



# Lowering the barriers to state wide implementation of Integrated Corridor Management

Joe Butler – UC Berkeley PATH  
Wednesday, Sept 20<sup>th</sup> - ITS-Ca 2017

Sept 20<sup>th</sup>, 2017



# Connected Corridors State Wide Program

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- **A state wide program focused on:**
  - Bringing ICM to major corridors in California
  - Growing Caltrans leadership in corridor based transportation management
  - Showcasing new technologies and processes
  - Delivering an ICM implementation on the I-210 in LA
  - Providing a solution that is affordable, replicable and scalable
  
- **Lowering the barriers to ICM adoption, operation, and maintenance:**
  - Funding and Costs
  - Work force skills
  - Technical Complexity and Risk



# How will we do this?

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- Help with access to and management of funding
- Provide system engineering documents and process templates
- Provide guidance on workforce skills, training and organization
- Enable the consulting ecosystem
- Provide a cloud based reference implementation architecture with data quality
- Provide a cloud based replicable and scalable intelligent data hub and DSS (Decision Support System)



# How will we do this?

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- ❑ **Certify ICM and TCS vendors as enabling plug in play data exchange interfaces**
- ❑ **Ensure Caltrans is actively leading this effort and integrating it with TSM&O**
- ❑ **Prove the viability of our solutions through a pilot on the I-210**
- ❑ **Caltrans and PATH freely sharing our work products through downloadable documents, software and training**



# Funding

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## □ State

- ▣ Worked with legislature to ease approval of “Congested Corridors”
- ▣ Working with legislature to define standards for approval
- ▣ Broadening the SHOPP program

## □ Regional

- ▣ Caltrans, through its work with LA Metro, has established an approved method for managing regional funds as part of an ICM

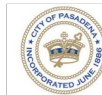
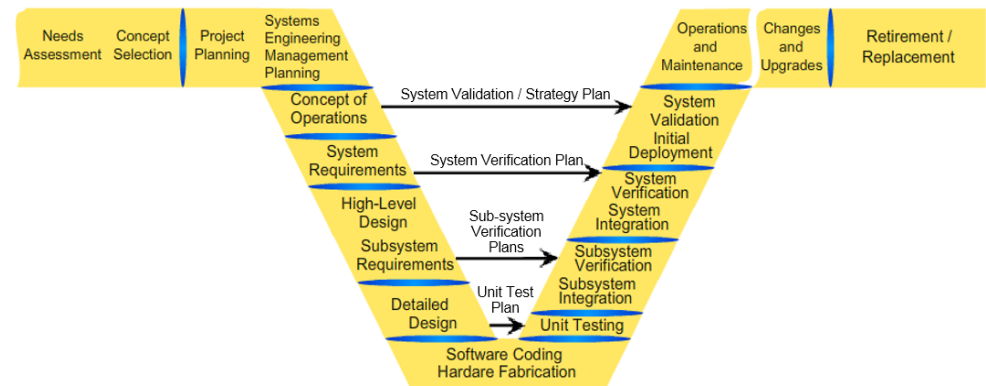
## □ Examples of applications for SHOPP and regional funding



# Templates, standards, and processes

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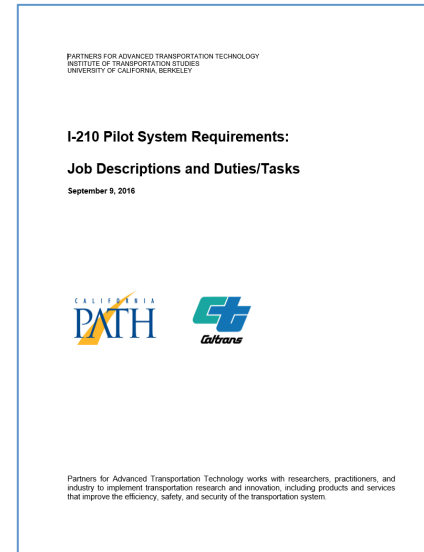
- ❑ **High quality system engineering documents**
- ❑ **These include technical, human and organizational requirements**
- ❑ **Examples of MOUs and charters**
- ❑ **Data Quality Standards**
- ❑ **Model Calibration guidance**
- ❑ **Organized for tailoring by each ICM effort**



# Workforce skills, training and organization

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- **KSA (Knowledge, Skills and Abilities) developed by Kimley Horn**
- **Organizational structures developed by SMG**
- **ICM Duties and Tasks (Human Requirements) developed by PATH**



