



# Connected

March 2015

A Quarterly Newsletter for Connected Corridors Stakeholders

## Update

Since our December newsletter, exciting things have been happening in the following areas:

**Funding News:** In February, we were notified that we were one of thirteen projects to receive “ICM Deployment Planning Grant” funds in the amount of \$200,000 (see article on page 2). Thanks to Caltrans HQ staff for taking the lead on preparing the grant application! In January we submitted a Metro Call for Projects application – on behalf of all partner agencies – for arterial improvements along the corridor in the amount of \$6.704M (with matching funds from Caltrans’ SHOPP funding which were previously secured). We should hear about the results of this application sometime this summer.

In **Outreach**, meetings took place in January and February with our stakeholder team. At the February meeting, representatives from the cities in the I-210 Pilot corridor attended for the first time and provided valuable insights. We also met with new staff at the City of Monrovia and with LA SAFE/511 regarding technical and partnering opportunities. We continue to expand our

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## Internal Changes for External Improvements

In the last three years, Caltrans has taken monumental steps to develop the innovative Connected Corridors (CC) Program. With the long-term goal of implementing the program on multiple corridors across the state, Caltrans’ commitment to Connected Corridors goes all the way to the top. Malcolm Dougherty, Caltrans Director, has publicly promoted CC, the agency released a new mission and vision that emphasizes partnerships, system performance and sustainability, and most notably, Caltrans has embarked upon a reorganization of District 7’s Division of Traffic Operations to better support corridor management.

The new organizational structure currently being implemented moves the Division from functional to geographically-based units (see new org. chart on page 3). The primary goal is to create an organization that focuses on corridor and system management and addresses the following priorities: establish accountability for corridor performance, improve collaborative, multi-agency planning for operations, expand real-time active traffic management, provide cross-functional working and training opportunities for staff, and ensure responsiveness to internal and external partners.

The plan establishes “Corridor

Managers” to serve as experts for individual corridors and assigns specialty functional staff to work under each one. Additionally, the plan calls for the creation of a dedicated “System Monitoring & Evaluation” office to continuously assess the entire system’s performance and analyze potential actions to be taken to address identified deficiencies. A System Management Principal position has also been created to assist the Deputy District Director with effectively managing the new organization and these new functions.

The first Corridor Manager will be assigned to the I-210 corridor and will be responsible for overseeing operations for the entire corridor (beyond the I-210 Pilot boundaries), including coordinating with partner agencies to map the corridor’s long-term operational vision. Recognizing that the Connected Corridors I-210 Pilot will be a key transportation system management and operations (TSM&O) tool available to the I-210 Corridor Manager, it is envisioned that this Corridor Manager will work with the Connected Corridors Project Manager to support the long-term operations of Connected Corridors once implemented, along with other corridor strategies that are already

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## ● CC Update, continued from page 1

outreach to as many agencies and organizations as possible! If you know of a group or agency that would benefit from hearing about the I-210 Pilot, please let us know.

The first agreement between the stakeholders – *the Project Charter* – has been drafted and is out for review. We hope that the Project Charter will be executed in the next few weeks. This summer, a more formal *Memorandum of Understanding* will be drafted and presented to the stakeholders for review and approval.

The *Concept of Operations* was released, and a workshop to discuss it was held on Tuesday, March 17th in Arcadia. Thanks to all who provided input into the ConOps prior to its release and to those who have

already reviewed the first draft. For more information on the status of this detailed document, see the ConOps article on page 4.

This past month, PATH researchers delivered an Interstate 680 analysis to Caltrans using PATH-developed tools and techniques. This predecessor work lays an important foundation for the tools and techniques to be used for the I-210 Pilot.

We are actively working on determining the *systems* that are currently in place in the corridor at the cities, County, and Caltrans, and how they will be integrated across multiple jurisdictions. This will be the basis of information sharing and our Decision Support System (DSS).

## FHWA Awards One of Thirteen Grants to I-210 Pilot

The Federal Highway Administration (FHWA) recently awarded \$2.57 million in Integrated Corridor Management grants across ten states to expand the use of real-time travel information in highly congested urban areas. The Connected Corridors I-210 Pilot was one of thirteen sites selected by FHWA and received a total award of \$200,000, the maximum available per recipient.

The grants are designed to help the recipients tap various technologies to combine real-time information from highway, rail, and transit operations, the FHWA said. The awards are spread among Arizona, California, Florida, Maryland, New Jersey, New York, Oregon, Texas, Utah and Virginia.

