Connected Corridors
Face-to-Face Meeting

Tuesday, December 10th , 2019
1:30 – 3:30 pm
LA Metro

Agenda

- **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 Caltrans TMC – Tuesday January 28th
  - (Monrovia, Duarte, LA Metro, Caltrans, County, Arcadia, Pasadena)

Happy Holidays!

Caltrans Metro Foothill Transit SCAG SGVCOG

Rafael Molina – New Head of Operations

- New Caltrans D7 Deputy District Director of Operations
  - Started as a student assistant
  - Senior Transportation Engineer
  - Chief for the Office of Corridor Manage ment (South)
- Bachelor of Science in Civil Engineering, a registered Civil Engineer and a licensed Project Management Professional
- In his spare time, he enjoys traveling, attending jazz concerts and sporting events
- Loves Connected Corridors (OK Joe added that with editorial flair and license)

CC Outreach with FHWA and other DOTs

Announcement: FHWA-hosted Informational Meeting

"Open Source Collaboration for Integrated Corridor Management (ICM) Systems"
Tuesday January 14, 2020 1-4 p.m.

NCTCOG – Natalie Bettger, Tom Bamonte and possibly Kapsch as their consultant – 3
NYSDOT – Jim Davis, John Bassett and two from ICF – 4
TxDOT – Jianming Ma and possibly Joe Hunt - 2
Caltrans – Nick Compin, Brian Sim, Ahmad Sadegh - 3
PATH – Tom West and Joe Butler - 2
Arizona – Faisal Saleem, ADOT and consultant - 3
VDOT – Any McElwain and possible one more - 2
NITTEC – Athena Hutchins and Fariel Bouattoura as her consultant - 2
Transcom – Steve Levine, possibly Rob Bamford and their consultant – 1
NJTPA – Solomon Caviness - 1
NJDOT – Wasif Mirza and possibly Sal Cowan - 2
USDOT – Neil Spiller, Bob Sheehan, Ralph Volpe, Jim Hunt, Jon Obenberger, who else? - 5
I95 CC – Denise - 1
ITSA – Patrick - 1
IGC – Behnam Hosseini – 1
TSS – Matt Jules - 1

I-210 Overall Summary

New Schedule – Till Launch (Page 1 of 2)

- ATMS Incident Management to Production – December 2019
- Complete Call for Projects Procurement – January 2020
- Deploy DSS Test System – February 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

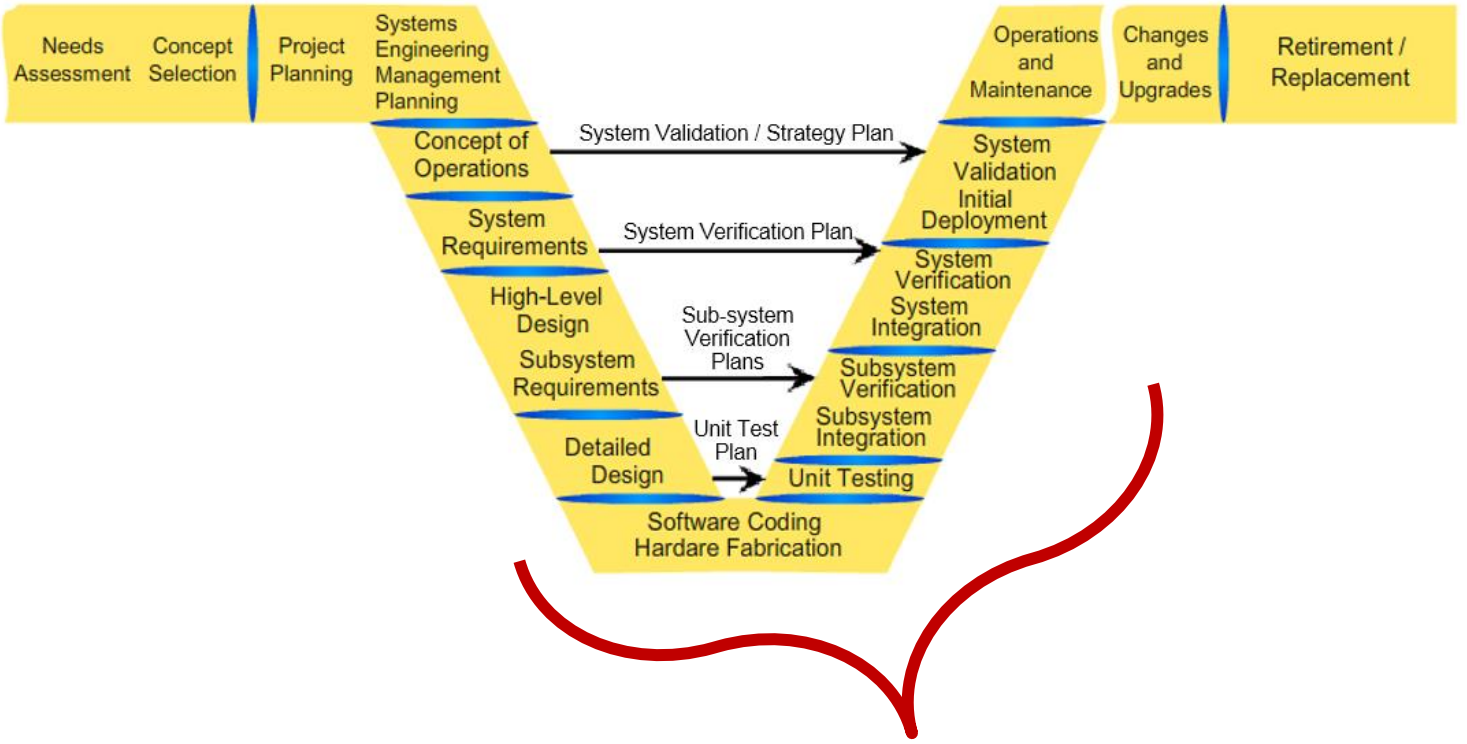
New Schedule – Till Launch (Page 2 of 2)

- 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

- **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



Data Quality Metrics – Inventory and Values

- **Freeway**
  - Real-time feed for PeMS D7 data is now stable
  - No major data drop for about two months
- **Arterial**
  - Starting with next face to face will report data quality and inventory changes for:
    - Arcadia
    - County
    - Caltrans (Stretch Goal)
- **Signal Timing Plans**
  - Caltrans completed bench testing of the signal timing plans