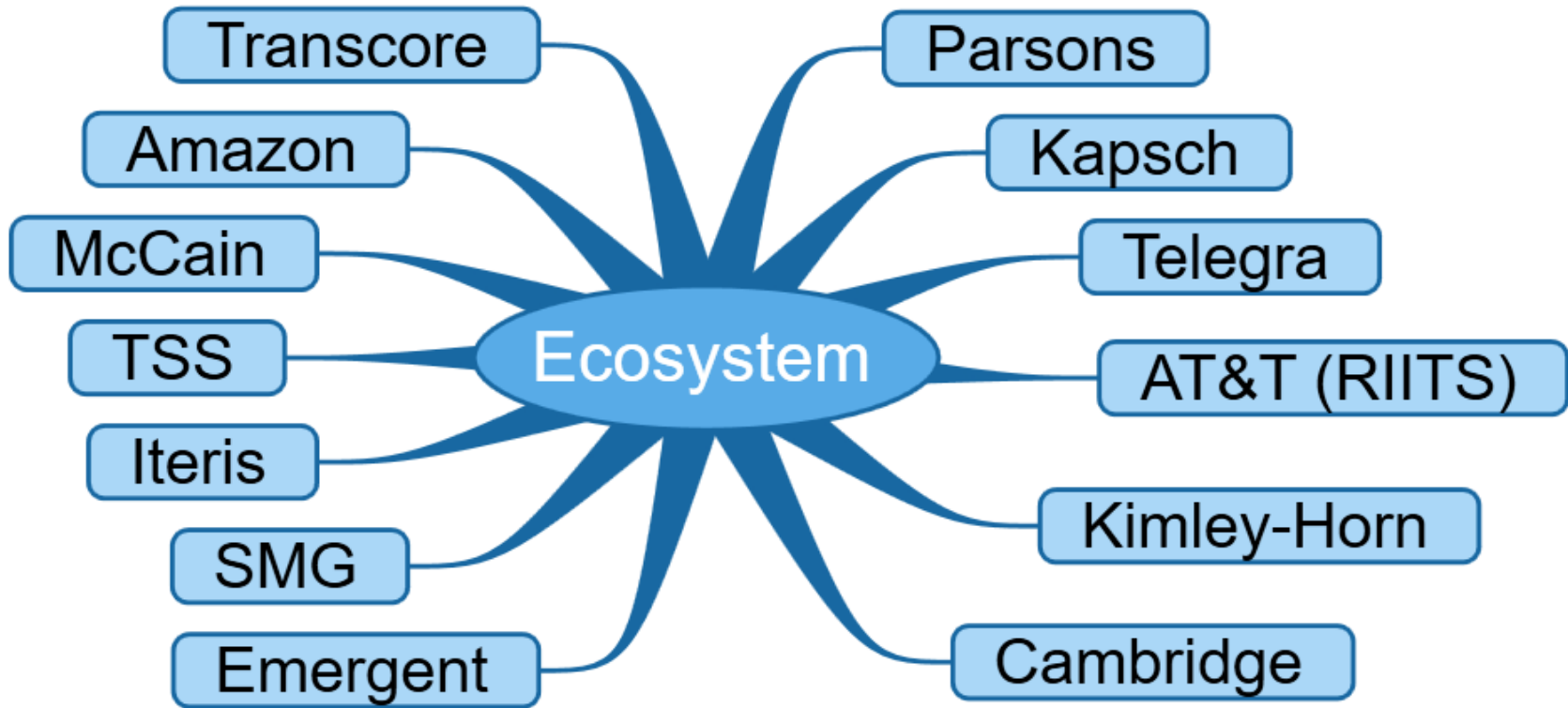
- Corridor Champions
- Corridor Manager
- Corridor Technical Manager
- Corridor Data Analyst
- Traffic Engineers
- Data Analysts
- Software Engineers
- Electrical Engineers
- Database Administrators
- Stakeholders
- Maintenance Staff
- Information Technology Support
- Information Technology Security
- TMC/TCS Operators
- Transit Field Supervisors
- Public Information Officers
- First Responders
- Outreach and Communications Manager

- **Presenting to AASHTO Center of Excellence on workforce skills - Nov 8<sup>th</sup>**
- **Developing new courseware for the Institute of Transportation Studies at Berkeley**
- **Developing a white paper for the Ca legislature on work force skills required for TSM&O**