“State-of-the-art technologies like these make the entire transportation network better, safer, and more reliable for commuters, businesses, and freight shippers,” said U.S. Transportation Secretary Anthony Foxx. “An efficient transportation system is at the heart of a healthy national economy.”

Representatives from the FHWA plan to host a teleconference with all award recipients as well as individual meetings with each project’s team and stakeholders to help advance the administrative and procedural tenets of the grant award process, and assist in each region’s ICM planning efforts.

Congratulations to the Connected Corridors team and all the grant recipients!



## ● External Improvements, continued from page 1

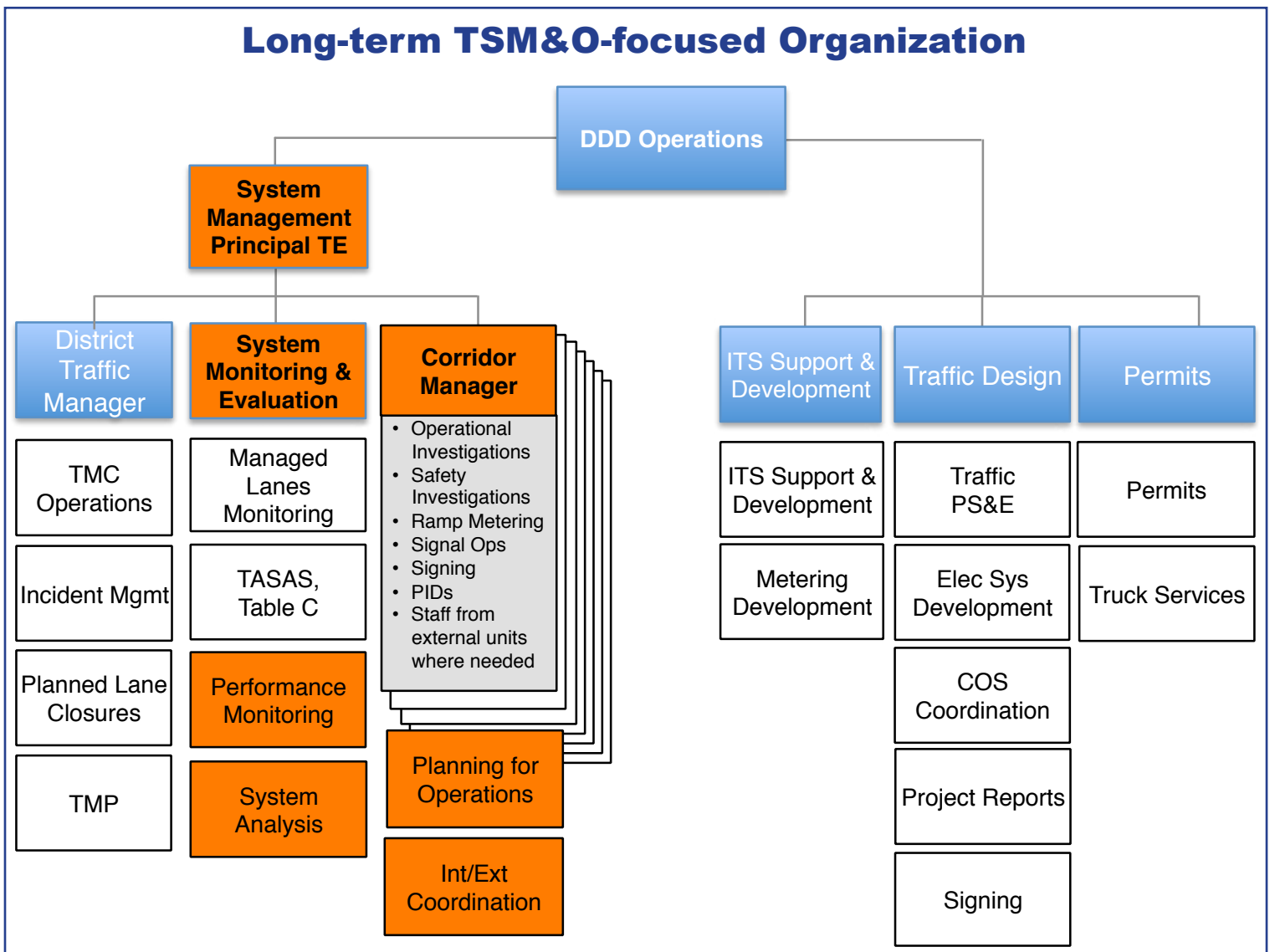
in place or deployed in the future.