DSS Test Launch - Goals for February 2020

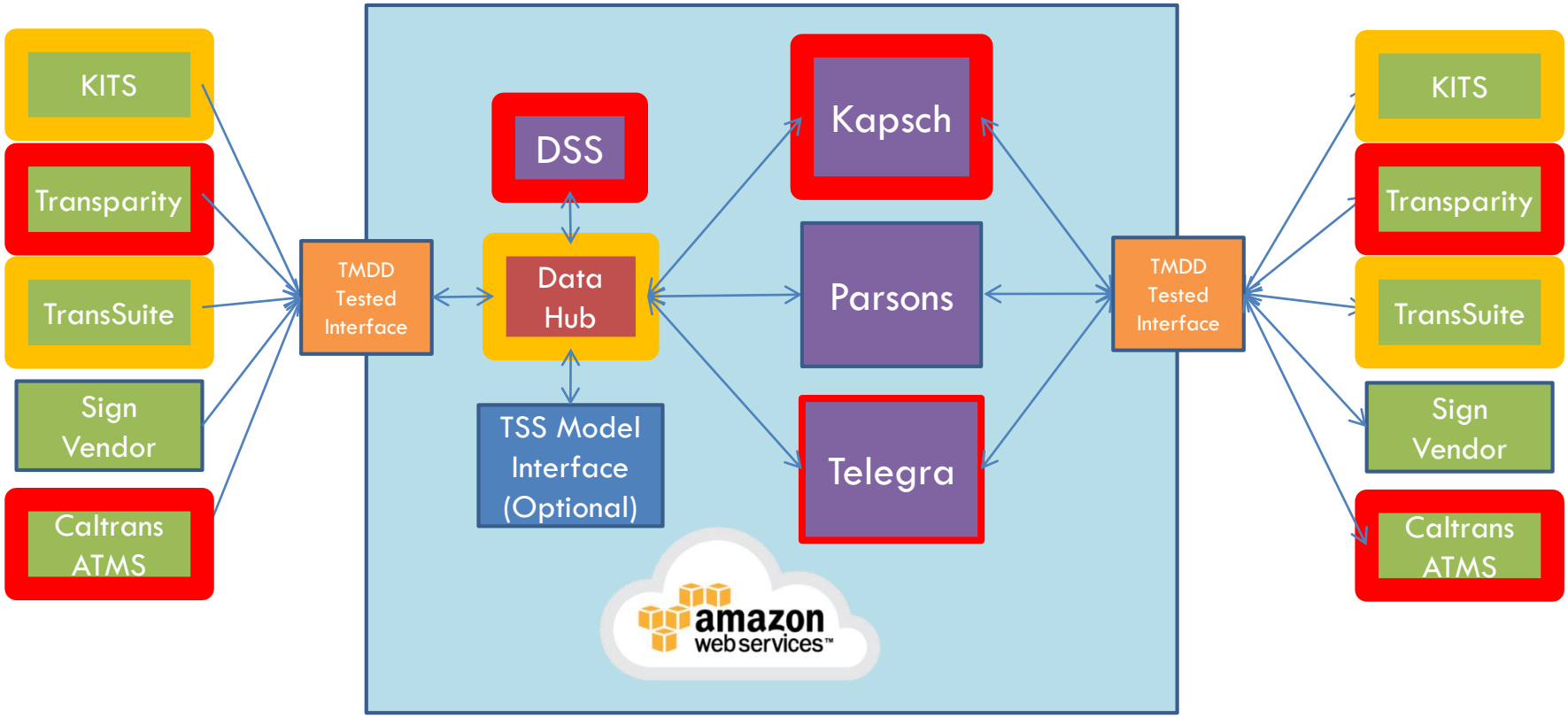
- **Anthony to discuss in more detail later in presentation**
- **Expected outcomes**
  - Response plans and metrics for review by stakeholders
  - Metrics for use in benefits analysis
- **Functions running real-time 24/7**
  - Capture incidents and data on freeways and arterials
  - Requires ATMS in 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

Refinement of Workflows and Metrics

- **Refinement of Detailed Workflows**
  - Meeting with Anthony, Brian, Mort, Allen, and David on Dec 19th
  - Weekly calls with Anthony, Francois, Mort and David
  - Continued work on response plans
- **Metrics**
  - Meetings with TSS (Aimsun) yesterday and in January
  - A metrics score card

Incident			I-210 EB @ San Gabriel																			
Response Plan Evaluated			WB_Art_Foothill_Michillinda_SanGabriel 135																			
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** SR-134 or I-605 --> Off-Ramp Detour #1				**Stats - Detour #1** WB_Art_Foothill_Michillinda_SanGabriel				**Stats - Detour #2** None			
	Upstream Off-Ramps *vehs*	Dwnstrm On-Ramps *vehs*	*vehs*	Fwy Queue *min*	Detour #1 *min*	Detour #2 *min*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*
No-Response Scenario	7737	4610	7154	57.6	29.8	Null	160,886.0	7,558.3	4,834.9	21.29	28,495.0	2,692.4	2,303.5	10.58	1,658.9	326.9	27.0	5.07	Null	Null	Null	Null
Response Scenario	8162	4662	7496	55.5	19.5	Null	162,367.5	7,472.8	4,715.5	21.73	29,455.2	2,653.1	2,250.1	11.10	2,102.5	306.2	16.6	6.87	Null	Null	Null	Null
Change	425	52	342	-2.1	-10.3	0.0	1,481.5	-85.4	-119.5	0.44	960.2	-39.3	-53.5	0.52	443.6	-20.7	-10.3	1.79	0.0	0.0	0.0	0.0
Change %	5.5%	1.1%	4.8%	-3.6%	-34.7%	0.0%	0.9%	-1.1%	-2.5%	2.1%	3.4%	-1.5%	-2.3%	4.9%	26.7%	-6.3%	-38.3%	35.3%	0.0%	0.0%	0.0%	0.0%

C2C Interface Implementations - Status



Four areas of focus over the years

- **Environment**
  - Cloud, languages, tools, etc.
- **Deployment and Testing**
  - Processes that are reliable, scalable, fault tolerant
- **Actual Functionality**
  - Data Hub
  - DSS
  - Data Interfaces
- **Architecture**
  - How everything above works together
  - Specifications for interfaces

Systems Development and Integration

- **Production system initial stand-up**
  - Preparing production system initial stand up. Components are up and ready for final configuration, final workflows, CMS deployment, and AMS system integration. Networking currently disconnected from the outside world.
  - Awaiting move of ATMS incident capture functionality to production
- **Improve system resiliency**
  - Began use of elastic load balancing with automatic recovery after failure for data hub processors
  - Have tested failure of mongo database and automatic startup of new one in clustered environment

Systems Development and Integration

- **Improve release frequency – goal is new release to test every week**
  - Completed implementation of containerization strategy and use of AWS Elastic Container Service with data hub processors as first launch candidate.
    - Will improve developer speed, release quality, and system failure recovery time and resilience.
  - Completed first version of configuration and credentials services modifications to support containerization strategy.
    - This will allow deployments to be more generic with regards to environment. i.e cloud in different districts and even to developer workstation
- **Support AMS efforts for January launch**
  - Continued implementation of estimation, prediction, rules launch
  - Anthony to discuss later

Systems Integration

- **Pasadena**
  - Documentation review completed. Received test endpoint from McCain. Verified base communication contracts seem correct.
  - Waiting for certificate update to allow system integration test.
- **LA County**
  - Receiving data in data hub. Ongoing review of data and operation.
- **Arcadia**
  - Receiving data in data hub. Ongoing review of data and operation

System Integration

- **Corridor Management System (Kapsch)**
  - Preparing for initial production deployment.
- **ATMS**
  - D7 ATMS modified to support I-210 CC system – May 2019
  - Worked with PATH to support testing & refining on development server - May 2019 to current
  - Working on the deployment of the I-201 CC support & other functions on the production server
  - Timeline to deploy on the production server – Dec 10-12, 2019

I-210 Connected Corridors
Face-to-Face Meeting

LA Metro, One Gateway Plaza, 3rd Floor Union Station
Conference Room, Los Angeles, CA 90012

Tuesday, December 10, 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

Dec 10, 2019

Project Objective

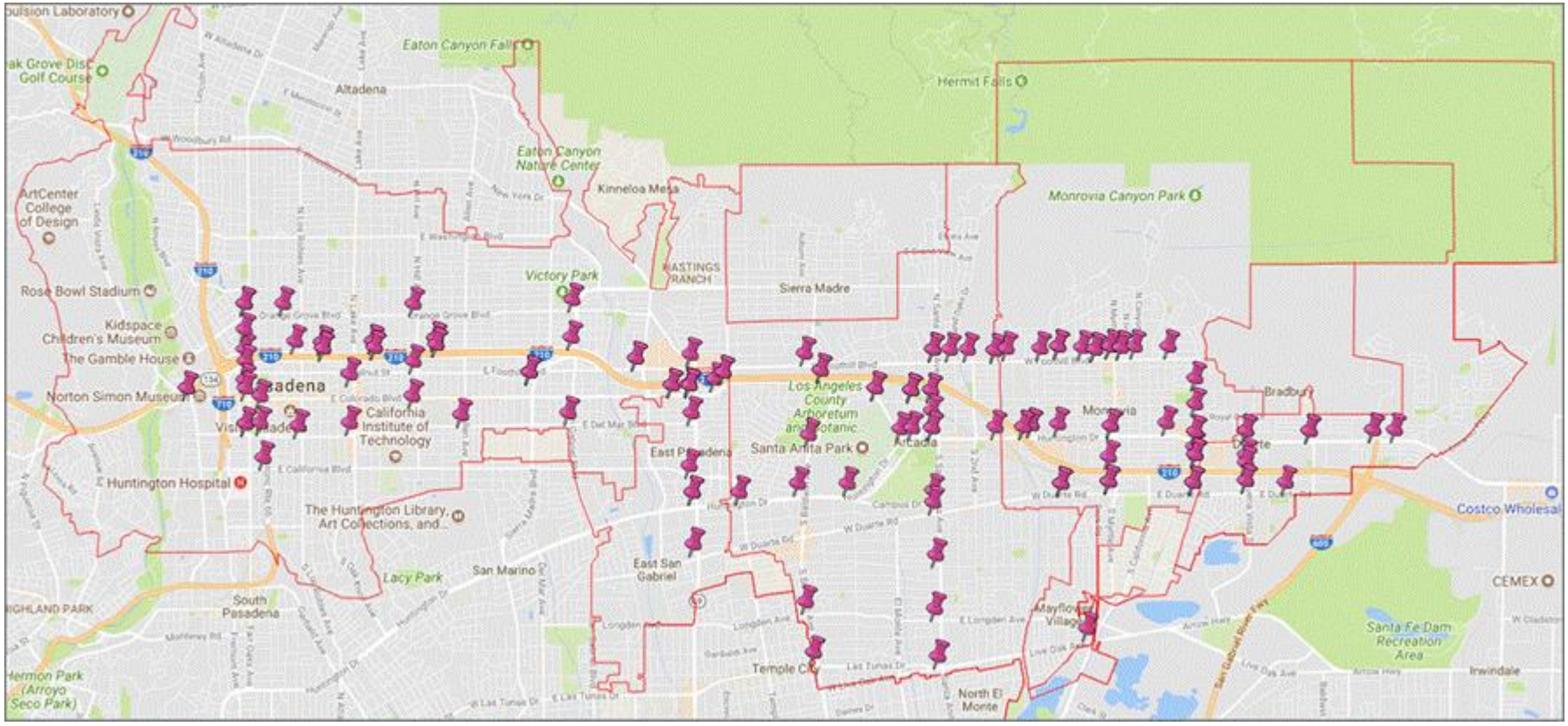
- Assist Caltrans D7 to manage the execution of the 9 arterial ITS improvement projects

