Connected Corridors
Face-to-Face Meeting

Tuesday, January 28th, 2020
1:30 – 3:30 pm
Caltrans TMC
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 LA County – Tuesday March 10th
  ▣ (Monrovia, Duarte, LA Metro, Caltrans, County, Arcadia, Pasadena)
Joe, that’s me, will retire later this year!!

- I have decided to retire this summer – Yes!
  - My last day will be July 1st
  - 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

- 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.
I-210 Overall Summary
New Schedule – Till Launch (Page 1 of 2)

- 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)

- 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
<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
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</thead>
<tbody>
<tr>
<td><strong>Before Study</strong></td>
<td>March to April 2021</td>
</tr>
<tr>
<td><strong>Pilot Launch</strong></td>
<td>April 2021</td>
</tr>
<tr>
<td><strong>Kapsch</strong></td>
<td>April 2021 – August 2021</td>
</tr>
<tr>
<td><strong>Parsons</strong></td>
<td>August 2021 – December 2021</td>
</tr>
<tr>
<td><strong>Interim Benefits Analysis</strong></td>
<td>Dec 2021</td>
</tr>
<tr>
<td><strong>Telegra</strong></td>
<td>Dec 2021 – April 2022</td>
</tr>
<tr>
<td><strong>After Study</strong></td>
<td>March to April 2022</td>
</tr>
<tr>
<td><strong>Kapsch</strong></td>
<td>May 2022 – August 2022</td>
</tr>
<tr>
<td><strong>Procurement of CMS system</strong></td>
<td>July 2022</td>
</tr>
<tr>
<td><strong>Pilot complete</strong></td>
<td>September 2022</td>
</tr>
</tbody>
</table>
Systems Engineering Status
DSS Test Launch - Goals for March 2020

- 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

- **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

- 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

- KITS
- Transparity
- TransSuite
- Sign Vendor
- Caltrans ATMS

- DSS
- Data Hub
- TMDD Tested Interface
- TSS Model Interface (Optional)

- Kapsch
- Parsons
- Telegra

- TMDD Tested Interface

- KITS
- Transparity
- TransSuite
- Sign Vendor
- Caltrans ATMS
Systems Development and Integration

- **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

- **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

- **Pasadena**
  - Actively working with McCain on integration with Transparity 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

- **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
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
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
### Project Objective

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

<table>
<thead>
<tr>
<th>#</th>
<th>Package Description</th>
<th>Contract #</th>
<th>Contract Status</th>
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<tbody>
<tr>
<td>1</td>
<td>Bluetooth – Iteris Velocity</td>
<td>07A4470</td>
<td>Completed, Contract Closed</td>
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<tr>
<td>2</td>
<td>Bluetooth – BlueToad</td>
<td>07A4477</td>
<td>Awarded, in Progress</td>
</tr>
<tr>
<td>3</td>
<td>New Controller Cabinets</td>
<td>07A4761</td>
<td>Advertised on 9/26/19, to be awarded</td>
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<tr>
<td>4</td>
<td>Communication Upgrades</td>
<td>07A4479</td>
<td>Installation Completed</td>
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<td>5</td>
<td>Firmware/Timing Plan Updates/Controller Upgrades</td>
<td>07A4480</td>
<td>Awarded, in Progress</td>
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<tr>
<td>6</td>
<td>Video Detection System</td>
<td>07A4481</td>
<td>Awarded, in Progress</td>
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<tr>
<td>7</td>
<td>Data Communication Module and Video Detection Software Upgrade</td>
<td>07A4755</td>
<td>Advertised on 1/2/20, to be awarded</td>
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<tr>
<td>8-1</td>
<td>DMS Procurement</td>
<td>07A4792-3</td>
<td>Awarded, in Progress</td>
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<tr>
<td>8-2</td>
<td>DMS Integration</td>
<td>07A4794</td>
<td>Awarded, in Progress</td>
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<tr>
<td>8-3</td>
<td>DMS &amp; Static Sign Installation</td>
<td>N/A</td>
<td>To be handled by stakeholders</td>
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<tr>
<td>9</td>
<td>Environmental Stations with Air Quality Sensors and Open Data Systems</td>
<td>07A4388</td>
<td>Awarded, in Progress</td>
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## Project Area

