Integrated Dynamic Transit Operations (IDTO) Prototype Development and Demonstration

T3 Webinar on Transit Safety & Mobility Applications in a Connected Vehicle World

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May 14, 2014

IDTO: Integrated Dynamic Transit Operations

- **What is it?**
  - Transit-specific component of the US DOT Dynamic Mobility Application (DMA) Program
  - Builds on FTA's history of adopting technology to help improve efficiencies and rider experiences
  - Blends the emerging Connected Vehicle concepts with advances in smartphone technology and GPS-location information

- **What does it do?**
  - Provides dynamic scheduling, dispatching, and routing capabilities
  - Enables and 'protects' multi-modal and multi-agency transfers
  - Facilitates dynamic ridesharing
  - Integrates these features into a single system, for the benefits of both travelers and operators

CORRIDOR (CONTROL) DATA ENVIRONMENTS

PERF MEAS

TCON NECT

TDISP

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DRIDE
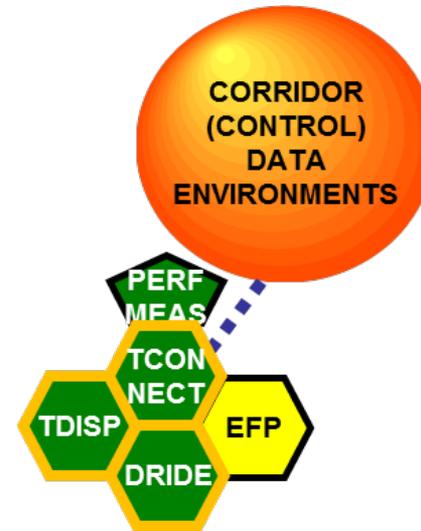
What is IDTO?

- Leverages existing and emerging applications and tools in an integrated approach

- Benefits both travelers and transit service operators

- Consists of three primary applications.

  - T-CONNECT (aka Connection Protection) increases the likelihood of making successful transfers

  - T-DISP (Dynamic Transit Operations)
    - For the traveler, T-DISP provides an ability to access real-time information about available travel options in order to best manage their commute.
    - For an agency, T-DISP extends demand / response services to support dynamic routing and scheduling

  - D-RIDE takes the concept of traditional pre-planned ridesharing (i.e., carpooling) and brings it into the 21st century enabling drivers and travelers, in near real-time, to exchange information about needs or in case of a driver, available space.

- Intends to demonstrate the technical feasibility of this application bundle, as well as examine the impacts and transformative benefits of this integrated solution

IDTO Research and Development Path
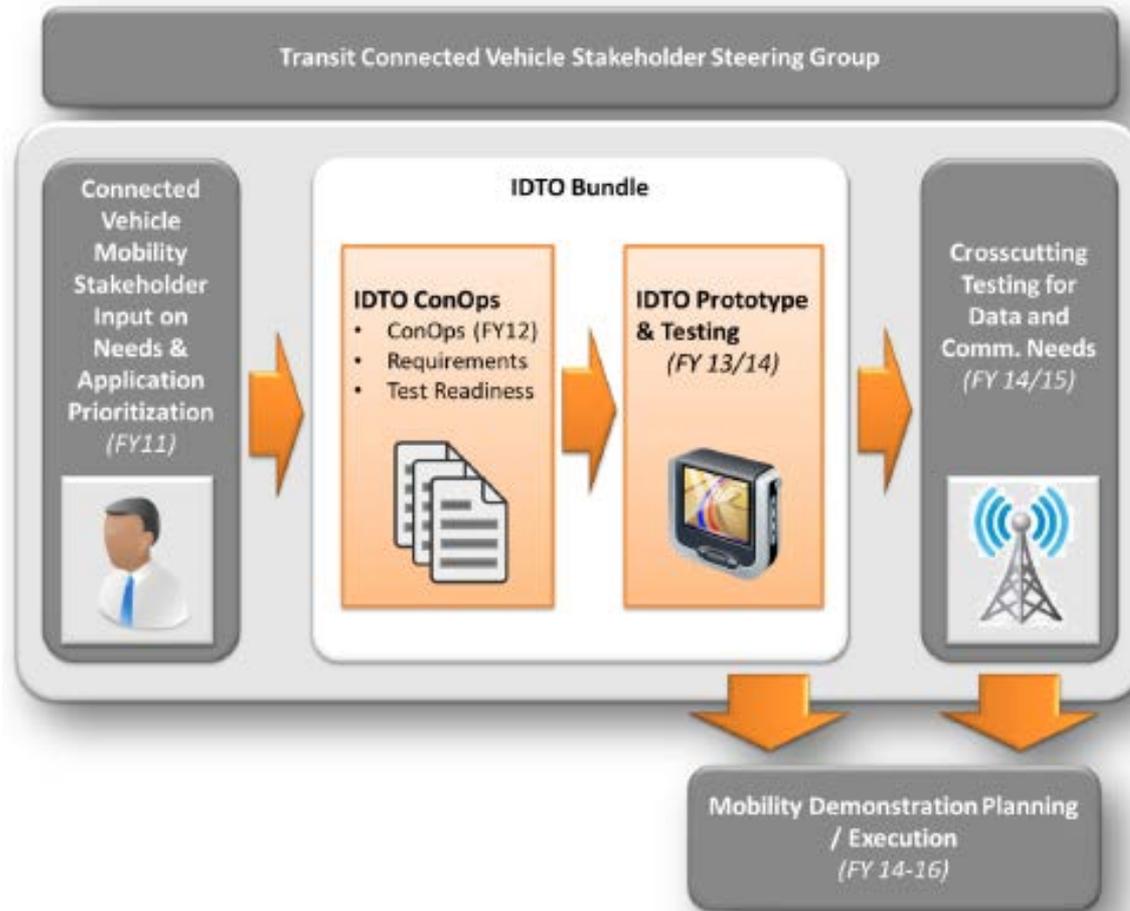
Prototype Development and Deployment Sites