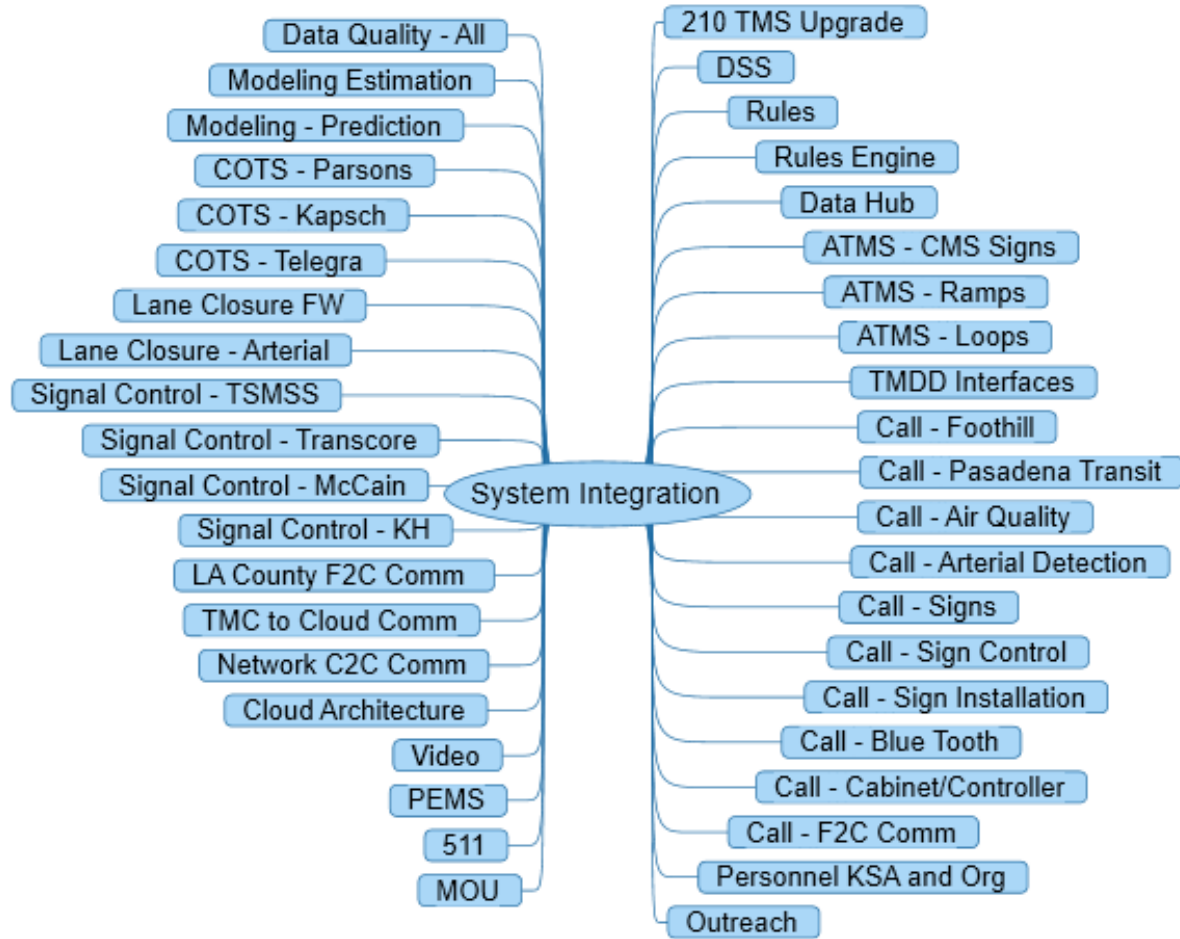
# Industry and Consulting Eco System

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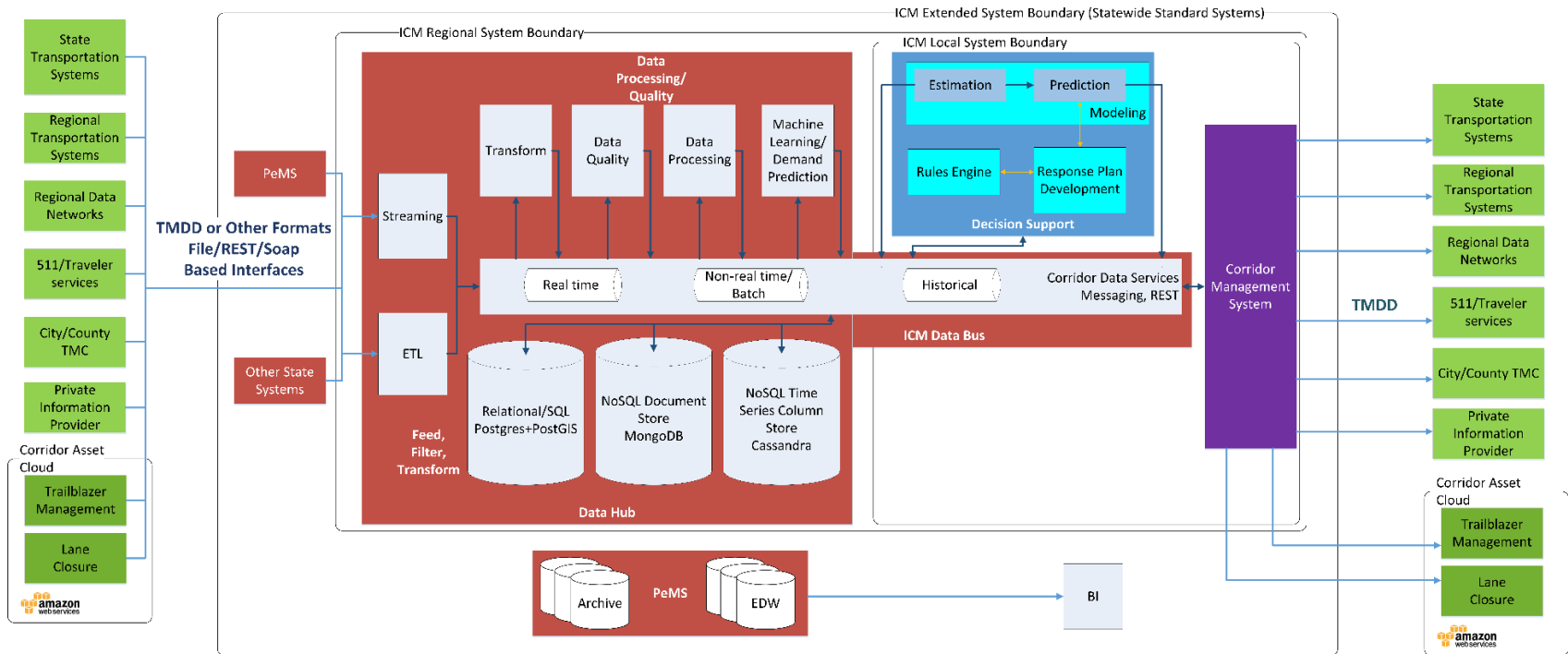


# ICM Integration – Subsystems



# Reference Implementation Architecture

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# ICM Vendors – TMDD Standard Interfaces

- **The following ICM vendors will be participating in the pilot**
  - ▣ Kapsch – EcoTrafix
  - ▣ Parsons – iNET
  - ▣ Telegra – topXview
  
- **Each of these vendors will provide software with interfaces built to permit exchange of data through CC defined TMDD standards**

T  
M  
D  
D



# TCS Vendors – TMDD Interfaces

- **The following TCS vendors will participating in the pilot**
  - Kimley-Horn – KITS
  - McCain – Transparency
  - TransCore – TransSuite
- **Each is developing TMDD data exchange interfaces defined as part of the CC standards**
- **There will also be a sign vendor (not yet selected) with data exchange**