#	Package Description	Contract #	Contract Status
1	Bluetooth – Iteris Velocity	07A4470	Completed
2	Bluetooth – BlueToad	07A4477	Awarded, in Progress
3	New Controller Cabinets	07A4761	Advertised on 9/26/19
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	Under DPAC Review
8	Advanced Traveler Information Systems	TBD	DMS Procurement– Awarded 12/2/19 DMS Integration – Advertised 11/14/19 Infra. Installation – in Progress Static Signs – Caltrans, in Progress
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.)

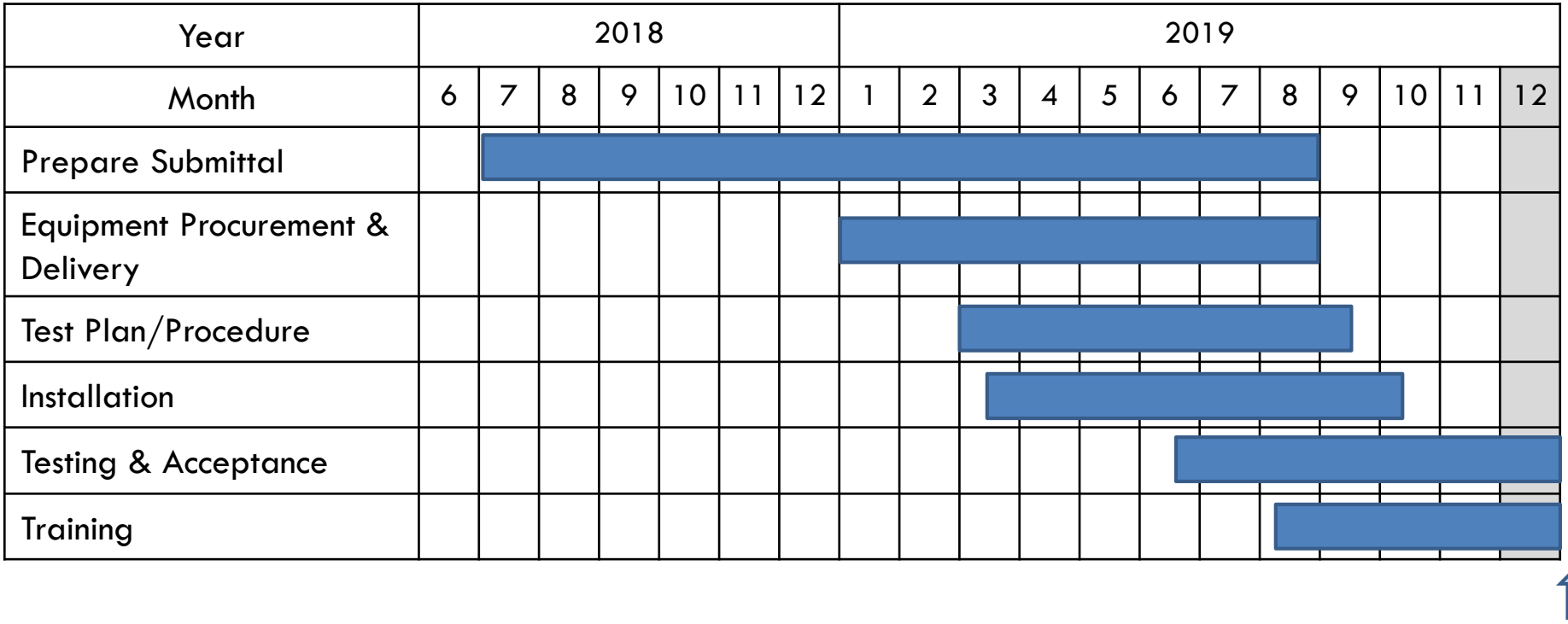


UPDATE ON

PACKAGES 1-9

Dec 10, 2019

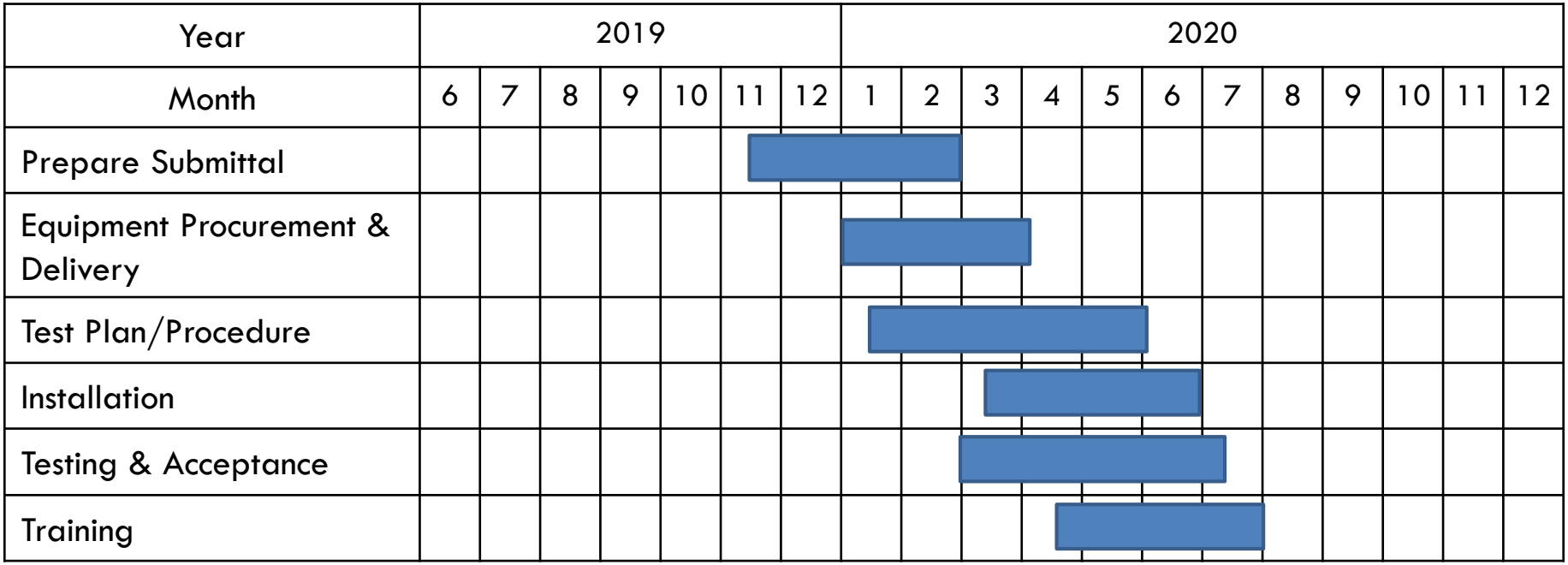
Target Timeline - P1, P2, P4, P6, P9



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

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

Target Timeline - P3, P5, P7, P8



P3: Advertised by DPAC, to be awarded
P5: Material Submittal & Procurement Phase
P7: Being Reviewed by DPAC
P8: DMS procurement – awarded
DMS integration – advertised
DMS design & installation – handled by stakeholders, in progress
Static Sign – handled by Caltrans, in progress

