

APPENDIX B. DEVELOPING REQUIREMENTS FOR THE I-210 PILOT

Developing requirements for a complex corridor management system is not an easy task. The requirements must specify the expected behaviors of all parts of the system—human and otherwise—including hardware, software, people, and organizations.

No one person understands the system fully at the start of the requirements process, nor can they, for the requirements emerge from the additive process of each person defining what they believe the system must do in order to meet their needs. In a successful requirements-gathering process, each person will learn more about their fellow users and how their requirements can fit in with the requirements of others. This process is iterative and can require creativity and compromise. It is thus both educational and definitional.

To facilitate requirements-gathering for the I-210 Pilot, the Connected Corridors team employed an “actors and stories” approach. This approach begins by defining all the major people and components that either comprise the system or will interact with it. These people and components are called “actors” because they perform one or more “roles” in the operation of the system.

Next, a narrative methodology is used to elicit people’s views of how the system will work. This narrative is called a “story.” The story describes the step-by-step way in which each person envisions interacting with other parts of the system. Effectively, by describing what they expect to do and what they expect from others, and in what order they expect this to occur, people begin to define their overall expectations of the system.

As each person creates their own stories and hears the stories of others, they gain a broader understanding of the overall system and can then refine their story. As each role is better defined and each story becomes more detailed (some stories will be more detailed than others), a list of requirements is generated. One of the goals of listening to others’ stories is to work toward a common set of requirements that capture everyone’s important expectations without overly limiting the implementation details of the final system.

This process, which participants often find enjoyable, results in testable requirements, a clear view of how each user will judge success, and the outline for an operational manual. It is also an important mechanism for helping stakeholders gain a more “corridor-centric” perspective.

The “actors and stories” framework was used as a starting point for requirements-gathering meetings with I-210 stakeholders, which ultimately led to the requirements described in this document. The following sections of this appendix include:

- A description of the “actors” and their roles
- The “stories” used for requirements discussions, including their relation to user needs
- Notes from the requirements meetings with corridor stakeholders

B.1. ACTORS

1) Managers

- a. Corridor Manager
 - i. The person designated as being responsible for success of corridor management operations in the I-210 Connected Corridor
 - ii. Oversees day-to-day operations and monitor the performance of the agencies in addressing the impact of incidents in the corridor
 - iii. Ensures coordination with other agencies regarding the incident
 - iv. Coordinates with first responders, local police department to define protocols which will be used during an incident
 - v. Prepares regular reports on corridor activities and leads meetings of the involved agencies in reviewing and resolving issues in Corridor Operations
 - vi. Coordinates with the member agencies to ensure processes and funding are in place.
- b. Corridor Technical Manager
 - i. The Technical Manager is the person with overall responsibility for the software and hardware components of the system. In contrast to the Corridor Manager who is responsible for the overall processes and human relations of the system.
 - ii. Reviews the hardware and software systems of the Corridor each day to determine any behaviors that are outside nominal.
 - iii. If errors occur the Technical Manager is charged with responding and ensuring these systems return to working order as soon as possible
 - iv. Responds to data analytics results and requests for remediation
 - v. Maintains the road map of system enhancements, improvements and upgrades.
- c. Stakeholder Managers
 - i. Managers in the member agencies are key in advocating for the I-210 Connected Corridor internally within their agency.
 - ii. The Managers will have access to Corridor performance reports and will understand not only the role of their member agency, but how well that role is being carried out.
 - iii. Such Managers provide the link between the Corridor Manager and the governing body of that agency
 - iv. They are also tasked with ensuring resources (both human and financial) are well utilized
- d. Software and Hardware Technical Managers
 - i. Technical leaders responsible for the strategic direction and improvement of one or more hardware or software systems. Along with the stakeholders help to define the requirements for the system and provide ongoing support during operations.

- e. Funding Advocates
 - i. Within all member agencies are staff whose role is to secure funding. Such staff will be aware of the Connected Corridor, its operations and its benefits so that the Corridor can be represented in funding activities to ensure continuity of financial support.
 - ii. Funding Advocates are responsible for ensuring that the agency processes are in place for continued funding.
- f. Stakeholder Governing Bodies
 - i. Stakeholder governing bodies need to be made aware of the performance of the Connected Corridor on a regular basis so that they understand its benefits. This will ensure that the Corridor becomes integrated into the member agencies' day-to-day activities

2) Technical Staff

- a. Caltrans HQ Engineers
 - i. Responsible statewide for Caltrans hardware and software systems
 - ii. Monitor connected corridor projects
 - iii. Assess compliance with Caltrans procedures
 - iv. Suggest modifications to Caltrans procedures
- b. Traffic Engineers
 - i. Ramps Plans
 - 1. Participate in designing response plans for use by the DSS through defining ramp meter rates for various scenarios
 - 2. Assess existing ramp metering plans and modify metering rates and plans as needed for various severities of an incident
 - 3. Intervene in the event of an incident which is beyond the scope of the DSS and so requires manual control
 - 4. Participate in post-incident reviews of response plan results
 - ii. Signal Plans
 - 1. Design response signal timing plans and response routes for use by the DSS
 - 2. Verify that plans in place are working and implemented when needed in an event of an incident
 - 3. Assess existing signal timing plans and modify as needed for various severities of an incident
 - 4. Intervene in the event of an incident which is beyond the scope of the DSS and so requires manual control
 - 5. Participate in post-incident reviews of response plan results

- iii. Transit
 - 1. Develop detour plans for their buses/train cars to go in an event of an incident for use in DSS
 - 2. Determine hotspot locations/routes from existing count/ridership data that can be heavily affected from an incident
 - 3. Intervene in the event of an incident which is beyond the scope of the DSS and so requires manual control
 - 4. Access available bus/transit inventory
 - 5. Access routes currently in place
- c. Maintenance Technicians
 - i. Identify if there are any disconnects or deficiencies within the communications network
 - ii. Identify hardware faults in the field
 - iii. Troubleshoot these deficiencies and ensure that communications between different systems are working
 - iv. Be on standby to support other stakeholders in operations
- d. Electrical Engineers
 - i. Ramp Meters
 - 1. Implement improvements in ramp meter systems
 - 2. Review ramp metering system to ensure on-going DSS compatibility and functionality
 - ii. Traffic Signals
 - 1. Implement improvements in traffic signal system
 - 2. Review traffic control system to ensure on-going DSS compatibility and functionality
 - iii. CMS
- e.
 - 1. Implement improvements in changeable message sign systems
 - 2. Review changeable message sign system to ensure on-going DSS compatibility and functionality
- f. Software Engineers
 - i. Develop and maintain the operations of the software in the Corridor
 - ii. Perform maintenance and upgrades on the software in the Corridor
 - iii. Troubleshoot bugs and issues within the software in the Corridor
- g. Modelers
 - i. Model different instances of an incident and identify locations for congestion to aid engineers in developing appropriate response plan
 - ii. Maintain the models
 - iii. Calibrate/validate through analysis of results during/after an incident

3) Operators

- a. Caltrans TMC
 - i. Log pertinent information regarding an incident (location and approach direction, severity, # of lanes closed, time of incident)
 - ii. Identify and ensure the plan of action (response plan to be implemented) according to the incident
 - iii. If needed, control ITS elements to verify traffic conditions (CCTV, CMS, Bluetooth readers, etc.), and to fine-tune DSS response plans to current conditions
 - iv. Adopt control during events where manual intervention is needed
- b. City
 - i. Assist in the development of DSS response plans
 - ii. Log pertinent information regarding an incident (location and approach direction, severity, # of lanes closed, time of incident)
 - iii.
 - iv. Coordinate with own local first responders, police department, and fire department regarding incident
 - v. Coordinate with other stakeholders in confirming the incident
 - vi. Liaise with Caltrans during an incident (for discussion)
 - vii. Control ITS elements to verify traffic conditions, and to fine-tune DSS operations if needed
 - viii. Adopt control during events where manual intervention is needed
- c. County
 - i. Assist in the development of DSS response plans
 - ii. Log pertinent information regarding an incident (location and approach direction, severity, # of lanes closed, time of incident)
 - iii. Liaise with Caltrans during an incident (for discussion)
 - iv. Control ITS elements to verify traffic conditions
 - v. Fine-tune DSS operations, if needed
 - vi. Adopt control during events where manual intervention is needed
- d. Transit Dispatchers
 - i. Identify the location and severity of the incident
 - ii. Identify where the current location of each bus/train car running for the route that is affected by the incident
 - iii. Coordinate with other agencies through DSS regarding current traffic conditions during an incident
- e. Freight Dispatchers
 - i. Receives information on traffic conditions that could affect deliveries
 - ii. Conveys the traffic information to truck drivers, and may suggest alternate routing

- f. Transit Field Supervisors
 - i. Implement proper response plans by Transit Dispatchers in response to the incident (i.e., bring shuttle buses, implement extra buses, etc.)
- g. Metro On-Scene Coordinator
 - i. Responsible for determining and directing actions by Metro staff during an incident
 - ii. Liaises with emergency services

4) Public Relations

- a. PIO
 - i. Metro PIO
 - 1. Would get involved (issue a Media Alert or Press Advisory?) if there is an incident involving Metro buses or light rail
 - ii. Caltrans D7 PIO
 - 1. Does field assessment and informs media if there is an incident involving the freeway (I-210 or other parallel freeway that might affect the I-210)
 - iii. CHP PIO
 - 1. Would issue an advisory or alert re: freeway incident/event
 - iv. City PIO's
 - 1. Issue Media Alerts/Press Advisories if there is an incident impacting City assets and services
 - v. County PIO
 - 1. Issues Media Alerts/Press Advisories if there is an incident impacting County assets and services
- b. 511 Personnel
 - i. Responsible for getting information/alerts regarding incidents or events into the regional 511 System
 - ii. What about other links to 511 (RIITS, social media/Twitter, Waze, Google, etc.)?
- c. Media
 - i. Attend the scene
 - ii. Report to the public
 - iii. Traffic reporters
 - 1. Pass on information to the public
 - 2. Report conditions
 - iv. In LA, we've been told that radio station helicopters provide information on incidents (and events?) in near real time

5) Data Managers

- a. Data Analysts – Responsible for three major functions
 - i. Data Quality
 - 1. Identifying data problems
 - 2. Understanding the source of the problem
 - 3. Remediation plans
 - ii. Performance Measurements
 - 1. Tracking metrics
 - 2. Performing analysis
 - 3. Identifying trends
 - iii. Identifying new data sources
 - iv. Data Analysts are to collect and validate information regarding the incident (location, severity incident, as well as hotspot locations where congestion is observed)
- b. Data Hub Managers- (Perhaps IEN and or RIITS) – Managers responsible for ensuring the data hubs are operational at all times. Responsible for funding, technical personnel and major decisions. Responsible for external data feeds. May work with
 - i. Database Managers – Trained personnel responsible for ensuring performance, security and system recovery of data.
 - ii. IT Support
 - iii. Communications Support

6) Road Users

- a. Auto
 - i. People or machines operating a passenger vehicle in the corridor
 - ii. Capable of receiving recommendations for route changes
 - iii. Capable of receiving traffic-related messages
- b. Shared-ride Services
 - i. People or machines operating on-demand, non-fixed route passenger vehicles in the corridor with multiple pick-up and drop-off points
 - ii. Capable of receiving changes to delivery locations or schedules
 - iii. Capable of receiving traffic-related messages
- c. Light Truck/Deliveries/Freight (?)
 - i. People or machines operating mid-size trucks with non-fixed routes, capable of receiving recommendations for route changes
 - ii. Capable of receiving changes to delivery locations or schedules
 - iii. People capable of receiving messages
- d. Heavy Truck/Deliveries/Freight (?)
 - i. People or machines operating large trucks
 - ii. Capable of receiving changes to delivery locations or schedules
 - iii. Capable of receiving messages

- e. Bus Operators
 - i. People or machines operating a bus in the corridor
 - ii. Capable of receiving information from dispatchers
 - iii. Needing to know of changes to network
 - iv. Needing to know of changes to routes or other items on network
 - v.
- f. Train Operators
 - i. People or machines operating a train
 - ii. Capable of responding to an incident based on corridor management suggestions.
 - iii. Capable of receiving information from dispatchers
- g. Bicyclists
 - i. People operating a bicycle
 - ii. Capable of receiving recommendations for route changes
- h. Pedestrians
 - i. People walking and capable of receiving recommendations for route changes
- i. Car Passengers
 - i. People capable of receiving traffic-related and other messages while a passenger
 - ii. Capable of providing active input to the system because they are not driving.
- j. Bus Passengers
 - i. People capable of receiving traffic-related and other messages while a passenger
 - ii. Capable of providing active input to the system because they are not driving.
- k. Transit Passengers
 - i. People capable of receiving traffic-related and other messages while a passenger
 - ii. Capable of providing active input to the system because they are not driving.

