

## *A Quarterly Newsletter for Connected Corridors Stakeholders*

Greetings! This newsletter was created to update our Connected Corridors (CC) stakeholders and partners on the status of the I-210 CC Pilot. Our goal is to provide our stakeholders with interesting and useful regular updates.

### **Project Update**

Since the last update, much work has been done in the following areas:

- **Analysis, modeling, and simulation (AMS)**—See our feature article on the AMS process.
- **Stakeholder involvement**—At the end of August, a transit user needs meeting was held and included representatives from Metro Bus and Rail, Foothill Transit, and Pasadena ARTS. Team members also presented information on the project to the City Council of Duarte and at [ITS California](#).
- **Data collection**—The article on [Arterial Data](#) gives more information on the extensive progress made the last few months. Thank you to all of our team members for your participation in data count collection.
- **Concept of Operations (ConOps)**—We are currently focusing on completing the ConOps, with initial review by the stakeholders planned for later in January.

Also, a special thank you to Caltrans staff for quickly completing a project study report to secure over \$18 million in SHOPP funding for the project! These funds will be used for the freeway portion of the project, and additional funding through Metro's [2015 Call for Projects](#) is being sought for the arterial portion of the project.

### **Feature Article: Analysis, Modeling, and Simulation**

Central to the Connected Corridors (CC) effort is AMS, or Analysis, Modeling, and Simulation. The purpose of AMS is to a) enhance understanding of the pilot among stakeholders, b) test the applicability of various control strategies, and c) provide analytical justification to support corridor repairs and upgrades. Using a detailed but fluid process, the AMS effort will enable the Connected Corridors team (including stakeholders) to evaluate how different strategies could potentially improve mobility within the corridor. AMS incorporates both data from the corridor, such as traffic counts, number of incidents, etc., and firsthand knowledge from local practitioners of how the corridor functions. Blending these two key sources of data enables CC engineers to refine the developed models and more closely predict how the corridor will respond to individual changes such as accidents, events, etc.

As shown in Figure 1 below, the first step in the AMS process is to assess operations. This involves taking all available data from the corridor and analyzing how things

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are currently functioning. This assessment works on answering questions such as: where are the bottlenecks, what are the travel times throughout the day, where are the bus routes and stops, how many accidents occur on the freeway, on the arterial, etc. Once this assessment is complete, the AMS team can begin selecting specific scenarios for model development. The AMS team is focusing first on incident-related congestion and selecting scenarios that are 'typical' of the corridor and/or represent a key challenge caused by incident-related congestion. Simultaneously, interventions, or potential changes to the corridor, are also selected. For example, a

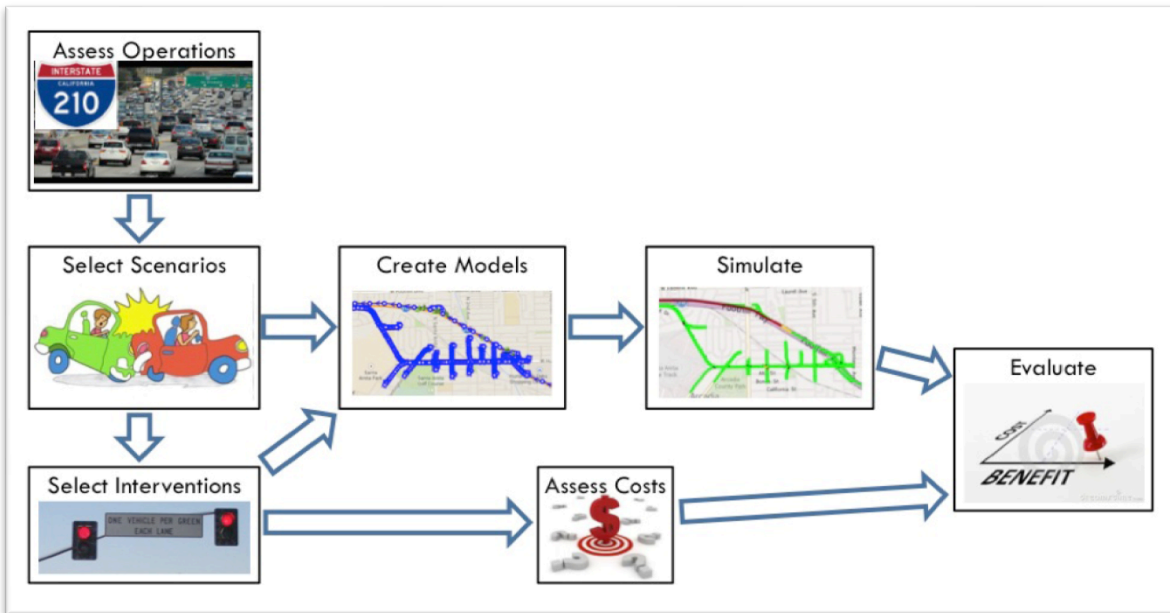


Figure 1

potential scenario might be a freeway collision in which two lanes are blocked for 30 minutes. One intervention that might be analyzed to manage this scenario would be ramp metering and arterial traffic signal coordination. This is only an example of what a scenario could be, as the team is still currently assessing operations.

