
CTfastrak
Automated Bus Project
CONNECTICUT
DEPARTMENT OF TRANSPORTATION

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CTDOT

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CTDOT

U.S. Department of Transportation
Federal Transit Administration

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CTDOT Public Transportation

- Public Transportation in CT is Different
- 75% transit operated directly by CTDOT through private contractor
- 25% transit operated by transit districts
- CTDOT subsidizes about 95% of transit district operating costs
- CTDOT has direct oversight over pretty much all of transit statewide
- Engaged in all transit capital projects as well

CTfastrak Fixed Guideway

- BRT Facility in Central CT
- Owned & Maintained by CTDOT
- Opened March 2015
- $567 Million (80% Federal, 20% State)
- 9.4 Miles Long
- 11 Stations
- 5 Intersections
- Includes Multi-Use Trail (5 miles)

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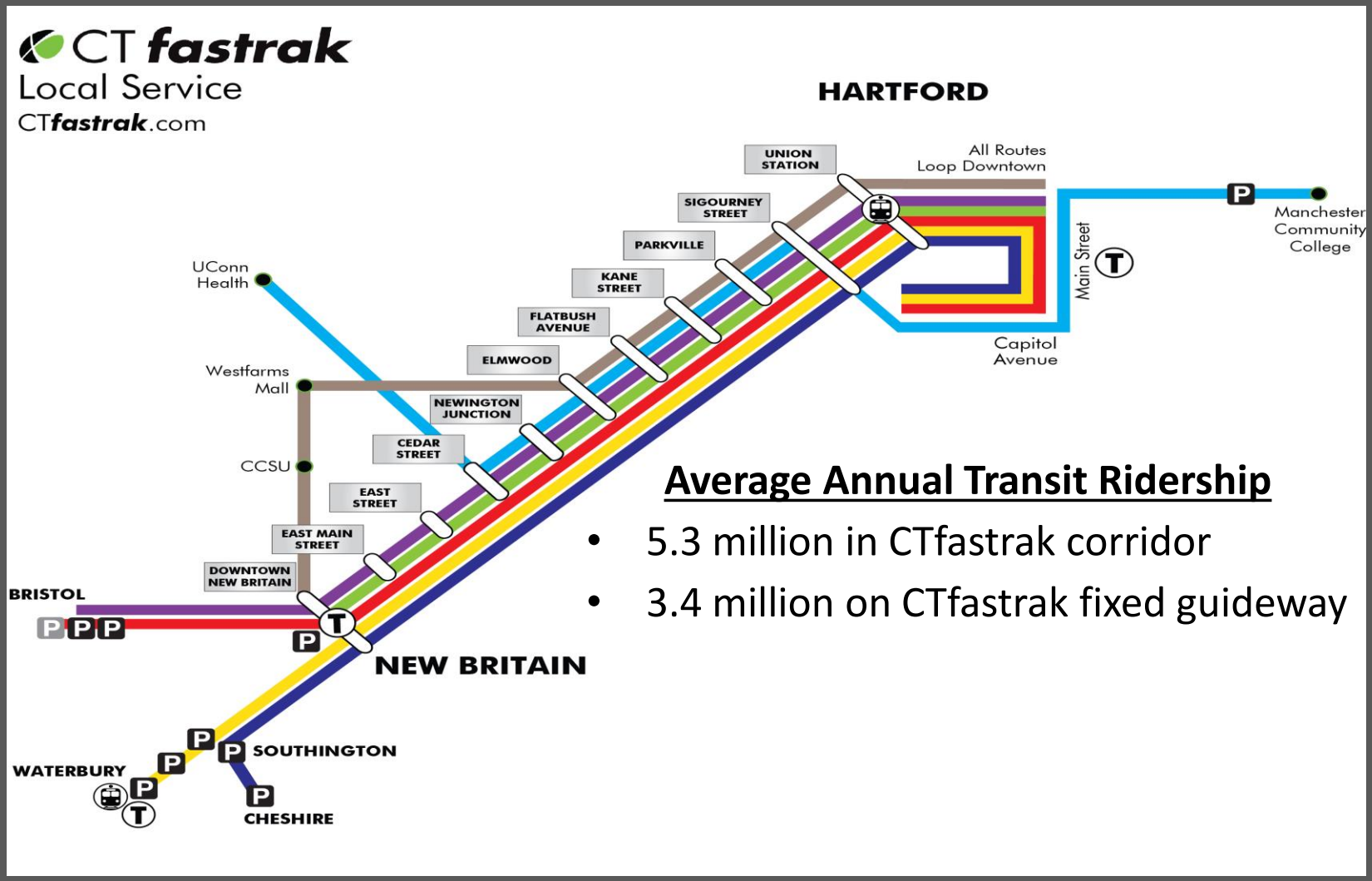
CTfastrak Service Routes



