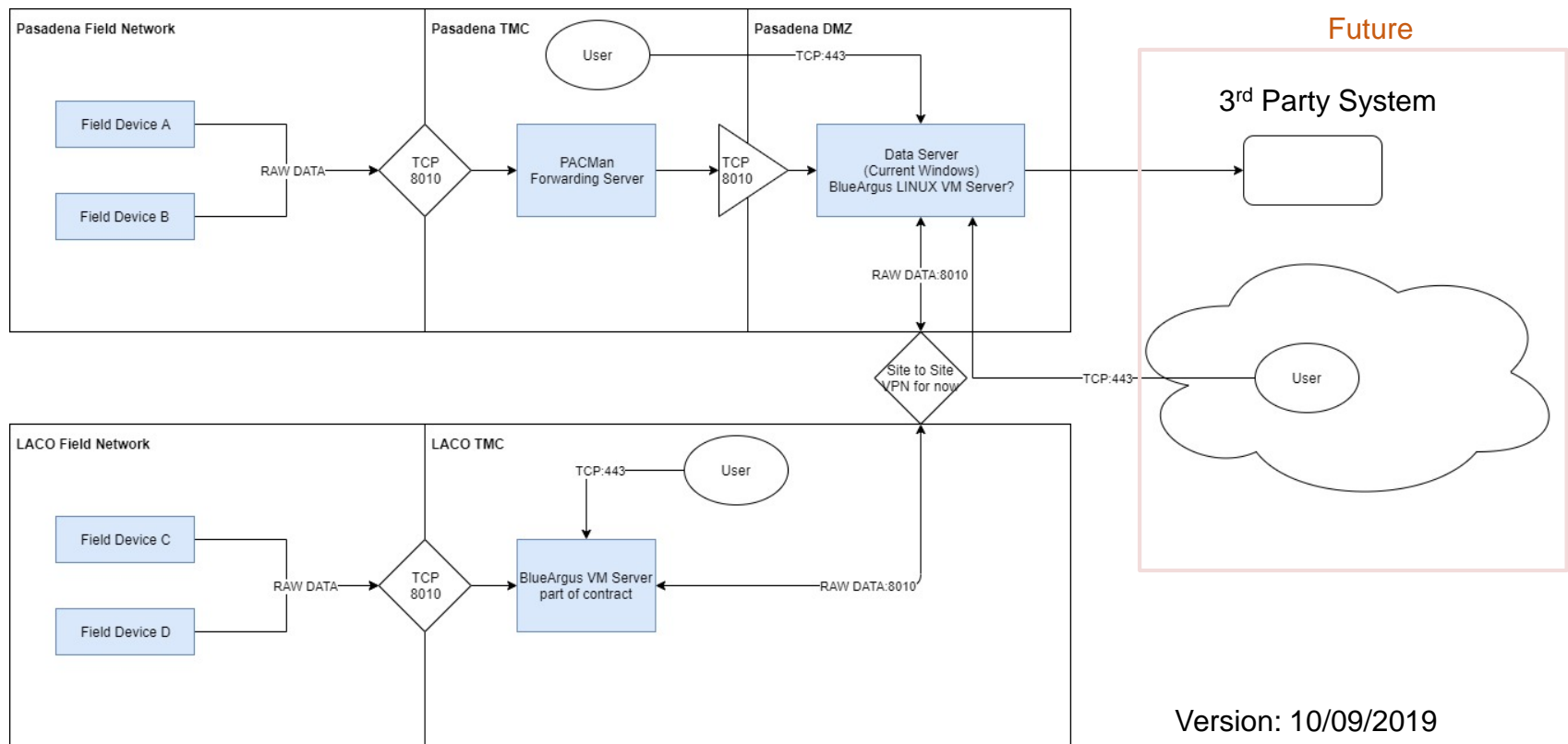
Pkg. #	Pkg.	Contract #	Project Status
2	Bluetooth – BlueToad	07A4477 DBX	<ul style="list-style-type: none"> <li>• NTP: 7/10/2018</li> <li>• Kick-off Meeting: 7/30/2018</li> <li>• Submittal Approved: 10/12/2018</li> <li>• Installation: <ul style="list-style-type: none"> <li>• LA County: 11 locations done; LACo VM server configured on 5/15/19; working on LA Co &lt;-&gt; Pasadena VPN connection</li> <li>• Pasadena: scheduling field installation at 11 locations and server installation at TMC (early Feb 2020);</li> </ul> </li> <li>• Testing: <ul style="list-style-type: none"> <li>• LA County: contractor is supporting LA County on system testing</li> <li>• Pasadena: to be scheduled after installation</li> </ul> </li> <li>• Expected to be completed: March 2020 (90%)</li> </ul>



# Package Status – Pkg # 2

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## □ P2 - BlueToad Travel Time System – Comm. Architecture



# Package Status – Pkg # 3

32

Pkg. #	Package Name	Contract #	Project Status
3	New Controller Cabinets	07A4603	<ul style="list-style-type: none"> <li>Disqualified: Bids came above the SB limit (314k).</li> <li>Procurement Package revised per Stakeholder comments on Pkg. 5</li> <li>Cancelled by DPAC in the week of 3/15/19</li> <li><b>Advertised: 9/26/19</b></li> <li><b>Received the bid</b></li> <li>Expected to be awarded by: Late Jan 2020 (together with other pending packages)</li> <li>Expected to be completed: Q2 2020</li> </ul>



# Package Status – Pkg # 4

33

Pkg. #	Package Name	Contract #	Project Status
4	Communication Upgrades	07A4479 Kanaan Construction	<ul style="list-style-type: none"> <li>NTP: 7/13/2018</li> <li>Kick-off Meeting: 7/30/2018</li> <li>Submittal &amp; RFI Approved: 5/6/2019</li> <li>Equipment procured</li> <li>Installation of 35 locations: completed</li> <li>Testing: completed</li> <li>Testing Reports: submitted on 1/13/2020</li> <li>Original Scope: Completed</li> <li>Next steps: <ul style="list-style-type: none"> <li>Close all RFIs</li> <li>Additional 2 POE extenders to be installed at 1 location (Approved CO)</li> <li>Discuss at C2C meeting <ul style="list-style-type: none"> <li>7 locations in LA County – no communications yet</li> <li>Option 1 : Waiting until RIITS network and L3 Switches are available – 3<sup>rd</sup> Quarter 2020</li> <li>Option 2: Install 2 additional radios</li> </ul> </li> </ul> </li> </ul>



# Package Status – Pkg # 5

34

Pkg. #	Package Name	Contract #	Project Status
5	Firmware/Timing Plan Updates/Controller Upgrades	07A4480 CPE, Inc	<ul style="list-style-type: none"> <li>NTP: 7/17/2018</li> <li>Kick-off Meeting: 7/30/2018</li> <li>Submittal Reviewed but Required hardware/firmware changed per Stakeholder Comment</li> <li>Contractor revised price estimate (\$121,049.50) lower than original amount (\$171,600.00) – reviewed &amp; approved by stakeholders                             <ul style="list-style-type: none"> <li>Arcadia</li> <li>Pasadena</li> <li>LA County</li> <li>Caltrans</li> </ul> </li> <li>Material Submittals – submitted, in review</li> <li>Materials Procurement – to be started</li> <li>Installation Permits – in progress</li> <li>Est. Duration: 6 months</li> <li>Expected to be completed: 3<sup>rd</sup> Quarter, 2020</li> </ul>



# Package Status – Pkg # 6

35

Pkg. #	Package Name	Contract #	Project Status
6	Video Detection System	07A4481 Traffic Loops Crackfilling, Inc	<ul style="list-style-type: none"> <li>NTP: 7/10/18</li> <li>Kick-off Meeting: 7/30/18</li> <li>10/9/18: Conducted Site Survey</li> <li>10/18/18: Submittal approved</li> <li>Installation: <ul style="list-style-type: none"> <li>21 out of 22 installations are completed (2 LA County, 5 Monrovia, 3 Arcadia, 8 Pasadena, 3 in Duarte)</li> <li>1 location in Pasadena: conduit too small. Proposed action is approved. Installation has been scheduled (Contractor is renewing the permits)</li> </ul> </li> <li>Testing: in process</li> <li>Expected to be completed: Feb 2020 (90%)</li> </ul>



# Package Status – Pkg # 7

36

Pkg. #	Package Name	Contract #	Project Status
7	Data Communication Module and Video Detection Software Upgrade	07A4601	<ul style="list-style-type: none"> <li>Disqualified: Bids came above the SB limit (314k).</li> <li>Originally cancelled by DPAC;</li> <li>Revised Package being reviewed by DPAC</li> <li>Advertised: 1/2/2020</li> <li>Bid due: 1/16/2020</li> <li>Multiple bids have been received</li> <li>Expected to be awarded by: Late Jan. 2020</li> <li>Est. Duration: 6 months</li> <li>Expected to be completed: Q3 2020</li> </ul>



# Package Status – Pkg # 8-1

37

Pkg. #	Package Name	Contract #	Project Status
8-1	Advanced Traveler Information Systems: DMS Procurement	07A4792-3	<ul style="list-style-type: none"> <li>• Advertised: 10/25/19</li> <li>• Awarded: 12/2/ 2019</li> <li>• Kickoff meeting: 12/19/2019</li> <li>• Material Submittals: <ul style="list-style-type: none"> <li>• 12/30/2019: v1 Submitted &amp; Reviewed</li> <li>• 1/24/2020: v2 Submitted for Stakeholder Review</li> </ul> </li> <li>• Expected to be completed: Q2-Q3 2020</li> </ul>