This reorganizational effort is the first of its kind in the nation, and is breaking new ground in terms of the institutional, organizational and budgetary arrangements necessary to successfully implement integrated corridor management initiatives like the Connected Corridors program. “The reorganization and related process and program enhancements will bring about the necessary cultural change to embrace the new role Caltrans will need to play in partnership with other regional transportation leaders,” said Ali Zaghari, Deputy District Director for Traffic Operations. This new organizational structure is being implemented as a pilot in District 7, but discussions have already begun with other urban districts across the state about possible implementation in their respective areas.

The reorganization is a shining example of Caltrans’ dedication to its new vision of creating “a performance-

driven, transparent and accountable organization that values its people, resources, and partners; and meets new challenges through leadership, innovation, and teamwork.” The Connected Corridors I-210 Pilot and the larger CC Program should prove to be even more successful as a direct result of this reorganization and the many staff working hard at Caltrans to transform the way the agency manages transportation. We look forward to future updates of how these innovative institutional and organizational changes are positively impacting the I-210 corridor and our CC stakeholders.

For questions regarding the Connected Corridors I-210 Pilot, please contact Project Manager Sam Esquenazi at sam.esquenazi@dot.ca.gov. For questions regarding the Division of Traffic Operations reorganizational effort, please contact System Management Principal Sheik Moinuddin at shiek.moinuddin@dot.ca.gov or Deputy District Director Ali Zaghari at ali.zaghari@dot.ca.gov.





# Concept of Operations Outlines Vision for I-210 Pilot

**“The ConOps describes the ‘who, what, when, where, why, and how’ of an ICMS.”**  
**– RITA U.S. DOT**

Last month, a draft of the Concept of Operations (ConOps) for the I-210 Pilot was sent to stakeholders for review and input. This detailed document is essential to the project as the final version will outline the shared vision for the I-210 Pilot ICM system. Stakeholder collaboration is CRITICAL to developing the final version of the ConOps and taking that next step towards deploying a system all stakeholders can endorse.

The ConOps presents the cross-jurisdictional travel management strategies that are being considered by the various stakeholders to improve overall corridor operations during significant incidents and events. It is a document specifically written from the perspective of the corridor stakeholders to foster agreement on an overall approach, an organizational structure, and relevant processes. According to the U.S. Department of Transportation’s “ConOps Discussion Checklist,” the following questions are typically addressed in a ConOps:

