



Caltrans Division of Research,
Innovation and System Information

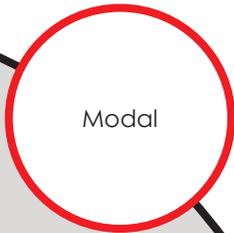
Research



Results

Investigating Relationships Between Highway System Performance and Transit System Management

Reporting on the latest in Integrated Corridor Management (ICM) and Urban Partnership Agreements (UPA).



Modal

MAY 2018

Project Title:

UTC - Transit Priority Corridor (UCTC)

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WHAT WAS THE NEED?

The California Department of Transportation (Caltrans) prepares Transportation Concept Reports for each State route within a District, which provides a long term (20-25 year) plan for that route. A Transportation Concept Report identifies current operating conditions, future deficiencies, a target level of service for each segment in that route, and improvements needed to sustain or reach those targets across all transportation modes. The public transportation mode is an important element that is also included in a Transportation Concept Report.

The purpose of this project is to enhance the Transit Facility section of the Transportation Concept Report guidelines. The project will select a San Francisco Bay Area highway corridor (within District 4) that presently has public transportation (i.e., buses) options that influence highway system performance. A "sketch" level transit planning tool, (e.g., spreadsheet analysis) will be developed to determine (score) the effects of transit on highway system performance. This may include transit indicators such as service quality (speed, reliability); transit ridership (passenger miles or mode share); and mode shifts or automobile travel reductions.

The selected corridor will be evaluated, analyzed, and conceptually developed to transform the corridor into a transit priority corridor. The transit priority corridor plan will provide Caltrans with additional transit elements to incorporate into the Transportation Concept Report guidelines for future Transportation Concept Report development.



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WHAT WAS OUR GOAL?

By running on or in parallel to state highways, transit provides mobility and throughput. A single corridor can be affected: transit service increases person-throughput on a corridor. Or the system more broadly may be affected: by moving people who might otherwise drive, transit enables greater mobility across multiple corridors and routes. This was evidenced by transit strikes in the Bay Area that resulted in system wide congestion on the highways running similar routes to the BART system. Transit can increase the highway system's capacity in terms of person throughput, on a given corridor and on broader subsets of the system. Transportation concept reports, the main planning document for corridor management, currently do not take into account any transit service that run in parallel to the transportation corridor of interest. As demand for travel on these corridors increase, Caltrans is looking for options to manage this demand and incorporate analysis of transit service into corridor planning documents.

This task order will analyze the effect of transit along highway corridors and look at the ways that transit system management and highway performance are similar and different from each other. The project will analyze the degree of influence that different types of transit can have on highway performance and accommodation of future growth. This includes the following questions:

- How does the relationship between highway performance and adjacent transit service change based on transit frequency?
- Related: How does person throughput vary as a function of transit frequency?
- How does this relationship change based on the type of transit service provided?
- When there is additional travel demand on a corridor, how and where can this demand be directed?
- What happens to the highway system when there shocks to the transit performance, such in the case of a labor strike?

In addition to the focus on specific measures, we will investigate a set of questions that take a broader look at the similarities and differences between highway system performance and transit system performance. This includes the following questions:

- What are the differences between highway system management and transit system management?
- How are the ways that corridors are measured congruent or not with transit performance measures?
- What are the trade-offs between corridor level improvements and transit system wide performance and management?
- What are examples of highway operator (state DOT) and transit operator collaboration?

WHAT DID WE DO?

The research was broken up in six tasks:

- Literature Review
- List of Selected Highway Corridors for Integrated Corridor Management Consideration
- Integrated Corridor Management: Case Studies
- At the Intersection of Highways and Public Transit: Potential Performance Measures
- Comparing Highway and Transit Performance Measures: Variable Matrix
- Policy Brief

WHAT WAS THE OUTCOME?

LITERATURE REVIEW

This task reported on the latest literature on, and state of practice in, Integrated Corridor Management (ICM) and Urban Partnership Agreements (UPA).

LIST OF SELECTED HIGHWAY CORRIDORS FOR ICM CONSIDERATION

The Researchers believed that many corridors currently managed by Caltrans could leverage adjacent transit service to improve corridor

throughput. According to an internal Caltrans spreadsheet received in June 2015, Caltrans has identified five corridors as top priority. The Researchers identified three of those five top priority corridors included substantial amounts of adjacent public transit service. The three are I-80 corridor in District 4, and the I-210 and I-110 corridors in District 7. Although the proposed corridors in District 12 may hold promise for integrated corridor management, the Researchers did not recommend that public transit be included in these corridors' management strategy.

Two map series were developed from the analysis of the corridors. The first shows the count of transit lines near highway segments with an overlay of current ICM priority corridors. The second shows a more detailed breakdown and displays the highway segment data with information about current and proposed high occupancy vehicle (HOV), high occupancy toll (HOT) lanes, and detailed information regarding bus and rail lines. The benefit from the maps is to use transit to improve person throughput in the selected highway corridors.

INTEGRATED CORRIDOR MANAGEMENT: CASE STUDIES

This task presents several case studies of ICM corridors (and one UPA project) whose implementation is already under way. These projects show how transportation agencies and departments are poised to use ICM and UPAs to improve highway performance. It is important to note that as of the date of this research there were no publicly available data on the effect of transit provision on an ICM freeway corridor.

AT THE INTERSECTION OF HIGHWAYS AND PUBLIC TRANSIT: POTENTIAL PERFORMANCE MEASURES

This deliverable discussed the complications involved in using metrics for multiple modes, and outlined performance measures used in ICM and UPA corridors, as they apply to goals identified in the Literature Review.

COMPARING HIGHWAY AND TRANSIT

PERFORMANCE MEASURES: VARIABLE MATRIX

The matrix in this deliverable outlines performance measures for both highway and transit modes as described in the previous task; they are grouped by the goals identified in the Literature Review. Performance measures in italics are measures with some interaction between transit and highway performance and are discussed in the Selected Highway Corridors for ICM Consideration Task.

POLICY BRIEF

This task gives an overview of the process undertaken to evaluate the latest practice in accounting for transit service in freeway planning and concept reports. The main objective was to identify measures that are appropriate for assessing the performance of multimodal transportation corridors. Deliverables from this process are briefly described; select recommendations from the Statewide Transit Strategic Plan are then reviewed and presented with new information uncovered from this undertaking.

WHAT IS THE BENEFIT?

This research reported on the latest literature on, and state of practice in, Integrated Corridor Management (ICM) and Urban Partnership Agreements (UPA). The study draws goals and insights from case studies, identifies measures that could be used for tracking changes in highway corridors, presents a matrix of considerations, and offers results and recommendations. The goal of this research was to inform Caltrans of the context and conditions of successful ICMs and UPA implementations.