<table>
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<th>Package Description</th>
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<th>City of Pasadena</th>
<th>City of Arcadia</th>
<th>City of Monrovia</th>
<th>City of Duarte</th>
<th>LA County</th>
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<td>Bluetooth – BlueToad</td>
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<td>DMS Integration</td>
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UPDATE ON

PACKAGES 1-9
### Target Timeline - P1, P2, P4, P6, P9

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<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
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<td>Month</td>
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<td>7</td>
<td>8</td>
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<tr>
<td>Prepare Submittal</td>
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<tr>
<td>Equipment Procurement &amp; Delivery</td>
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<tr>
<td>Test Plan/Procedure</td>
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<td>Installation</td>
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<tr>
<td>Training</td>
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## Target Timeline - P3, P5, P7

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<th>2020</th>
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<td>Month</td>
<td>6 7 8 9 10 11 12</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
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<tr>
<td>Prepare Submittal</td>
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<td>Equipment Procurement &amp; Delivery</td>
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<tr>
<td>Test Plan/Procedure</td>
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<tr>
<td>Installation</td>
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<td>Testing &amp; Acceptance</td>
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<tr>
<td>Training</td>
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</table>

- 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)

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<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
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<td>Month</td>
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<td>DMS Procurement</td>
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<td>DMS Delivery</td>
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<td>DMS Integration</td>
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<td>DMS System Testing</td>
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<tr>
<td>Training</td>
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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

<table>
<thead>
<tr>
<th>Pkg. #</th>
<th>Pkg.</th>
<th>Contract #</th>
<th>Project Status</th>
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</thead>
</table>
| 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 |
## Package Status – Pkg # 2

<table>
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<th>Pkg. #</th>
<th>Pkg.</th>
<th>Contract #</th>
<th>Project Status</th>
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<tbody>
<tr>
<td>2</td>
<td>Bluetooth – BlueToad</td>
<td>07A4477 DBX</td>
<td>• NTP: 7/10/2018&lt;br&gt;• Kick-off Meeting: 7/30/2018&lt;br&gt;• Submittal Approved: 10/12/2018&lt;br&gt;• Installation:&lt;br&gt;  • LA County: 11 locations done; LACo VM server configured on 5/15/19; working on LA Co &lt;-&gt; Pasadena VPN connection&lt;br&gt;  • Pasadena: scheduling field installation at 11 locations and server installation at TMC (early Feb 2020);&lt;br&gt;• Testing:&lt;br&gt;  • LA County: contractor is supporting LA County on system testing&lt;br&gt;  • Pasadena: to be scheduled after installation&lt;br&gt;• Expected to be completed: March 2020 (90%)</td>
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P2 - BlueToad Travel Time System – Comm. Architecture

Future

3rd Party System

Version: 10/09/2019
### Package Status – Pkg # 3

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<tr>
<td>3</td>
<td>New Controller Cabinets</td>
<td>07A4603</td>
<td>• Disqualified: Bids came above the SB limit (314k).</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Procurement Package revised per Stakeholder comments on Pkg. 5</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>• Cancelled by DPAC in the week of 3/15/19</td>
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<td></td>
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<td>• <strong>Advertised: 9/26/19</strong></td>
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<tr>
<td></td>
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<td></td>
<td>• <strong>Received the bid</strong></td>
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<td></td>
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<td>• Expected to be awarded by: Late Jan 2020 (together with other pending packages)</td>
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<td></td>
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<td>• Expected to be completed: Q2 2020</td>
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## Package Status – Pkg # 4

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<th>Pkg. #</th>
<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>Communication Upgrades</td>
<td>07A4479</td>
<td>• NTP: 7/13/2018&lt;br&gt;• Kick-off Meeting: 7/30/2018&lt;br&gt;• Submittal &amp; RFI Approved: 5/6/2019&lt;br&gt;• Equipment procured&lt;br&gt;• Installation of 35 locations: completed&lt;br&gt;• Testing: completed&lt;br&gt;• Testing Reports: submitted on 1/13/2020&lt;br&gt;• Original Scope: Completed&lt;br&gt;• Next steps:&lt;br&gt;  • Close all RFIs&lt;br&gt;  • Additional 2 POE extenders to be installed at 1 location (Approved CO)&lt;br&gt;  • Discuss at C2C meeting&lt;br&gt;  • 7 locations in LA County – no communications yet&lt;br&gt;  • Option 1: Waiting until RIITS network and L3 Switches are available – 3rd Quarter 2020&lt;br&gt;  • Option 2: Install 2 additional radios</td>
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### Package Status – Pkg # 5