Traffic models are then constructed to recreate specific traffic conditions, the selected scenarios, and the selected interventions. As the models are developed, the team begins using them to run simulations. The team also reviews the costs of each selected intervention. Costs may include new equipment, staff time for maintenance, additional software or interfaces. Another important part of the simulation process is evaluating the accuracy of the developed models and whether they reflect how the corridor is functioning or could function with specific interventions. This becomes an iterative process of modifying the model, in tandem with input from local stakeholders, to create accurate and useful recommendations.

Once the models are fully developed and determined to be good predictors of how the selected interventions will impact the corridor, the team will be able to review

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each analyzed intervention and its potential effects on the I-210 corridor. Since the models will influence what interventions are ultimately implemented, building models that are accurate and reliable is certainly essential. However, the models are still just one piece of the puzzle. Stakeholder input, the corridor's functional requirements, and available resources are also important to deploying a successful ICM project.

### **Arterial Data**

A critical input for the AMS endeavor is data. In the August edition of the Stakeholder Update newsletter, we reported great progress on arterial data collection. Many of our stakeholders have been invaluable to the data team by ensuring as much data as possible is reported and available for further analysis. Types of data we've been able to collect include timing sheets, sensor diagrams for ALL intersections in the four Phase 1 cities, traffic counts, turning counts, and some traffic impact study data. For the City of Arcadia, the team has actually been given observer access to the City's live traffic signal control system through a VPN connection.

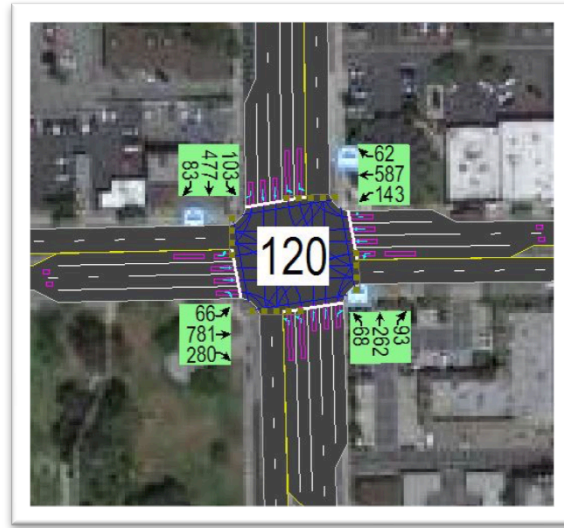


Figure 2

Figure 2 shows an illustration of traffic demand data for an intersection within the I-210 corridor. The number 120 in the middle represents the traffic signal length (in seconds); the turn counts for one hour of time are shown in the four green boxes; and the detectors for that intersection are shown by the purple boxes near each approach.

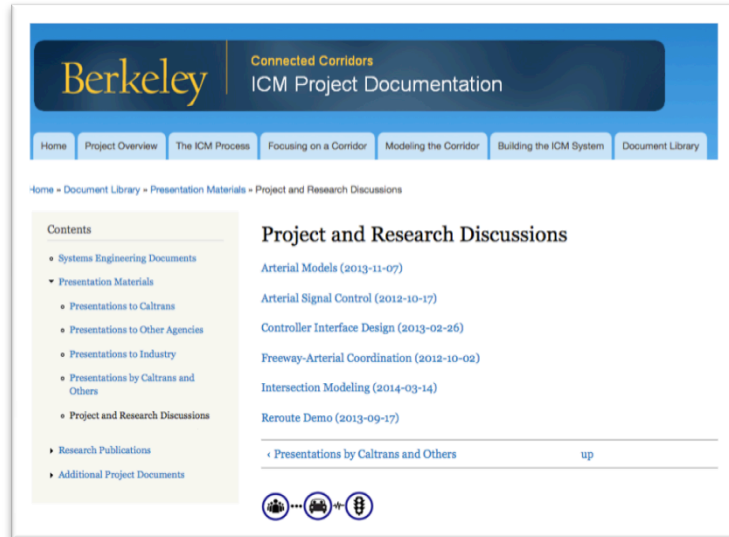
Although the team is quite pleased with the amount and quality of arterial data received thus far, we are reviewing whether there are still critical gaps that will need to be filled. Since all *available* arterial data has been collected, any remaining gaps would require either fixing sensors and/or hiring a private contractor to collect new data. Multiple consultants are already working to obtain turning counts for 100 intersections within the corridor, and more could be added at a later date.