Average Annual Transit Ridership

- 5.3 million in CTfastrak corridor
- 3.4 million on CTfastrak fixed guideway

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CTfastrak Downtown Hartford

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CTfastrak Vehicle Types

The region's first rapid transit system

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- Length: 30 feet
- Rider Capacity: 28 seats, 10 standees
- System Use: New CT***fastrak*** Connector & Circulator Routes
- Manufacturer: Gillig LLC, California

- Length: 40 feet
- Rider Capacity: 39 seats, 10 standees
- System Use: CT***fastrak*** Local Routes
- Manufacturer: New Flyer, Minnesota

- Length: 45 feet
- Rider Capacity: 55 seats, no standees
- System Use: CT***fastrak*** Express Routes
- Manufacturer: MCI, Illinois

- Length: 60 feet
- Rider Capacity: 55 seats, 19 standees
- System Use: CT***fastrak*** guideway/Downtown Htfd
- Manufacturer: Nova, NY

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CTfastrak Station Features

Raised Platforms

Real-Time Bus Arrival Signs

Crosswalks with Flashers

Ticket Vending Machines

ADA Access

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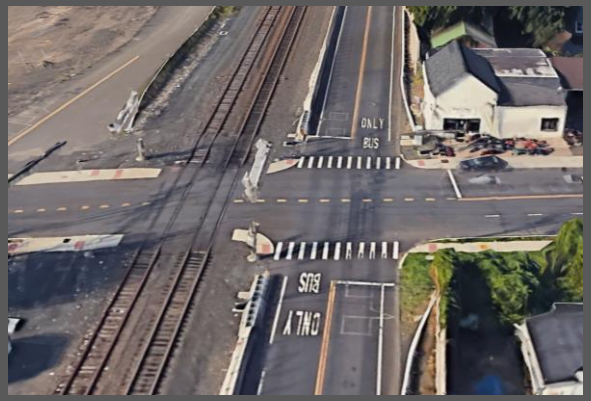
CTfastrak At-Grade Intersections



Hamilton Street

Oakwood Avenue

Smalley Street

East Main Street

Stanley Street

Our Vision

Bus Automation On CTfastrak

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Partners

Federal Transit Administration

Project Sponsor

U.S. Department of Transportation Volpe Center

Project Sponsor

Prime Recipient
Project Lead

cte

Project Manager
Technical Consultant

NEW FLYER OF AMERICA

Bus Manufacturer
EVSE Supplier

CT transit

Transit Service Operator

ROBOTIC RESEARCH

ADS Technology Developer/Integrator

University of Connecticut 1881

Data Collection and Analysis

New Flyer Xcelsior Charge AV

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Bus Automation

- Deploy three 40-foot automated buses in revenue service on CTfastrak fixed guideway
- Automated driving capabilities will include steering, braking, lane keeping, pedestrian and object detection, precision docking, platooning, etc.
- Buses will operate in automated mode on fixed guideway all times of day, night, weather conditions and can travel up to 40 mph
- Buses will have safety driver in driver seat able to take over
- Buses will be manually driven in Downtown Hartford

Precision Docking

Existing Docking Challenges

- All doors must align correctly to allow safe, level, ADA boarding
- Damages occur if bus hits or scrapes platform
- Wide gaps are unsafe, driver must deploy bridge plate