<table>
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<th>Pkg. #</th>
<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
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</thead>
</table>
| 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 – submitted, in review  
- Materials Procurement – to be started  
- Installation Permits – in progress  
- Est. Duration: 6 months  
- Expected to be completed: 3rd Quarter, 2020 |
## Package Status – Pkg # 6

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<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
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<tr>
<td>6</td>
<td>Video Detection System</td>
<td>07A4481</td>
<td>• NTP: 7/10/18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Loops</td>
<td>• Kick-off Meeting: 7/30/18</td>
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<td></td>
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<td>Crackfilling,</td>
<td>• 10/9/18: Conducted Site Survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inc</td>
<td>• 10/18/18: Submittal approved</td>
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<td></td>
<td>• Installation:</td>
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<tr>
<td></td>
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<td></td>
<td>• 21 out of 22 installations are completed (2 LA County, 5 Monrovia, 3 Arcadia, 8 Pasadena, 3 in Duarte)</td>
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<tr>
<td></td>
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<td></td>
<td>• 1 location in Pasadena: conduit too small. Proposed action is approved.</td>
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<td>Installation has been scheduled (Contractor is renewing the permits)</td>
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<td>• Testing: in process</td>
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<td>• Expected to be completed: Feb 2020 (90%)</td>
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## Package Status – Pkg # 7

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<td>• Originally cancelled by DPAC;</td>
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<td>• Revised Package being reviewed by DPAC</td>
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<td>• Advertised: 1/2/2020</td>
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<td></td>
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<td></td>
<td>• Bid due: 1/16/2020</td>
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<td>• Multiple bids have been received</td>
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<td>• Expected to be awarded by: Late Jan. 2020</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Est. Duration: 6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Expected to be completed: Q3 2020</td>
</tr>
</tbody>
</table>
## Package Status – Pkg # 8-1

<table>
<thead>
<tr>
<th>Pkg. #</th>
<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
</tr>
</thead>
</table>
| 8-1    | Advanced Traveler Information Systems: DMS Procurement | 07A4792-3      | • Advertised: 10/25/19  
• Awarded: 12/2/2019  
• Kickoff meeting: 12/19/2019  
• Material Submittals:  
  • 12/30/2019: v1 Submitted & Reviewed  
  • 1/24/2020: v2 Submitted for Stakeholder Review  
• Expected to be completed: Q2-Q3 2020 |

<table>
<thead>
<tr>
<th>Item</th>
<th>Total</th>
<th>Caltrans</th>
<th>LA County</th>
<th>Pasadena</th>
<th>Status</th>
<th>Lead time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMS</td>
<td>21</td>
<td>2</td>
<td>2</td>
<td>17</td>
<td>Approved</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Poles</td>
<td>21</td>
<td>2</td>
<td>2</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pull boxes</td>
<td>21</td>
<td>2</td>
<td>2</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power &amp; Comm Cables</td>
<td>11,000 ft</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radios</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>Approved</td>
<td>18 weeks</td>
</tr>
<tr>
<td>Signal Control System</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Servers</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
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</table>
Package Status – Pkg # 8-2

<table>
<thead>
<tr>
<th>Pkg. #</th>
<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
</tr>
</thead>
</table>
| 8-2    | Advanced Traveler Information Systems: DMS Integration | 07A4794    | • Advertised: 11/14/19  
• Awarded: 1/3/2020  
• Kickoff meeting: 1/14/2020  
• Working on system architecture diagrams  
• Expected to be completed: Q1 2021 |

Note: Sign control system is procured in Pkg # 8-1.
## Package Status – Pkg # 8-3

<table>
<thead>
<tr>
<th>Pkg. #</th>
<th>Package Name</th>
<th>Contract #</th>
<th>Project Status</th>
</tr>
</thead>
</table>
| 8-3    | Advanced Traveler Information Systems: DMS & static sign Installation | N/A to be handled by Caltrans, LAPDW, & Pasadena | • DMS Installation:  
  • To start after hardware & software are delivered (May-June 2020)  
  • LA County: start after Aug – Oct 2020  
  • Pasadena: expected Jun – Sep 2020  
• Static Signs Installation:  
  • Ordered by Caltrans Maintenance Group: Jul. 2019  
  • take 9-12 months  
  • Installation will be handled by Caltrans  
• Expected to be completed: Q3 2020 |
## Package Status – Pkg # 9