Item	Total	Caltrans	LA County	Pasadena	Status
DMS	21	2	2	17	Approved
Poles	21	2	2	17	
Pull boxes	21	2	2	17	
Power & Comm Cables	11,000 ft	TBD	TBD	TBD	
Radios	12	0	0	12	Approved
Signal Control System	3	1	1	1	
Servers	3	1	1	1	

Lead time: 16 weeks

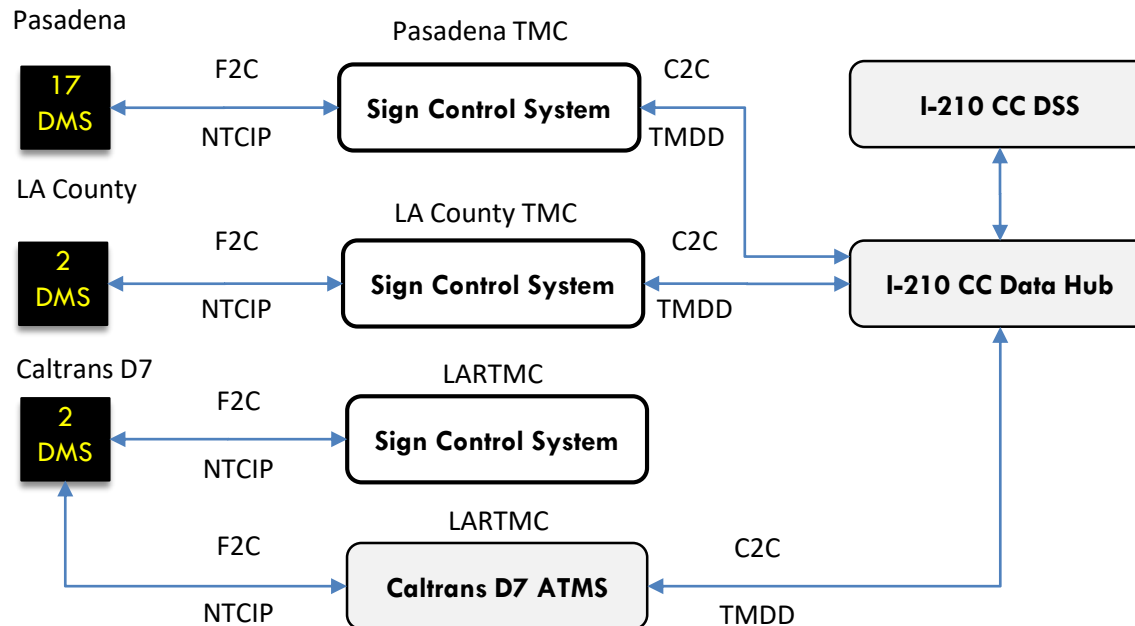
Lead time: 18 weeks



# Package Status – Pkg # 8-2

38

Pkg. #	Package Name	Contract #	Project Status
8-2	Advanced Traveler Information Systems: DMS Integration	07A4794	<ul style="list-style-type: none"> <li>Advertised: 11/14/19</li> <li>Awarded: 1/3/ 2020</li> <li>Kickoff meeting: 1/14/2020</li> <li>Working on system architecture diagrams</li> <li>Expected to be completed: : Q1 2021</li> </ul>

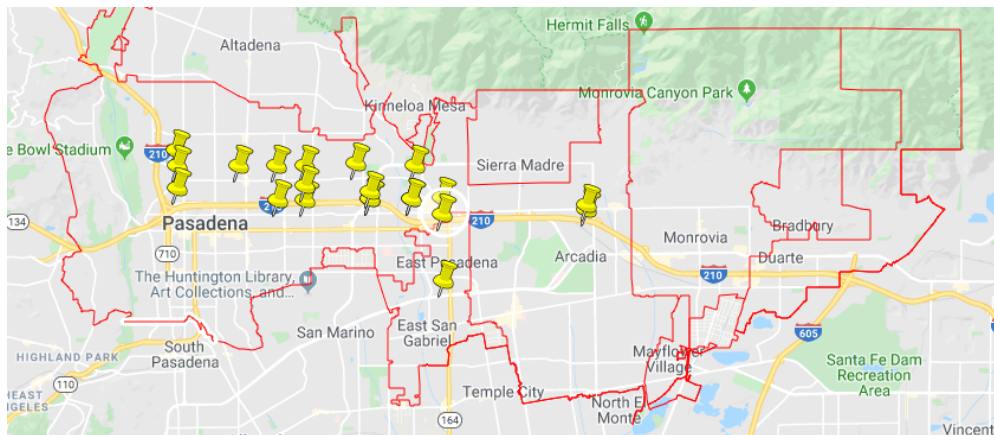


Note: Sign control system is procured in Pkg # 8-1.

# Package Status – Pkg # 8-3

39

Pkg. #	Package Name	Contract #	Project Status
8-3	Advanced Traveler Information Systems: DMS & static sign Installation	N/A to be handled by Caltrans, LAPDW, & Pasadena	<ul style="list-style-type: none"> <li>DMS Installation:                             <ul style="list-style-type: none"> <li>To start after hardware &amp; software are delivered (May-June 2020)</li> <li>LA County: start after Aug – Oct 2020</li> <li>Pasadena: expected Jun – Sep 2020</li> </ul> </li> <li>Static Signs Installation:                             <ul style="list-style-type: none"> <li>Ordered by Caltrans Maintenance Group: Jul. 2019</li> <li>take 9-12 months</li> <li>Installation will be handled by Caltrans</li> </ul> </li> <li>Expected to be completed: Q3 2020</li> </ul>



# Package Status – Pkg # 9

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Pkg. #	Pkg.	Contract #	Project Status
9	Environmental Stations with Air Quality Sensors and Open Data Systems (ODS)	07A4388 Cal Poly Pomona	<ul style="list-style-type: none"> <li>NTP: 6/29/18</li> <li>Kick-off Meeting: 7/12/18</li> <li>Environmental stations                             <ul style="list-style-type: none"> <li>Roadside study done</li> <li>Field installation done – 6/7/19</li> <li>Collect data and analyze data - ongoing</li> </ul> </li> <li>ODS                             <ul style="list-style-type: none"> <li>Coordination w/ Foothill Transit &amp; Pasadena Transit                                     <ul style="list-style-type: none"> <li>Face-to-Face Meeting 10/10/19</li> </ul> </li> <li>Coordination w/ PATH                                     <ul style="list-style-type: none"> <li>Data Specification</li> <li>Sample Response Plan</li> <li>Inventory of Road Network, Signal ID</li> </ul> </li> <li>Coordination w/ Caltrans                                     <ul style="list-style-type: none"> <li>Communications Architecture/Setting</li> </ul> </li> </ul> </li> <li>Expected to be completed: Q2-Q3 2020</li> </ul>



# Next Steps

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- ❑ Package 2: Start field unit installation & server installation in Pasadena
- ❑ Package 3: Track status – to be awarded
- ❑ Package 4: Install 2 additional POE extenders at 1 location, close contract
- ❑ Package 5: Review/approval material submittal & proceed to procurement
- ❑ Package 6: Complete installation at 1 location in Pasadena & complete acceptance testing
- ❑ Package 7: Track status – to be awarded
- ❑ Package 8-1: Continue procurement
- ❑ Package 8-2: Develop architecture diagram
- ❑ Package 8-3: Track 8-1 status
- ❑ Package 9: Support coordination on communication path & testing



# **Thank You and Questions?**

Jan 28, 2020



**kapsch** >>>  
challenging limits

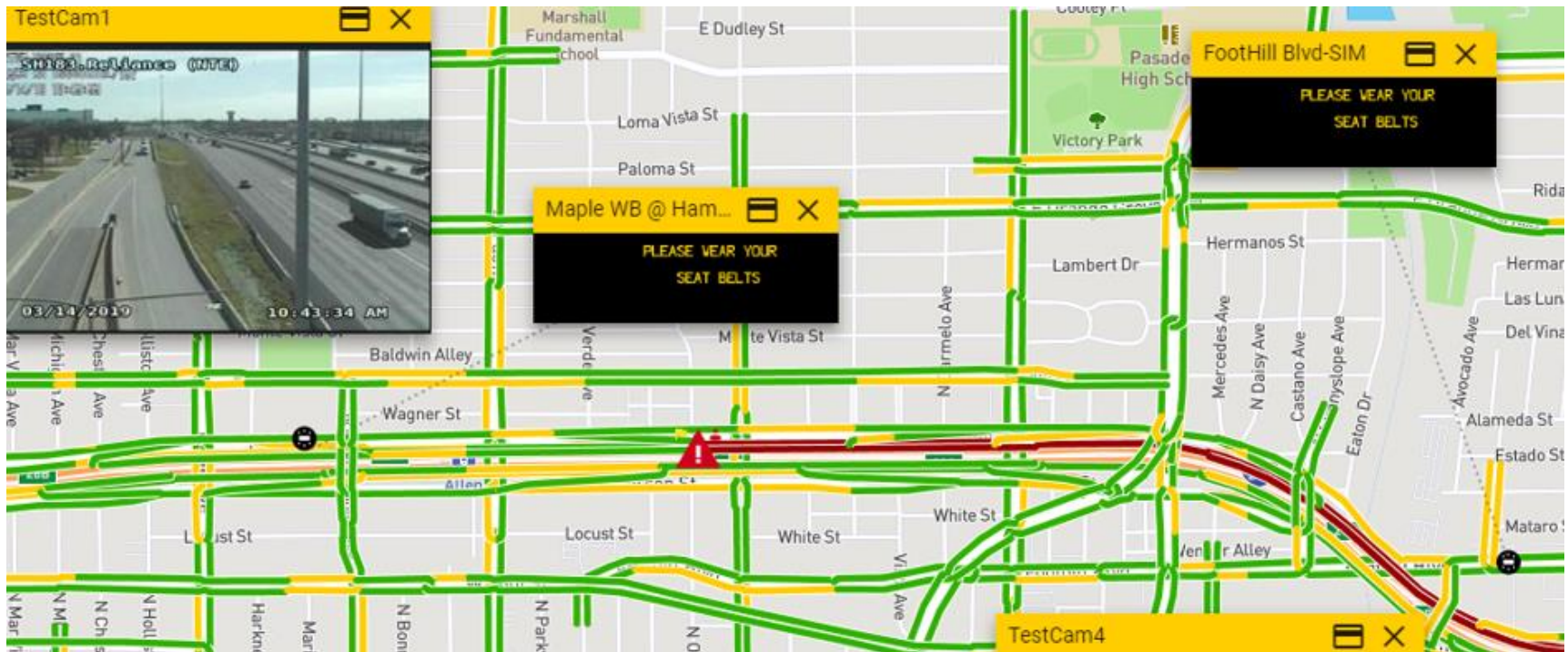
# I-210 CALTRANS Pilot, January 28<sup>th</sup>, 2020