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

Update on 9 Packages

Pkg. #	Pkg.	Contract #	Project Status
1	Bluetooth – Iteris Velocity	07A4470 PTM	• NTP: 7/10/2018 • Kick-off Meeting: 7/30/2018 • Submittal Approved: 8/16/2018 • Installation & Testing Completed on 5/29 & 5/30/2019 • Accepted by Arcadia, Documents Submitted • Completed

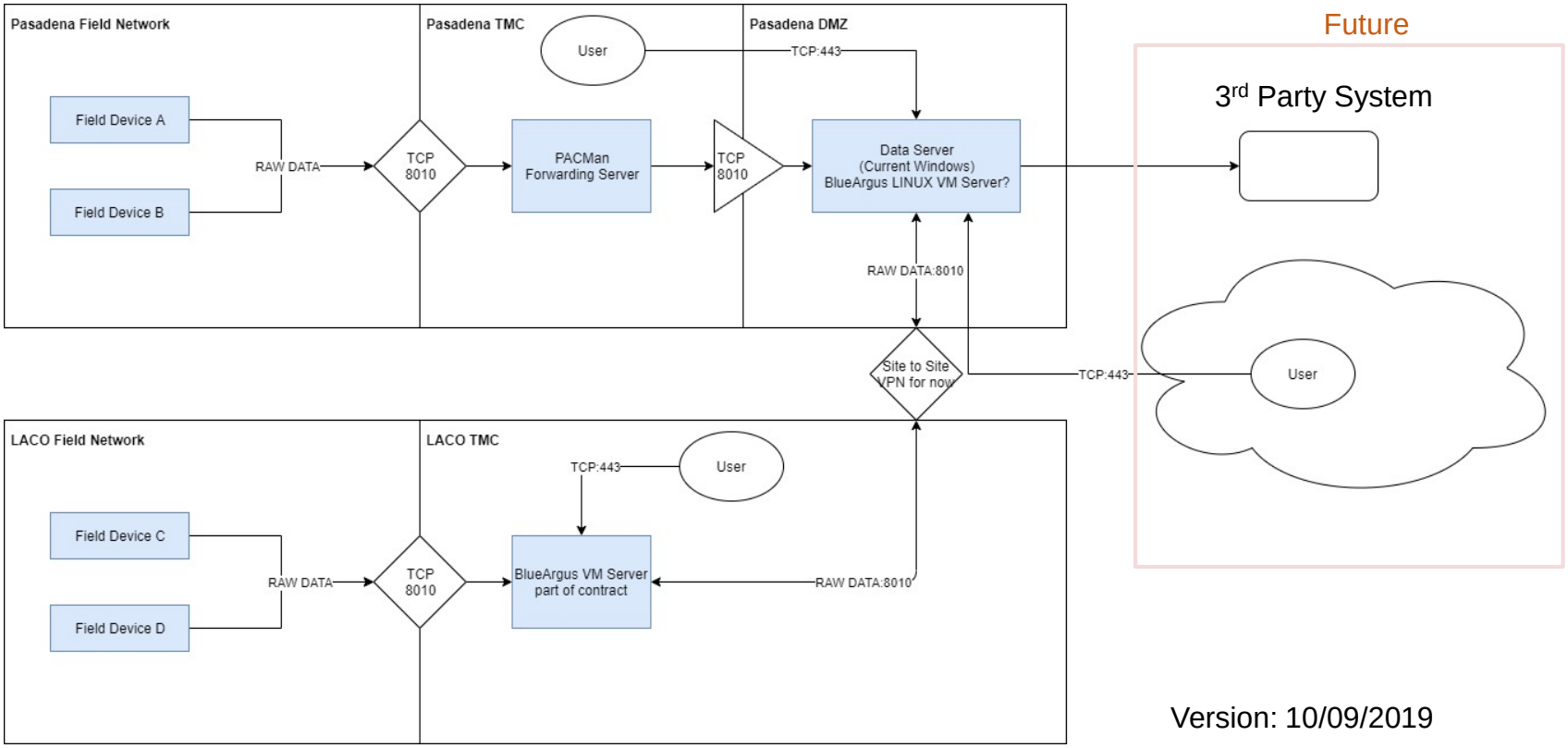
Update on 9 Packages

Pkg. #	Pkg.	Contract #	Project Status

2	Bluetooth – BlueToad	07A4477 DBX	• NTP: 7/10/2018
			• Kick-off Meeting: 7/30/2018
			• Submittal Approved: 10/12/2018
			• Installation:
			  • Field: 11 out of 22 locations done; remaining 11 locations in Pasadena to be scheduled
			  • Server: LA County VM server configured on 5/15/19; architecture agreed on 10/9/19,
			  • Stakeholders:
			  • (1) Pasadena review hardware/software specs
			  • (2) Pasadena & LA County: set up VPN connection
			  • (3) Caltrans: evaluate cost change;
			  • Contractor: schedule TMC & field installation upon approval
			• Test reports: to be submitted after installation
			• Expected to be completed: Jan 2020 (90%)

Update on 9 Packages

- **P2 - BlueToad Travel Time System – Comm. Architecture**



Version: 10/09/2019

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 • Cancelled by DPAC in the week of 3/15/19 • **Advertised: 9/26/19** • **Received the bid** • Expected to be awarded by: Jan 2020 (together with other pending packages) • Expected to be completed: 2nd Quarter, 2020

4	Communication Upgrades	07A4479 Kanaan Construction	• NTP: 7/13/2018
			• Kick-off Meeting: 7/30/2018
			• Submittal & RFI Approved: 5/6/2019
			• Equipment procured
			• Installation: in-progress
			  • Status Tracking: https://airtable.com/shrRq9JBFpftRKBgq
			  • 4 LA County, 20 Monrovia, 2 Arcadia, 8 Duarte: done
			  • 1 Duarte: CAT6 cable pulling – being handled by LA County
			• Testing & Acceptance: in progress, reports to be submitted
			• Expected to be completed: December 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 but Required hardware/firmware changed per Stakeholder Comment
			• Contractor revised price estimate ($121,049.50) lower than original amount ($171,600.00) – reviewed & approved by stakeholders
			  • Arcadia
			  • Pasadena
			  • LA County
			  • Caltrans
			• Material Submittals – in progress
			• Materials Procurement – to be started
			• Installation Permits – in progress
			• Est. Duration: 6 months
			• Expected to be completed: 2st Quarter, 2020

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status

6	Video Detection System	07A4481 Traffic Loops Crackfilling, Inc	• NTP: 7/10/18
			• Kick-off Meeting: 7/30/18
			• 10/9/18: Conducted Site Survey
			• 10/18/18: Submittal approved
			• Installation:
			  • 21 out of 22 installations are completed (2 LA County, 5 Monrovia, 3 Arcadia, 8 Pasadena, 3 in Duarte)
			  • 1 location in Pasadena: conduit too small. Proposed action is approved. Installation: waiting on the schedule for the boring company.
			• Testing & Reports – Testing to be scheduled
			• Expected to be completed: Jan 2020 (90%)

Update on 9 Packages (cont.)

Pkg. #	Package Name	Contract #	Project Status
7	Data Communication Module and Video Detection Software Upgrade	07A4601	• Disqualified: Bids came above the SB limit (314k). • Originally cancelled by DPAC; • Revised Package being reviewed by DPAC • Expected to be advertised by: Dec 2019 – Jan 2020 • Expected to be awarded by: Late Jan. 2020 • Est. Duration: 6 months • Expected to be completed: 2nd Quarter, 2020

Update on 9 Packages (cont.)

Pkg. #	Pkg.	Contract #	Project Status

8	Advanced Traveler Information Systems	N/A	• DMS Procurement (21 locations)
			  • Advertised: 10/25/19
			  • Awarded: 12/2/19
			  • Scheduling the Kickoff meeting
			• DMS Integration
			  • Advertised: 11/14/2019
			  • To be awarded (est.): Dec. 2019
			• DMS Design & Infrastructure Installation (21 Locations)
			  • Handled by stakeholders
			  • 17 Pasadena – in progress ($13K – 14K per location)
			  • 2 Caltrans – in progress
			  • 2 LA County – 1 year backlog (Oct. 2020, $120K), to be funded by Metro
			• Static Sign Procurement
			  • Ordered by Caltrans Maintenance Group: Jul. 2019
			  • Take 9-12 months
			• Expected to be completed: 2nd – 3rd Quarter, 2020

Update on 9 Packages (cont.)