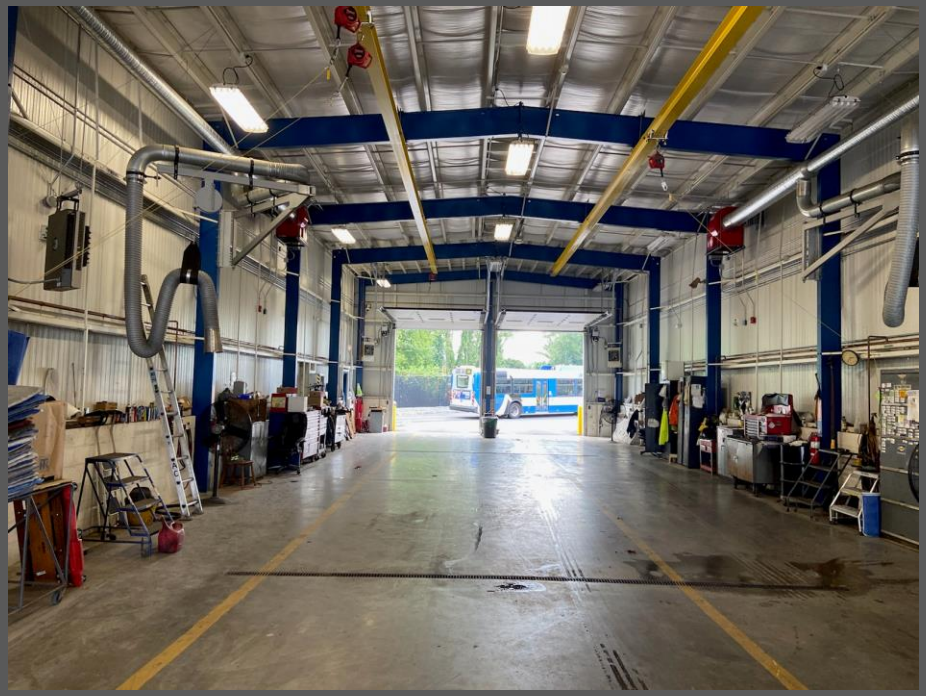
Testing ADS Solution to Dock Bus Correctly Every Time

- Improves Safety
- Enhances Mobility
- Saves Time and Money

Bus Platooning

- **Peak period ridership demands larger buses** *(60ft articulated)*
- **Off peak ridership makes large buses look wasteful to taxpayers**
- **Platoon smaller** *(40ft)* **buses during peak, break platoon off-peak**
- **Allows for better service, improved headways, increased capacity**