- Battelle Memorial Institute, along with TranSystems and the OSU Transit Lab, is leading the Prototype Development and Demonstration Effort

- A team from the Volpe National Transportation Systems Center is leading the Impacts Assessment project

- The prototype demonstration and assessment will take place in two locations
    - 1st Location: Columbus, Ohio
    - 2nd Location: Central Florida

- The Columbus demonstration is scheduled to go live this week.

- Central Florida is expected to go live later this summer

Conceptualization of IDTO System
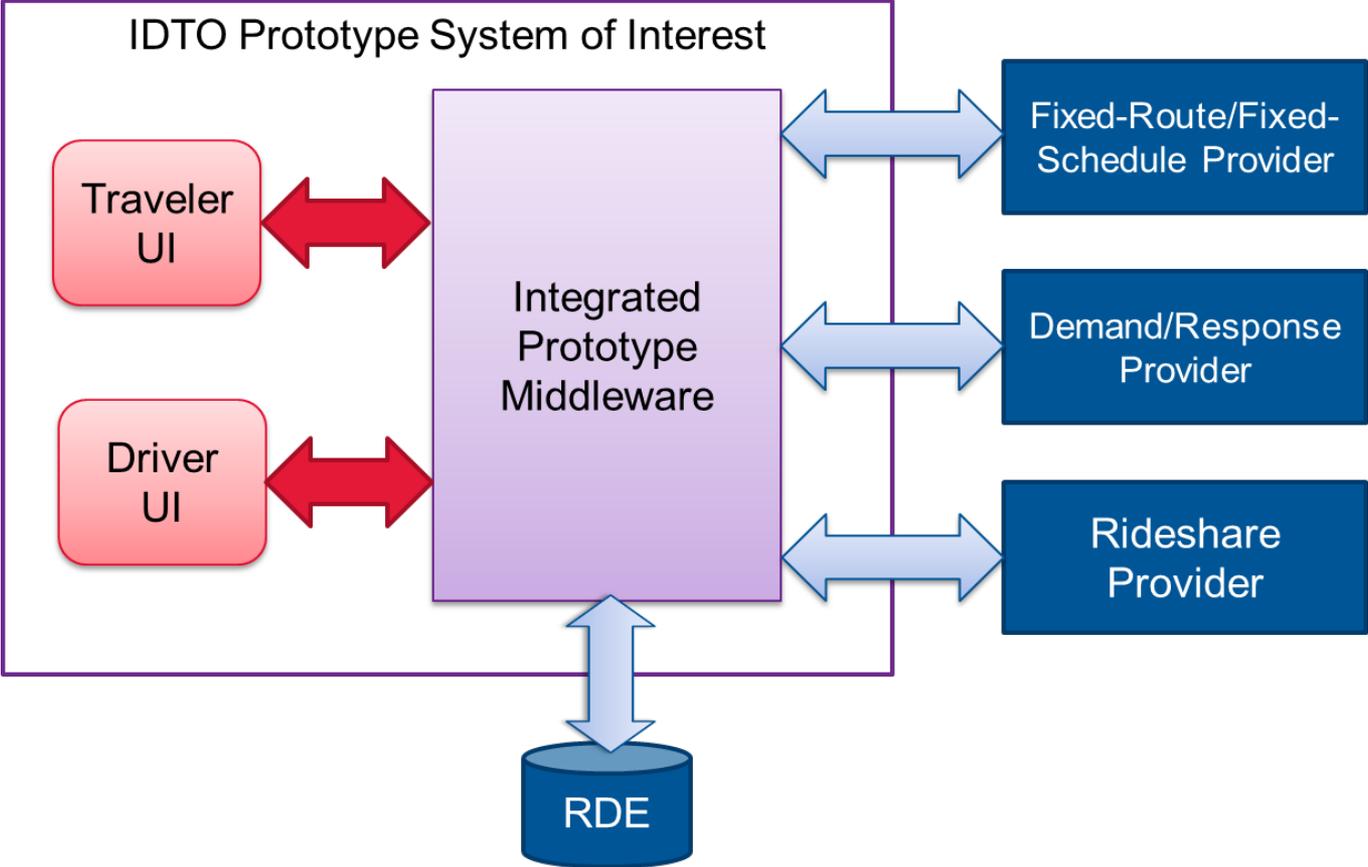
Critical Factors to Success