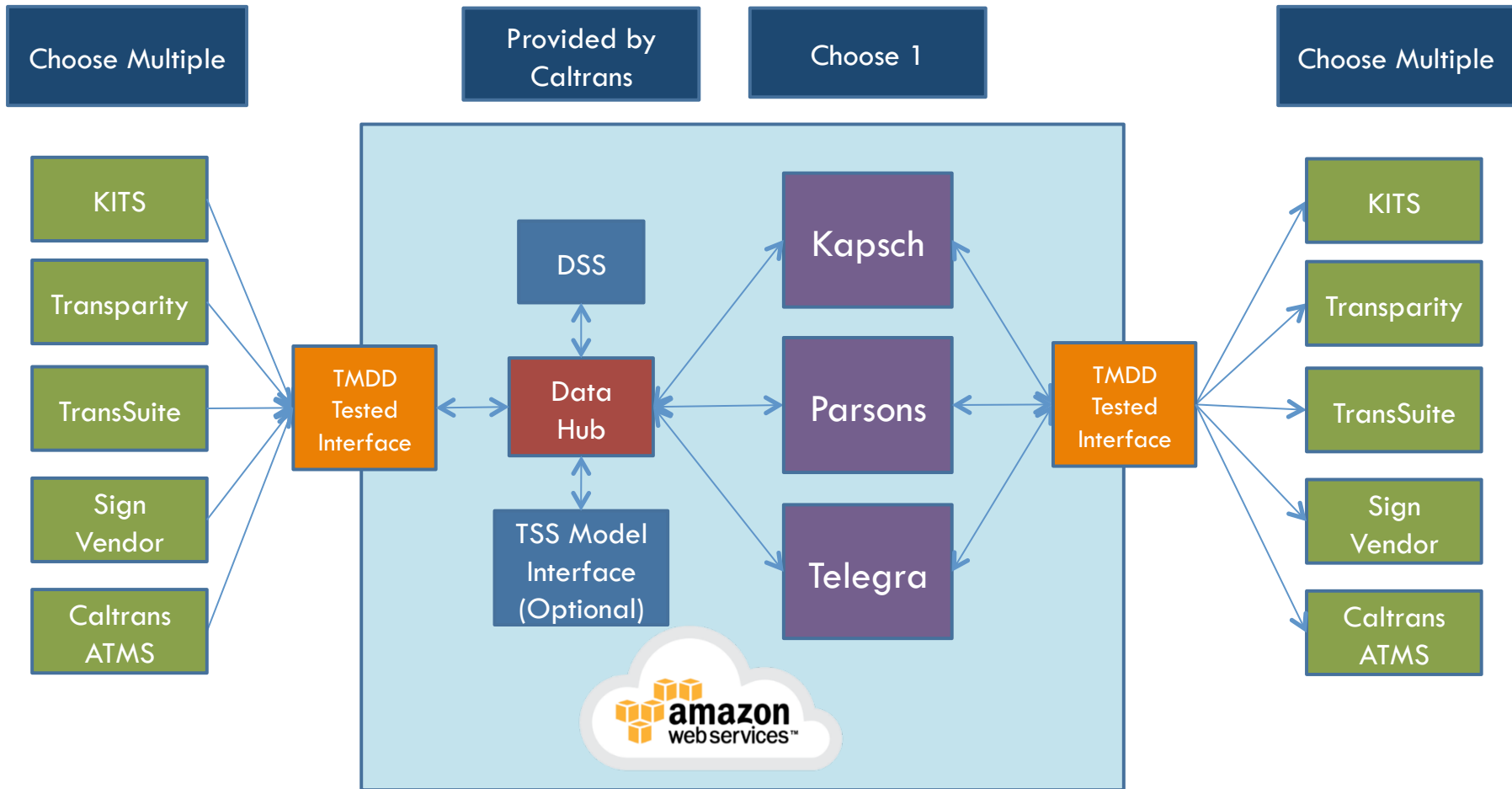
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# Mix and Match

## Standardized, tested Interfaces

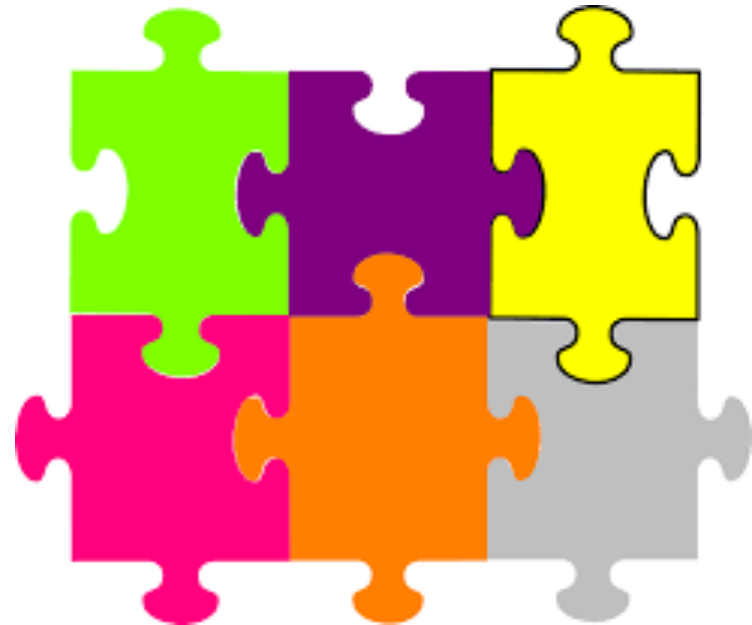
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# Other software updates and interfaces