7) Organizations

- a. Commercial retail operations
 - i. May wish to know of changes to the transportation network
 - ii. May wish to work with transportation managers on incentives
- b. Other organizations – Chamber of Commerce, Homeowners Association, especially those near transit hubs or the freeway
 - i. May wish to know of changes to the transportation network
 - ii. May wish to work with transportation managers on incentives
- c. Freight Organizations
 - i. May wish to know of changes to network
 - ii. May change Freight and Freight Transit on network

- d. Transit Agencies
 - i. Operate Railroad Operations Centers (ROC) and Bus Operations Centers (BOC)
 - ii. May wish to know of changes to network
 - iii. May change routes or other items on network
 - iv. During a train incident requiring a bus we would like to let them know the available bus routes to use immediately, also work with them to establish the bus bridge and then maybe provide assistance for quick passage of those buses and let new passengers know so they can do something. And of course let everyone else know. Mile marker translation from Metro to Caltrans.
 - v. If staircases from the Metro tracks are used, then we need to know because it will require closing of freeway lanes near these staircases.
- e. Civic Organizations
 - i. May want to know overall effects of network changes
- f. Regional Government Organizations such as SCAG, SCAQMD, SGVCOG
 - i. May want to know overall effects of network changes
- g. General Public
 - i. May want to know of changes
 - ii. May want to know of overall effects of network changes

8) Public Safety

- a. CHP
 - i. This is the first CHP officer dispatched to the scene
 - ii. Will need to communicate with others about lane closures; involvement of police, fire, coroner, hazmat, etc.;
 - 1. Who will communicate to TMC and others re: I-210 strategy to deploy?
 - 2. Will call for additional aid?
- b. Local Police
 - i. This is the first police officer dispatched to the scene
 - ii. Responds to incidents; can be lead agency if event in in the local jurisdiction (i.e. Race track in Arcadia or Rose Bowl in Pasadena)
 - iii. Lead agency if accident is on I-210 arterial
 - iv. Who changes local signal timing, if requested by I-210 personnel/DSS
- c. Local Fire
 - i. This is the first truck dispatched to the scene
 - ii. Responds to incidents if there is a fire involved
 - iii. Also responds if EMT is required (no fire)?
- d. Metro Police
 - i. Metro Police dispatched to an incident involving transit
 - ii. Involved if incident involves bus or light rail
- e. County Sheriff
 - i. County Sheriff dispatched to an incident involving transit

- ii. Involved if incident involves bus or light rail
- f. Ambulance Drivers
 - i. First ambulance to the scene when dispatched
 - ii. Responds if requested by CHP, Police or Fire
- g. Hazardous Materials
 - i. Hazmat team is dispatched to the scene by an actor
 - ii. Responds if requested by an actor
- h. Coroner
 - i. Coroner or representative is dispatched to the scene by an actor
 - ii. Involved if there is a fatality
- i. Freeway Service Patrol (FSP)
 - i. Patrols the I-210 providing emergency on-demand roadside service to vehicle operators

9) Systems

- a. Decision Support System
 - i. Responsible for observing the current state of the transportation system, accepting guidance from people, selecting appropriate response plans, predicting the effect of those response plans and presenting the results of the predictions for review and acceptance
 - ii. Responsible for recommending when system response plans should return to nominal
 - iii. Who monitors or follows-up on the response from the DSS?
- b. 511 System
 - i. Responsible for disseminating information to people and organizations
 - ii. Responsible for gathering information from people and organizations
- c. Signal Systems
 - i. People and software responsible for knowing state of signal systems, communicating this state to the Inventory system, knowing state of detectors and communicating to inventory system, knowing signal plans and communicating to scenario management, accepting new signal plan from response enactment and ensuring this is used
- d. Ramp Systems
 - i. People and software responsible for knowing state of ramp systems, communicating this state to the Inventory system, knowing ramp plans and communicating to scenario management, knowing state of detectors and communicating to ???, accepting new signal plan from response enactment and ensuring this is used
- e. CMS Systems
 - i. Responsible for knowing status of changeable message sign systems
 - ii. Communicates this status to the Inventory system

- iii. Implements sign messages
 - iv. Communicates with scenario management, accepts new sign messages from response enactment and ensures this is used
- f. Inventory
 - i. Responsible for maintaining an up to date inventory of the system, the content of ITS elements and the status and state of those ITS elements.
- g. Scenario Management
 - i. Responsible for permitting response plan development, modification and storage
- h. Response Approval
 - i. Responsible for choosing or permitting users to choose the response plan to implement
 - ii. Can modifications be made and if so what would they be, what are the limits
- i. Response Enactment
 - i. Responsible for sending the control actions that the scenario recommends
 - ii. Responsible for letting folks know if these actions have not been applied
 - iii. Responsible for saving the response in the data hub
- j. Performance Evaluation
 - i. Track the corridor metrics
 - ii. Determine effectiveness of DSS predictions
 - iii. Determine deltas between the response and no response
- k. Historical Data Archive
 - i. Responsible for storing and providing network system state, DSS results, performance metrics and processed historical data.
- l. Data Processing
 - i. Responsible for processing real-time data into historical data needed by the decision support system, the data analysts and the modelers
 - ii. Responsible for determining data quality of received data and providing a quality score for use by the DSS, the data analysts and the modelers
- m. Data Hub
 - i. Ensure all other system components can request data
 - ii. Ensure all other systems can send appropriate data out
- n. Management Console
 - i. Determines the overall operational state of the system. Basically uses the inventory system and basic software system capabilities to determine how much of the system is working
 - ii. Determines who can use the system

10) System Managers

- a. ATMS
 - i. Responsible for collecting, analyzing and storing/archiving freeway traffic data
 - ii. Monitors the operation of detection equipment and reports faults
 - iii. Accesses CCTV cameras and displays CCTV images to individual operators and through wall mounted displays
 - iv. Maintains and displays a map of current traffic conditions
- b. IEN
 - i. Collects traffic data from traffic control systems
 - ii. Collects equipment status information from traffic control systems
 - iii. Distributes traffic data and equipment status information
 - iv. Enables the remote selection traffic signal timing plans
- c. RIITS
 - i. Collects and distributes data from and to ITS data sources in Los Angeles County such as the County IEN, Caltrans ATMS
 - ii. Collects and distributes incident data from WAZE
 - iii. Distributes selected data to registered third party users

11) Third Party

- a. Data Providers
 - i. Commercial organizations that provide data to the data hub for use by system software components
 - ii. People – It is hoped that people will be active participants in the management of the 210 corridor providing various types of data and feedback
- b. Data Consumers
 - i. Commercial vendors who utilize information for
 - 1. Dissemination to the public
 - 2. Dissemination to data providers
 - 3. Dissemination to commercial services
 - ii. Research organizations

B.2. STORIES FOR DISCUSSION

1) Incident Management Planning – There will be a story for planned/unplanned events with and without transit.

- a. Response Plan Creation
 - i. The Corridor Manager is responsible for managing the response plans working with the following actors.
 - ii. Determine the section of the corridor this plan is associated with
 - iii. Determine the severity it will be used for
 - iv. Determine the location
 - v. Determine the available reroutes
 - vi. Determine the available signal plans
 - vii. Determine the available ramp plans
 - viii. Determine the CMS plans
 - ix. Determine the outreach and Public Information
 - x. Determine exception rules
 - xi. Determine rules when it just won't work
 - xii. Determine everyone who needs to be notified
 - xiii. Determine who can approve or disapprove
 - xiv. Simulate to determine effects
 - xv. Determine the effects of demand

2) Incident Management Execution

- a. Incident Detection
 - i. The system is told by a person that there is an incident
 - ii. The system is told by another actor who is a system (e.g. CHPCAD) that there is an incident
 - iii. The system looks at traffic data and determines if it differs from what is normally expected. How much deviation from normal is considered an incident is determined by people actors?
- b. Incident Validation
 - i. A person or multiple persons validate that there is an incident
 - ii. No validation is necessary
- c. Incident Characterization
 - i. Location
 - ii. Lanes, trains, other items affected
 - iii. Expected Duration
 - iv. One or more people provide the information
 - v. The system tries to determine it
 - vi. Both the system and people work to provide the information

- d. Determining probable effects of the Incident Severity
 - i. Does the system predict the effects of the incident?
 - ii. This step is done by a person
- e. A severity is determined
 - i. System
 - ii. People
- f. A determination is made whether to look at response plans
 - i. System
 - ii. People
- g. Initial Response Plan Selection`
- h. Rules Application to Plans
- i. Prediction using Plans
- j. Selection of plan
- k. Implementation of plan

3) Daily Work

- a. Data Collection
 - i. Baseline
 - 1. Every day, data is recorded to determine day-to-day traffic patterns. This data serves as the “baseline” for the incident plan. When traffic patterns divert from what is considered as “baseline”, it will be an indication of an incident or an unplanned event.
 - ii. Operational
 - 1. Data is collected in terms of how each element in the system operates on a day-to-day basis. When an element is not operating correctly, or is not communicating with the rest of the system, it is an indication that action is needed by stakeholders or maintenance crew who can troubleshoot the issue prior to/during an incident/event.
- b. Data Quality
 - i. Filtering
 - 1. This is the on-going checking of the data being collected and used within the system to verify its accuracy.
 - 2. Identifying issues with the availability of data and its sources
 - ii. Validation
 - 1. Data samples are taken and validated by cross-referencing with other sources
 - 2. Once validated, the findings are reported to the relevant agency for correction
- c. System Monitoring
 - i. Data Analysis
 - 1. Data is analyzed to determine the location and severity of the incident.

2. Data is also analyzed to identify congestion points and their severity.
 3. Data analysts look through the information being streamed within the system to assess the impacts of past incidents and evaluate response.
 4. Additional external data sources used may include social media sources, and other third party sources.
- ii. ITS Element Analysis
 1. Each element within the system is assessed its status to identify if any of the elements are not functioning correctly or not communicating.
 2. An assessment is made as to the effect on response plans and corrective actions taken.
 - iii. Road Network Analysis
 1. The road network is analyzed to identify potential bottleneck points which could affect the response in the event of an incident.
 2. Other issues such as pavement condition, and striping issues are identified to see if these could adversely affect the response plans to an incident.
 3. An assessment is made as to the effect on response plans and corrective actions taken.
 - iv. System Monitoring
 1. Communication between each stakeholders is maintained for the purpose of coordination in an event of an incident. Furthermore, should any element be updated/upgraded to aid in implementing response plans, each stakeholder and element in the system will be made known its abilities for coordination during an incident.
- d. Model Management
 - i. Ensuring model is calibrated
 1. Data collection is crucial in keeping the model current and calibrated. With the use of current traffic patterns, each response plan will be tested with current (up-to-date, not real-time) traffic volumes to ensure that the response plans will be appropriate for each incident.
 - e. Planning of maintenance and upgrades
 - i. The technical staff and maintenance staff will be involved in the preventive maintenance and upgrades of the elements within the system. Both the technical staff and maintenance staff will identify the deficiencies in the elements such as ITS hardware, and compile funding sources to fund for upgrading the elements.

4) Maintenance – Short-Term Deviations from Nominal

- a. People tell us when there will be changes to the roadway
 - i. Network changes
 - ii. ITS element unavailability

- b. We update the model with a notice that these changes will occur and whether this should be considered an incident to be managed
- c. People tell us that certain ITS elements will not be or will not be working. We need to determine if this should affect the response plans we can choose.