Pkg. #	Pkg.	Contract #	Project Status

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
			• Environmental stations
			  • Roadside study done
			  • Field installation done – 6/7/19
			  • Collect data and analyze data - ongoing
			• ODS
			  • Coordination w/ Foothill Transit & Pasadena Transit
			  • Face-to-Face Meeting 10/10/19
			  • Coordination w/ PATH
			  • Data Specification
			  • Sample Response Plan
			  • Inventory of Road Network, Signal ID
			  • Coordination w/ Caltrans
			  • Communications Architecture/Setting
			• Expected to be completed: 1st Quarte, 2020 (80%)

Next Steps

- Package 2: Get Pasadena's approval on the materials to be installed at TMC; Start field unit installation & server installation in Pasadena;
- Package 3, 7, 8: Tracking status
- Package 4: Complete installation
- Package 5: Review/approval material submittal & proceed to procurement
- Package 6: Schedule installation at 1 location in Pasadena & acceptance testing
- Package 9: Support coordination

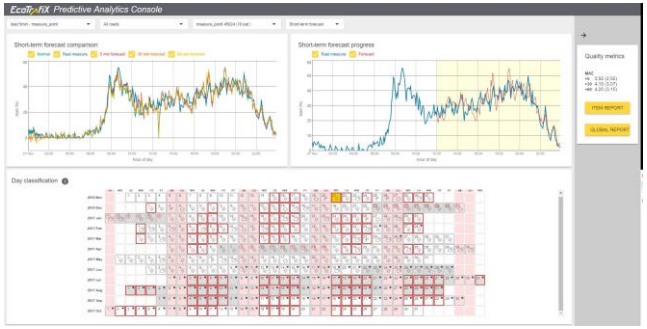
Thank You and Questions?

I-210 CALTRANS Pilot, December10, 2019

Kapsch TrafficCom

Integrated Corridor Management

EcoTrafiX Product Status

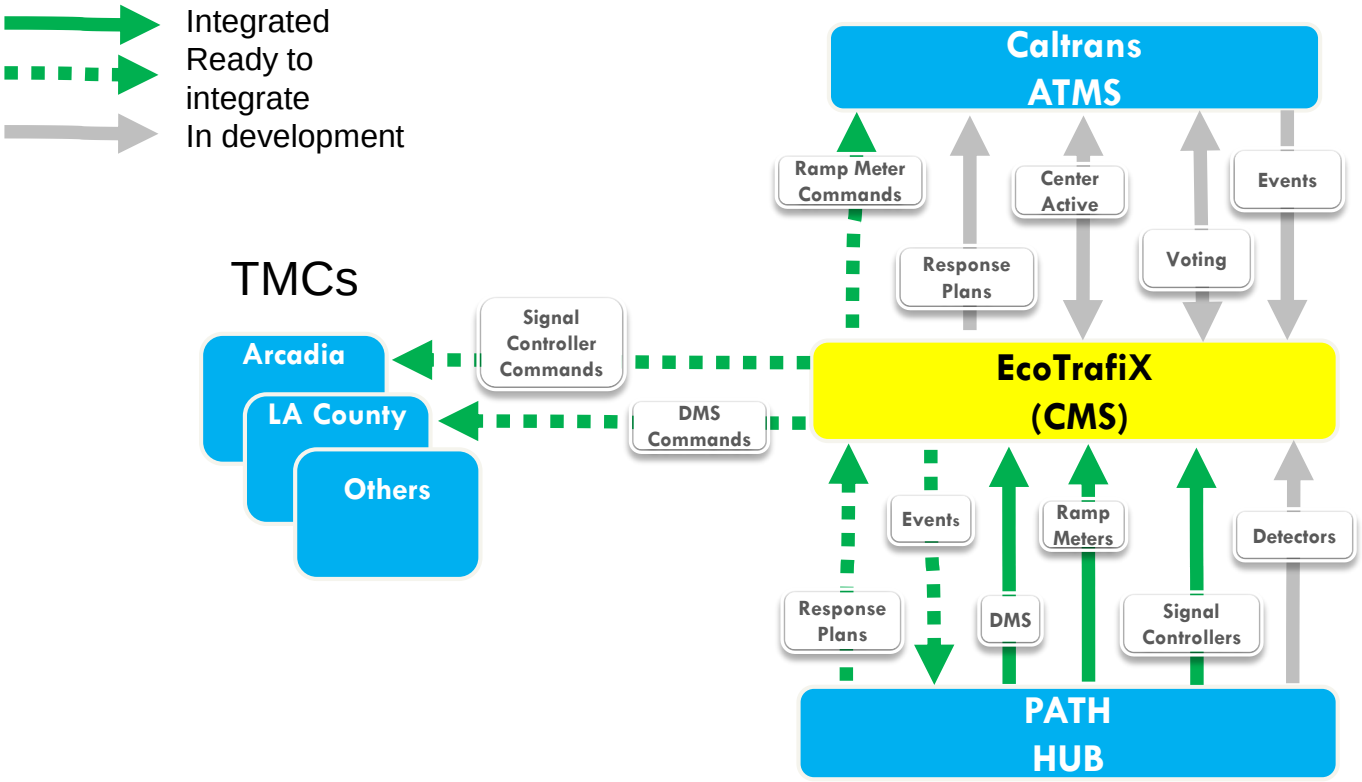


- In progress:
  - Product upgrade completed
    - Agency Response Plan Voting
    - Configure Ramp Meter icons
    - Handle unexpected inventory/status ordering
    - Handle full device inventory messages (vs. one-at-a-time)
  - Provide import/export access to EcoTrafiX Response Plans
  - Associate incidents with multiple ICM links/lanes and arterial movements (major product update scheduled December 2019) ***ON TRACK DELIVERED***

EcoTrafiX Interface Status

- Publish Events to Hub – ready to integrate with DSS
- Receive Events – simulated until ATMS is available in AWS
- Response Plans – ready to receive from DSS
- Traffic Signals live from Arcadia & some LA County signals
- DMS – receiving from Hub
- Ramp Meters – receiving from Hub (simulated from ATMS)
- Response Plan Item Execution – ready to integrate with TMCs

EcoTrafiX Status



EcoTrafiX Status

- Next Steps
  - Integrate with PATH's Hub
    - EcoTrafiX send Events to HUB
    - DSS send Response Plans to EcoTrafiX
  - Integrate with CALTRANS ATMS
    - ATMS send Events to EcoTrafiX/HUB
    - EcoTrafiX exchange Voting with ATMS
    - EcoTrafiX send Response Plans to ATMS
    - EcoTrafiX exchange Center Active with ATMS

