CONNECTED CORRIDORS UPDATE

HAPPY NEW YEAR!
Agenda

- Connected Corridors Overall
- Funding Discussion
- I-680 Discussion
- Work Plan Update
- Outreach Update
- System Engineering Update
- Decision Support Update
- Applied Research Update
- TRB Update
- Conclusions
Funding

- We are short
Connected Mobility - VIP

- **Connected People**
  - Travelers, Businesses, Government Agencies

- **Connected Infrastructure**
  - Sensors, Controllers, Vehicles, TMCs

- **Connected Vehicles**
  - Cars, Trucks, Buses, Trains, etc
Connected Corridors – Current Focus

- **Connected People**
  - *Travelers, Businesses, Government Agencies*

- **Connected Infrastructure**
  - *Sensors, Controllers, Vehicles, TMCs*

- **Connected Vehicles**
  - *Cars, Trucks, Buses, Trains, etc*
Vision poster from TRB

Connected and Automated Corridor

- Connected and Automated Vehicles
- Connected Infrastructure
- Integrated Corridors
- Connected Travelers
The Connected Corridors Program

- Organizational and cultural changes
- Funding and strategic planning
- System Engineering
- Relationship management with gov agencies, industry, legislature
- Decision Support Tools
- Applied research
- 210 Pilot
- Evaluations
- 50 corridors in Ca
I-210 Pilot – Overall Schedule

2014
1. Project Initiation & Management
   10/1/13 - 12/29/17
2. Outreach Activities
   10/1/13 - 12/29/17
3. Corridor Preparation
   11/1/13 - 10/3/16
4. Concept Exploration & User Needs
   11/1/13 - 8/14/14
5. Analysis, Modeling and Simulation
   1/6/14 - 3/4/15

2015
6. SEMP
   6/13/14 - 12/22/14
7. ConOps
   7/28/14 - 1/20/15
8. System Reqs
   12/12/14 - 4/30/15
Next Steps

- User Needs Meeting – ID potential strategies and metrics
- Improve day-to-day communication between participants
- Complete corridor characterization with data and models
- Install temporary sensing
- Move various funding processes forward
- Implement organizational arrangements
- Provide initial simulation analysis of corridor strategies
- Complete Concept of Operations
I-210 Outreach Update

- Arcadia, Monrovia and Duarte – December and January
- Every city has agreed to share data and attend user needs workshop
- User needs workshop end of February in Duarte
- SGVCOG transportation committee must be contacted before workshop. Side conversation with Mark.
- Possible interactions with DCCM, DCCRM and ATM projects
- Consider public announcement – Video, etc as per other projects
- Should begin to consider possible 511 interactions
- ICM DART workshop in Dallas in Feb – Sam and Joe should go
User Needs Meeting Agenda

- Acknowledge the potential of everyone in the room
- What are the relevant challenges of this corridor
- How would we measure improvement
- What strategies are we suggesting
- How might we implement these strategies for an incident
- What user constraints will we place on the implementation

- Must prepare well for this meeting with small premeetings
Funding Update

- PIDS – HQ/D7 preparing for fund allocation
- HQ working on obtaining additional person hours
- LA-Metro preparing for possible fund allocation
- ICM USDOT funding – Proposal submitted, strong competition
System Engineering Update

- Continuing to characterize the corridor
- Have begun asking for data – Who should do this?
- Have begun identifying missing sensors and controllers
- Need to install temporary sensing in corridor
- Began working on System Engineering Management Plan (SEMP)
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<td>PATH, Caltrans District 7, and Corridor partners to fully support project execution phase is not obtained in a timely manner.</td>
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<td>The scope of the project is significantly altered during the course of the project, thus impacting schedule and budget.</td>
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<td>PATH's systems team has either insufficient resources assigned to it or is unable to scale up in a timely manner.</td>
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<td>PATH's management team, including the Communications Manager, is not adequately staffed to meet scheduled project activities or unplanned changes to the project.</td>
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<td>Caltrans has not assigned required personnel (per work breakdown) in a timely manner.</td>
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<td>Regional Transportations Partners have not assigned needed personnel to support the pilot project.</td>
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<td>The existing freeway traffic data gathering infrastructure does not provide sufficient or accurate traffic data to support the development of efficient traffic management strategies</td>
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<td>The existing arterial traffic data gathering infrastructure does not provide sufficient or accurate traffic data to support the development of efficient traffic management strategies</td>
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<td>Planned enhancements to the freeway traffic data gathering infrastructure may not become operational in time for the pilot project.</td>
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We are setting up a workshop to help architect the overall decision support system.