5) Unplanned Absences, Errors, Malfunctions

- a. Changes to network
- b. ITS Elements break
- c. Software breaks
- d. People out sick
- e. The DSS should try to determine if there is an unplanned change and its importance.
- f. Some may be seen as an incident.
- g. We don't really know how to deal with bad data or multiple ITS elements

6) Reporting and Performance Evaluation

- a. Monthly Review
 - i. This will provide a look back over events/incidents that have occurred in the Corridor in the past reporting Period (nominally a month) compiled from system reports
 - ii. The system reports will provide details of incidents that have occurred such as;
 - 1. Total number of incidents with start time and end time and severity
 - 2. For each incident, a summary containing:
 - a. Incident description (what happened)
 - b. Actions taken by/initiated by operators in response
 - c. Actions initiated by the DSS
 - d. Estimated reduction of impact due to operator/system interaction
 - iii. A brief analysis of "lessons learned" will be included identifying:
 - 1. Scenario (action) modifications
 - 2. New scenarios and actions
 - iv. The format will be such that it can be used for reporting to stakeholder governing bodies
 - v. A log of scenario updates and additions will be included

7) Program Management

- a. Maintaining relationships
 - i. Key to the success of the management of the Corridor is inter-agency operations and cooperation. Understanding how the agencies are working together will help identify where actions need to be taken for improvement
- b. Ensuring funding

- i. Any system requires continuous improvement to ensure its sustainability and maintain its benefits. Such an effort requires funding to provide labor resources and procure equipment and services.
 - ii. Provision of funding will be the responsibility of several agencies and so coordination of funding efforts is needed to avoid any gaps in funding
- c. Planning of system upgrades
 - i. It is inevitable that some maintenance activities will impact the operation of the ICM in some way. The member agencies need to be aware of such future breaks in service in order to plan and accommodate them.
- d. Ensuring proper training and cultural changes

B.3. CONNECTING STORIES WITH USER NEEDS

Table B-1: Mapping User Needs to Stories

	User Need (from Table 3-2)	Story
1	Collect and Process Data	3
2	Collect and Process Demand Data	3
3	Monitor Asset Availability	3
4	Decision Making Assistance	2
5	Operational Forecast Capability	2
6	Strategy Effectiveness Assessment	6
7	Multi-Agency Coordination Support	7
8	Automated Incident Response Capability	3
9	Manual Control Capability	3
10	Preferred Control Setup Options	2
11	Device Modification and Addition Capability	1
12	Information Visualization	3,7
13	Provision of Data to TMC operators and transit dispatchers	2
14	Provision of Data to End Users	2
15	Historical Data Archiving	2
16	ICM System Management	1,3
17	System Maintenance	4,5
18	Training Support	7

Table B-2: Mapping Stories to User Needs

	Story	User Need (from Table 3-2)
1	Incident Management Preparation	11,16
2	Incident Management Execution	4,5,10,13,14,15
3	Daily Activities	1,2,3,8,12,16
4	Maintenance	17
5	Unplanned problems	17
6	Reporting and Performance Evaluation	6
7	Program Management	7,12,18

B.4. REQUIREMENTS MEETINGS NOTES

Part of the requirements-gathering process included meeting with agencies and stakeholders to understand their perspectives and identify the needs they believed the ICM system should meet. Notes from those meetings are included on the following pages. The notes, which vary in format from meeting to meeting, illustrate both the process and the source materials used to develop system requirements.

CALTRANS HQ — OFFICE OF TRAFFIC MANAGEMENT

Date: 08/19/2105

Attendees:

Ramp Metering – Khan Vu, Terry Thompson

Traffic Signal Operations: – Martha Styer

Lane Closure Management – Arshad Iqba (Attended second half of meeting)

Summary

This was an interesting meeting with quite a bit of discussion. Attendees believed we needed to be able to determine the state of the road network in real time and use this to understand where we have and can use extra capacity. We then need to utilize this extra capacity by changing ramps and signal timing across jurisdictions. Once done, we then need to be able to get people to use this capacity through appropriate signage, 511, and third party information providers. Extra capacity will require some sacrifice by cross street traffic and this must be acknowledged and accepted. Multiple routes should be considered for an incident and these routes should be personalized based on traveler's preferences and destinations.

Details were added including a requirement that ITS elements be IP addressable, that all ITS elements must be on the same clock for synchronization to work and maintenance needs to have the resources to keep them running.

Additionally, educational and presentation materials are needed to help personnel understand ICM and to present recommendations and results. There needs to be processes for funding, approval of response plans. Good communication between all stakeholders is required.

Detailed notes follow.

What is the capacity of the network and how do we ensure maximum capacity?

Raj started by showing what an incident is as per the Concept of Operations. This elicited numerous questions which resulted in a number of requirements.

Requirement: Must be able to determine the extra capacity of the road network in real time.

Implied Requirement: The ability to model/estimate network capacity based on multiple control scenarios for current and future traffic.

Comment: There are real challenges with detection

Requirement: Detection must be implemented and maintained

Comment: Off pavement detection has many advantages

Requirement: Design Constraint: Consider off pavement detection (radar for example)

Question: How do we divert local traffic to different routes? For example, there may no longer be an easy left hand turn in some places.

Requirement: Must be able to divert local traffic and communicate with local traffic.

Requirement: Must be able to tell people directly which route to take. Caltrans worried that this is not allowed right now on CMS signs.

Question: How do we ensure maximum network capacity?

Requirement: Design Constraint: Must be willing to sacrifice some cross traffic

Requirement: Design Constraint: Must be willing to reduce or remove right turns

Comment: There are difficulties with coordinating signals caused by clocks being wrong.

Requirement: Real-time verification that the clocks are correct

Requirement: Real-time verification that the timing plans are what we think they are

How will routes be determined?

Requirement: Multiple routes should be considered for an incident

Requirement: Multiple on and off ramps should be considered for an incident

Requirement: Routes not to take should also be identified

Question: Will there be different routes for different people with different goals? For example, some folks will take a longer route if it helps the situation.

Requirement: Must be able to communicate overall information on the incident and to suggest more than one route to individuals based on their preferences.

Question: Will local businesses be impacted?

Requirement: Must take local business desires into account when selecting routes

Implied Requirement: Must be able to determine local business needs

What information will be communicated to travelers?

Requirement: Must be able to communicate routes to travelers

Requirement: Should be able to communicate routes not to take to travelers

Requirement: Should provide communication based on traveler destination

Requirement: There must be signs on the freeway

Requirement: There must be signs on the arterials. While other methods of sharing information were discussed it seemed that folks felt some form of signage was essential.

Implied requirement: Should have a general idea on origin-destination for travelers on the highway

Implied requirement: Should have a general idea on origin-destination for travelers on the local arterials. This requirement resulted from a discussion on how local traffic routes will be impacted by reroutes.

Implied requirement: If there is an application, it should permit people to enter their OD information and get an answer specific to their needs.

Comment: Concern that third-party information providers will not provide the same information.

Requirement: Work with third-party providers to provide coordinated information sharing.

What information will be communicated to businesses?

Requirement: Must determine what information businesses are interested in

Requirement: Must communicate this information

Will ramp metering and signal plans be changed as part of a response plan?

Requirement: Ramp metering and signal plans will be changed as part of an incident response

Requirement: Must ensure equity with local roadways. Don't just dump traffic from freeway

Question: What is the Caltrans policy for ramp meters. Can we change a ramp to green as opposed to turning it off?

Implied requirement: Ability to change ramp meter to green

Requirement: Must resolve timing issues between signals of different jurisdictions and ramp meters

Policy Change: Loops are right across from the limit lines. Be nice to change the location of the monitoring.

Requirement: Change location of loops to be downstream of ramp entrances.

How to Create and Ensure Acceptance of Response Plans

Requirement: Design Constraint: Use areas of interest when designing the response plans. For example: TransSynch is a partition feature.

Requirement: Time-space diagrams for each response plan

Comment: In order to ensure adoption of ramp metering plan changes as part of an incident response, it is important to show there is a win for the ramp metering team. Some districts have dedicated ramp metering personnel and others do not.

Requirement: Ongoing work with the ramp metering teams to ensure understanding of goals and how ramp metering changes help the overall system

Requirement: Good educational tools (animations and pictures) to show ICM concepts

Requirement: For HQ to accept response plans

- a) Must only apply to events and incidents
- b) Must be reviewed by district personnel

Hardware/software

Comments:

URMS – Is in the cabinet, ATMS communicates with the URMS. However, we believe that the URMS is remotely accessible. What is the communication channel to get there? Must speak with David Wells.

If power is lost, then signals run normally for two hours and then flash red

Question: Should we let other folks change signal plans if communication is down and if so who should change it?

Requirement: All ramp meters to be IP Addressable

Requirement: All signals to be IP Addressable

Requirement: Battery backup to be present at Ramps and Signals

Implied Requirement: Maintenance checks to ensure that the batteries are working

Organizational Requirements

Implied Requirement: Good communication between districts and HQ

Implied Requirement: Process for districts to review and approve response plans

Implied Requirement: Funding process for maintenance of ITS elements

CALTRANS HQ — INCIDENT MANAGEMENT

August 20, 2015

Larry Wooster, Caltrans

Summary:

This was a wide-ranging discussion on incidents, how they are managed today, and how they may be managed in the future. In essence, new procedures, training, and personnel are needed to ensure Caltrans can assume its new role as corridor manager during an incident. A number of items were discussed:

- 1) What is an incident? Caltrans thinks of incidents as principally times they must send out the TMT. However, incidents may not require that level of response but still require traffic management (changes to signals, ramp meters, etc. may need to occur).

- 2) What is the extent of Caltrans' responsibility? It is now being extended to non-state owned arterials. That is a change. This will require additional MOUs and additional knowledge and data on arterials. In particular, there were discussions on sharing information with cities
 - a. Must develop methods for verifying incidents on city streets (cameras for example)
 - b. City Lane Closures must be shared centrally
 - c. Methods for rerouting on city streets need to be developed
 - d. Understanding when construction is occurring is a challenge
 - e. Have real-time information on state of city streets
- 3) What is the role of Connected Corridors in incident management? Connected Corridors is focused on managing transportation around the incident and not on the incident clearing itself. Nor is it focused on incident reduction. So the primary requirements for Connected Corridors are:
 - a. That communication occurs between the Connected Corridors response team and first the incident identifier and then the incident commander. The formalization of this will require an MOU.
 - b. That communication occur between the cities, the incident manager and the Connected Corridors team
- 4) There needs to be dedicated personnel in the TMC to watch over corridors. There is not sufficient staffing at this point.
 - a. Corridor focused operator who must have simple clear instructions and must be able to make decisions with being blamed if something goes wrong
 - b. Ramp and signal person at TMC
- 5) Once the incident response is initiated there needs to be a way to get first responders to the incident. This should be considered in response planning.
- 6) There are questions on how to know when an incident has ended and response plans should be discontinued. There needs to be improved communication between both the incident manager and the Caltrans TMT with the TMC/CC team.
- 7) Procedures need to be refined for the use of TMCAL and logging of actions in general

Actors:

- CHP – 99% of the time CHP knows what is happening
- Fire
- EMS
- Towing
- TMC
- Cities

Details of Meeting

Items of Interest:

- 1) Secondary accidents may occur 20% of the time

- 2) If there is spillage during an incident, on the state highway, the owner gets a first attempt to remove the spillage, then Caltrans.

High-Level Concept / User Need

Flexibility

How do incidents develop?

- 1) 911 Call to CHP
- 2) CHP unit sent to investigate
- 3) CHP enters call into the CAD system, they indicate if Caltrans is needed
- 4) CHP sits with Caltrans
- 5) Caltrans may use cameras to investigate. This is hit or miss
- 6) The TMC responds by setting CMS signs
- 7) The TMT responds
- 8) If needed Caltrans Maintenance responds

Requirement: CHP must let Caltrans know when there is an incident on the corridor by flipping the right switch. They may be open to trying this on our corridor.

Requirement: Have to get first responders to an incident.

- 1) Close lanes and go in opposite direction for example
- 2) Just provide a corridor of some type

Requirement: Incident Commander coordinates with Corridor Manager

Requirement: MOU between CHP and Corridor Manager

Unclear Requirement: The system sees a disturbance in the traffic, what should it do?

How are incidents managed?

Will there be an MOU to give CHP control over the arterials?

Requirement: Dedicate someone in the TMC to look at corridors – Explanation: There are 3 max people in the TMC at any time. Operation Snowflake may get in the way. There should be a TMC person who goes and looks when the software determines there is an incident or when the CHP indicates in some way that there is.

How are incidents completed?

When do we turn them off? This is a big question.

Requirement: Need to know how to end response plans

Cities

Assistance from cities is an issue. Signals synchronized. They ask CHP to set up the intersections.

Requirement: Need to know about arterials.

Incident needs to be verified. Caltrans get into trouble if they recommend reroutes when there is no lane closure.

Requirement: Need to verify incidents on arterials

City will tell Caltrans and then reroute traffic.

How will trailblazers work?

Requirement: Understand how to reroute traffic on city streets

Requirement: Cities share lane closure system on a weekly basis with 10 Codes.

Systems

CHP CAD and then the ATMS; TMCAL is also used. (TMCAL is used as an activity log. For example, call Pasadena and note whether they answer or not.)

Must be 3 systems: CAD is used for verification, cameras for verification, ATMS is the response plan. CAD provides a lot more information. There are issues with speed and accuracy/specificity of CAD system.

Field tells when closures start and finish. Supposed to call into the TMC.

Operator needs

Don't put the operators in a bad position where they will be blamed.

City cameras for visibility on city streets.

Want information online without any questions on what to do.

Operators must be able to:

- Make some decisions.
- Take simple steps.
- Provide feedback and update.

Operators: Signs, not ramp meters only for on or off, not signals.

Can we have ramp metering and signals folks dedicated to a corridor for 24-hour shifts?

Want to see feedback in real time (for 100% of all arterial intersections that have a plan change). Want to verify that it is working.

Some troops that handle out-of-the-norm conditions.

