



Caltrans Division of Research,
Innovation and System Information

Research

Notes

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Project Title:
Development and Demonstration
for Dynamic Transit Operations System

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Task Manager:
Lai T. Saetern
Transportation Engineer (Electrical)
Lai.Saetern@dot.ca.gov

Demand Responsive Transit Operation Based on Dynamic Passenger Information

Develop a fully functional Integrated Dynamic Transit Operation (IDTO) prototype system that builds upon Dynamic Traveler information.

WHAT IS THE NEED?

Transit service has not been cost effective and the level of service, when measured by connectivity and service frequency, has been generally undesirable in the majority of suburban regions in California. The recent development of Connected Vehicle technologies (broadly defined as communication and positioning technologies) and real-time information about the overall transportation systems (both transit and highway networks) has begun to make dynamic transit operation feasible.

Dynamic transit operations, including Dynamic Dispatch (T-DISP) and Connection Protection (T-CONNECT) can substantially improve transit service quality by providing faster, more convenient and cost effective trips to the traveling public. T-CONNECT application scenarios are intended to improve the successful transfer between mode (from car to bus, train to bus) and between different bus routes of an individual agency.

- T-CONNECT enables public transportation providers and travelers to communicate improving the probability of successful transit transfers.
- T-DISP application scenarios are intended to adjust transit operation to be more responsive to travelers demand and traffic conditions.

UC Berkeley California Partners for Advanced Transportation Technologies (PATH) proposes transforming current fixed route operation into dynamically focused transit services in suburban regions across California.

WHAT ARE WE DOING?

PATH proposes a suite of IDTO scenarios to be implemented at Tri Delta Transit covering several dynamic operations. Multimodal real-time traveler information system will be integrated with the dynamic transit operation in order to



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offer maximum benefit to travelers. The following provides additional details of the two dynamic operation scenarios.

T-CONNECT application scenarios are intended to improve the successful transfer between mode (from car to bus, train to bus) and between different bus routes of an individual agency. There are a total of 11 routes operated by Tri Delta Transit that connect with BART and/or Park-N-Ride Lots. PATH will work with Tri Delta Transit to identify the fixed-routes and key transfer points between Tri Delta Transit routes to be included in the T-CONNECT applications.

T-DISP application scenarios are intended to adjust transit operation to be more responsive to travelers demand and traffic conditions. PATH will include the following T-DISP scenarios, including:

- Deviating from the route to avoid traffic congestion (can be detected by real-time traffic conditions and incident information).
- Deviating from the route to pick up passengers who are either having difficulty gaining access to the transit stop, or prefer to be picked up at familiar and/or alternative locations.
- Demand-responsive connector which provides flexible transit service on different times-of-day to meet the needs of transit customers and transit system capacity limits.

WHAT IS OUR GOAL?

Propose to demonstrate a fully functional IDTO prototype system that enables T-DISP and T-CONNECT services as well as real-time information for transit operations and travelers. This prototype IDTO will be tested and demonstrated in full scale transit agency where the field testing will collect data to support the IDTO impacts assessment evaluation.

WHAT IS THE BENEFIT?

What has been envisioned is that by transforming current fixed route operation into dynamic focused transit services in suburban regions across California, transit service will become faster and better transportation option for significantly more travelers. Furthermore, the transit operation costs will be reduced, and transit systems will assume a greater role in the total solution to transportation congestion, safety, and improved air quality.

WHAT IS THE PRODUCT OF THIS RESEARCH?

The product will be an Integrated Dynamic Transit Operation lab prototype system and demonstration of the laboratory prototype system.

WHAT IS THE PROGRESS TO DATE?

The results from this research could lead to a future pilot testing of the system to other neighboring transit agencies in Contra Costa County, and then a regional deployment of IDTO throughout Contra Costa County.