Kapsch TrafficCom

*Integrated Corridor Management*

# I-210 Integrated Corridor Management Kapsch Update

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Tim O'Leary  
January 28, 2020



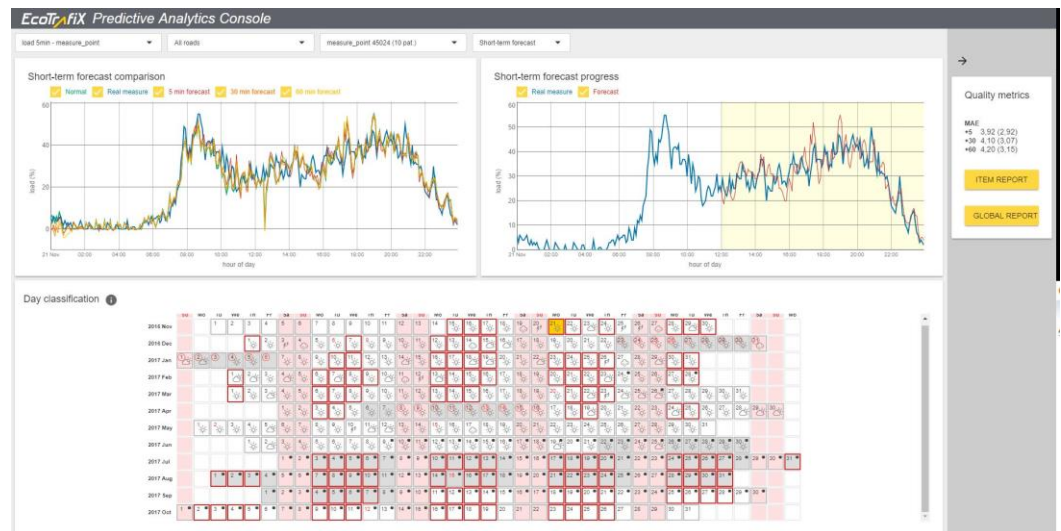
# EcoTrafIX Product Status

45

- Associate incidents with multiple ICM links/lanes and arterial movements  
**DELIVERED 12/19/2019**

- In progress:

- Provide import/export access to EcoTrafIX Response Plans
- Align lane status (clear/blocked) with ICM arterial movements
- Tailor agency Response Plan voting



# EcoTrafIX Interface Status

46

## Good progress:

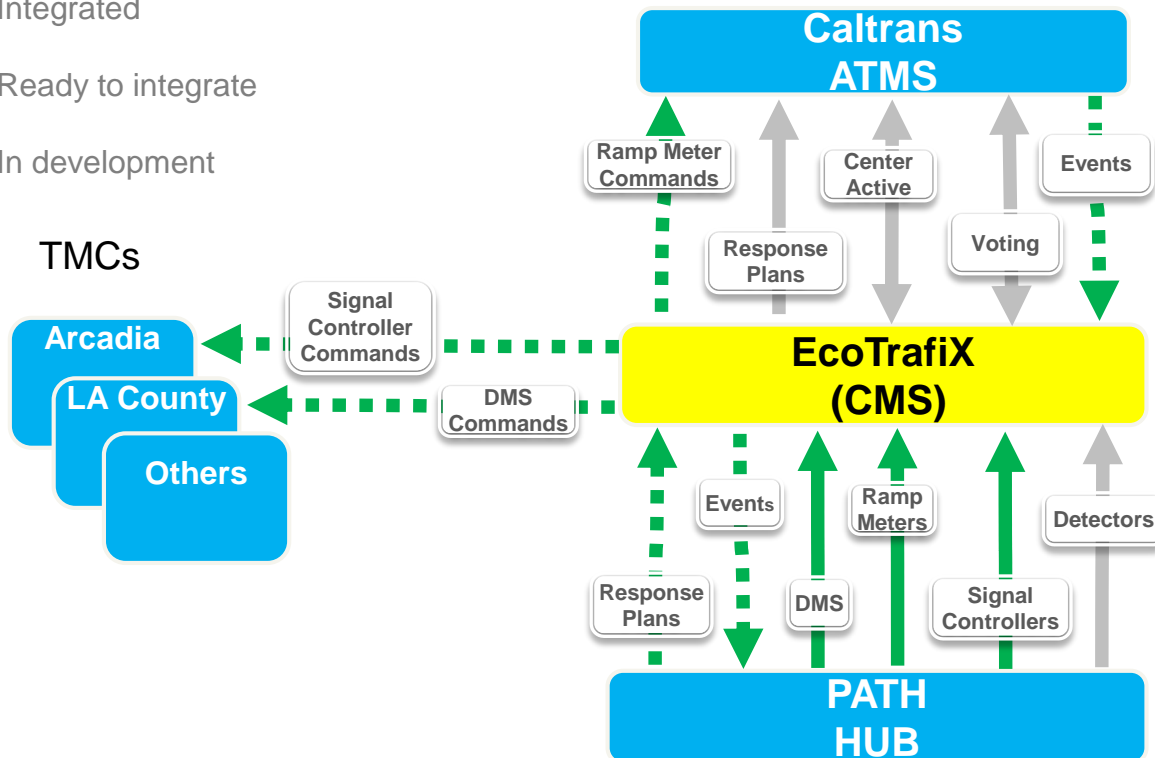
- PATH established a network connection between EcoTrafIX in AWS and a test instance of the Caltrans ATMS
- EcoTrafIX subscribed to ATMS events
- ATMS is sending event updates to EcoTrafIX
- EcoTrafIX forwarded ATMS events to PATH's Hub
- Investigating:
  - ▣ EcoTrafIX did not like the content of the ATMS event message
  - ▣ PATH rejected the event message – EcoTrafIX fix in progress
  - ▣ Scheduled to try again on 1/28
- ***We are happy to report that Kevin Merrill of Arcadia can now access the I-210 EcoTrafIX deployment***



# EcoTrafIX Status

47

## Interface



# EcoTrafIX Status

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## Next Steps

- ATMS send Events to EcoTrafIX
- EcoTrafIX send Events to HUB
- DSS send Response Plans to EcoTrafIX
- EcoTrafIX exchange Voting with ATMS
- EcoTrafIX send Response Plans to ATMS
- EcoTrafIX exchange Center Active with ATMS