Construction/maintenance needs

Monitoring of construction activities for cities

Monitoring of maintenance activities for cities and Caltrans

Closure goes beyond 5:00 AM. We need to make sure this happens.

Information from data, travel data, and queue length

CALTRANS HQ — MAINTENANCE

August 20, 2015

Gonzalo Gomez and Jason, Caltrans

Summary related to requirements

This was an informative discussion as the CC team had not had the input of maintenance personnel until this point. The ability to manage a corridor rests on working data sensors, communication lines and controllers (ramps, signals, etc.). Maintenance has a profound impact on the mean time between failure of these devices and their basic working condition on any given day. Maintenance needs more people to ensure that corridor equipment is working.

Maintenance does not set priorities or even determine what will be maintained when. This is done by operations. However, maintenance sometimes note that equipment is in need of repair and may malfunction. Improved coordination between operations and maintenance to proactively deal with likely problems is required for good corridor system uptime.

In general reporting and documentation needs to improve including:

- 1) A complete inventory with as built documentation (Both are not complete)
- 2) A way to see the overall state of a corridor's equipment
- 3) Reviews of numbers of repairs as indication of areas of risk

Details

Gonzalo – Program Advisor for HN4. Also responsible for staff oversight, policy recommendations for traffic devices (CCTVs, etc.) and communication components. He also deals with non-electrical, non-ITS elements, such as lighting, etc. He is involved in field deployments in D4, system configurations, communication, etc.

Jason – Jason is involved with state forces staff, electricians 1 and 2 and their supervision. He also managed TOSNET

TOSNET - In 1998 Traffic Operation Systems Network (TOSNET) arrived, originally to maintain communications. TOSNET manages an on-call series of contracts used to perform work that Caltrans can't get to. TOSNET does other field elements now and not just communication.

The TOSNET contract is responsible for communication components between field elements and TMC (wireless, fiber, microwave):

1. Hub contracts to keep field housing up to spec
2. Fiber or copper – minor repair to fiber cuts

Note: When maintenance crew is mentioned, it means electrical maintenance.

Priorities

We see the priority as safety devices first. So ramp meters and CMS are lower priority. Lighting, traffic signals, pumping station are a higher priority.

Preventive and reactive maintenance

Maintenance doesn't decide what goes on the road. We maintain what others have decided. And since reliability is important for equipment, this includes both preventive and reactive maintenance.

- **Preventive maintenance.** The preventive maintenance orders originate within Maintenance from the Integrated Maintenance Management System (IMMS). Preventive maintenance occurs 2-3 times a year.

We feel that there is a need for improved communication between Ops and Maintenance. For example, we will do a preventive maintenance check and see a condition that needs to be addressed, and we note it on the IMMS work order. But the information does not get into Operations' workflow in a way that helps prevent failures.

- **Reactive maintenance.** A key point for reactive maintenance is that we do not actively monitor and use the systems, so Traffic Operations need to bring it to Maintenance in the desired priority in TRACK. (TRACK is the ticketing system. Operations will assess the problem—comm or equipment—and then send to Maintenance. Priority is set in the TRACK system.)

Road closures

Are road closures required? Yes, depending on the device and the location and depending on what you are trying to do. Especially on the freeways a closure may be required, especially for repairs.

There is a coordinator who arranges lane closures.

Equipment

The problem we face from time to time is old obsolete equipment. Hard to keep everything working if equipment is old and obsolete. Maintenance is not to be used for improvements.

Make sure you're scheduling your equipment on a timely basis through the SHOPP program. Recently because of increasing fund estimates SHOPP did allocate money for the ITS rehabilitations.

Want a more formalized checklist for the state of equipment. Qualitative type of issues. Couple of reports are:

1. Monthly report to division chief. Excel file of all contracts, how much we have expended.
2. TOSNET quarterly (?), how many hours spent on field elements in a given district.

Our goal is to pull any info we need. The number of repairs can lead you to estimates of reliability or awareness there is something wrong with that section/item (bad locations, old equipment).

Neither IMS nor TMS inventory are 100% complete.

- 1) Inventory needs to be better.
- 2) Traffic Ops have a life cycle replacement program.
- 3) We don't have as built; we use TOSNET contracts to get as built docs.
- 4) Issues of incomplete installations. ITS is not a priority to construction folks.
- 5) Installations are done in locations that are hard to get to, getting better.
- 6) Maintenance needs to be involved in PID phase.
- 7) When the initial maintenance contracts for new equipment is over, then Caltrans must pick it up.

There needs to be a way to see the state of a corridor's equipment. We need to step back and look not just at electrical maintenance.

Other comments

Always behind in person power.

Next step

Need to set up another meeting.

CALTRANS HQ — PEMS

August 20, 2015

Attendees: Tim Hart and another person whose name I don't seem to have.

This discussion occurred within the context of a need for a data hub, a one-stop shop where different systems could all send and receive data. This was a pleasant discussion about PEMS, its current variants (CPEMS, APEMS, etc.) and its possible role as a data hub responsible for managing additional types of data relevant to corridor management. Data categories could include:

- 1) Static
- 2) Real-time
- 3) Historical
- 4) Performance – New metrics such as travel time

This data would include:

- 1) Vehicles
- 2) Bikes
- 3) Pedestrians

Data Types would also be expanded to include probe data but for all changes additional funding is needed

We also discussed that it would be sensible to use CPEMS for other corridors in California (and not just for San Diego).

There were no requirements provided for data content as those requirements will be provided by members of the Connected Corridors team.

However, there were requirements stated for what it would take to ensure people use PEMS in an expanded role as well as to meet MAP21 goals. These included

- 1) Sufficient staffing for the PEMS HQ team:
 - a. An engineer (software/data) to work with PEMS
 - b. New person to do training (now have two planners doing this)
 - c. Provide training, run reports, do some data analysis.
- 2) Shared responsibility with the districts (especially as data becomes more real-time)
 - a. Providing data
 - b. Ensuring the quality of the data

We also discussed that the current requirements for working loops is 90%. We noted that it mattered which loops were working and that a percentage such as 90% did not take into account that some sensors were more important than others.

CALTRANS D7 — SIGNAL OPERATIONS

September 1, 2015

Kelvin Vo, Augustus (Gus) Gumboc, Ajaykumar (Ajay) Shah

Allen Chen was at the meeting for a short time; an additional meeting will be set up with Allen

Samson Teshome, CT D7

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Summary: This was a good meeting with the personnel who will be working with Samson to ensure signal timings are modified appropriately during an incident. Their level of commitment was obvious as they consistently focused on requirements for ensuring they could do their work. These included how to communicate on site (cell phones), how to get to the site (cars), how to coordinate with the local traffic engineers and how to modify work role descriptions to permit flexibility in work times and over time.

Communication is very important. Must coordinate with peers at city agencies

Data is also key. Can neither set appropriate signal timings nor perform good after incident analysis without data. Right now they have set timing patterns based on known data however that data may be old and inaccurate.

<i>Need/Requirement</i>	<i>Notes/Follow-up Needed</i>
Coordination and Response	
Response requires either remote access or being on scene	While automation will help there will always be incidents where being on site is important
Expedited access to CT vehicle to get to the field	Currently a Chief needs to sign out for the car if needed for overnight stay. Managers can sign for same day use. However, vehicles run out and one may not find a vehicle to use unless booked days in advance, which does not work for incidents.
If equipment needed for response, need expedited service	Currently need to create a project
More coordination with arterial signals; meet with cities to share timing plans, software, reroutes, etc.	Caltrans engineers are only responsible for Caltrans signals.
	About 22 signalized intersections that are owned by Caltrans are under an active Maintenance and Operation agreement with Pasadena and Duarte and, as a result, Caltrans Timing Engineers don't have access to them.
Caltrans should be involved in the scenario discussions	
The County needs to be able to change some of the city signals	Was this comment for after-hours operations?
Core unit personnel need to be identified and cross-trained so someone can cover in case of illness	
Have consistent personnel doing the work	County engineers do the timing "on paper," but technicians change the timing in the field. As a result, on-the-spot modification would require both the Engineer and Technician to be present during incidents for County Operated intersections. If City has a contractor, they may not be a timing

	engineer, which can cause problems.
Need a policy and flexibility regarding CT personnel working overtime and after hours	Similar procedure to TMT shall be adopted when it comes to overtime resource allocation and approval process.
Training for signal timing personnel if they will have expanded roles with the TMT	
Arterials need to be added to incident reviews	TMT incident reviews? Only for TMT activities within the CC.
Signals and timing personnel should be involved in incident review with TMT	If incidents last more than 3 hours, then there is an immediate review (?). TMT currently do incident reviews. Or just hold a monthly meeting with all stakeholders to conduct after incident discussion to improve the response and build on lessons learned.
Concise definition of an "incident" (duration, etc.)	Let's use the definition reflected on the TIM pdf file Larry shared with us?
Clear definition of roles, areas of responsibility	Does not include CMS
Clear definition on how after hours' time will be managed	
Traffic models are needed to ensure proper synchronized timing	
Equipment failure responses need to be defined for incidents	Power failure is maintenance, if there is a communication failure then maintenance will collaborate with Tadeo to fix it.
Situational Awareness	
Signal personnel need to freeway/arterial traffic volumes and turning movements and throughput at intersections	Data important for detailed incident critiques
Access to traffic counts, construction timing, uses (schools, etc.) around the area	
Travel time data is useful	
Lane closure charts in advance for upcoming closures	This is already available in LCS
Need to know LOS for intersections and ramp meters	
Peak hour reviews every three years	How often does this happen now? Depending on overtime resource availability
Must reduce equipment failure rates – focus on detection	Bad detection leads to bad decisions which leads to complaints
Every cabinet should have a site visit every year (AM and PM)	
Maintenance personnel should visit every 90 days to make sure equipment is working	Now they visit every six months
Need to know rail crossings and schedules	
Need to agree on basic success metrics	Safety, reliability, mobility for corridor. Level of service for intersections and ramps
To extent possible, computer systems should help generate metrics	
Metrics must be able to show how signals and ramps improved the situation	
Communication	
Good communication with all internal and external agencies	
Need the right person to call: designated "point/contact person" at each agency	Include contact for design issues
Communications protocol with the cities	Who and how to call – CM is the contact for CT
Communications devices	Smart phones – Not Available for CT Team yet

CALTRANS D7 — MAINTENANCE

September 1, 2015

John Brock and J. Rodriguez

Samson Teshome, CT D7

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Summary: Maintenance was well prepared for this meeting and had many ideas on how to ensure better corridor operation both during incidents and normal operations. There are a number of practices which could be improved and processes where higher levels of conformance would reduce maintenance challenges (ensure documentation for example).

Additional focus should be placed on maintainability when designing roads and equipment.

There was a comment: Noon to 8:30. What was this in reference to?

Also what is MSR?

<i>Need/ Requirement</i>	<i>Notes/Follow-up Needed</i>
Standardization	
Systems need to work together and talk to each other	
CCTVs and CMSs should be similar type with same communications to make maintenance easier	Custom cables for CCTV, CMSs, and fiber are problematic
All lighting should be 120/240	Custom lighting is a problem
Standardize all equipment	New “custom” equipment is hard to repair
Upgrade older models	Ensure funding is available to do this
Ensure there is funding to standardize/upgrade	
Review lifecycle of equipment	Need estimate of when it might break, plus spare parts ordered. Need a list of improvements for the I-210 (J said he can prepare it)
Modules on CMSs should be replaced	
Prepare lists of what is likely to break	
Prioritize work by list of what is likely to break	
Equipment and staffing levels	
Maintenance personnel and equipment are needed	For example, they used to have 8 people; now they have 3 in the maintenance department. Sometimes no parts, no documentation
Need newer boom truck(s)	Current truck is over 10 years old and maintenance is an issue
Need newer trucks	Trucks are down 25% to 35% of the time
Need to change from THW to XXHW system	Ants don’t eat the XXHW wire
Need maintenance location in Alta Dena	
Communication	
Maintenance staff need to be more involved in PS&E (plans, specifications, and estimates) for equipment	For example, hybrid truck can’t tow pole due to smaller chassis (but smaller truck ordered because it’s cheaper and hybrid)
Design changes at 65% and 95% review need to be implemented	Design plan comments are not incorporated
Department needs cell phones and smart phones	To see more quickly how to fix something (with pictures, for example)

Improve, speed up self-reporting	What does this mean?
Need faster verification of problems in the field; call-back numbers must be correct and available	
Maintainability	
Need to know equipment's MTBF (mean time before failure)	
CMS installations need a "turnout" lane so that traffic lane doesn't have to be closed to do repairs or maintenance	
CMSs need the "glare shield"	Removing them causes problems, reduces MTBF, impairs maintainability
Need preventative maintenance schedule and funding	Must do more preventative maintenance
Make sure all drawings are correct, current, in stock, and available	This is a real problem today
100% of items are in stock	This is currently true, but not true for loops or fiber
Fix right more than 60% of the time	Currently items are fixed correctly 60% of the time. Need additional info on this requirement.
Loop maintenance needs to be improved	They are currently in slabs (or they are not in slabs?)