Numerous vendors are involved and we must facilitate their working together.

Sandag has agreed to share their rules engine if we provide them with any updates that we make and ensure their system and the California system do not diverge overmuch.

We have begun modeling the 210 Corridor.

Modeling approach – Analysis → Static Scenarios → Dynamic Scenarios → Dynamic Control.
## Decision Support Components

### Data Sources
- Traffic Sensors
- Probe Vehicles
- Traffic Management Centers (TMCs)
- Information Service Providers (ISPs)
- Travelers

### Input Processes
- Data Validation
- Data Filtering

### Visualization
- Mapping Functions
- Performance Metrics

### Output Processes
- Control Actions
- Travel Advisories

### Actuations
- Traffic Signals
- Ramp Meters
- CMS
- Transit
- Parking

### Information
- 511 Systems
- Information Service Providers (ISPs)
- Traffic Management Centers (TMCs)

### Guided Simulation
- Estimation
- Prediction
- Asset Availability
- Control Rules
- Response Plan Development
- Control Recommendations
Vendors Interactions

Caltrans D7
System Integrator

LA County
Traffic Signal Control
Kimley-Horn and Associates, Inc.
Traveler Information
ITERIS
Blue Commute

Pasadena
ITS Solutions

Arcadia
Traffic Signal Control
TransSuite

Traffic Signal Control
TransSuite

Video Traffic Detection

CCTV Cameras

System Metrics Group

Simulation

PTV GROUP

Mygistics

Simulation

Dynamic Traffic Assignment Model
## Vendors Interactions

<table>
<thead>
<tr>
<th>Monrovia</th>
<th>Duarte</th>
<th>Irwindale</th>
<th>LA Metro</th>
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<tbody>
<tr>
<td>Traffic Signal Control</td>
<td>Traffic Signal Control</td>
<td>Traffic Signal Control</td>
<td>Bus Tracking / Traveler Information</td>
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<td><img src="image1.png" alt="Kimley-Horn and Associates, Inc." /></td>
<td><img src="image2.png" alt="Kimley-Horn and Associates, Inc." /></td>
<td><img src="image3.png" alt="TransCore" /></td>
<td><img src="image4.png" alt="nextbus" /></td>
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### Common Equipment Vendors

- ECONOLITE
- ITERIS
- McCain
- SIEMENS
- Schneider Electric
- Sensys Networks
Vendors Interactions

**Simulation/Analytical Tool Providers**
- Aimsun
- Vissim
- TransModeler
- TransCAD
- Synchro
- SimTraffic
- Paramics

**Potential Engineering Consultants**
- SAIC
- Fehr Peers
- URS
- Kittelson & Associates, Inc.
- AECOM
- HNTB
- Stantec
- Parsons Brinckerhoff
- CH2M-Hill
- Parsons
- Schneider Electric
Applied Research

- Real Time Origin Destinations from Cell Tower Data (AT&T)
- Full integration of probes as data source (Here/Nokia and Inrix)
- Macro modeling capabilities based on measured traffic data and not driver behavior estimates
- Highway, arterial and transit coordination in real time
- Improvements in reroute response and estimation
- Determination of modeling accuracy
- Human Factors – outward looking
- Institutional issues
TRB Update

- Quite a few people attended
  - Caltrans – Marco from D7, Coco (DRI Director), others
  - RITA – JPO – Bob Sheehan, others
  - LA-Metro – Frank, others
  - Pasadena – Fred Dock
  - SANDAG – Peter Thompson
  - DART - Koorosh Olyai
  - Various consultants and vendors
  - PATH – Tom, Joe, others

- Lots of discussion on the evolution of ICM towards Connected Corridors - VIP (Vehicles, Infrastructure and People)
Conclusions

- We are moving along well. Better than we anticipated
- Must manage our risks
- Begin more active involvement of the transportation community
- Utilize larger VIP vision where appropriate
- Other items?