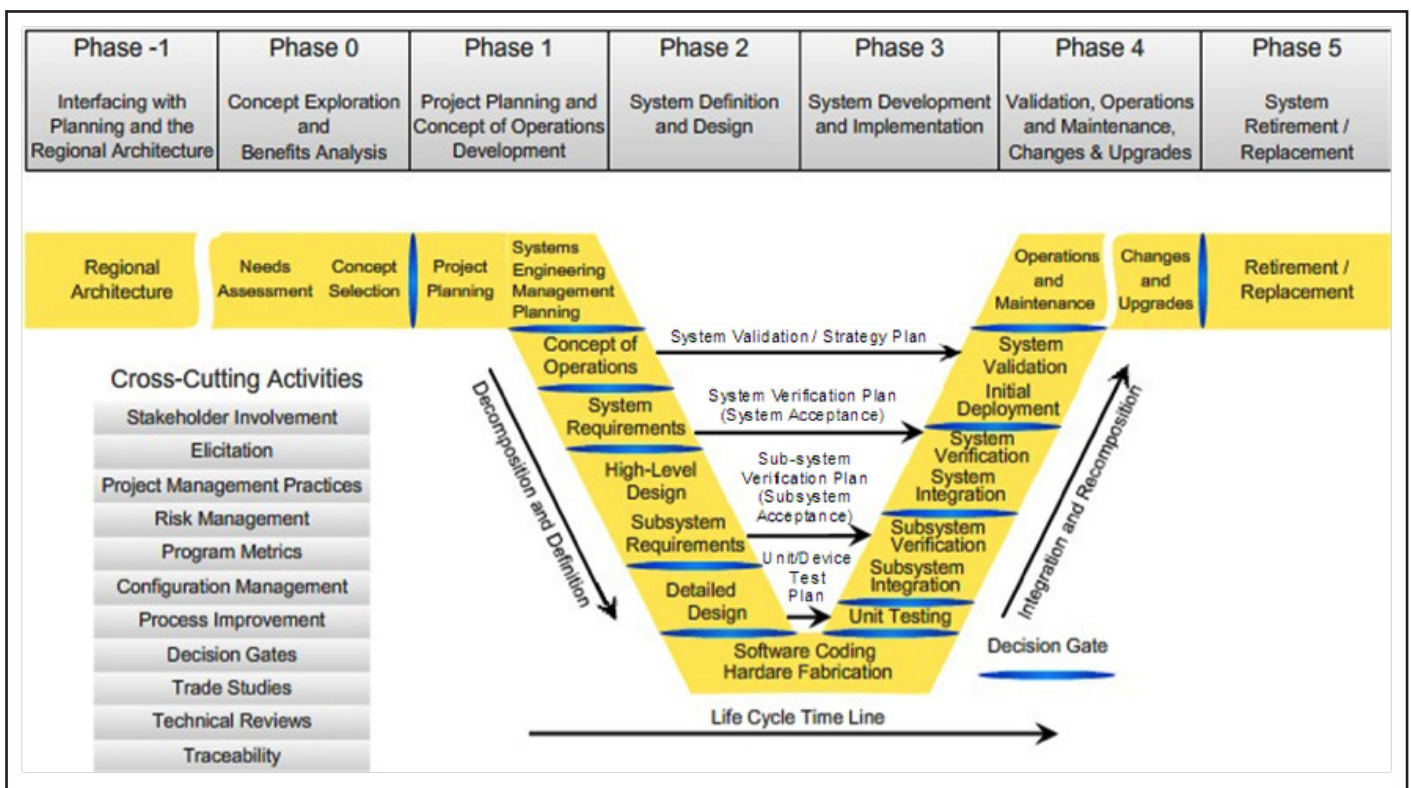
- What are the greatest challenges of the corridor?
- What operational scenarios would benefit most from an Integrated Corridor Management System (ICMS) and how?

- What assets might an agency contribute toward the ICMS?
- In what ways could an agency contribute to an integrated approach to corridor operations?
- How could the region be different in 5 years with ICM?

The I-210 Pilot ConOps addresses these questions, and much more, through fifteen sections covering the project scope, current corridor conditions, agencies and assets, an overview of the proposed system concept, six operational scenarios, and a summary of potential impacts on corridor operations. Following an initial release in late January, stakeholders were asked to submit their feedback and input to Francois Dion by March 5, 2015 for the changes to be included in the next version of the document. For those short on time, there is an Executive Summary for management personnel seeking an overview of the ConOps and even a ‘guide for quick reading’ list on page E-4.

Stakeholders also had an opportunity to learn more about the ConOps at the recent Face to Face meeting held on February 24 and a workshop to discuss and refine elements of the ConOps was held on March 17th. All stakeholders were strongly encouraged to attend as discussions continue to seek to address all the comments

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## Q & A with CC Pilot Partners

*In this new Question and Answer series, we ask some of our Connected Corridors Pilot partners to share their perspective with us regarding the I-210 Pilot. Special thanks to our first panel of stakeholders, Sam Esquenazi from Caltrans District 7, Reinland Jones from LA Metro and Phil Wray from the City of Arcadia.*

### **1. In your opinion, what makes Connected Corridors unique?**

**Sam Esquenazi (SE):** The concept of Connected Corridors is simple; the implementation is the challenge, that's what makes this project so unique. The basic premise is that as individual system operators we are not taking full advantage of what our systems could do if we could get them to synergistically work together. Caltrans and the City of Los Angeles tried something like this with the I-10 SMART Corridor project back in the late 90's. The concept behind that project was how we as system operators could take better advantage of the freeway and the adjacent arterials when a significant incident on either facility occurred. The concept was great, but both agencies, Caltrans and the City of LA, did not do their homework. The agencies did not take the time to develop a trusting relationship. Understanding this past shortcoming has only improved the Connected Corridors project as there has been a tremendous emphasis made on the importance of developing trust, outreach and open dialog amongst all stakeholders. This is also why, in my opinion, the pilot is unique and will be a success.