CALTRANS TMC – TMT AND LCS

August 26, 2015

Joe Vengas

Samson Teshome, CT D7

Raj Porandla, CT HQ

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Summary: The meeting focused on the TMT. We may need a separate meeting to discuss the Lane Closure System (LCS). Overall there were several items discussed:

1. How to know about incidents where the CHP or local law enforcement does not request the Traffic Management Team (TMT)
2. Expanding incident response to involve changing signals on city arterials.
3. How to better involve cities in incident planning and response
4. The need for additional data needed for planning for and managing incidents

<i>Need/Requirement</i>	<i>Notes/Follow-up Needed</i>
Data	
Caltrans needs arterial information	CT currently has no arterial information
Additional cameras would be beneficial	
Incident Information	
Need better local law enforcement/city input	Arterial signal synchronization, for example, also just knowing when an incident occurs on a city street

CT needs to know about all incidents from the CHP	Currently on a “need to know” basis
Cities need to communicate local lane closures to CT weekly (in advance)	
Incident Management	
Would like response plans for smaller routes	Currently response plans are in place for major routes/connectors
Trailblazer signs on the arterials are needed	
Organizational	
The team needs to be expanded; additional personnel to verify how things are working in the field	
TMC operators need training	What type of training?

CALTRANS TMC — OPERATIONS

August 26, 2015, 12:30 pm

Osama Assaad

David Lau

Samson Teshome, CT D7

Raj Porandla, CT HQ

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Alan Clelland, Iteris

Summary: The proper role of the TMC and its operators is challenging.

1. TMC Operators are used to having cameras for verification and they will want verification data from city streets also. There needs to be multiple ways to verify incidents.
2. A very important message was that the operators should be involved in the design process from the beginning.
3. New functionality should not require more terminals and systems for the operators and should be straightforward to use.
4. Functionality should be deployed incrementally and there should always be the ability for operators to approve and modify response plans

<i>Need/Requirement</i>	<i>Notes/Follow-up Needed</i>
Data-Related Requirements	
Arterial conditions need to be taken into account for deciding response	
TMC needs better information on city streets	
Local streets need detection	
Need 100% video coverage on city arterials to detect and verify, accessible at CT TMC	For visual feedback on whether the recommendation is working at arterial intersections

Point-to-point travel times on freeways and arterials (between Point A and Point B)	
Arterial PeMS needed	
The arterial information needs to feed into the DSS in case the arterial gets backed up	
Need information and way to monitor construction and maintenance projects on the freeway and arterials	For example, real-time ramp closures for construction events
Construction pick-up cannot be after 5 am	Need enforcement
Software System	
System needs to have simple steps for CT operators, be accessible and usable	<p>Already overloaded with screens. Don't:</p> <ul style="list-style-type: none"> • "Add another system" • "Add customer monitor" • "Layer information onto current screens" <p>Integrate the new information / functionalities into the current systems.</p>
Single entry of data: Operator must not need to input info twice into two systems	
Access multiple data sources to verify conditions	Don't rely on one source of data
The system needs to integrate with ATMS and TSMSS	What is TSMSS?
System should be smarter and give more than basic data	(e.g. ability to provide the real-time delay between any two points selected by an Operator on the map)
System should make one or two recommendations (not just one)	
Operator approval needed (especially in in early days of operations)	
DSS should reassess response and adjust -- escalation procedure	<p>Need to do Lessons Learned:</p> <ul style="list-style-type: none"> • Quick analysis of response to an incident • Assessment of impact • Changes needed to response plans
Deploy system incrementally	
Flexibility to modify/add functions	
TMC-Related	
Either need more training for operators or more diverse personnel in the TMC	Don't expect knowledge of timing plans by all operators
On-line policy and procedures for: <ul style="list-style-type: none"> • Consistency between shifts/operators • General schema of things 	
TMC needs more staffing on the weekends	
Other Items	
Move messaging direct to driver (generated by DSS) to provide more info to motorist	
Positive confirmation of message delivered (e.g., by CMS)	
Need trail blazer signs on arterials	
Local cities need staff to handle incidents after hours	

CALTRANS TMC — RAMP METERING

August 26, 2015

Afsaneh Razavi

Samson Teshome, CT D7

Raj Porandla, CT HQ

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Summary: The meeting focused on the basic needs of organizations who want to perform integrated corridor management. These include:

1. Good cooperation between agencies
2. Good data and information
3. Upgraded equipment
4. Proper resourcing and training

<i>Need/Requirement</i>	<i>Notes/Follow-up</i>
Data-Related	
All groups and agencies need to be coordinating (ramp metering, signals, maintenance, safety, etc.)	
Need better understanding of the corridor (city streets, detour routes, etc.)	
Need good detection	
Need detection all the way through the ramps and at left turns	
Need cameras and CMSs on arterials	
Organizational and Staff	
Need additional staff to review, study, and maintain meters	
Need plan review training	
Ramp Metering team needs to be at meetings and review after-studies	
Provide resources to do location studies and annual studies	
Training and job classifications are important (some jobs are more than a "technician;" need a Traffic Engineer)	
Management needs to understand the work and provide the resources	
Equipment and Software	
Ensure all controllers are 2070 controllers and apply Universal Ramp Metering software	

CALTRANS TMC — HARDWARE AND SOFTWARE SUPPORT

August 26, 2015

Liem Phan – Managing Field Elements

Binh Nguyen – Managing Field Elements

Alebachew Bekele – Communications and Field Elements

Amahates Dimira – Hardware and Software

Tadeo Lau – Performance Data

Samson Teshome, CT D7

Raj Porandla, CT HQ

Joe Butler and Lisa Hammon, PATH/Connected Corridors

Summary: There are many challenges to integrated corridor management and its implementation should not be allowed to make work tasks more complex than absolutely necessary. The goal is challenging requiring the sharing of information (security concerns), the building of new systems, the collection of new data, the training of operators and the improvement in reliability of equipment.

The personnel in this meeting are responsible for hardware and software support within the TMC and for communication with field elements into the TMC.

<i>Need/Requirement</i>	<i>Recommended by</i>	<i>Notes/Follow-up Needed</i>
Data		
Need local arterial feeds into the TMC	AD	
TMC Systems		
Want one integrated system; hard to operate different software systems; integrate with ATMS (or its replacement)	AD	
Need to deal with security issues	AD	Not comfortable allowing people to see everything and there are IT issues, too
Organizational		
TMC operators need more training	ST	They only have basic knowledge
Maintenance and Field Elements		
Need to change to IP field elements. (SONNET or SONET system is dying out and parts are difficult to obtain)	AB	This may already in the pipeline according to Raj
Maintenance response time needs to be improved	AB	

I-210 Pilot: System Requirements

No CMSs should be down; need 95% up time for corridor management	AB	Up time will be improved by converting to IP (AD)
Need to resolve copper wire theft issue	AD	
Need to replace some cabinets and controllers as they are very old and dirty which leads to failures	BN	
If radar is deployed, maintenance department will need training	LP	

METRO TRANSIT

October 28, 2015

Stephen Rank (bus operations) and Tamara (rail operations) for Patrick Preusser

Joe Butler and Lisa Hammon (UC Berkeley), Reinland Jones (LA Metro)

Requirement	Notes/Follow-up Needed
Ensure we can effectively communicate information	<p>Metro currently uses a web-based system called Everbridge (http://www.everbridge.com/), as do many police, fire, and airports. The system sends automated alerts (predefined messages that indicate a change in status in the Metro bus environment) to a large group of people.</p> <p>For different alerts, different people are contacted; there can be contact groups for specific events at specific locations. (How the list of contacts and numbers is maintained may have security issues across organizations.)</p> <p>Based on the alert, Metro knows if they need to do a reroute. Alerts also indicate changes to or the ending of incidents. Metro could build arterial information into the Everbridge system.</p>
Corridor agencies as a team (cities, county, etc.) to create a special set of Everbridge alerts for the 210 area	
Get Samson on the Everbridge alerts. Also, Samson to call Metro when an incident occurs.	The BOC and ROC have a 24/7 control center where Samson can communicate I-210 issues (213-922-4634)
Passenger notification is important	
Tie Metro passenger communications to 511	Passengers can get social media info/tweets currently
Transit signal priority is important	
45-foot buses need to be the norm for a bus to be able to use a route	45-foot buses have the biggest turning radius
Need DSS to communicate with the ROC and BOC	The BOC and ROC have Standard Operating Procedures for each function
All cities that are part of CC should forward any permits issued for public events to Metro	City of LA currently does this. Allows Metro to consider effects of events and road closures on transit. For example, they routinely change routes for USC games (and have a good system in place for those games: website, twitter, standard detours for the football season, hand-signs at bus stops).

Other Notes:

- There are 16,000 bus stops in the Metro system.
- The Gold Line extension has a new division in Metro.
- The Metro PR rep will be involved through the duration of an incident.

Connected Corridors follow-up:

- Meet with the Vehicle Operations Supervisors (VOSs). Reroute decisions are made by Vehicle Operations Supervisors who work with police and provide just-in-time route modifications. They work with the sheriff to contact police. (A deputy sheriff is housed in the control center.)
- Meet with the Bus Operations Center (BOC) manager, Nadine Triche-Williams, and the Rail Operations Center (ROC) manager, Troll Ken.
- Meet with Scott Norwood, Director of Emergency Services at Metro. He is putting together a “Multi-Agency Compact” (MAC) between public transit agencies for mutual aid.

CITY OF ARCADIA

September 1, 2015

Participants:

Name	Agency / Company	Email
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Eunise Reynon	Iteris, Inc.	evr@iteris.com
Mike Lang	Arcadia FD	mlang@arcadiaca.gov

Note: **(R**)** denotes potential requirements

- Introductions

- Project Background
 - Initiative by FHWA
 - Sample situation: incident at the I-210, Lake exit (coinciding with Soccer Game ongoing in the Rose Bowl)
 - Focus is on arterial systems
 - Entire corridor is managed together
 - Currently, there is difficulty in coordination between agencies
 - Goal: to develop pilot system within corridor to help manage it
 - Existing system stays; another layer will be in place to tie different systems together
- Requirements Gathering – Concept of Operations
 - Describe roles and responsibilities
 - Answers the question: what should the system do?
 - Process to identify people involved (actors), and each has a story
 - To talk about what each stakeholder would like to see in the system
 - Once requirements are documented, this becomes the basis for the design of the system
 - Caltrans has about \$22M for ITS improvements; agencies have will have funding for their own improvements (approx. \$5.8M)
 - The system is more about people than computer system
- Planning incidents
 - Multiple events ongoing in the area
 - Events in Santa Anita race track (i.e., Breeders’ Cup – plenty of visitors going in and out of town)
 - UCLA games – people are shuttled in and out of the track heading towards the Rose Bowl
 - Issue: I-210 is congested, so motorists go to the “Y”
 - A challenge due to limited roadway width, roadway limits, etc.
 - Goal is to funnel people out of the city as much as possible
- Incident response
 - For major events – helicopter is used as an overview of the area
 - Example: during the car carrier accident, helicopter is used to overlook traffic conditions
 - Helicopter use shared with City of Pasadena
 - Debrief after the event to discuss what worked, what didn’t
 - Issue: during CHP events, local PD and CHP have no information exchange unless someone is at the scene to coordinate
 - Tough to coordinate with CHP
 - (R**) helpful board (CHP) information, CCTV network
 - (R**) Caltrans to actively coordinate with CHP
 - (R**) Local PD to know about incident to prepare proactively
 - (R**) PD upgrades = to look at traffic conditions on site
 - Currently, PD at times manually override controller cabinets to flush traffic
 - One of the challenges is during responding immediate need
 - Not a problem when an event is pre-planned
 - (R**) active interaction with traffic operator
 - (R**) data information to see in the system:
 - Extensive data information to show traffic conditions