<table>
<thead>
<tr>
<th>Pkg. #</th>
<th>Pkg.</th>
<th>Contract #</th>
<th>Project Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Environmental Stations with Air Quality Sensors and Open Data Systems (ODS)</td>
<td>07A4388 Cal Poly Pomona</td>
<td></td>
</tr>
</tbody>
</table>

- 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: Q2-Q3 2020
Next Steps

- 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?
I-210 CALTRANS Pilot, January 28\textsuperscript{th}, 2020

Kapsch TrafficCom

Integrated Corridor Management
EcoTrafiX Product Status

- 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
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

**Interface**

- Integrated
- Ready to integrate
- In development

**TMCs**

- Arcadia
- LA County
- Others

**EcoTrafiX (CMS)**

- Ramp Meter Commands
- Center Active
- Events
- Response Plans
- Voting
- DMS
- Signal Controllers
- Ramp Meters
- Detectors

**PATH HUB**

**Caltrans ATMS**

**Events**
EcoTrafiX Status

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!

Kapsch TrafficCom
4256 Hacienda Drive, Suite 100
Pleasanton, CA 94588
USA

www.kapsch.us

timothy.oleary@Kapsch.net
Test Launch
Test Launch DSS Demo

- Freeway Data
- Arterial Data

Data Hub

Estimation

Incident Results (after test launch)

Response Plans for evaluation

Rules

Prediction

Metrics

Response Plan
Test Launch Goals for January 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
Incident Location

- HOV and two mainline lanes blocked near Myrtle exit
Detours Activated

- HOV and two mainline lanes blocked near Myrtle exit

  Myrtle off-ramp to Myrtle on-ramp

  Huntington off-ramp to Mount Olive/I-605
In future, the incident will be entered from an ATMS or “purple box” system.
Demo Kickoff: RPM
Test Launch Demo Overview
Test Launch Demo Overview

Scorecard
Evaluation Results

- End of 15-mph congestion area

Incident no response

Incident with response
Evaluation Results

- Evaluation area selected: Zones 3-4-5-6
## Resulting Score Card

### Incident
- **I-210 EB @ San Gabriel**

### Response Plan Evaluated
- **WB_Art Foothill_Michilinda_SanGabriel 135**

### Simulation Period
- 13:00 - 14:00
- **60 min**

### Evaluation Period
- 13:15 - 14:00
- **45 min**

### Number of Simulation Runs
- 1

### Ramps
<table>
<thead>
<tr>
<th>Off-Ramps</th>
<th>On-Ramps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>Downstream</td>
</tr>
</tbody>
</table>

### Screenline
<table>
<thead>
<tr>
<th>Puv Queue</th>
<th>Detour #1</th>
<th>Detour #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>veh</td>
<td>veh-mi</td>
<td>veh-mi</td>
</tr>
<tr>
<td>min</td>
<td>veh-hrs</td>
<td>veh-hrs</td>
</tr>
</tbody>
</table>

### Travel Times
<table>
<thead>
<tr>
<th>VMT</th>
<th>VHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>veh-mi</td>
<td>veh-mi</td>
</tr>
<tr>
<td>veh-hrs</td>
<td>veh-hrs</td>
</tr>
</tbody>
</table>

### Stats - Area (Zones 3-4-5-6)

### Stats - Fury Mainline, HOV, Connectors

### Stats - Detour #1

### Stats - Detour #2

### Fury Queue

### Productivity - Network
- **Sub-Score:** 2,000 veh
- **Normalization Value:** 1,000 veh/hr
- **Normalized Sub-Score:** 150 points

### Travel Time Improvements
- **Improvements:** 0.03 min
- **Score:** 0.200 points

### Network Performance
- **Improvements:** 0.49 mph
- **Score:** 6.300

### Productivity - Fury & Detours
- **Improvements:** 503.8 veh-mi

### Fury Queue Improvements
- **Score:** 4.100
Software Development
Software Development Progress

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

- **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
Data Quality
**I-210 – Freeway Data Quality**

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

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

- **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

![Graph showing %VDS Missing over time](image)
Arterial Detector Inventory Check

- 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.
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

- **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 9th, 2020
    - Last detector data from December 31st, 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

- 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

- **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
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
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
Next Steps

- 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\textsuperscript{th} at LA County)