# Thank You!

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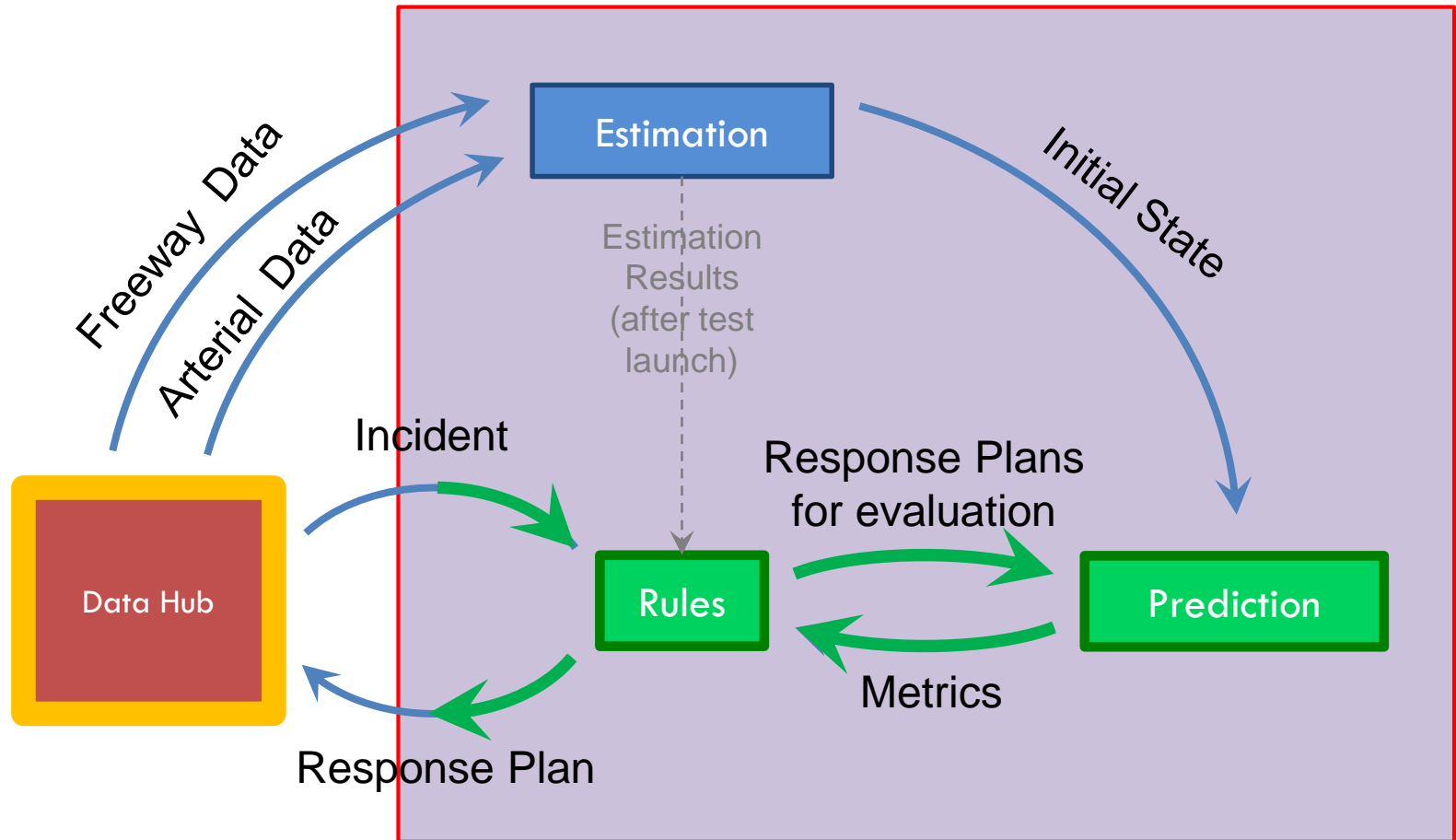


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# Test Launch

# Test Launch DSS Demo

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# Test Launch Goals for January 2020

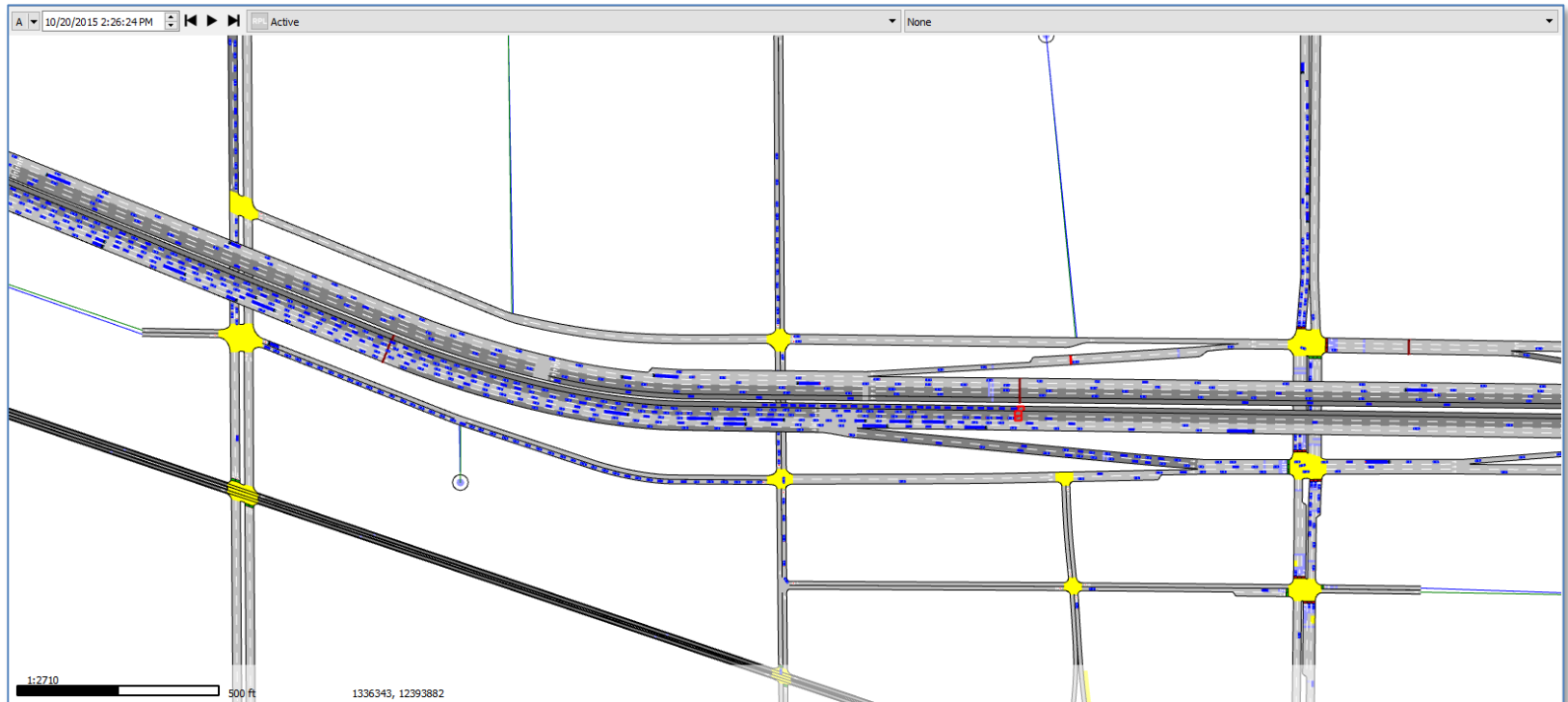
52

- **Functions running real-time 24/7**
  - ▣ Capture incidents
  - ▣ Capture data on freeways and arterials
- **Functions running on demand**
  - ▣ Estimation, Prediction, and Rules
  - ▣ Historical and real-time modes
- **Expected outcomes**
  - ▣ Response plans and metrics for review by stakeholders
  - ▣ Metrics for use in benefits analysis
  - ▣ Ability to demonstrate operation
  - ▣ Find and fix bugs
  - ▣ Move forward with system integration