- To have a degree of interaction, level of real-time data between systems
 - System will make a recommendation
 - Identify type of incident and who should be involved (during working and non-working hours)
- Sources for incidents: 911 calls, third-party sources (Waze, SigAlert)
 - Communications with dispatchers
- **(R**)** to alert everyone about the incident, and how it affects each agency
- Fire department gets initial call from CHP
 - Call comes from Verdugo Dispatch, located in Glendale Command Center → handles 13 cities within the area; overseen by Glendale Fire Department
 - Dispatch has view of various department fire engines, has real-time conditions for incidents
 - Fire is involved when big incidents happen
- Future system will not change how fire/PD responds
- **(R**)** social media alerts to notify public
- **(R**)** Support of interagency communications: getting the right person to be informed (who can we get in touch with regarding the event/incident?)
 - Incident commander
- What happens without the system? (Current Operations)
 - CCTV Cameras are used to verify incidents
 - **(R**)** Later use of data and/or video for review of incidents and responses would be useful
 - Communications with Caltrans, oversight to other agencies
 - Officers currently use a combination of WAZE, SigAlert and the CHP incident log for current incident information
 - Little communications between CHP and local Police
 - **(R**)** Delivery of info to the officer at the scene should be via his/her smartphone; in future possibly via tablets in vehicles
 - **(R**)** Generate contact list
 - **(R**)** e-mail blast regarding road closures and incidents
 - Individual distribution list – updated and distributed when there are changes
 - **(R**)** system speaking to NIXEL
 - According to FD, Verdugo Dispatch will communicate with the nearest fire engine to respond to incident
 - **(R**)** Verdugo has “Instant Action Plans” which Verdugo “transmits” to the responding services – how to incorporate into the ICM?
 - **(R**)** all PD’s in the area to coordinate (possible future requirements meeting with all local PD’s with CHP)
 - **(R**)** all events to be pre-planned → ICS forms, incident action plans to circulate
 - **(R**)** effective and detailed mapping system to look at traffic – currently, FD looks at an iPad to look at traffic conditions
 - **(R**)** have the system tie in with Verdugo CAD system
 - **(R**)** sharing of live video feeds between CHP, county, and city
- How much should be done during rush hour?
 - No additional throughput vehicles in corridors
 - **(R**)** effective signage – FD recommends changing static “Green” guide signs to digital signs
 - **(R**)** notify everyone about response plans done and changes done

- **(R**)** alerts when volumes from detectors go beyond baseline conditions (unusual traffic patterns)
- **(R**)** ICM should report problem conditions on the freeways/surface streets (unusual traffic patterns); allows operator/person to “get in the loop” before actions are taken
- **(R**)** have human intervention/verification – represents human filter
- **Other notes:**
 - **(R**)** Provide access to real-time information:
 - Video
 - Map-based traffic and incident data
 - Verdugo dispatch comprises all 13 cities in the SGV; addresses incidents on freeways and surface streets
 - Helicopter is JPA w/Pasadena
 - Arcadia police manually control Caltrans off-ramp intersections
 - **(R**)** Dynamic signing of closures on arterial streets
- **Conclusion**
 - Desire on the part of participants to meet again

CITY OF DUARTE

Initial Meeting — October 8, 2015

Rafael Casillas, Duarte Public Works Manager

Alan Clelland, Iteris

Reinland Jones, Metro

Lisa Hammon, PATH/Connected Corridors

Requirement	Notes/Follow-up Needed
Improve communication between Duarte, CHP, and Sheriff’s Dept.	Currently no communication; the City’s Engineering Department is not informed of incidents and relies on local media for information; in the future the City will access the County’s KITS traffic control system and manually adjust timings to account for traffic pattern changes during incidents
Huntington Drive is the main issue during incidents as other alternate routes are limited, especially south of the freeway. A study is underway to examine how traffic operations along Huntington Drive may be improved in response to Council requests.	Not sure how this may/may not affect the Requirements; need to stay informed on progress
Evaluate/change connector meter at the 605/210 interchange; traffic is avoiding the Connector metering by U-turning at Huntington Drive/Mount Olive intersection	Samson and Sam are looking into this
No trucks on Huntington Drive	7-ton weight restriction ordinance passed by the City Council
Need to connect Huntington Drive at Mt. Olive to KITS	Note that this intersection is not on KITS as it is a

Requirement	Notes/Follow-up Needed
	Caltrans intersection; but it should fall under the Caltrans TMSSS in the future?
Sign at Buena Vista currently says "210 Freeway" but should also say "605 Freeway"	East of Buena Vista, Eastbound direction prior to entrance ramp
Major accident information needs to be communicated to Rafael, however, it is the Public Safety Officer (PSO) who is the key decision maker in the City in terms of response to incidents and unusual situations (communicates with PIO, Emergency Services, Engineering)	PSO communicates with the Duarte PIO and City Manager; PSO will continue to be primary contact in the future and so should be the target for receiving information from the ICM
Duarte Public Safety Officer should be present at first responders' meeting	Need pre-meeting with PSO
PSO needs to know probable duration of incidents	
Duarte would like a KITS workstation to access the system and make timing adjustments (especially at Mount Olive and Buena Vista intersection)	Check that this is to be supplied by County
To do the above (adjust timings) Duarte engineers would need access to arterial data to assess the situation	
Need "fix" for Buena Vista off-ramp since it is offset from the intersection	It's timed but not synchronized and the intersection can get blocked
Need camera at Mt. Olive	City staff currently use a web browser to access Caltrans CCTV camera images
Duarte has old electrical infrastructure and has power outages; battery back-up is installed at Mount Olive /Huntington Drive, but others are needed, e.g., at Crestville and Las Lomas	Need battery back-ups to avoid signals going down
Need County involvement in changing traffic signals	Rafael is the only engineer in Duarte (he is a structural engineer, not traffic engineer); does not want novices changing the signals
Duarte would like a "pre-approved/automated" response as much as possible	
Need to determine what effect the Gold Line extension will have on the corridor	Has at-grade crossings and will have 7 minute headways; County will be developing RR signal timings
The ICM should support response to incidents in the Foothills; i.e., so that ICM actions can help emergency response	This is important in the case of fires in the San Gabriel mountains
The Field Services Manager should get notification of any traffic signal issues	The Field Services Manager gets info on signals down and he routes to Siemens as the maintenance contractor to do repairs

Other Notes (not necessarily Requirements):

- No parallel arterial in Duarte except Huntington Drive (Live Oak is very far south)
- The southeast area of Duarte has access issues. The signal just east of Las Lomas gives priority to residents.
- In Duarte, there are ways to "avoid" the connector meter at the 605/210, and this is a problem.
- Duarte currently can do web updates, email blasts, etc.
- Rafael would like to be more proactive, but Duarte is a small city and his team is small.
- John Fasana (Duarte Councilmember) is on the Metro Board.
- City of Hope is a very large employer in Duarte.

- The signal at Mountain and Duarte Road has 17 phases (train, pedestrians, plus Monrovia and County involvement).
- Not many big accidents on Duarte arterials
- The Sheriff for Duarte is out of the Temple station.
- LA County fire for Duarte is out of Commerce.
- The part-time traffic engineer is Dominic Milano (who also is contracted by Monrovia).

Follow-up Meeting — October 29, 2015

Rafael Casillas, Duarte Public Works Manager, and Larry Breceda, Public Safety Manager

Alan Clelland, Iteris

Hank Hsing and Marty Amundsen, LA County PW

Reinland Jones, Metro

Lisa Hammon, PATH/Connected Corridors

<i>Requirement</i>	<i>Notes/Follow-up Needed</i>
Planning	
The Duarte PSM should be involved in incident management Planning activities	
Consider traffic signals in Irwindale and Azusa, as their traffic signals can create gridlock on EB Duarte arterials	
Foothill Bridge (2 lanes) is a big constraint	County-owned; 2 lanes; not enough capacity
Mont Olive/Huntington intersection is the major issue for WB traffic	This is a CT intersection; the signal is not on KITS
No re-routes on Royal Oaks	Schools on Royal Oaks
Response	
Provide the status of local incidents in the corridor and current local traffic conditions to the City's PSM	See notes below; PSM wants to be the filter on traffic info to the PIO
Incident status should include an indication of the zone and extent of impact of the incident for local agencies to readily understand if and how they are affected	
PSM and PIO departments need more coordination	Some information is sent from each office and the Sheriff's office uses Nixle
PSM wants to get corridor alerts and information (but not every piece of information)	Smart phones are the primary communication devices used
Reporting	
Provide web-based access to historical information (e.g., incident reports)	
Provide post-incident analysis reports to better understand how best to route responders	
Rafael could use corridor information and reports	

Other Notes (not necessarily Requirements):

Public safety

- The Public Safety Office is also a Sheriff's substation.
- City contracts with County Sheriff for policing and County Fire.
- The PSM does not interface directly with Verdugo Communications Center but goes through the County Sheriff.
 - Temple Station is dispatch for Duarte (this is the main sheriff's station) and covers the whole I-210 Corridor.
 - The County Sheriff has Duarte staff contact/shift information and Emergency Operations Center (EOC) information.
 - Main contact at Temple Station is Sergeant Anthony Haynes.

Day-to-day operations

- The PIO in Duarte is Karen Herrera in the Administration office.
- On a day-to-day basis, the PIO will retweet Nixle output or will send out the City's own tweets.

Planning

- Duarte has evacuation plans in place.
- Hazardous mitigation plans are in place; Encanto Park is the staging area.

Incident management

- City staff is responsible for incident response.
- The City gets information through the County Sheriff at Temple Station.
- There is little opportunity for response to influence traffic on the City streets, as they gridlock so quickly.
- Arrow Highway is a constraint (past Live Oak).
- The status of local incidents in the corridor and current local traffic conditions has value for the City's PSM and PIO.
 - The information should be filtered by the PSM before going to the PIO.
 - The PIO filters the information to the community.
- The zone of impact of the incident is important.

Sharing services

- Duarte has close links with Monrovia and is actively investigating sharing services such as signals maintenance currently contracted out to Siemens (Republic ITS).

CITY OF MONROVIA

October 29, 2015

Monrovia Attendees: Ron Pelham (Fire); Jim Mead (Police Department); Tim Blackburn, Niles Boyer, and Brad Merrell (Public Works); Tina Cherry (Community Services Director)

Other Attendees: Alan Clelland (Iteris), Lisa Hammon (UC Berkeley), Hank Hsing and Marty Amundsen (LA County PW), Reinland Jones (LA Metro)

<i>Requirement</i>	<i>Notes/Follow-up Needed</i>
The I-210 CC system needs to inform the Verdugo Comm Center of an incident, which in turn will notify the Monrovia police dispatch center if relevant to the City	
Communication with Fire is important in case accident/incident backs up routes for fire access to other calls	
Need cross-communication between cities	
Notifying the public of large incident/accident is important	
Need coordination between departmental Public Information Officers (PIO)	Monrovia does not have a city-wide PIO. Each department has its own PIO/PR; possible coordination with City Manager's PIO.
Provide support for control of portable CMS	Can rent them within about 2 hours
Install KITS workstation	County to verify if this will be provided.
Enable viewing of video from Monrovia intersection detection cameras	The City would like to be able to bring back video from intersection cameras and view the images on an as-needed basis. The City does not have a TMC but would view images from either the signal shop, Public Works offices, or police dispatch.
Enable viewing of video from CCTV cameras on Huntington Drive	If CCTV cameras are installed along Huntington, then the images should be brought back to the Police dispatch center.
Provide data/information for post-incident response analysis	

Other Notes (not necessarily Requirements):

Planning

- There is little to no pre-planning for incidents
- Monrovia has an "action team" with barricades, signs, etc.
- City staff is primarily reactive with the exception of regular road closures such as the weekly Farmer's Market which the City Public Works ("action team") staff handle
- They recognize that Verdugo does have pre-planned responses
- Monrovia Fire Department is part of Verdugo Communications Center (seamless borders with others who participate in Verdugo including Pasadena and Arcadia, but not Duarte)

Incident Detection

- If there is an accident/incident on a major arterial in Monrovia, Police Department dispatch is notified by Verdugo Comm. Center, and an email blast may be sent out

Incident Response

- Police Department is incident command for Monrovia
- The media is the main source of information during a major incident
- Verdugo creates incident logs
- They sometimes use portable CMS (which they rent) and would like to have two which they own
- Monrovia uses Nixle; the police chief and fire chiefs are the filters for Nixle messages

Reporting

- Monrovia police and fire do post-incident follow-up/debriefing
- This has proven useful for future planning

Communication

- Smart phones are the communication devices of choice

Maintenance

- Monrovia does its own routine signal maintenance but has a contractor (Siemens, see Duarte notes) for other maintenance tasks
- Equipment is inspected quarterly (i.e., traffic signals)

Signals

- The City has some signals under the County KITS system
- City develops signal timing plans; implemented by the County
- City willing to develop “extra” plans if needed for corridor management
- City staff are unlikely to modify signal timings on the fly but would switch to another timing plan in the event of an incident affecting the City streets

CITY OF PASADENA

Wednesday, September 2, 2015

Participants:

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Note: **(R**)** denotes potential requirements

- Introductions
 - Introduced ICM and Caltrans Reorganization
 - Discussing Phase I of the project
 - Problem trying to solve? Incidents
 - About 25% of congestion is related to incidents
 - Project is data-intensive