Bus Electrification



Building charging infrastructure at CTtransit Hartford facility

Testing performance of battery electric buses in BRT service

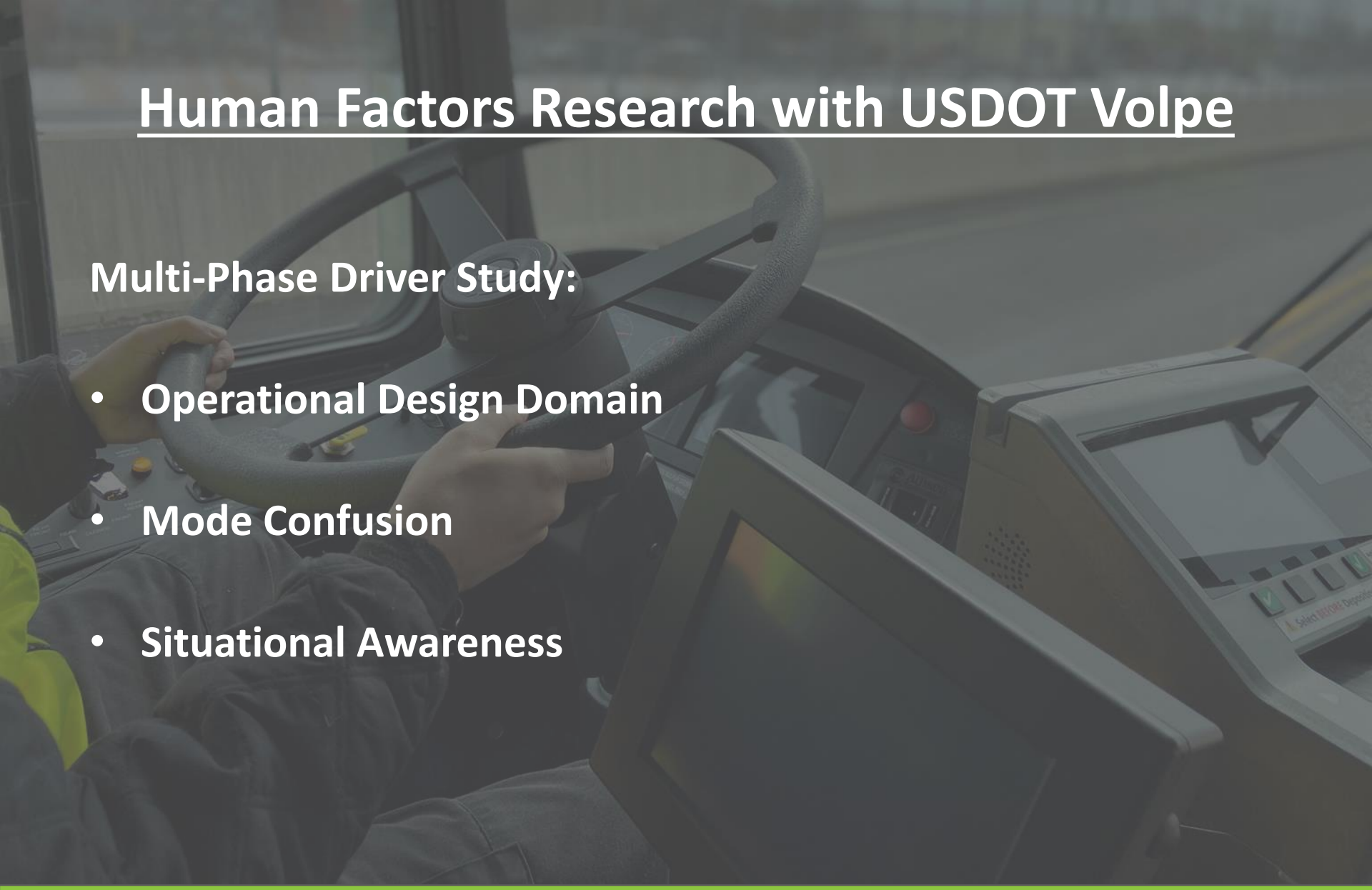
Signal / Intersection Improvements

- Dual-mode RSUs for V2X communications (SPaT & MAP)
- New traffic signal controllers (Cubic/Trafficware Commander NT2)
- New stop bar & advanced traffic detection (camera & radar)
- Additional equipment to alert bus of potential red-light violations
- Cellular backhaul (day 1) and fiber (future) for remote monitoring

Human Factors Research with USDOT Volpe

Multi-Phase Driver Study:

- **Operational Design Domain**
- **Mode Confusion**
- **Situational Awareness**



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Automated Bus Perception & Adoption Surveys

- UConn to survey riders and drivers before & during deployment
- Findings will inform future actions
- Summary of findings will be made available

Current Project Timeline

Activity	Dates
Vehicle Design, Build & Test *(off site)*	**2021-2022**
Infrastructure Design & Build on CTfastrak	**2021-2022**
Vehicle Testing on CTfastrak	**Late 2022**
Operations on CTfastrak	**2023**

Current Project Budget

Funding Amount *Includes Federal Funds & Non-Federal Match*	Funding Source
$3 Million	FTA IMI Grant + State
$2.4 Million	FTA Low-No Grant + State
$4.1 Million	FTA 5339 Formula + State
$0.3 Million	FHWA SPR Formula + State
$1.2 Million	FTA Other Formula Funds + State
$11 Million	**TOTAL**

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