# Incident Location

53

- HOV and two mainline lanes blocked near Myrtle exit

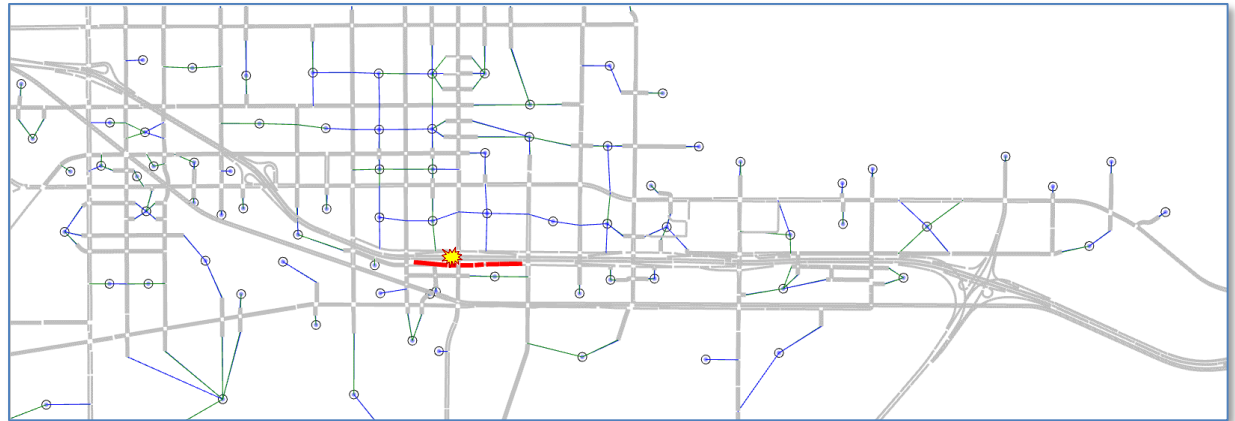


# Detours Activated

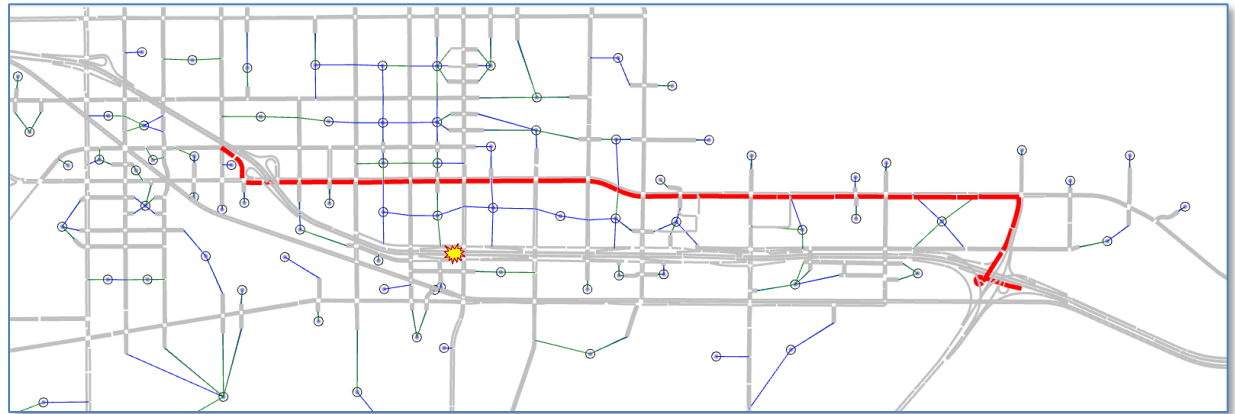
54

## □ HOV and two mainline lanes blocked near Myrtle exit

*Myrtle off-ramp to  
Myrtle on-ramp*



*Huntington off-ramp to Mount  
Olive/I-605*

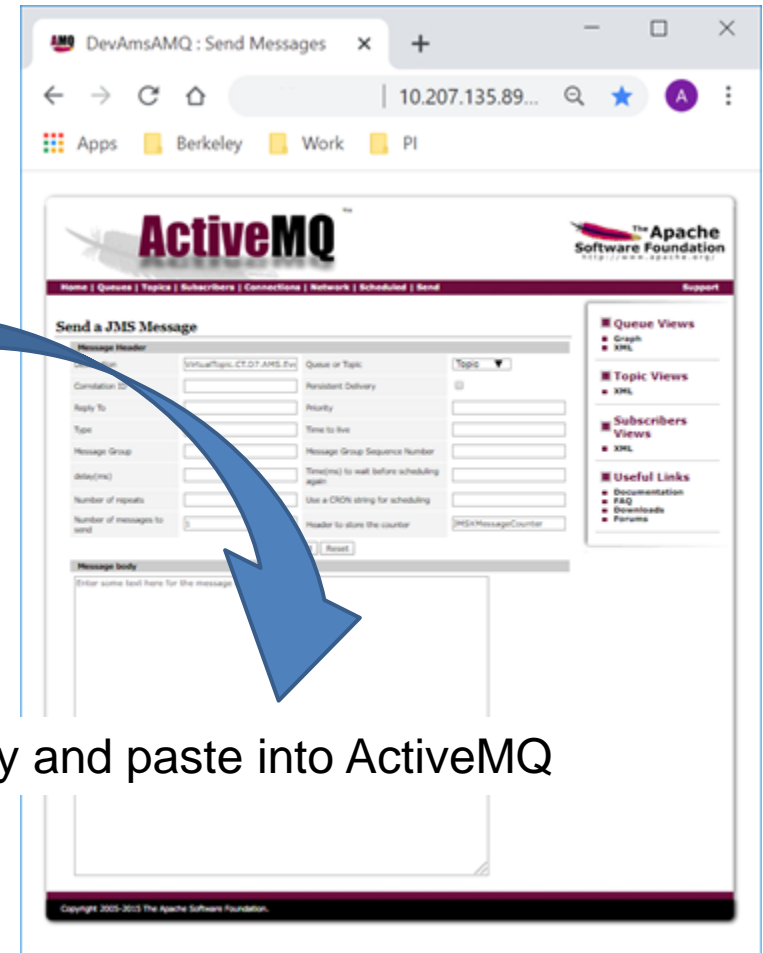


# Demo Kickoff

55

In future, the incident will be entered from an ATMS or “purple box” system

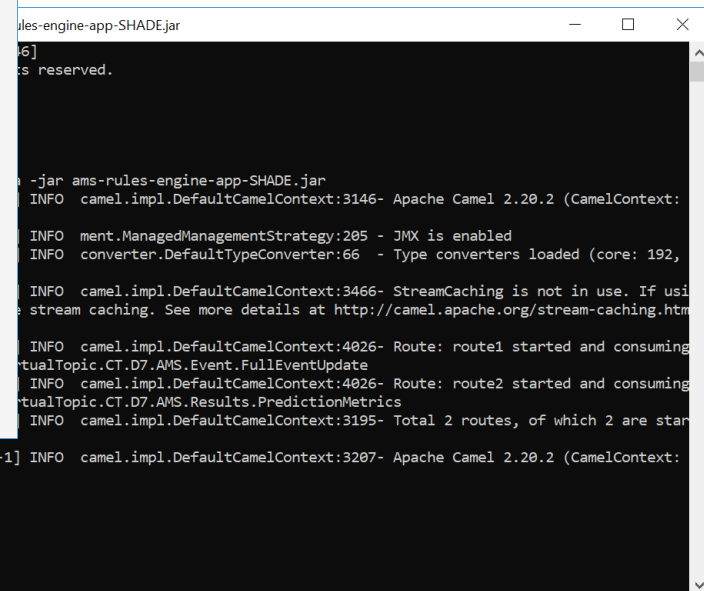
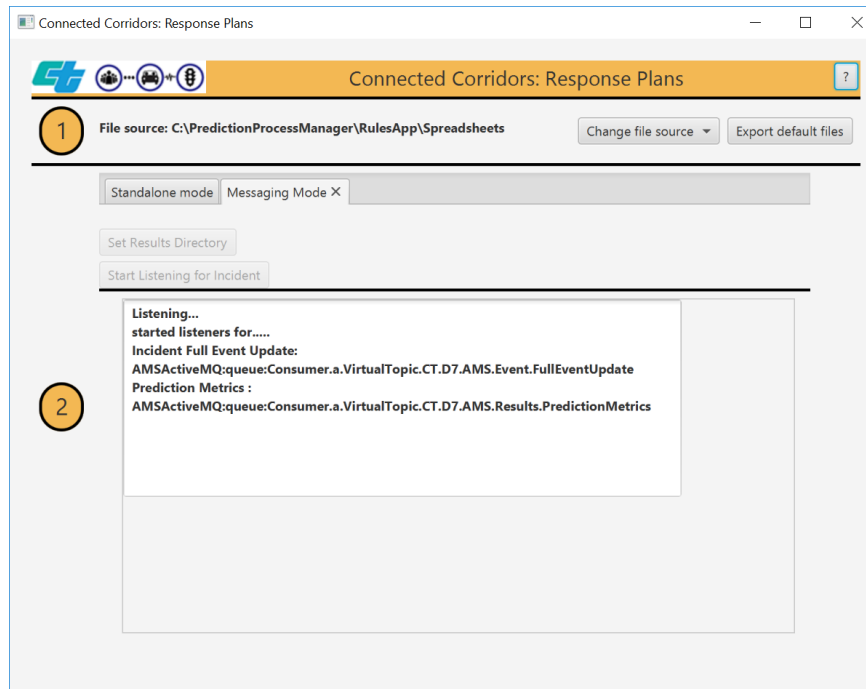
```
1 fev.JsonFixedForPredictionMyrtle.json
2 {
3   "message-header": {
4     "organization-sending": { "organization-id":
5       "Caltrans-D7"},
6     "organizations-receiving": {
7       "organizations-receiving-item": [{
8         "organization-id": "Datahub"}]},
9     "message-type-version": 2,
10    "message-number": 1,
11    "message-time-stamp": {
12      "date": "20200125",
13      "time": "1579596260765",
14      "offset": "-0800"
15    }
16  },
17  "event-reference": {
18    "event-id": 1242245,
19    "event-update": 1,
20    "update-time": {
21      "date": 20200125,
22      "time": 1579595984438,
23      "offset": "-0800"
24    }
25  },
26  "event-indicators": { "event-indicator": [
27    { "status": "confirmed",
28      "severity": "minor",
29      "planned-event-class": "incident",
30      "active-flag": "yes"
31    }
32  ] },
33  "event-headline": {
34    "headline": { "accidents-and-incidents": "multi
35      vehicle accident",
36    "headline-element": 1
37  },
38  "event-element-details": { "event-element-detail": [{
```