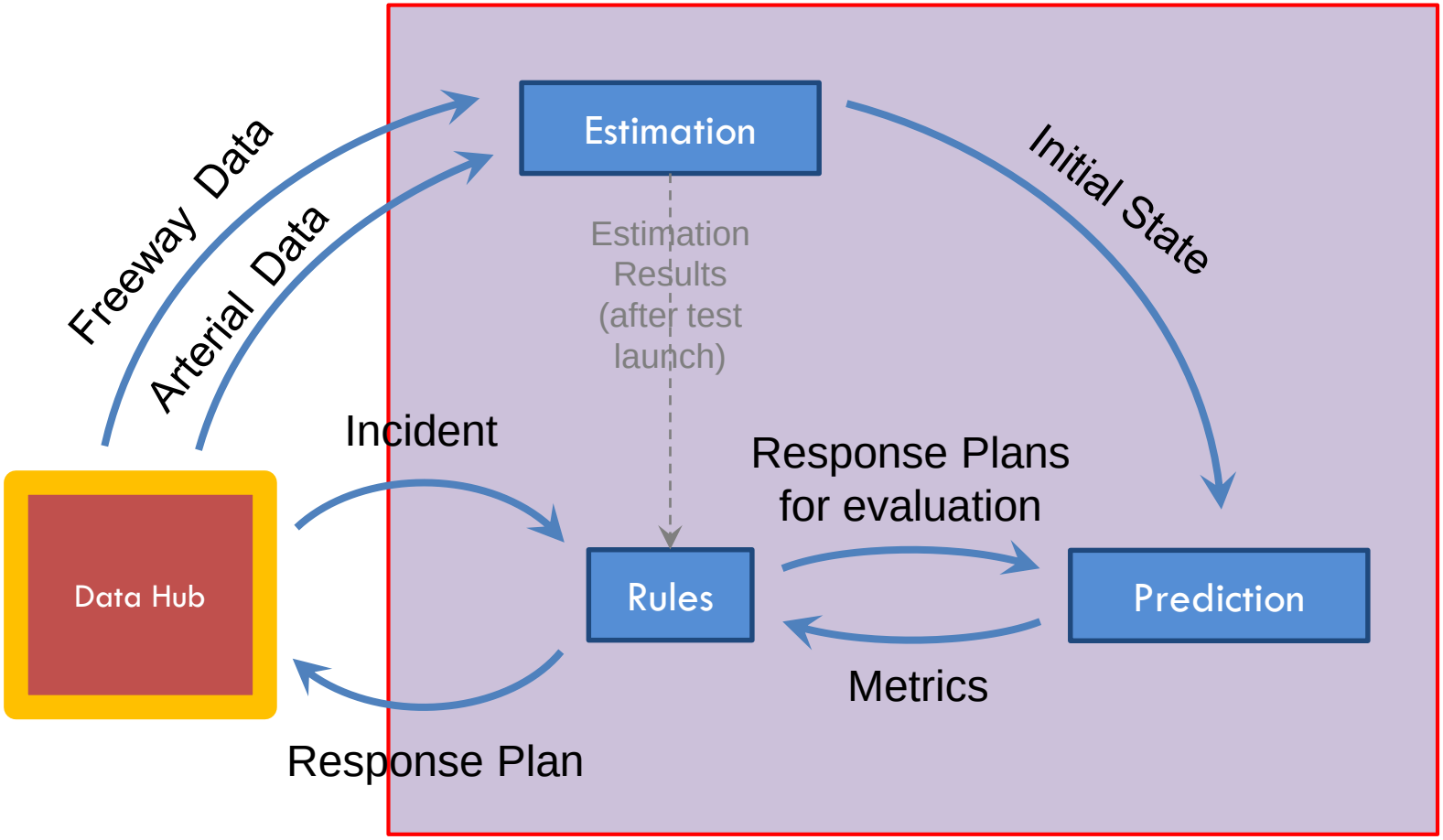
Kapsch TrafficCom

4256 Hacienda Drive
Suite 100
Pleasanton, CA 94588
USA

Timothy M. O'Leary
Director, Sales & Business Development North America
Email: timothy.oleary@kapsch.net
Phone: 657.237.4241

DSS Test Launch

Test Launch DSS



Test Launch Goals for February 2020

- **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

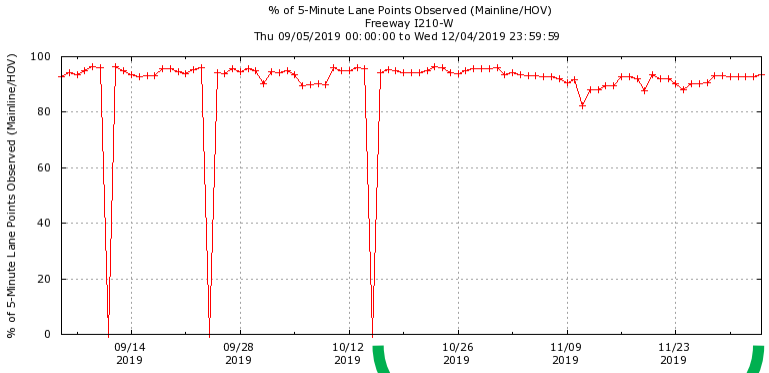
Data Quality

I-210 – Freeway Data Quality

- **Real-time feed for PeMS D7 data is now stable**

THIS IS A VERY BIG DEAL!!!!!

- **No major data drop for about two months**



Arterial Data Quality

- **Data Management and Data Quality Analysis**
  - Frequent inventory changes of detectors in Arcadia
  - LACO detector data is stable in the data hub

- **Arcadia**
  - Added phase arrows to TransSuite Map

Stakeholder Progress

Response Plans – Stakeholder Progress

- **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
- **Pasadena (80 CC Intersections)**
  - 23 intersections are programmed with Connected Corridors flush plans
  - New signal installed at Walnut & Parsons lot
  - Updated timing plan at Walnut and Pasadena

Response Plans – Stakeholder Progress

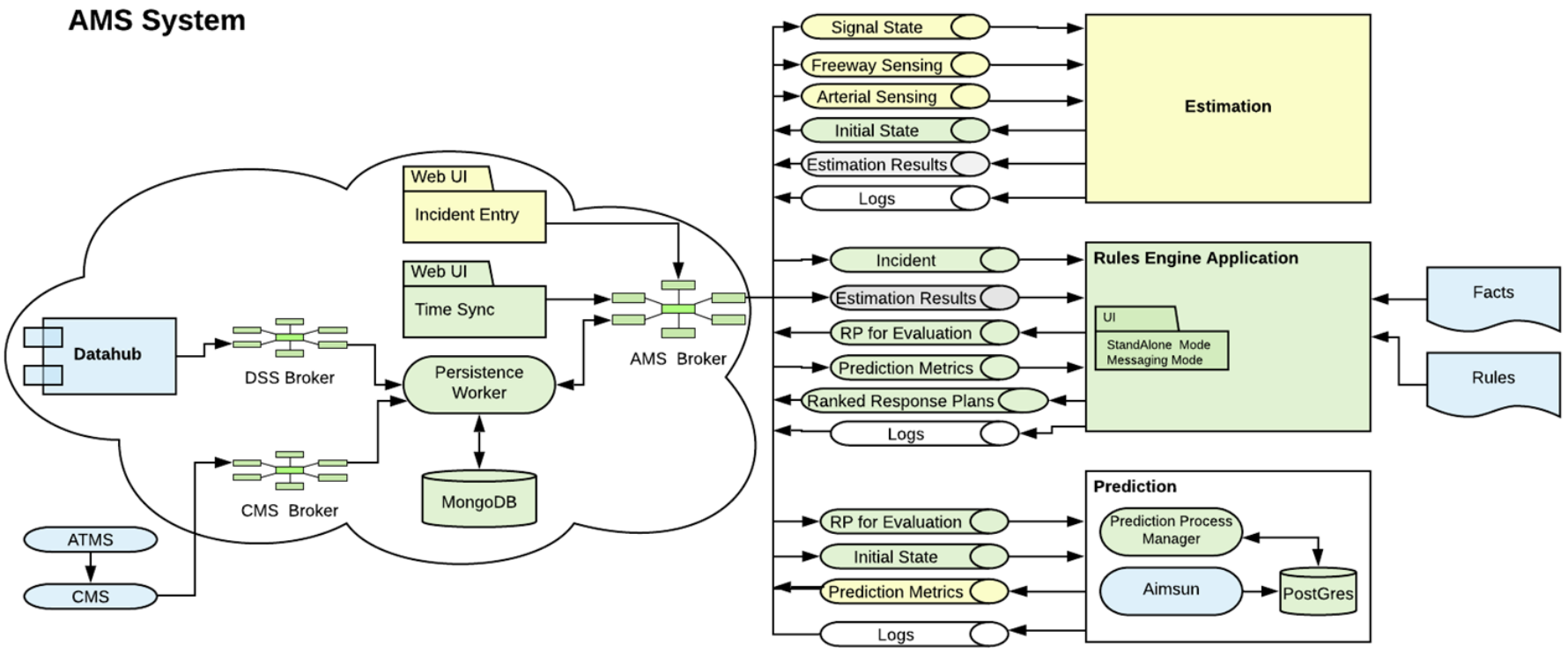
- **Arcadia (19 CC Intersections)**
  - 17 intersections are programmed with Connected Corridors flush plans on Huntington, Foothill, and Santa Anita
  - 2 additional intersections awaiting installation of 2070 controllers on Colorado
  - Continued bench testing on single test controller with success (both manual and C2C commands)
    - Discovered how TCS calculates duration of control request
    - Discovered that intersections in manual mode ignore control requests
  - Additional detectors added in the field (ongoing)