- Caltrans spending \$22M starting in January 2016
 - About \$5.8M promised to this project (arterials)
- Introduced Samson as Corridor Manager
 - Signal people assigned to him to coordinate with different agencies' signal people
- Introduced new Central Corridor Organization
- Lisa discussed new newsletter (to be distributed quarterly)
- ITS CA meeting on September 21st
- Requirements Gathering
 - The core of this project is to reduce impact of incidents in the arterials and freeways
 - Requirement comes from people working on the project
 - Actors and Stories introduced
 - Design Constraints
 - Example: Caltrans TMC personnel requires not to include an additional screen for them to look at
 - What does this mean to everyone?
 - For participants to look at the actors and stories document and see what is best for them
 - **(R**)** To coordinate with different construction activities for agencies
 - Edison? Pasadena Water and Power?
 - Where to get construction information? Public/Private Entities
 - A command center is typically established in terms of special events/incidents – this serves as an information center
 - **(R**)** To have a meeting with everyone in Verdugo Fire Communications
 - **(R**)** To know what each city is proposing as far as detour routes go
 - **(R**)** Have pre-planned routes
 - **(R**)** Command center is important and needs to be involved
 - Fire and PD pre-plans events – They have command posts established (This is true for Rose Bowl events)
 - **(R**)** Corridor manager/personnel should be involved in planning meetings that currently take place for large, planned events at the Rose Bowl, etc.
 - **(R**)** Everyone to be involved in emergency pre-planning
 - Operations are sometimes done on the fly (setting some intersections on manual flash to direct traffic)
 - **(R**)** To have available information directed to maintenance people for coordination and troubleshooting (e.g., improved communication re routine maintenance)
 - And portable signage may be helpful
 - **(R**)** Find out what is happening in the arterials and freeways live
 - **(R**)** Automatically sends information to mobile and website for bus reroutes
 - **(R**)** E-mail list for appropriate people
 - **(R**)** Depending on severity, send out e-mail blast
 - PD: works from watch commander desk

PASADENA TRANSIT

October 28, 2015

Sebastian Hernandez and Britt Card (Pasadena Transit); Norman Baculinao (City of Pasadena)

Joe Butler and Lisa Hammon (UC Berkeley); Samson Teshome (CT)

Pasadena Transit indicated that their main goals are:

- 1) Keeping the buses running
- 2) Not changing the routes if possible (route changes require human intervention at the bus stops, posting of signs)
- 3) Meeting on- time arrival goals
- 4) Providing good info to their ridership
- 5) Staying within budget

All of these are challenged during a significant incident when all roads become congested. Their buses have GPS that reports to dispatch (I believe), and the dispatchers will reroute buses as needed during an incident. Buses cannot go on all streets (depends on bus size). The road supervisor will develop a plan for reroutes that is safe. They share routes with Metro, and bus size is more of an issue for Metro.

Pasadena bus routes run mostly north-south (Lake and Fair Oaks are the biggest routes). The traffic diversions we are considering run mostly east-west, so the challenge is how to get north-south buses through intersections whose timing for north-south traffic may have been reduced. It would seem that Transit Signal Priority (TSP) would be a good answer. They are not currently using TSP.

Requirement/Need	Notes/Follow-up Needed
Need information/notification if there is an incident, closure, change in traffic control, construction: How will this affect bus routes and arterials (delay, rerouting, etc.)?	Planning office and contractor need the information. A working group will be recommended to develop a strategy for having real-time information on land closures for the main CC reroutes.
Real-time arrival information at the bus stops	Planned?
Provide updates to onboard announcements and service alerts	Currently can update service alerts in about 30 minutes
Transit pass transparency in case of major incident	Already exists; Metro and Pasadena Transit passes interchangeable
Put additional buses into service during an incident	This is a budget issue
Detour routes should not be bus routes if possible	Fewer cars on major bus route (e.g., encourage vehicles to take Green instead of Colorado during an incident)
Work with a central planning committee on responses to incidents	

Additional information:

- Pasadena Transit hours of operation are from 6:00 AM to 8:00 PM, and dispatchers are present during these hours. The transit office staff also respond to questions from the ridership community, receiving approximately 50 calls/day.

- The Pasadena TMC is open 7:30-5:30, closed every other Friday. Personnel are present for emergency and planned large events outside of these hours.
- Pasadena Transit is connected to 511, Google maps, and the Connections website; they also use twitter.
- Road Supervisor goes to the scene of big incidents.
- Pasadena police manually control traffic during a major incident that occurs after-hours.
- Norman and Bahman are the central communications point in Pasadena; they notify transit, dispatch, planning, etc.
- Pasadena would be willing to sponsor a pilot project on lane closures in the city (if they have ICM Corridor implications) as part of the I-210 Pilot.
- CT Lane Closure System specifications need to be sent to Norman.
- Pasadena Transit will provide ridership numbers for 2014 to Samson and the on-time performance.
- It was suggested that we meet with dispatch and also with Access Services (disabled services for Altadena, Pasadena, and San Marino).

PUBLIC SAFETY / FIRST RESPONDERS

Monday, November 16, 2015

Participants:

Name	Agency / Company	Phone	Email
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Note: **(R**)** denotes potential requirements

- Introductions
- Project Background
 - The goal of this project: to bring together all stakeholders along the I-210 corridor for the purpose of tying together systems within the project area
 - Support communications between agencies
 - To help route traffic around the incident
 - The project is not changing anything happening at the scene of the incident; need info from incident to have intelligent decisions in traffic side
 - Goes two ways – flushing traffic from freeway to street, and from street to freeway
 - To achieve this, we need help from fire department, police department, and first responders
- Current operations
 - Verdugo Communications handles up to the I-605 Freeway
 - Verdugo and CHP handles wider areas within the corridor
 - **(R**)** Traffic is handled by law enforcement (PD); this must be maintained under any future arrangements
 - Intel is pushed through law enforcement from dispatch
 - **(R**)** Involve Pasadena, Monrovia, Duarte and notify/consult CHP for information
 - For incidents → Local PD has the information, then forwards to Verdugo
 - If incident occurred in the freeway – field people notifies dispatch, which notifies CHP, then notify Verdugo/LACF
 - **(R**)** Have information relayed to all stakeholders
 - Currently, CHP does not notify city and vice versa
 - Field personnel relay information to communications center, then communications center relays to others
 - **(R**)** need to establish protocol with field personnel for distribution of information
 - **(R**)** need to have fire department to law enforcement communication
 - **(R**)** response routes
 - Currently, Verdugo gets info from CHP as to where to go
- **(R**)** The system should provide better traffic information on surface streets
 - Currently, information is obtained through Google Maps
 - **(R**)** improve information sent to the public
 - **(R**)** Have the ability to provide different information to the responders than is going to the public

- Fire doesn't care about traffic – they will go and reach the incident location regardless
- Law enforcement also focused on the incident; only CHP cares about traffic
- East I-210 is very limited in diversion routes
- **(R**)** Issues caused by Gold line crossings will aggravate responses; Coordination with Metro Rail in the future (for upcoming Gold Line) must be supported
- **(R**)** Additional meetings for planning diversion routes
- Planning for responses (Pre-planning)
 - Done to understand what the likely response for the systems are
 - Limited routes for I-210: Colorado, Foothill, Duarte, Huntington
 - From the cities = no planning; others = planned
 - Pasadena with Rose Bowl Events
 - Duarte with Farmer's Market
 - According to CHP, incidents make events dynamic – each incident is different
 - For big events, LACC gets information, e-mail from Don, CHP is CC'ed
 - CHP uses radio to dispatch center
 - **(R**)** Communicate any changes to stakeholders
 - Example: green lines along WB Huntington for 6 miles
 - LACC = CAD to CAD communication for real-time information
 - **(R**)** dedicated person to be at the scene to confirm severity of incident
 - **(R**)** regular meetings with local agencies and CHP
 - On scene managers determine which ramps will be closed/opened
 - CHP will not take the pre-planned route
 - Fire Department will get to the incident one way or another – they have lights and sirens
 - **(R**)** Do not worry about how Fire Department gets to the scene/do not dictate how Fire goes to the incident
 - **(R**)** include fire department for review for designing diversion routes
 - **(R**)** include CHP in pre-planning
 - **(R**)** do not flush traffic towards stop-controlled intersections
 - **(R**)** use signal controlled routes as alternate routes/detours
- Who should know about timing?
 - **(R**)** Fire, Local PD, CHP all to know about flush plans and preferred response routes
 - **(R**)** All dispatch centers should be notified of plan changes as they are made
 - **(R**)** Need to talk to Verdugo Comm Center and LACC to understand how to inform Fire and Police of response actions
 - **(R**)** CHP should participate in design of detour routes
 - routes/traffic are deferred to local PD for jurisdictions outside of CHP
 - **(R**)** use CMS to divert traffic
 - Pasadena DOT is involved
 - **(R**)** have on scene officers know which corridors are coordinated
 - **(R**)** quick override of signal timing if needed
 - **(R**)** the more ways to move information, the more success this project will have
 - Smartphones, e-mails, app
 - **(R**)** have different tabs/layers for different groups
 - Example: LACC should only know if the President is in town
 - For local PD, they are involved in pre-planning with the engineers
 - For Duarte – works with public works and county sheriff
 - Public Works is in charge of pre-planning
 - **(R**)** for incidents/events: information should be present on where the flow of traffic is

- Important to know where the bottleneck is
- Implementation
 - A team effort to manage traffic
 - (R**) have effective communication during dynamic events
 - Implementation of diversion routes
 - For Duarte: On scene sheriff → communications center to dispatch → dispatch to sheriff to where traffic is flowing
- What is the answer to make sure information goes back to operators to make the right decisions?
 - (R**) need protocol to local PD/State
 - (R**) need to clarify the authority for what is being done
 - (R**) need to access to law enforcement radio
 - When 911 call comes in, information goes to PD dispatch
 - (R**) need two-way local PDs communication
 - (R**) develop protocol to automate process with local PD
 - (R**) Implement protocol with automated processes
 - (R**) Have a threshold in place → do not communicate smaller events
 - (R**) Response actions to include notifications as to who needs to know what and who needs to do what
 - (R**) establish MOU with each city
- How to ensure communication after the incident?
 - Caltrans has access to CHP CAD
 - (R**) have one person for each agency to come together in one central TMC
- Reporting/Performance Evaluation
 - For fire department, there is an after action review
 - (R**) Track response times to see if there is any improvement
 - Verdugo has information on response times
 - (R**) have a quarterly after action review for the corridor
 - Discuss average speeds before, during, and after the incident
 - Discuss clearance times/on scene time → not a performance measure for fire department
 - Identify major hotspots
 - (R**) get together for major review
- Who are the right people to participate?
 - (R**) involve:
 - local-level management (battalion commanders, division chief, etc.)
 - CHP: Sean Coyle (Baldwin Park); Denise Joslin (LACC)
 - (R**) Involve third-party companies such as WAZE
- Next steps
 - PIO meetings with Lisa

TRAFFIC OPERATIONS GROUP

Monday, November 23, 2015

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Note: **(R**)** denotes potential requirements

- Introduction
- Recap
 - One-on-one agency meetings with agencies already held to see how operations are done along the corridor
 - Last Monday – first responders’ meeting
 - This meeting – looking at specific actions during operations
 - To bring traffic operations people from different agencies together
- Corridor overview
 - Duarte’s restrictions on the east end
 - Multiple modes within the corridor
 - Focus: incident management and its impacts
 - It’s because of ICM that is why Caltrans is reorganizing
- Requirements gathering
 - Requirements for the agencies
 - Ex: Caltrans reorganization
 - To generate an open discussion → to build requirements (high-level) (due end of the year)
 - Once agreed, goes to lower level requirements (detailed)
 - Due end of March – beginning of April
 - Will it require more meetings? Maybe (Francois)
 - Send requirements to people to have comments
 - Actors are defined
 - Illustrates how each actor interact with the “system”

Stories

- Incident Management Planning
- Incident Management Execution
- Daily Activities
- Maintenance
- Unplanned Problems