- Agency / Partner Cooperation
  - Requires commitment to share data and to interact with the 3rd party IDTO 'provider'
  - T-CONNECT offerors must be willing to grant, within reason, the necessary 'holds', even if it means an exception to policy

- Availability of Key Information
  - IDTO is dependent of having both 'static' Schedule Information as well as current 'Arrival Time'.
    - Allows IDTO users to view offerings from multiple providers and plan/schedule multi-segment trips that may span multiple partners
    - Is critical for implementing the T-CONNECT functionality.

- Standardization of the Information
  - Industry initiatives such as the General Transit Feed Specification (GTFS) allow for a common format to enable agencies to share information, however..
    - GTFS is not a 'standard' and as such, may not be a long term solution
    - GTFS-Realtime is a step towards obtaining current Arrival Time information, but is not optimal for this purpose

- Transferability / Scalability
  - IDTO was designed with the requirement that it support deployment in more than one region and with varying types of transportation modes and operators.

Summary of the Columbus Partners

- **Two Locations**
  - OSU Campus Area
 - Defense Supply Construction Center

- **Partners**
  - Central Ohio Transit Authority (COTA)
    - Fixed Route / Fixed Schedule provider
    - Offering Connection Protection (T-CONNECT) on select routes
  - OSU Campus Area Bus System (CABS) provides an on-campus system that can interconnect with the COTA routes and support the T-CONNECT application
  - Capital Transportation, a private transportation providers, operates an on-base shuttle service at a local military base (DSCC) that connects with COTA routes in the area
  - OSU TaxiCABS, a new service coming online in late-May, offers real-time demand/response for faculty and staff of the University
  - Rideshare option still under development for the area, but is expected to be added to the IDTO service soon

Highlights of the Columbus IDTO Deployment

- The 'Connect and Ride' App is for free on both iOS and Android

- Also available at http://www.ConnectAndRide.com

- Open Trip Planner (OTP), is being leveraged as the Trip Planning 'engine'
  - Hosted in the cloud, independent of any specific partner
  - Uses schedule Information from participating partners
  - IDTO App then queries to obtain available trip / providers options based on user selections

- The T-CONNECT Opportunity Monitor, a major element of the IDTO concept, monitors travelers and both the incoming and outgoing vehicles and issues T-CONNECT requests when a 'hold' is warranted