Response Plans – Stakeholder Progress

- **Caltrans TSMSS (15 CC Intersections)**
  - Bench testing of flush plans completed
  - Updated signal plans sent to PATH
  - Next steps
    - Signal plans to be loaded into TSMSS
    - Signal plans to be loaded onto controllers

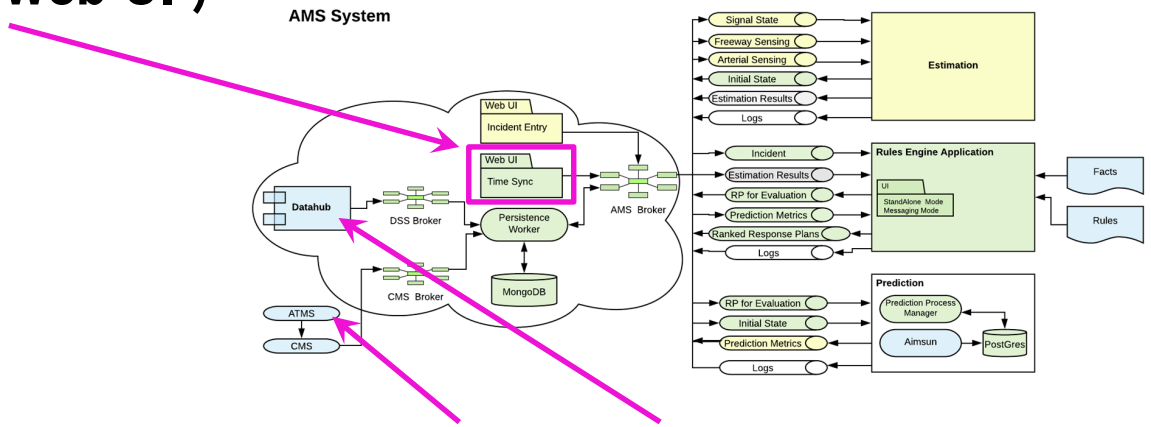
Software Development

Test Launch Software Dev Overview



Progress on Software Development

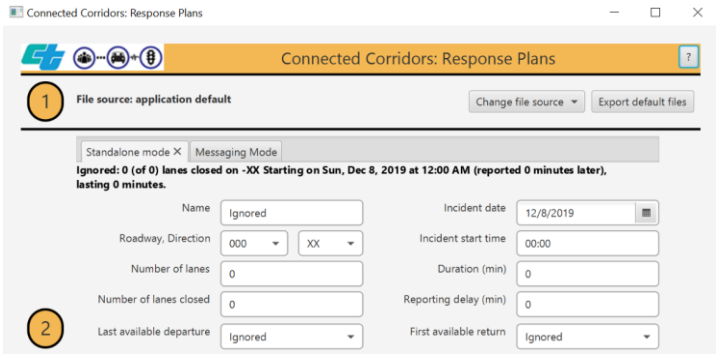
- **Ability to coordinate data and actions of prediction, estimation, and rules (Time sync Web UI)**

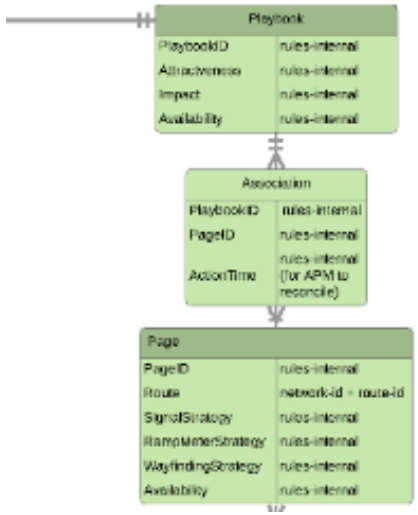


- **Ability to store all data received from ATMS and Datahub**
- **Ability to place data on proper communication pathways**
- **All communication pathways (topics and queues) are set up and configured**

Progress on Rules Engine App

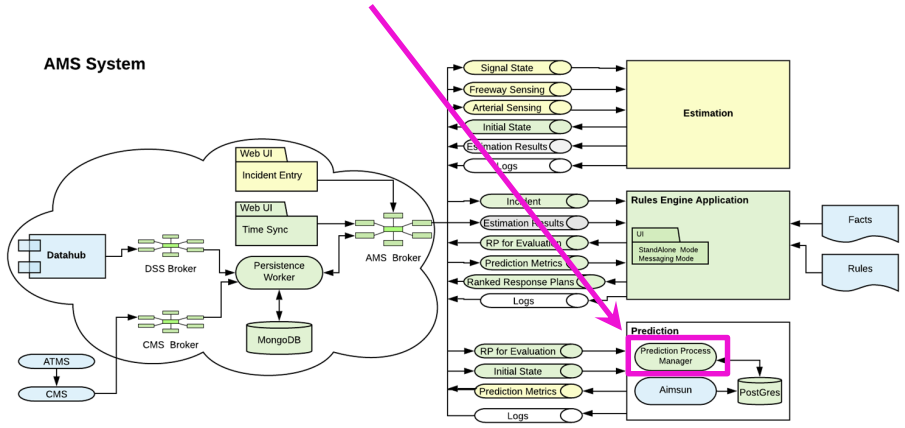
- **Rules Engine App**
  - Uses the new data model
  - Stand-alone test mode (user interface)
    - Spreadsheets that define the response plans can be edited
    - A traffic engineer can check that suggested response plans make sense
  - Messaging production mode
    - In the system, the app will interact with the communications channels without manual intervention





Progress on Prediction

- **Prediction Workflow Manager: A Java application that coordinates internal processes needed for prediction (including Aimsun)**



- **Prediction Workflow Manager**
  - Provides initial state from Estimation to Aimsun
  - Provides response plans from the Rules Engine App to Aimsun
  - Calculates scorecard from Aimsun simulation results

Progress on Estimation

- **Completed Aimsun offline simulations**
  - Needed for initial state when real-time data is unavailable
  - Needed to incorporate Aimsun OD and routing information
- **Completed function to combine arterial estimation results with freeway estimation results**
- **Completed function to generate traffic initial states usable by Aimsun**

Scorecard Example

Scorecard

- **A scorecard provides comparative metrics to evaluate one response plan scenario against an alternative scenario**
- **Each scorecard compares two scenarios:**
  - "No-Response" – Current scenario with incident in-the-field
  - "Response " – Alternative scenario with incident and response plan
- **For the test launch the statistic for comparison is a vertical screenline counting vehicles crossing from one side to the other**
- **In addition to the screenline, the scorecard presents an array of additional metrics**

Scorecard for Test Launch

- **During the test launch, there will be no deployment of a response plan in the field**
- **Therefore the only comparison will be against typical TOD operations**
- **For test launch each scorecard compares two scenarios:**
  - "No-Response" – Current scenario (TOD) with incident only
  - "Response " – Alternative scenario with incident and response plan

Scorecard for Future Launch

- **When response plans are physically deployed in the field, the meaningful comparison is between**
  - What is happening in real life
  - A viable alternative
- **Therefore the comparison will be against whatever has been deployed in the field**
- **For the future launch each scorecard compares two scenarios:**
  - "Current Response" – Current scenario with incident and current response plan, if any
  - "Alternative Response " – Alternative scenario with incident and some other response plan

Example Scorecard

WB incident near San Gabriel

- **Scorecard for WB incident near San Gabriel:**
  - TOD operations with incident
  - Same incident with135-second response plan on Foothill detour starting at Michillinda and ending at San Gabriel