**Reinland Jones (RJ):** Metro has encouraged multi-jurisdictional partnerships and coordination since the inception of the Call for Projects in 1995. However, the first step to integration is to develop an agency's internal systems to enable this capability. Thus, the majority of agencies have continued to follow that path before partnering with another agency to seek funding. In this scenario, the corridor stakeholders have partnered together with a common goal and vision prior to any funding commitment and will therefore be able to leverage funding to develop a cohesive system for the betterment of all involved agencies.

**Phil Wray (PW):** State and Federal highways and freeways are an integral part of most local communities. However, in the San Gabriel Valley, Caltrans and local governments have rarely worked together to solve traffic issues that impact each other. In my 30+ years in municipal engineering, this is the first time I have been approached by Caltrans asking to work together and share information and find solutions to our regional traffic issues. What makes Connected Corridors unique



is the collective effort of Caltrans, the County, Metro and the cities working together to address the corridor traffic issues in total and not just focus on freeway improvements.

### **2. What is one of the most important advantages that the I-210 Pilot ICM offers for your agency?**

**SE:** To me the Connected Corridors pilot project puts Caltrans right where it should be, which is at the forefront of current cutting-edge technology for the 21st Century. The additional advantage this pilot brings is that it will lay the groundwork and serve as a template for future Caltrans-led ICM projects in the State and possibly the nation.

**RJ:** Metro continually supports and promotes regional efforts aimed at improving mobility, maximizing person throughput, improving quality of life, and reducing greenhouse gas emissions, as outlined in the region's Long Range Transportation Plan (LRTP). Metro regularly develops and funds projects and programs that achieve the LRTP goals. However, with the sophisticated technology available to date, local agencies are still challenged with incident management and operations within their jurisdiction. The I-210 Pilot will not only equip local agencies to achieve better efficiency, but also explore cross-jurisdictional operations.

**PW:** We have spent a considerable amount of time and resources developing our own local traffic management program. The CC Pilot offers an opportunity to collaborate with our neighboring jurisdictions, integrate

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## ● Q & A, continued from page 5

our technologies, and share information, so that traffic management does not end at jurisdictional boundaries. A good example is Caltrans owned and operated traffic signals on arterial roadways in our jurisdiction that operate independently. Through this program, we will be able to share information on signal timing and coordination and develop ways to manage these key intersections in the event of various incidents.

### *3. What is one of the biggest challenges that we will face in the coming year? And what are you most looking forward to in the coming year?*

**SE:** This pilot has numerous “big” challenges, but to me one of the largest and most complex challenges will be to obtain executed Memorandums of Understanding and Cooperative Agreements that spell out in detail each stakeholder’s responsibilities. This is critical because it makes the individual stakeholder accountable for their actions. To make this work, we all have to really believe in the ICM philosophy and realize that our participation and actions can play a very significant role in the overall mobility of traffic in the corridor and the region when an incident occurs. I’m most looking forward to seeing how we as stakeholders can perhaps put aside some of our antiquated “me first” beliefs and work together for the overall good of the motoring public.

**RJ:** The stakeholders have explored the project in concept, the next and perhaps the largest challenge will be the in details of the Concept of Operations and System Requirements. As we move into these two categories, the level of involvement increases and the project moves closer into reality.

**PW:** The program seems to be gaining momentum through its initial introduction, data gathering, and now with planning for deployment. The implementation

will take time and patience on everyone’s part to see results. I don’t want us to lose momentum as a group and fall back to our individual jurisdictions working independently again. I am excited about the Caltrans SHOPP funding for the freeway components on the I-210 and seeing that get underway.

### *4. What do you believe will be the biggest benefit once the I-210 Pilot is implemented?*

**SE:** In my opinion the real winners and those who are going to achieve the biggest benefits are going to be the people who live and travel through the corridor on a daily basis. Motorists will see improvements in travel time delays and travel reliability along with meaningful coordination and synchronization between city street traffic signals and freeway ramp meters. There will be improvements in detector health and an increase in TMS elements necessary to run the system that will only help the ICM become more reliable and accurate. As a result of this pilot, travelers will have an integrated mixture of options that will provide better real time information on numerous multimodal facilities available to them within the corridor, along with information on parking availability that will make shifting travel modes a more attractive and viable option.

**RJ:** The biggest benefit once the I-210 pilot is implemented is the jurisdictional partnerships and the quality of life improvements. The systems built to date have been designed around and within jurisdictional boundaries. As the traveling public traverses through a corridor, they don’t see or experience these boundaries. The corridor is a complex network and the slated improvements will benefit travelers, businesses, residents, and air quality to the local communities. The CC pilot is not only promoting smart networks, but a healthier, integrated and intermodal network.