- Recruitment is multi-faceted, with social media a primary focus area

User Interface Example
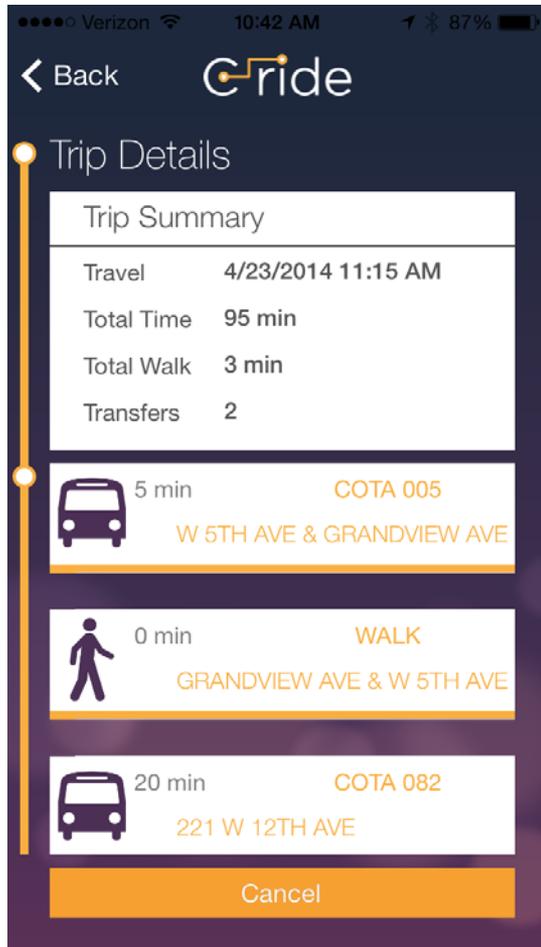
- Available for Web, iOS or Android
- Traveler-Owned Device (downloadable application)
- Interface allows for:
  - Trip Planning
  - Viewing Current Trip Details
  - Trip History
  - Notifications (not available via Web)

Mobile Data Terminal Example
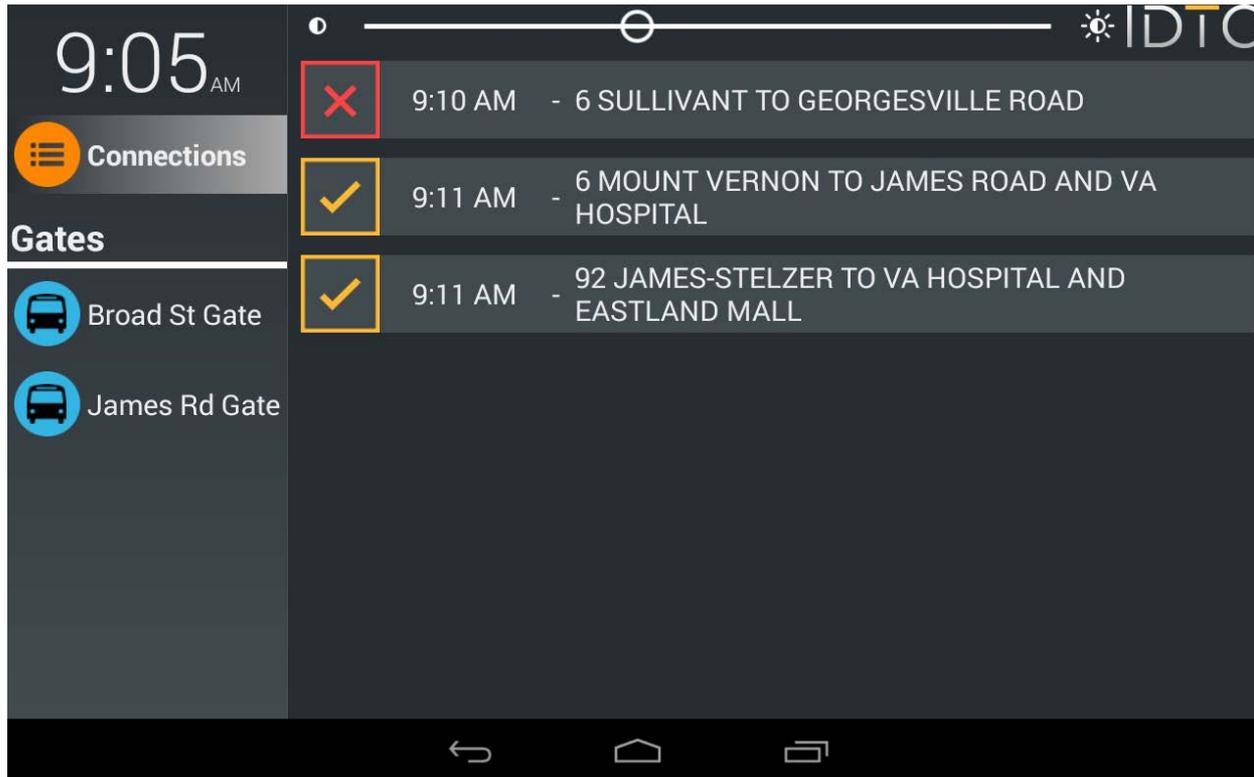
- Android-based LTE Tablet (Nexus 7)
- Provides AVL capability that previously didn't exist
- Interface allows for:
  - Viewing Current Bus Schedules and ETAs
  - Trip Planning: Can I pick up another customer?
  - Transfer Status