The team is currently busy syncing, verifying, and validating the data that has been collected from various sources, and helping the AMS team use the collected information to develop working analytical models and operational scenarios that will be used to further assess corridor operations.

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### **Connected Corridors Documentation Website (CC-Docs)**

One of the many unique components of the Connected Corridors program is the development of the Connected Corridors Documentation Website, called CC-Docs. Unlike static reporting usually done long after the project is over, CC-Docs allows for incremental reports and updates more closely aligned with the project's milestones. This means that instead of one massive PDF created five years from now, the CC-Docs site already contains a wealth of information about what the project team has completed and what is currently being worked on. Additionally, the site has been set up to promote the sharing of information among and across project teams. This translates into more teamwork, more collaboration, and ultimately, a better project. Stakeholders, agency partners, and Caltrans leadership also have access to the site to review and comment on documents during development, as well as provide approvals on finalized reports.



The CC-Docs site is located at: <http://ccd.docs.berkeley.edu/>. Since the site is currently password-protected, please contact Lisa Hammon at [lisahammon@berkeley.edu](mailto:lisahammon@berkeley.edu) to obtain log in information.

### **Workshops**

As a research institute of a public university, the sharing and transfer of knowledge is a fundamental principle for PATH. The CC-Docs site is one important part of the Connected Corridors effort to create a collaborative environment and help every team member advance in their knowledge and understanding of ICM. Another significant component is the Connected Corridors workshops. Many of our stakeholders have already attended at least one AMS workshop, and more workshops are planned for the coming months. The AMS workshops provide a great platform for PATH researchers to learn from those on the front lines and for those on the front lines to learn more about what is happening behind the scenes. Workshop participants can also advise researchers on various aspects of the project, such as data collection, relevant AMS scenarios, etc. Additionally, many of our stakeholders attended a workshop at the end of September by the San Diego Association of Governments (SANDAG). This workshop provided a wealth of

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information from the lead agency of the I-15 ICM project in San Diego on how to plan and implement an Integrated Corridor Management project.

At the August Connected Corridors workshop, the AMS team presented a video created by undergraduate student Kara Koyamatsu, showing how a traffic speed contour plot is formed. The team received a tremendous amount of positive feedback for explaining how these 'strange-looking ink blots' are actually read. In case you missed the video, you can watch it here: <http://youtu.be/9Nw0fnKDhTw>

The team already has another educational video in the works and plans to continue to expand the CC-Docs site to make it more informative for interested stakeholders. More information on this expansion will be available in a future issue of the Stakeholder newsletter.



### **ITS California Presentation**

On October 14<sup>th</sup>, Ali Zhagari (Caltrans District 7 Deputy District Director of Operations) and Alexandre Bayen (Director of the UC Berkeley Institute of Transportation Studies and Principal Investigator for the Connected Corridors project) took part in an ITS California presentation on “The

Connected Corridors Vision for California.” They outlined Caltrans’ long-term vision for Connected Corridors, including the current reorganization happening in District 7 and information regarding the I-210 Pilot. The presentation tied in perfectly with the conference theme of “Connecting California” and the conference’s opening session on connected vehicles, legislation, and funding. The presentation was well received by all. Materials from the entire technical session, including Ali’s and Alex’s presentation, are available here: <http://itscalifornia.org/session-presentations>

### **THANK YOU**

A big thank you to all of our stakeholders and partners for your ongoing support for Connected Corridors and the I-210 Pilot. If you know of additional individuals who would like to be added to our distribution list, please contact Lisa Hammon.

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**Contacts**

If you have questions about the status of the I-210 Pilot or any of the information discussed in this newsletter, please do not hesitate to contact us.

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***Note to Stakeholders***

The Connected Corridors team is currently working on an application for the 2015 Metro “Call for Projects” funding for regional capital transportation projects and programs within Los Angeles County. The Call for Projects is a competitive grant through which various federal, state, and local transportation funds are awarded to the most competitive, regionally significant projects. Due to the recent SHOPP funding secured by Caltrans for the freeways, the team is focusing on funding for the arterial components. Meetings are already underway for this important endeavor. If you would like more information, please call one of the contacts listed above.