Copy and paste into ActiveMQ

# Demo Kickoff: RPM

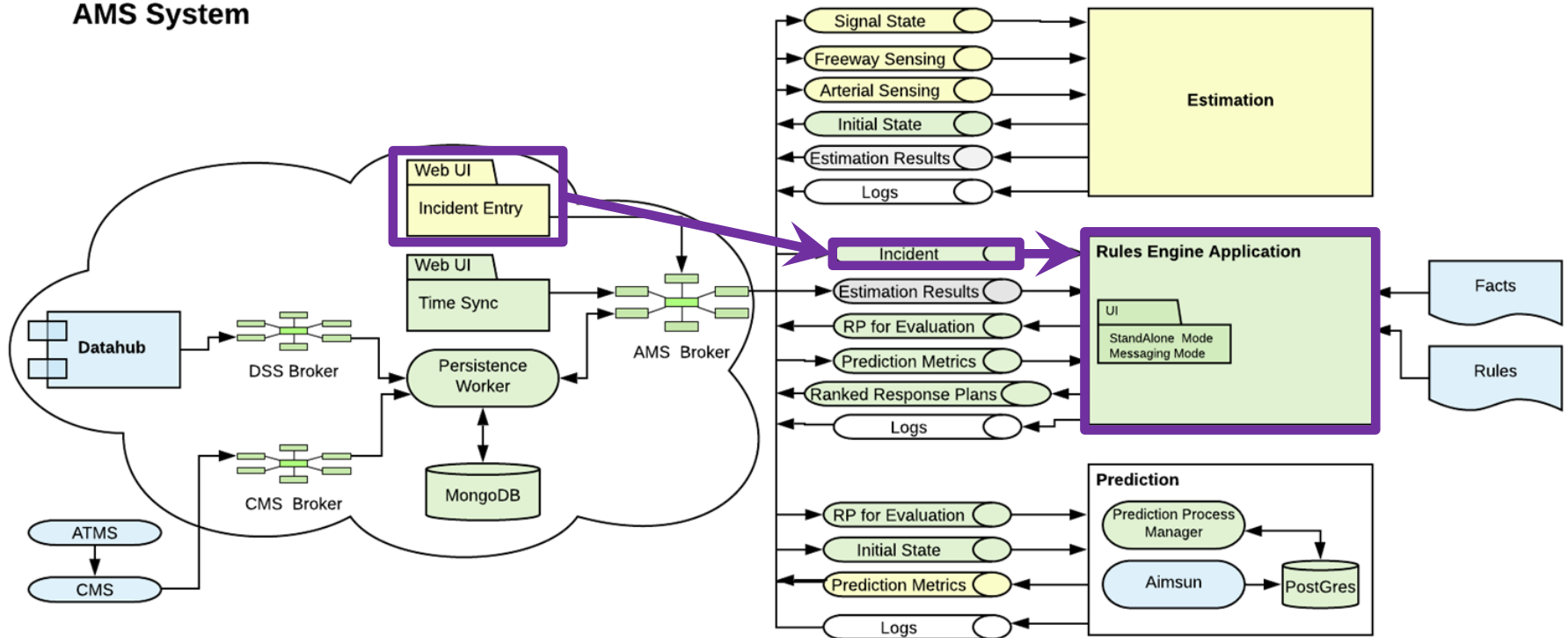
56



# Test Launch Demo Overview

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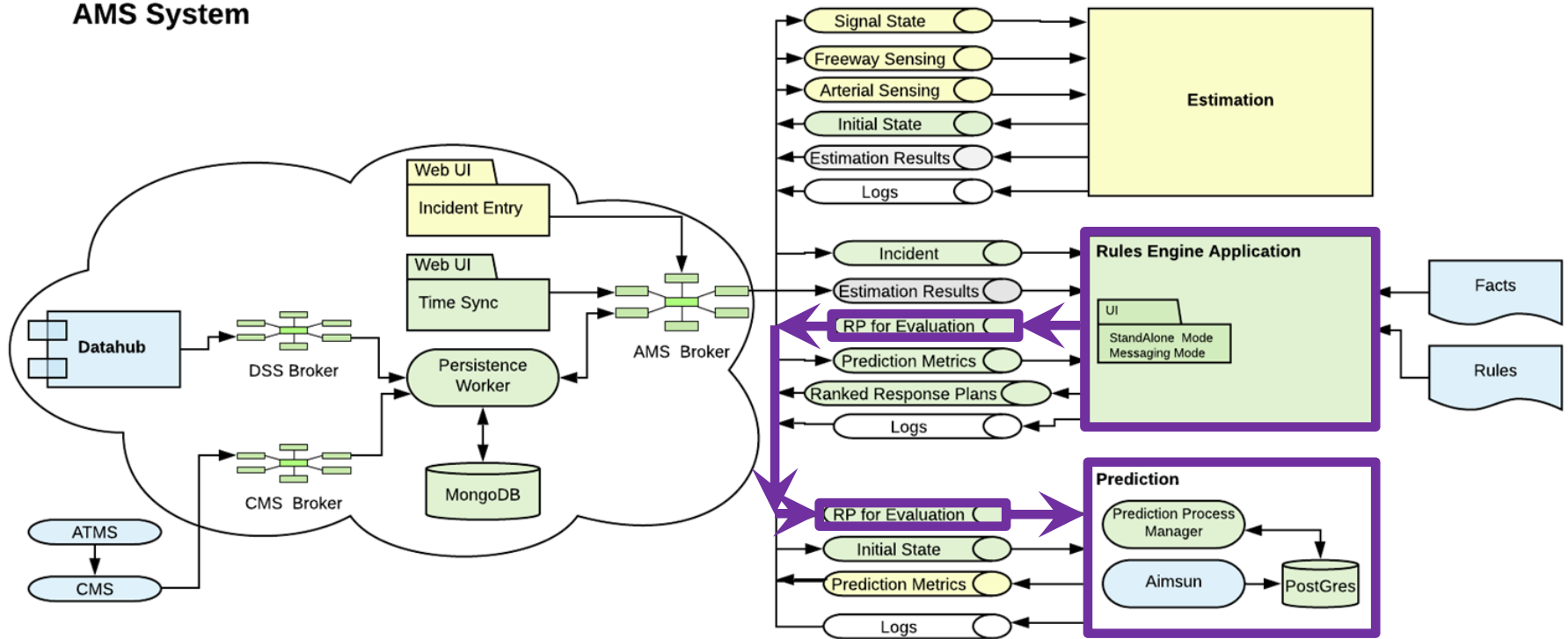
## AMS System



# Test Launch Demo Overview

58

## AMS System

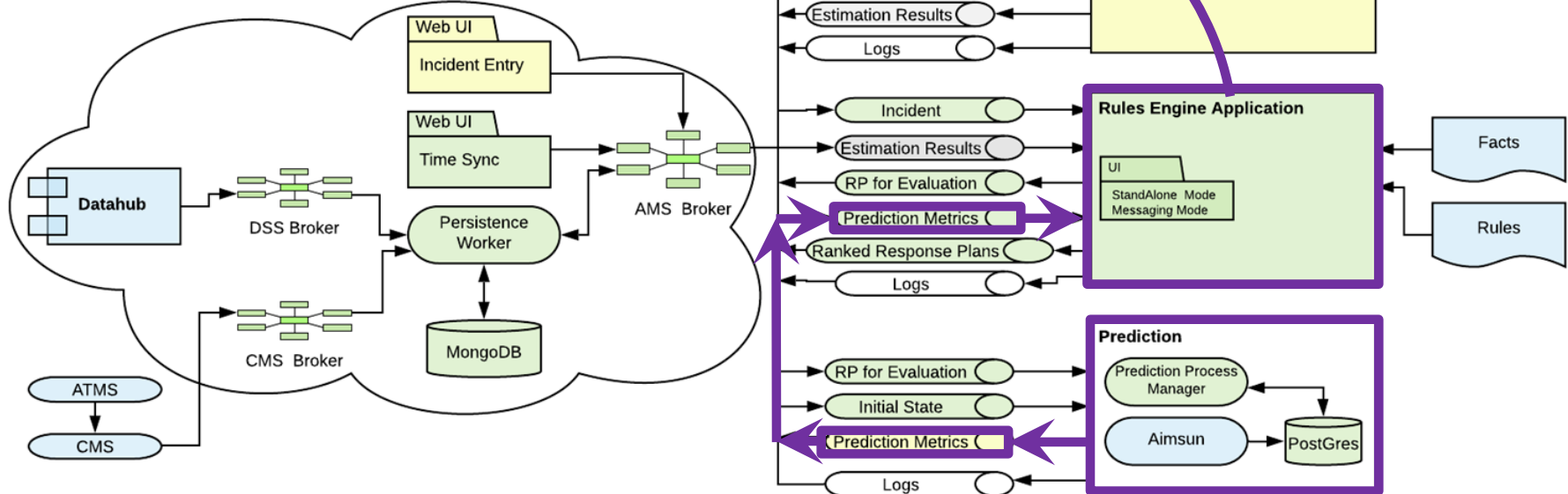


# Test Launch Demo Overview

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## Scorecard

Incident		1,200 TR @ San Gabriel																							
Response Plan Evaluated		Incident: 10, 20, 30min, 45min, 60min, 90min, 120min																							
Evaluation Period		1:00:00 1:15:00 1:30:00 1:45:00 2:00:00																							
Number of Simulation Runs		1000																							
		Travel Times				Status - Area (Zones 3-4-5-6)				Status - Frey Mainline, HOV, Connectors				Status - Detour #1				Status - Detour #2							
		Prey				Detour				Prey				Detour				Prey				Detour			
		Upstream	Downstream	On-Ramp	Off-Ramp	Prey	Detour	Prey	Detour	Prey	Detour	Prey	Detour	Prey	Detour	Prey	Detour	Prey	Detour	Prey	Detour				
		On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp				
7737	8033	7354	57.6	29.8	11.1	102,886.0	7,558.9	4,838.9	11.1	28,495.0	2,692.4	2,393.5	11.1	5,658.9	326.9	27.0	0.0	0.0	0.0	0.0					
6962	4860	7966	55.5	19.5	11.1	102,886.0	7,558.9	4,838.9	11.1	28,495.0	2,692.4	2,393.5	11.1	5,658.9	326.9	27.0	0.0	0.0	0.0	0.0					
625	50	345	1.2	10.3	0.0	1,481.5	85.4	129.5	0.0	960.7	39.3	53.5	0.0	443.6	20.7	10.5	0.0	0.0	0.0	0.0					
5.5%	1.5%	4.8%	1.0%	34.7%	0.0%	0.0%	1.5%	0.5%	0.5%	3.4%	1.5%	12.2%	0.0%	26.7%	4.5%	38.9%	0.0%	0.0%	0.0%	0.0%					