- Reporting & Performance Evaluation
- Program Management

- 1) Incident Management Planning
 - Duarte – low on resources, gets support from LA County Sherriff
 - Monrovia – same as Duarte; has a team for large events such as Farmer’s market
 - Pasadena – major event generators (Rose Bowl); staffing the TMC for special occasions
 - First Responders to learn more about what happens in the operations standpoint
 - For them, advance planning is important as to how to get equipment to the focus area
 - What strategies to have to keep routes open
 - What’s going on at the moment
 - LA County – information comes from Sam E.
 - Coordination with Pasadena and Caltrans
 - Pasadena PD gives a radio to Caltrans Special Events Coordinator
 - Caltrans: we know when and where a special event is, but for others, we don’t know
 - Pasadena – before, the City signed up for Nextel to get information broadcast – everything goes to Nextel which pushes towards e-mail and cellphones
 - Caltrans: we don’t tell how many lanes are open, but only how many lanes are closed
 - There will be some rerouting – how will the public be informed of the reroutes?
 - Do the agencies think there is benefit to getting together and getting out hypothetical situations? (pre-planning)
 - The ConOps talks about various scenarios which is conceptually accepted
 - The traffic is going to come anyway, how do we manage it?
 - Currently no pre-planning
 - PATH: have not finalized acceptable detour routes
 - First Responders’ response is going to change when the Gold Line opens
 - (R**) meetings on a regular basis
 - Discuss what possible changes to bring in
 - What kind of support do each agencies get currently?
 - Pasadena – for big incidents, they get a call from PD to increase lights along a corridor
 - Traffic operations do not do debriefs
 - Caltrans – no debriefs from First Responders
 - Pasadena – for planned events, there is a debrief, but for other events, no
 - Protocol for each agency? Do you see a benefit?
 - Yes (Caltrans)
 - Pasadena – coordination with Metro is informal; Metro representative calls when doing maintenance along the rail; they know who to contact
 - (R**) identify who to contact
 - Pasadena PD calls traffic operations
 - Caltrans set detours – but no coordination between CHP, Caltrans, and the agencies
 - (R**) Communication between agencies during the event
 - Caltrans staff are mostly flying blind
 - First Responders uses Google Maps for routing
 - PD uses dispatch to know where to go
 - There is a log that shows exactly what time the CMS were deployed
 - Incidents

- **(R**)** identify the incident severity as soon as possible, extent of the impact of the incident
 - The southern area is a training ground for young CHP officers
- **(R**)** identify the duration (estimated) and provide information to stakeholders
- **(R**)** the system should understand the severity of the incident through the information it's collecting
- The critical part is the initial assessment
- **(R**)** accurate initial assessment is important
- Who determines estimated time? – CHP
- First Responders only think of clearance of the incident
- **(R**)** identify how long the aftermath of the incident is
 - How much buildup created, how long the buildup will last
- **(R**)** keep a database of the incidents with each duration and containing each incident information
- Currently in San Diego – threshold notifies change in signal timing, etc.
- Incident/Threshold assessment
 - **(R**)** information as to how many people follow the CMS/how it's affecting traffic
 - **(R**)** once threshold for traffic is lowered, signs are automatically dropped
 - **(R**)** define the criteria in an absence of an incident to deal with residual congestion assisted by an incident – look at different rules and conditions
 - **(R**)** decide when the signal timing plans go back to normal
 - **(R**)** identify what partner agencies are doing
 - **(R**)** identify which signal timing plans to use and if agencies agree or disagree with the changes suggested
 - **(R**)** identify staff available
 - **(R**)** test system in hypothetical mode to see what the system will do
 - Set up a scenario and see how will it react based on historical data
 - Create a scenario using historical data/to run a simulation, change lane situations to see how the system reacts
 - **(R**)** have models for different scenarios – strategy planning
 - Post-analysis that will continue to validate decision support
 - Post-evaluation and follow through is just as important
 - Simulation to be used for post-analysis also
 - What is a pre-approved plan? → a set of pre-approved actions
 - Individual pre-approved actions
 - **(R**)** if staff is available, staff to have the ability to override the system to do plans on the fly
 - **(R**)** Have a “hierarchy” of automated actions:
 - Include levels from “operator must approve” through options for intervention through to fully automated
 - **(R**)** Agencies should be able to input plan manually
 - **(R**)** Caltrans staff should have the ability to override CMS messages
 - **(R**)** When manual adjustment is made on a local system, the ICM should be notified
 - **(R**)** Such actions are to be recorded for later analysis
 - **(R**)** System should record actions taken (local systems, by ICM user, by ICM) to be able to assess impacts (such as % traffic diverted)
 - **(R**)** system to have the ability to agree on the plan, but still has the flexibility to adjust minor details

- **(R**)** operators should have the ability to adjust the agreed plan when proven to fail
- Interagency Communications:
 - **(R**)** Operator/System Actions should be made available/visible to other users
 - **(R**)** Alerts to be sent to affected agencies
 - **(R**)** System to support messaging between agencies
- How important are the lane closures in developing the plan?
 - Very important
 - **(R**)** agency has to provide lane closure information (time, location, etc.)
 - **(R**)** notification for lane closures to be opened
 - **(R**)** Web interface to provide other people to input closures
 - **(R**)** for stakeholders to know what is the response plan
 - **(R**)** have the corridor manager to see which plans have been approved, or which adjustment has been made
 - **(R**)** have an alert that something needs to be done, a notification that something is done
 - Example: incident in Duarte, but minor incident, does not need to notify other agencies, but need to be recorded in case agencies want to know what happened
 - **(R**)** Infer lane closure system to additional detection/travel time readers installed
 - When one link segment fails, then we know something is wrong
- Do the agencies want the system to have ability for the users to report back to itself?
 - **(R**)** Yes, it helps out (crowdsourcing)
 - Currently has a webpage/app traffic signal incident – linked in to MMS
 - When it's cleared, it gets removed
 - **(R**)** system to link with assets available
 - **(R**)** to have a track allocation permit; rail operators to know if someone is out there for rail maintenance (Metro currently has it)
 - Metro Rail information needed by system:
 - **(R**)** train stopped
 - Pasadena currently has a community reporting app
 - Can we have data exported from it?
 - **(R**)** operators to have the ability to accept data and review data and modify if needed
 - To make sure data is a good quality data
 - **(R**)** system to have a visual overview of what's going on in the corridor
 - Icons to go over the maps
- Video sharing
 - LA County currently has about 70 cameras and is implementing a video sharing system
 - **(R**)** system to have video sharing for events
 - ConOps has cameras identified (private and public)
 - **(R**)** full sharing of cameras (private and public)
 - **(R**)** do not record videos during events
- Notifying next shift people
 - **(R**)** System to provide a way of informing next shift of current of on-going events
 - **(R**)** System to track key personnel availability (i.e. when on duty)
 - Everything is by functions (time of day functions)
 - These are for events that are out of the normal business hours/when no one is staffing TMC
- Unplanned problems

- Each agency manages their problems; It's just a matter of convenience
- **(R**)** define a threshold that informs each agency of events happening
- **(R**)** Equipment malfunctions to be shown on corridor map
- **(R**)** IEN to report signal equipment malfunctions to the system
- Performance Evaluation
 - **(R**)** have information to show what the system did vs when nothing is done – what's the improvement?
 - Types of metrics to be defined later

PUBLIC INFORMATION OFFICERS

Tuesday, December 15, 2015

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Note: **(R**)** denotes potential requirements

- Introduction
- Recap
 - One-on-one agency meetings with public safety already held to see how operations are done along the corridor
 - This meeting – how does information get relayed?
 - To bring public information people from different agencies together

- Current planning for planned events:
 - CHP: events they follow come from the city (local/community events not followed)
 - No regular meetings
 - Involved in Rose Bowl game
 - Are informed when involved with traffic control (reps in city meeting relays to PR CHP)
 - Metro: emphasis use of alternative transit
 - Gold line, shuttle service
 - Increase frequency of bus service
 - No database for information posted for events
 - CHP: EX: concert/soccer game → not informed
 - Caltrans: finds out about events through twitter
 - Central system is good
 - Emphasis on transit
 - Have encroachment permits for closures → PR sends out notification → CMS → no outreach further out to neighboring cities
 - Metro: not designed to be reactive to special events/incidents
 - React to problems on gold line
 - Bus bridge done regularly
 - Triggered by small events (EX: unidentified package)
 - Arcadia: no mechanism to inform easily
 - EX: permit for floats to go through Arcadia
 - How does public find out?
 - Benefit to have space to inform
 - Caltrans: permits are internal, not shared outside
 - Rose Bowl: Pasadena PD in contact
 - They only call CHP if they need help
 - CHP might already know by working in TMC while on patrol → then have to do last minute remedy
 - When it is something large, they will find out
 - Small events, they don't know about
 - **(R**)** calendar to post all info
 - Duarte:
 - EX: Wednesday before Thanksgiving
 - Police shut down bridge for 8hrs → called Caltrans dispatch → sent unit to check freeway (which was open) → off ramps were stuck → called again → explained connectivity → no way to get drivers away of what's going on
 - CHP not involved because no incident occurred
 - **(R**)** need to look at local street network
 - Foothill transit informed to reroute onto the freeway
 - **(R**)** Need to inform motorists directly
 - **(R**)** need to get CMS support through working together with Caltrans

- **(R**)** Need a protocol to help out cities, change in current operating procedure to show surface street info on CMS
 - Metro: how to relay information to drivers:
 - Options:
 - CHP CAD
 - Twitter
 - Callers/tipsters
 - Scanners
 - Radio stations
 - Best way to engage media:
 - Twitter is very powerful → considered attributable source by people in high levels
 - Caltrans: media doesn't understand corridor level congestions (Metro agrees)
 - Lack of familiarity of routes?
 - People don't believe what sign says?
 - People ignore signs?
 - Uneven radio participation
 - LA County: way to sit down with all media (traffic reporters) to engage in corridor idea?
 - Already sit down for TIP meeting with Caltrans and CHP → doesn't work
 - Meeting with traffic reporters:
 - They understand it
 - Radio stations policy affects what gets played
 - **(R**)** info in cars (radio not really working)
 - Radio gives mixed messages depending on what channels → no consistency in data given out
- Existing procedure for a major incident:
 - Caltrans PIO there letting media know what's going on
 - Not letting TMC know → they find out from media
 - TMC already there through on scene
 - CHP rep at TMC too
 - When county is involved, messages get relayed faster because reach is further
 - Don't really tell Metro unless very necessary
 - **(R**)** Should system support communication with Metro?
 - **(R**)** Have a central communication location → city can then make the decision to do something depending on if they can get out there (Caltrans)
 - Sometimes forget to talk to some people
 - **(R**)** System should prompt asking if they told everyone involved
 - **(R**)** Beneficial to have TSO just standing at the scene to inform drivers
 - UCLA study of Carmageddon → why did people not go out?
 - 405 sink hold: no media coverage
 - **(R**)** Continuous data collection from system to track what was done with previous incidents

- If you detour most people → success

- **(R**)** Pasadena needs consistent info regarding Rose Bowl
- **(R**)** Emphasis on arterial network since it plays a key role
- **(R**)** How to direct travelers on arterials
- **(R**)** Place extinguishable CMS along arterials?
- **(R**)** Create an app that talks to the driver without the driver having to activate something?

- Is CMS language consistency helpful? (Metro question to Caltrans)
 - EX: “traffic jam” is good
 - EX: “closed ahead” not good
 - Caltrans: limited to what you can post
 - **(R**)** Look at language for CMS display

- When an incident is currently going on, who do you talk to?
 - Caltrans:
 - CHP/law enforcement/fire/life
 - Manage traffic around structural issue
 - Sometimes it’s a waiting game
 - Don’t have problem finding people in the field
 - **(R**)** Create structure of employees for people not in field to follow (org chart)

- Daily activities:
 - LA County: sends out daily alerts to elected officials, reporters, and officers
 - Send report interest to list of ~100 people who can respond/relay information
 - Don’t want to send too much info, danger of info getting lost
 - Like what they’re doing
 - Blurb with 2 lines and contact info of LA County person dealing with content
 - Have a list of PIOs for cities
 - Caltrans: I-5 N/S weekly updates you can subscribe to (detours included)
 - **(R**)** Pasadena should inform similarly as LA County does
 - Caltrans and Metro have agreement to let each other know of what media is saying
 - **(R**)** System to pick up alerts/notifications to get to wider audience
 - Effective: hashtags on twitter similarities to have consistency

- Reporting and performance evaluation:
 - At a higher level, do you make reports post incidents?
 - CHP: yes, debrief
 - Caltrans: no, just happy it’s over, CMS change indicates end of incident
 - Nothing in PR formally

- People who worked on the incident know the lessons learned

- Personnel changes: what happens when someone retires/leaves
 - Establish word of mouth, professional curtesy
 - Chief is in loop to relay info to office

- CHP: will there be a study to make a smartphone platform similar to SigAlert?
 - TMC already detects incident pre twitter
 - When driver see overlapping information, they get confused

- **(R**)** real-time and engaging map to be updated by city (similar to SigAlert)
- **(R**)** drivers don't know what to do when they see something → how to show the driver where to go
- **(R**)** CHP: brand the corridor with a certain source for driver to use that's reliable
- **(R**)** Caltrans: convince people that longer distance may be shorter time
- **(R**)** Caltrans: relay info to drivers on which arterials have signal coordination
- **(R**)** alternate route notification

(R)** LA County: specific grouping notifications for routes/cities (similar to Nixle)