Dispatcher Interface Example
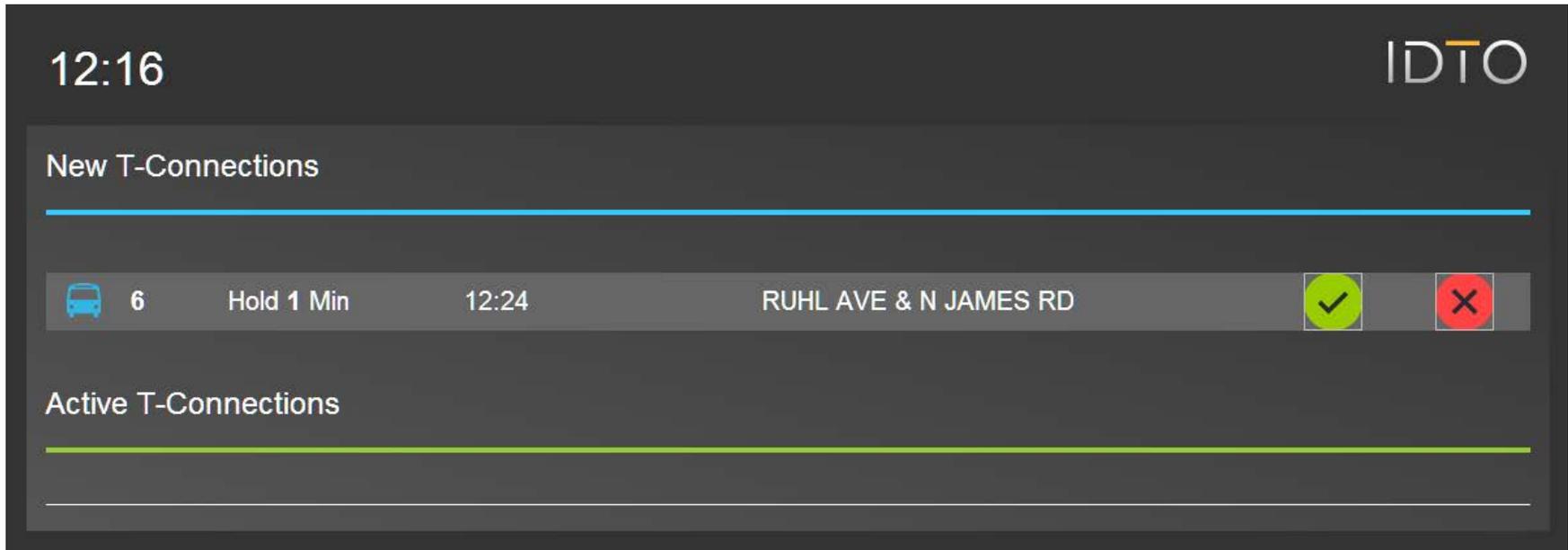
- Implemented as web-based portal

- IDTO-specific iPad devices installed at COTA

- Simple touch-screen interface displays:
  - Incoming Requests & Approved Transfers
  - Two Actions: Accept or Reject
  - Will auto-reject if no response

Summary of the Central Florida partners

- Central Florida Regional Transportation Authority (LYNX) is offering Connection Protection (T-CONNECT) associated with their fixed route / fixed schedule service on select routes serving Central Florida

- University of Central Florida (UCF) provides an on-campus transit system that can interconnect with the LYNX routes and support the T-CONNECT application

- SunRail, a new commuter rail line operating between Volusia and Orange counties, is expected to support the T-CONNECT application

- Flexbus, a new service coming online in late-summer in a 4-community region, offers real-time station-to-station demand/response for the public

- Rideshare option still under consideration for the area, but are also expected to be added to the IDTO service in the future

IDTO Research Timeline

- ConOps and System Requirements – completed, mid 2012

- Test Readiness – completed, October 2012

- Prototype Development and Impacts Assessment Procurement -completed, April 2013

- Prototype Requirements and Architecture – completed. Sept 2013

- **Prototype Development and Demonstrations, 2013-2014**

- Evaluation Results, expected Winter 2014

- Available for CV Regional Pilots, 2015 (est.)

Comments and Thoughts…..

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