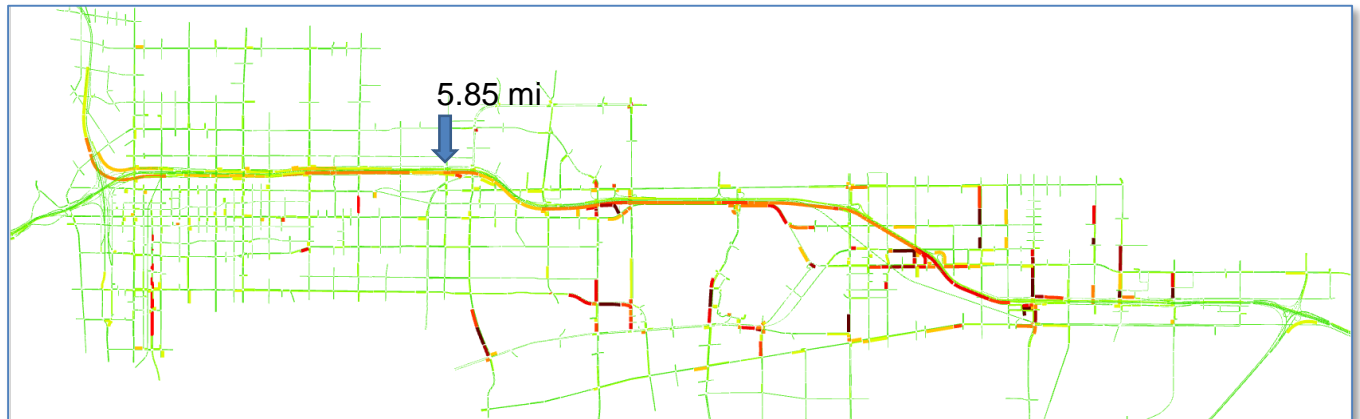


# Evaluation Results

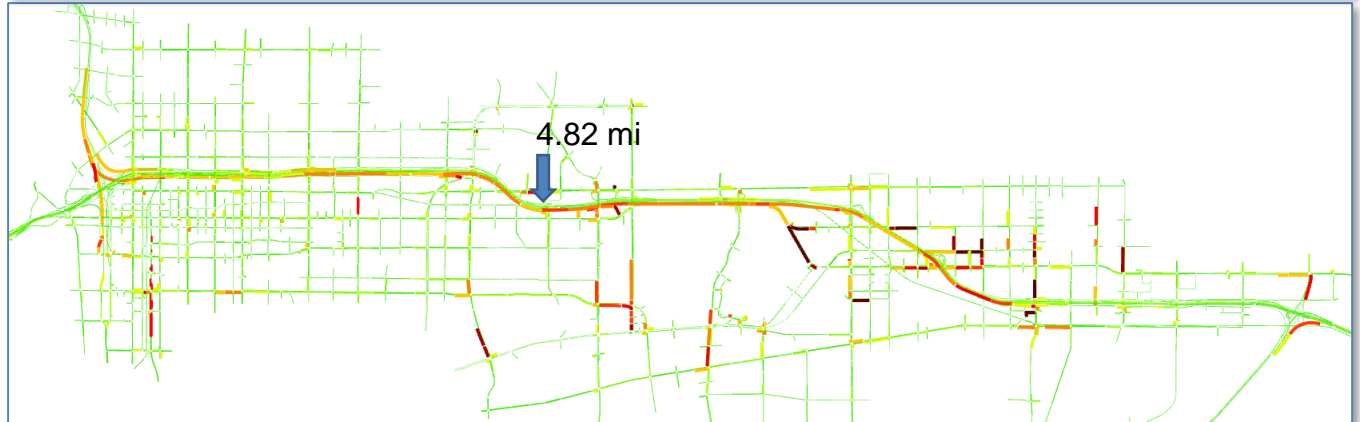
60

## □ End of 15-mph congestion area

Incident  
no response



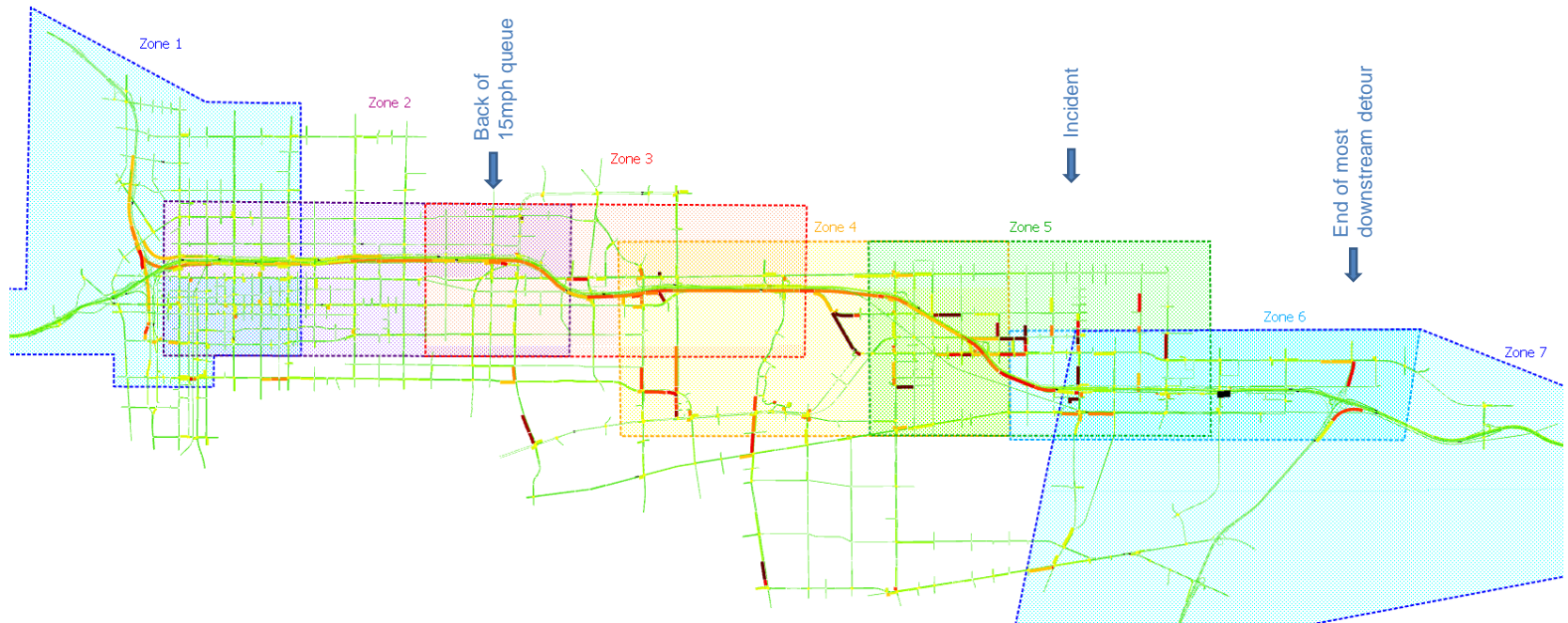
Incident  
with response



# Evaluation Results

61

## □ Evaluation area selected: Zones 3-4-5-6



# Resulting Score Card

62

Incident		I-210 EB @ San Gabriel																				
Response Plan Evaluated		WB_Art_Foothill_Michillinda_SanGabriel 135																				
Simulation Period		13:00 - 14:00 60 min																				
Evaluation Period		13:15 - 14:00 45 min																				
Number of Simulation Runs		1																				
Ramps		Screenline	Travel Times			Stats - Area (Zones 3-4-5-6)				Stats - Fwy Mainline, HOV, Connectors				Stats - Detour #1				Stats - Detour #2				Fwy Queue
Upstream	Dwnstrm		Fwy	Detour	Detour			Total	VMT /	SR-134 → Off-Ramp Detour #1 (Myrtle)				EB_Art_Evergreen_Myrtle_Myrtle				EB_Art_Colorado-Huntington_Huntington-Monrovia				Queue
Off-Ramps	On-Ramps		Queue	#1	#2			Delay	VMT /	VMT	VHT	Total	VMT /	VMT	VHT	Total	VMT /	VMT	VHT	Total	VMT /	Length
vehs	vehs	vehs	min	min	min	veh-mi	veh-hrs	veh-hrs	mph	veh-mi	veh-hrs	veh-hrs	mph	veh-mi	veh-hrs	veh-hrs	mph	veh-mi	veh-hrs	veh-hrs	mph	mi
o		8913	41.8	2.9	15.2	163,174	6,982	4,197	23.37	48,170	2,774	2,118	17.36	488	41	2	12	2,675	201	10	13.32	5.85
		9407	42.5	3.4	13.9	163,953	6,879	4,075	23.83	47,696	2,885	2,237	16.53	531	49	3	11	3,609	218	8	16.57	4.82
e		494	0.7	0.4	-1.3	779.1	-102.3	-122.1	0.46	-473.6	110.8	119.1	-0.83	42.4	8.2	0.4	-1.13	934.2	17.0	-1.3	3.25	-1.03
%		5.5%	1.8%	13.9%	-8.6%	0.5%	-1.5%	-2.9%	2.0%	-1.0%	4.0%	5.6%	-4.8%	8.7%	20.0%	17.2%	-9.4%	34.9%	8.4%	-13.9%	24.4%	-17.6%