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- **PEMS will be updated to permit simpler integration into new corridors based on the CC architecture**
  
- **We are also defining interfaces for:**
  - ▣ Transit
  - ▣ 511
  - ▣ Air Quality
  - ▣ Travel Time



# Software Examples

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## Incident Response Plan Development

Connected Corridors: Response Plans (v 0.7)

1 Rules location: application default Change rules source Export default rules

HOV, #1 lanes blocked: 2 (of 5) lanes closed on WB-210 after WBAllen and before WBHill. Starting on Sat, Jul 22, 2017 at 3:37 PM (reported 15 minutes later), lasting 60 minutes.

Name: HOV, #1 lanes blocked Incident date: 7/22/2017

2 Freeway, Direction: 210 WB Incident start time: 15:37

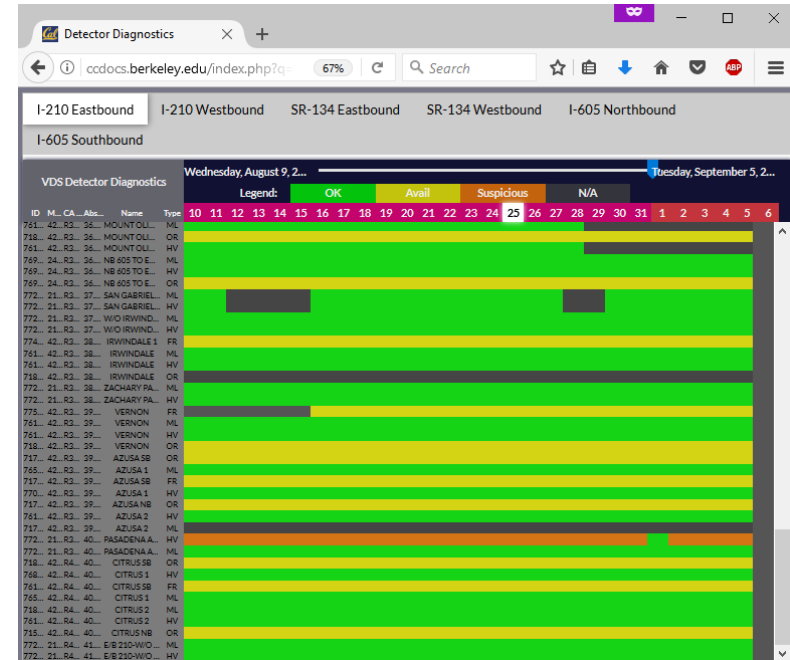
Number of lanes: 5 Duration (min): 60

Number of lanes closed: 2 Reporting delay (min): 15

Last available offramp: WBAllen First available onramp: WBHill

3 Develop plans Save results

## Data Quality on Freeways and Arterials



# Caltrans and the PATH Websites

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## Website on

- ▣ [connected-corridors.Berkeley.edu](http://connected-corridors.Berkeley.edu)
- ▣ [www.ccdocs.Berkeley.edu](http://www.ccdocs.Berkeley.edu)
- ▣ [www.dot.ca.gov](http://www.dot.ca.gov)

## Please contact

- ▣ Caltrans HQ – Nick Compin
- ▣ Caltrans D7 – Allen Chen
- ▣ Metro – Steve Gota
- ▣ PATH – Joe Butler

The screenshot shows the website for the I-210 Pilot ICM Project. The header includes the 'Connected Corridors' logo, the text 'A Program of Caltrans, PATH, and LA Metro', and the project title 'I-210 Pilot ICM Project' next to the Interstate 210 shield. Navigation tabs include Home, Project Overview, The ICM Process, Planning the System, Developing the System, Document Library, and Stakeholder Login. The main content area has three columns: 'Welcome' (describing the ICM system and design phase), 'This Site' (listing project activities and including a photo of an I-210 sign), and 'Questions?' (providing contact information and a map of California with the project area highlighted in red).





**Thank You**

