DRISI
Caltrans Division of Research, Innovation and System Information

Research Notes

Management of Multiple Integrated Corridor Management (ICM) Corridors

Formulate recommendations for strategies to enable multiple ICMs to work together.

Transportation Safety and Mobility

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Project Title:
Integrated Corridor Management – Connected and Automated Vehicles (CAV)

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WHAT IS THE NEED?

Caltrans is reorganizing to better support integrated corridor management (ICM) in the state. Corridor managers will serve as experts for individual corridors, responsible for overseeing corridor operations, coordinating with partner agencies, and improving collaborative, multi-agency planning. The Connected Corridors Pilot project aims to deploy an ICM system along the I-210 to mitigate incident-related congestion. While it makes sense to manage freeways, arterials, and transit in a coordinated way within a corridor, it is less clear how multiple corridors interact with each other, and how incidents and response plans along one corridor might impact a nearby corridor.

The success of future ICM projects depends on understanding how multiple corridors interact with each other, and how incidents and response plans deployed along one corridor may impact a nearby parallel corridor. Extension of decision support to cover multiple corridors is the next step in the evolution of ICM. Early identification of interoperability and compatibility challenges for multiple corridors is a necessary condition to avoid wasteful pitfalls and to hasten the realization of the true potential of future ICM projects. Reducing unintended consequences and costs of future ICM projects is the motivation for this research. This task aims to understand how to coordinate management of multiple corridors.

WHAT ARE WE DOING?

The research team at the University of California at Berkeley (UCB) will perform research that will identify situations where conditions on one corridor may influence management decisions on another corridor. To accomplish this, both probe data and traditional sensor data will be analyzed to answer questions about aggregate traffic patterns on a multi-corridor scale. The parallel

corridors of I-210 and I-10 in southern California are chosen as a venue for this study. The rationale for this choice arises from the quality of data available on these corridors as well as their relative proximity and levels of recurrent congestion.

This research will yield understanding on how multiple corridors interact with each other, and how incidents and response plans along one corridor may impact a nearby parallel corridor. Researchers will create methods to analyze mobile data, and to categorize paths and congestion events on two parallel corridors. Methods will also be created to categorize congestion events on two parallel corridors using traditional Performance Measurement System (PeMS) data. These methods will be used to distinguish recurrent from non-recurrent congestion patterns, and to relate traffic patterns identified on the two parallel corridors. Researchers will investigate how non-recurrent congestion on one corridor may affect demand patterns on the other corridor and determine when conditions on one corridor may influence management decisions on the other corridor.

WHAT IS OUR GOAL?

Our goal is to understand what kinds of effects can be expected when multiple corridors interact with each other, and how incidents and response plans along one corridor may impact a nearby parallel corridor. Ultimately, having successive ICMs that together support each other's objectives will assist the public by allowing travelers to make informed decisions about route choice, thus reducing the inconvenience to highway system users.

WHAT IS THE BENEFIT?

Efficiently run traffic systems support economic activity through reduced travel times, better access to parking, on-time freight delivery, and improved parking. Insofar as ICM supports economic activity by improving transportation system performance, this research enables these benefits to be expanded to cover multiple, interacting corridors. Better traffic management decisions will translate to better environmental outcomes, and improved livability.

This research will explore challenges on a multi-corridor scale, leading towards more flexible traffic management solutions to improve the quality of travel, while avoiding wasteful pitfalls, and reducing the possibility that compatibility challenges negate the advantages of future ICM projects.

This effort is crucial for Caltrans to push the envelope of what is possible with ICM, to demonstrate the ability to evolve with changing technologies, and to pioneer new possibilities in large-scale traffic management. Cutting-edge solutions adopted in California can become a model of organizational excellence and copied across the United States and around the world.

WHAT IS THE PROGRESS TO DATE?

The team distilled the findings in the previous memos into a list of factors that influence driver routing decisions. These findings suggest that the natural dispersion of routes due to a major freeway incident can be greater than 4-6 miles. Freeways within about 2-3 miles are attractive as reroutes. In urban areas with a dense freeway network, the effects of a traffic disruption may extend beyond an ICM's boundaries of control. Likewise, impacts of control strategies may also extend beyond ICM boundaries.

A partial draft of the final memo: Task #4, Memo #3 was written. A slide deck was assembled to communicate key findings of the project.