## Productivity - Network

Sub-Score **2,001** veh

Normalization Value **1,000** veh/hr

Normalized Sub-Score **150** points

Weight **0.200**

Score **46.0** points

## Travel Time Improvements

**-0.5** min

**-5.0** min

**10** points

**0.300**

## Network Performance

**0.46** mph

**2.00** mph

**23** points

**0.200**

## Productivity - Fwy & Detours

**503.0** veh-mi

**2,000.0** veh-mi/hr

**19** points

**0.200**

## Fwy Queue Improvements

**-1.03** mi

**-1.0** mi

**103** points

**0.100**



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# Software Development

# Software Development Progress

64

- **Main focus on test launch**
- **Integration of Rules, Prediction, and communications protocols**
- **Resolving issues with message content between system components**



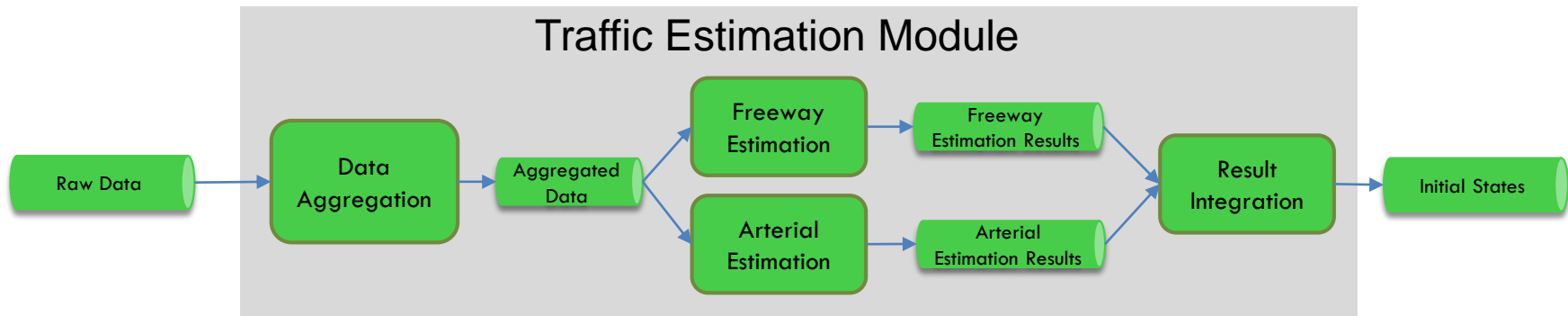
# Traffic Estimation

65

## □ Current Progress

### ▣ Finished the work flow

- Raw Data → Data Aggregation → Freeway & Arterial Estimation → Result Integration → Initial States



- Freeway estimation generates speed and density
- Arterial estimation generates 5-min average queues

66

# Data Quality

# I-210 – Freeway Data Quality

67

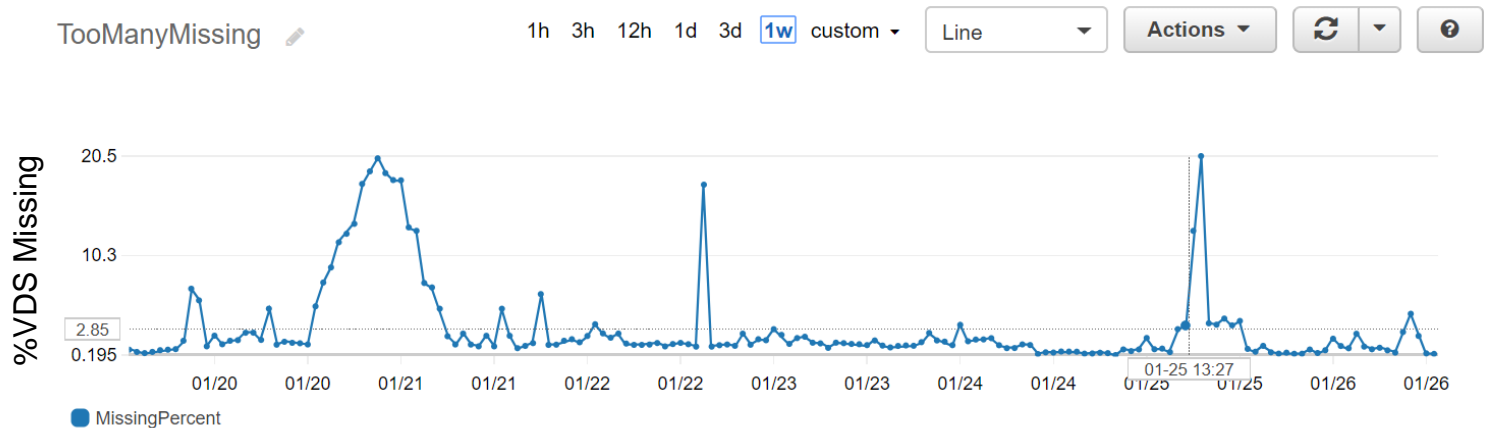
- **Recent sensor data availability is excellent**
  - ▣ Daily checks use PeMS 5-min data
  - ▣ Weekly checks use PeMS %Observed

Freeway Section	Direction	Sensor Availability Percentage	Sensor Availability Target	Past Target Accomplishment	Date of Degradation
I-210 PM 22.6 - 25	East	80.0%	90%	na	na
	West	90.3%	90%	1/18/2020	
I-210 PM 25 - 43.25	East	92.9%	90%	1/11/2020	
	West	94.1%	90%	1/11/2020	
SR-134 PM 11.4 - 13.5	East	99.5%	90%	1/18/2020	
	West	96.6%	90%	1/18/2020	
I-605 PM 22.93 - 28	North	97.5%	90%	1/18/2020	
	South	89.6%	90%	10/12/2019	10/19/2019

# Real-time I-210 Freeway Data Quality

68

- **Beginning to assess next level of data quality**
  - ▣ Real-time data quality is more difficult, but we are finally ready
- **Real-time feed for PeMS D7 data on I-210 corridor**
  - ▣ Occasional data drops noted
  - ▣ Monitoring percentage of VDS missing every 30 seconds



# Arterial Detector Inventory Check

69

- **Runs daily to ensure our detector configuration is up-to-date**
- **Checks all detector inventory messages retrieved from the data hub**
  - ▣ Currently for both LACO and Arcadia
- **Is able to detect the following:**
  - ▣ New/removed detectors
  - ▣ Configuration changes: name, lane number, direction, etc.



# Arcadia Data Quality

70

## □ **Detector Inventory**

- ▣ 543 detectors at 52 intersections
- ▣ 474 of them (at 36 intersections) are on detour routes

## □ **Detector Health**

- ▣ Overall detector health rate (on detour routes) was above 80% in the past weeks
- ▣ Major issue for “bad” detectors
  - Keep reporting zero values
- ▣ Intersections with “bad” detectors
  - Foothill / Second
  - Huntington / Baldwin
  - Huntington / Sunset
  - Huntington / Santa Clara
  - Duarte / First
  - Huntington / Second

# LACO Data Quality

71

## □ Detector Inventory

- ▣ 123 detectors at 21 intersections
  - 54 from LACO, 43 from Monrovia, and 26 from Duarte
- ▣ 107 of them (at 18 intersections) are connected to KITS and on detour routes

## □ Detector Health

- ▣ 94% health rate for those 54 detectors in LACO
- ▣ 63% health rate for those 43 detectors in Monrovia
  - Issue for “bad” detectors: keep reporting zero values
- ▣ 0% health rate for those 26 detectors in Duarte
  - Last inventory message from January 9<sup>th</sup>, 2020
  - Last detector data from December 31<sup>st</sup>, 2019
  - We were told that local/remote port numbers have been updated for these intersections
  - Is it a KITS configuration issue? Is there an error message?

# Stakeholder Progress

# Response Plans – Stakeholder Progress

73

## □ **Pasadena (80 CC Intersections)**

- 43 intersections are programmed with Connected Corridors flush plans
- New signal (PA 380) at Parsons Lot now operational
- Walnut and Pasadena: new 2070 controller and updated timing sheet

# Response Plans – Stakeholder Progress

74

- **LA County (6 CC Intersections)**
  - ▣ All 6 timing sheets completed and ready for implementation
  - ▣ Refinement of plans at Mt Olive intersection
- **Monrovia and Duarte (17 CC Intersections)**
  - ▣ 3 revised signal plans completed along Huntington



# Response Plans – Stakeholder Progress

75

## □ **Arcadia (19 CC Intersections)**

- ▣ 17 intersections are programmed with Connected Corridors flush plans on Huntington, Foothill, and Santa Anita
- ▣ 2 additional intersections awaiting installation of 2070 controllers on Colorado
- ▣ Additional detectors added in the field (ongoing)
- ▣ In coordination with LA County: Michillinda @ California Bl / Sunset Bl
  - New 2070 controller
  - Connected to Arcadia system

# Response Plans – Stakeholder Progress

76

- **Caltrans TSMSS (15 CC Intersections)**
  - ▣ Completed bench testing of flush plans
  - ▣ Most updated signal plans provided to PATH
  - ▣ Next steps
    - Three signal plans to be sent from Caltrans to PATH
    - Signal plans to be loaded onto controllers



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## Next Steps

# Next Steps

78


- ❑ **Continue systems integration**
- ❑ **Include ATMS and CMS into the next demo**
- ❑ **Include estimation in the next demo**
- ❑ **Develop plan for demonstration at 2020 ITS World Congress**



# Thank You



**Thank You**  
**and**  
**Next Meeting**  
**(Suggest Tuesday March**  
**10<sup>th</sup> at LA County)**

A decorative horizontal bar at the bottom of the slide, consisting of a red rectangular segment on the left and a blue rectangular segment on the right.