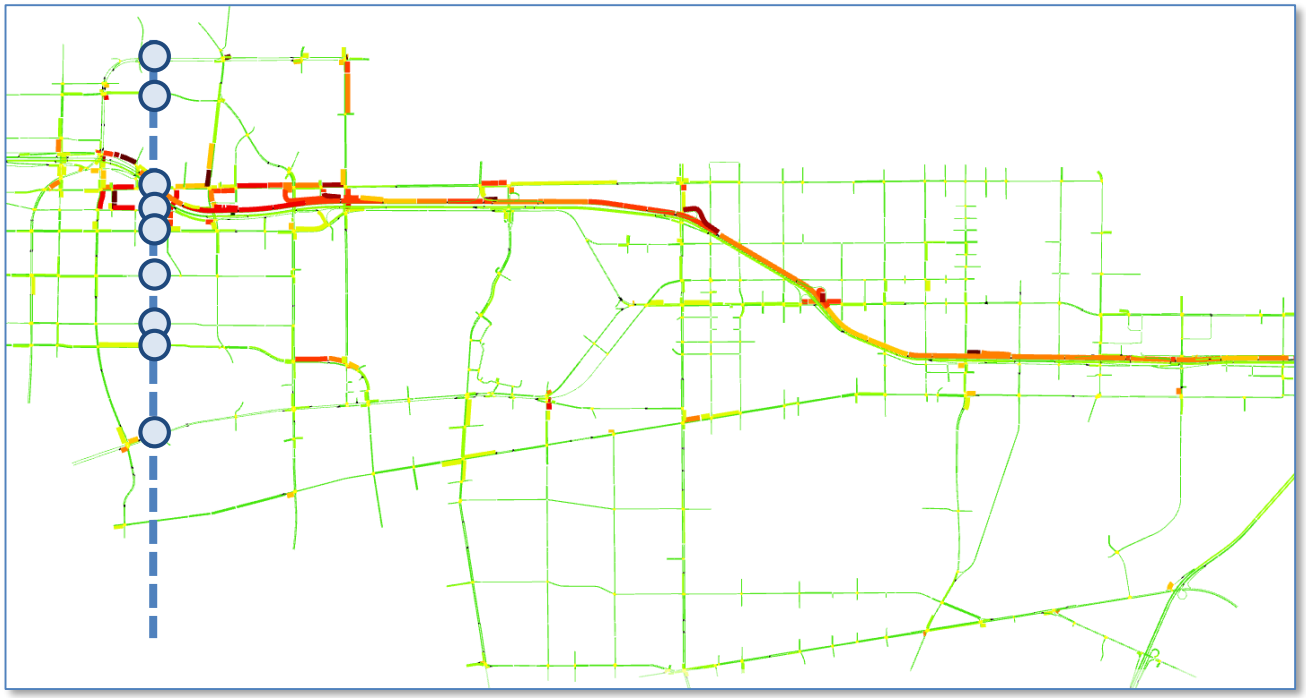
Incident	I-210 EB @ San Gabriel																					
Response Plan Evaluated	WB_Art_Foothill_Michillinda_SanGabriel 135																					
Evaluation Period	13:15 - 14:00	45 min																				
Number of Simulation Runs	1																					
	Ramps		**Screenline**	**Travel Times**			**Stats - Area (Zones 3-4-5-6)**				**Stats - Fwy Mainline, HOV, Connectors** SR-134 or I-605 --> Off-Ramp Detour #1				**Stats - Detour #1** WB_Art_Foothill_Michillinda_SanGabriel				**Stats - Detour #2** None			
	Upstream Off-Ramps *vehs*	Dwnstrm On-Ramps *vehs*	*vehs*	Fwy Queue *min*	Detour #1 *min*	Detour #2 *min*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*	VMT *veh-mi*	VHT *veh-hrs*	Total Delay *veh-hrs*	VMT/VHT *mph*
No-Response Scenario	7737	4610	7154	57.6	29.8	Null	160,886.0	7,558.3	4,834.9	21.29	28,495.0	2,692.4	2,303.5	10.58	1,658.9	326.9	27.0	5.07	Null	Null	Null	Null
Response Scenario	8162	4662	7496	55.5	19.5	Null	162,367.5	7,472.8	4,715.5	21.73	29,455.2	2,653.1	2,250.1	11.10	2,102.5	306.2	16.6	6.87	Null	Null	Null	Null
Change	425	52	342	-2.1	-10.3	0.0	1,481.5	-85.4	-119.5	0.44	960.2	-39.3	-53.5	0.52	443.6	-20.7	-10.3	1.79	0.0	0.0	0.0	0.0
Change %	5.5%	1.1%	4.8%	-3.6%	-34.7%	0.0%	0.9%	-1.1%	-2.5%	2.1%	3.4%	-1.5%	-2.3%	4.9%	26.7%	-6.3%	-38.3%	35.3%	0.0%	0.0%	0.0%	0.0%

	Productivity - Network		Travel Time Improvements		Network Performance		Productivity - Fwy & Detours		
Sub-Score	819	*veh*	-12.4	*min*	0.44	*mph*	1,403.8	*veh-mi*	
Normalization Value	1,000	*veh/hr*	-5.0	*min*	2.00	*mph*	2,000.0	*veh-mi/hr*	
Normalized Sub-Score	109	*points*	248	*points*	22	*points*	94	*points*	
Weight	0.200		0.300		0.250		0.250		1.000
Score	125.2	*points*							

Screenline Example

WB incident near San Gabriel

- **Includes all arterials and freeway segments crossing the line**
- **Consider only flows in same direction as incident (EB or WB)**

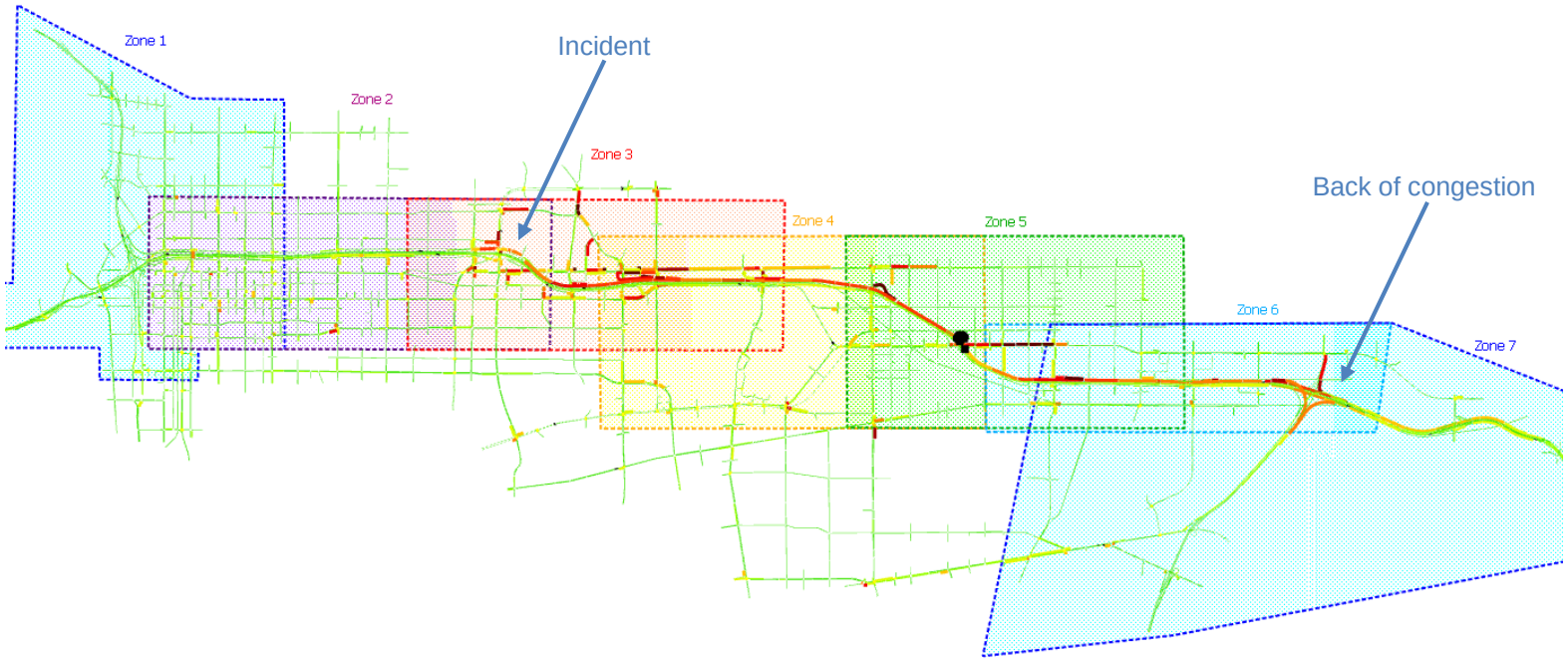


Area Stats

WB incident near San Gabriel

Stats area chosen due to extent of queue

- *Incident occurs in Zone 3*
- *Back of queue reach Zone 6*



Thank You

Thank You
and
Next Meeting
(Suggest Tuesday January 28th at Caltrans TMC)