Modal

Further Development of a Deployable Integrated Dynamic Transit Operations System (IDTO), Phase 2.5

Continue 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.

WHAT IS THE NEED?

Transit service has been very cost ineffective 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 to improve 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. University of California (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?

This proposed study is a continuation of the second phase of the research on IDTO. The objectives of the proposed research are:

DRISI

Caltrans Division of Research,
Innovation and System Information

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Research Notes

1. **Developing D-RIDE Strategy**
   a. PATH aims to link to the on-demand micro transit of Tri Delta Transit, "Tri-MyRide", as the last-mile solution. The on-demand shuttle is suitable to serve as one connection option in corresponding to the purpose of D-RIDE.
   b. Field Test of D-RIDE - Field testing of D-RIDE will be conducted for 6 months. PATH will work with Tri Delta Transit to launch IDTO operation through viable outreach means to continuously solicit travelers throughout the field test period.
   c. Verification and evaluation of D-RIDE applications - A comprehensive analysis will be conducted to verify and evaluate the D-RIDE application, and the connectivity between T-CONNECT and D-RIDE.

2. **Demonstration of T-CONNECT in AC-Transit**
   a. One of the IDTO objectives is to implement the Connection Protection (T_CONNECT) application to a wider scope within California.
   b. Extend Connection Protection to AC Transit region - PATH will investigate and analyze potential connection protection demands within AC Transit area by examining the historic transit data, APC data for example. The BART-to-bus and bus-to-bus connections will be all
   c. Developing Field-Operation-Test Plan - PATH will develop a Plan for FOT that specifies major aspects of the field operational tests, including procedures for launching IDTO, performance monitoring, system management, data collection and analyses, and user activity tracking, etc.
   d. System Installation and Field-Operation-Test - PATH will work with AC Transit to determine the implementation approach,
   e. Data collection and analysis - The IDTO system will collect and archive a rich set of data to fully support the evaluation of the IDTO system and services

   f. System Maintenance and Handoff - PATH will monitor the system and perform regular maintenance of the system, including server maintenance, data backup, software update, daily log and reporting. System issues will be handled promptly to minimize system down time.

3. **Transit/[C-]V2X Working Group**
   a. Assist Caltrans in development of the Research Integration/Demonstration Deployment Assessment roadmap for connected transit operation.

4. **Bus Transit Operation At or Near Signalized Intersections**
   a. Improvement of bus transit efficiency and safety around intersections using connected infrastructure and V2I communication

WHAT IS OUR GOAL?

The goal is to address the needs of suburban transit agencies in California and across the country. This research best serves three of the California Department of Transportation's (Caltrans') Goals, namely, flexibility, reliability, and Performance. For flexibility, the strategic focus is to enable transit as an integral portion of solutions to congestions; for reliability and performance, the strategic focuses are operation and reliability improvements.

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 a faster and better transportation option for significant more travelers, 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 PROGRESS TO DATE?

April 1, 2022 – June 30, 2022

Project completed May 16, 2022

Task 2. IDTO System Enhancement for D-RIDE application

Completed, results available in final report

Task 3. IDTO application for AC Transit

Subtask 3.1 Extend Connection Protection for AC Transit region

PATH team has presented the preliminary results of the trip data analysis from the perspectives of Connection Protection scenario, sites, and real demand. AC Transit confirmed the availability of their smart terminal TCH for the interaction with bus drivers. Met in June as a recap of the concept of Connection Protection and the goal of tests. Requirea a determined solution of the on-board driver interface as the urgent next step. Ahsan @ AC Transit has consented to follow up by talking to their TCH tech staff. However, we did not make a schedule for that task, which makes the effort lack of guarantee in my view.

Task 4. Connected Transit Operation Roadmap

Completed – results available in final report

Task 5. Monitoring Transit Ridership in Bay Area

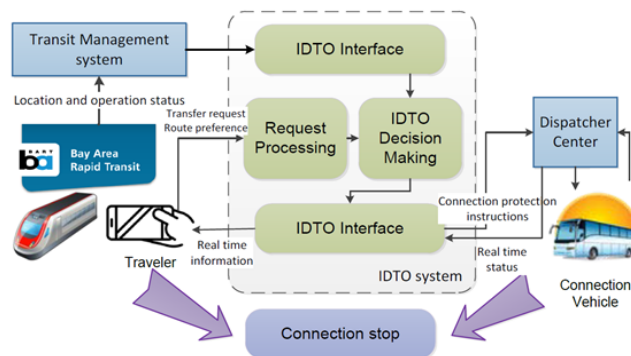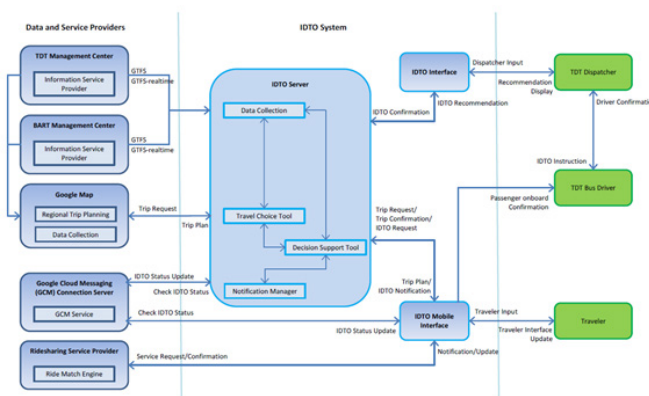Completed – results available in final report

IMAGES

Image 1: Flowchart of the System Components

Image 2: Flowchart of IDTO System