**PW:** Certainly, the benefit of sharing information and technology as mentioned previously is huge, but also closer relationships and communication with our partners, especially Caltrans, is really big. Additionally, our local policymakers have expressed frustration over the years with the impact of the freeway on the community’s quality of life, and the perception that when an incident occurs on the freeway, Caltrans doesn’t care about the impact to surrounding communities. This program is proof that we are proactively doing something about it.

*“Alone we can do  
so little; together  
we can do so  
much.”*

*-Helen Keller*



## ● ConOps, continued from page 4

submitted and concerns that may have been raised. Additional workshops and/or individual stakeholder meetings may be held to ensure every stakeholder has an opportunity to ask questions and provide input.

While the ConOps is non-binding and will remain a living document through the life of the project, the 'Final ConOps,' with consensus from all stakeholders, will be used to develop the system requirements. The system requirements will outline in even further detail specifically what the ICM system will be able to do. The 'Vee Diagram' pictured on page 4 reiterates the steps of the systems engineering (SE) process that the I-210 Pilot is following to carry the development of the proposed ICM system from initial concept to design and to implementation. The ConOps and subsequent system requirements document will lay the foundation upon which to develop a high-

level and detailed design of the ICM system to be implemented. Completion of the ConOps also leads the project into Phase 2 of the SE process: system definition and design.

Other recent ICM projects in the U.S. have also followed the SE process and have completed a ConOps, including the I-15 project in San Diego, the US-75 project in Dallas, and the I-80 project in the San Francisco Bay Area. These documents along with many more were reviewed extensively as a part of the development of the I-210 ConOps and remain available on the Connected Corridors website for all interested parties.

The release of the draft is an important milestone for the pilot and we look forward to receiving your feedback and working towards our next milestone of a final document.

## PATH Graduate Student Honored for Research



Recognized for being at the top of his peers, 2014 University of California, Berkeley graduate Jack Reilly received the Milton Pikarsky Memorial Award in Science and Technology from the Council of Universities Transportation Center (CUTC) for his Ph.D. Graduate students from academic transportation centers across the U.S. were nominated for the award.

"I was honored to learn that others in my field found value and merit in the research I have been conducting for the last few years," says Reilly. "I believe it's also validation of the approach to research emphasized in the Mobile Millennium and Connected Corridors projects since I have been in the lab: theoretical contributions to the transportation field with accessible and real-world results in implementation."

Reilly completed his doctoral degree in October 2014 in Civil Systems Engineering under adviser Alexandre

Bayen at the Institute for Transportation Studies.

Working on his doctoral degree, Reilly took full advantage of the range of projects and disciplines in his department, including creating crowd-sensing platforms, measuring earthquakes with cell-phones, creating pollution maps from traffic, studying game-theory as applied to freeway route-choices, and developing novel traffic routing engines.

Reilly was able, and encouraged, to implement his theory on large, real-world systems as a part of his program. Reilly tested iPhones to measure earthquakes, and helped develop an iPhone app for the AppStore, which records accelerometer data from participants and broadcasts their measurements back to a central server for aggregation. His control algorithms were fully implemented within the Connected Corridors system at the Partners for Advanced Transportation Technology, which will be used during a field-test pilot on a real freeway in California.

"Knowing that your research has real-world impact gives much more weight and longevity to your work," says Reilly.

Reilly was recognized at the CUTC awards banquet in January 2015 during the Transportation Research Board Annual Meeting in Washington, D.C. and awarded a \$2,000 check. He currently works at Google in the Maps data group.

## 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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## About

**Connected Corridors** is a collaborative effort to research, develop, test, and deploy a framework for corridor transportation system management in California. Our aim is to fundamentally change the way the state manages its transportation challenges for years to come. Starting with a pilot on Interstate 210 in the San Gabriel Valley, the Connected Corridors program will expand to multiple corridors throughout California over the next ten years. As an Integrated Corridor Management (ICM) program, Connected Corridors looks at the entire multi-modal transportation network and all opportunities to move people and goods in the most efficient manner possible.

**CONNECTED** is a quarterly newsletter with updates and stories about the Connected Corridors program. For more information on the program or the newsletter, please visit our website at [connected-corridors.berkeley.edu](http://connected-corridors.berkeley.edu).