

# **Enhanced Transit Operations and Travel Experience in Connected Vehicle Environment**

Yehuda Gross, USDOT (retired)

Gwo-Wei Torng, Noblis

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# Connected Vehicle Environment

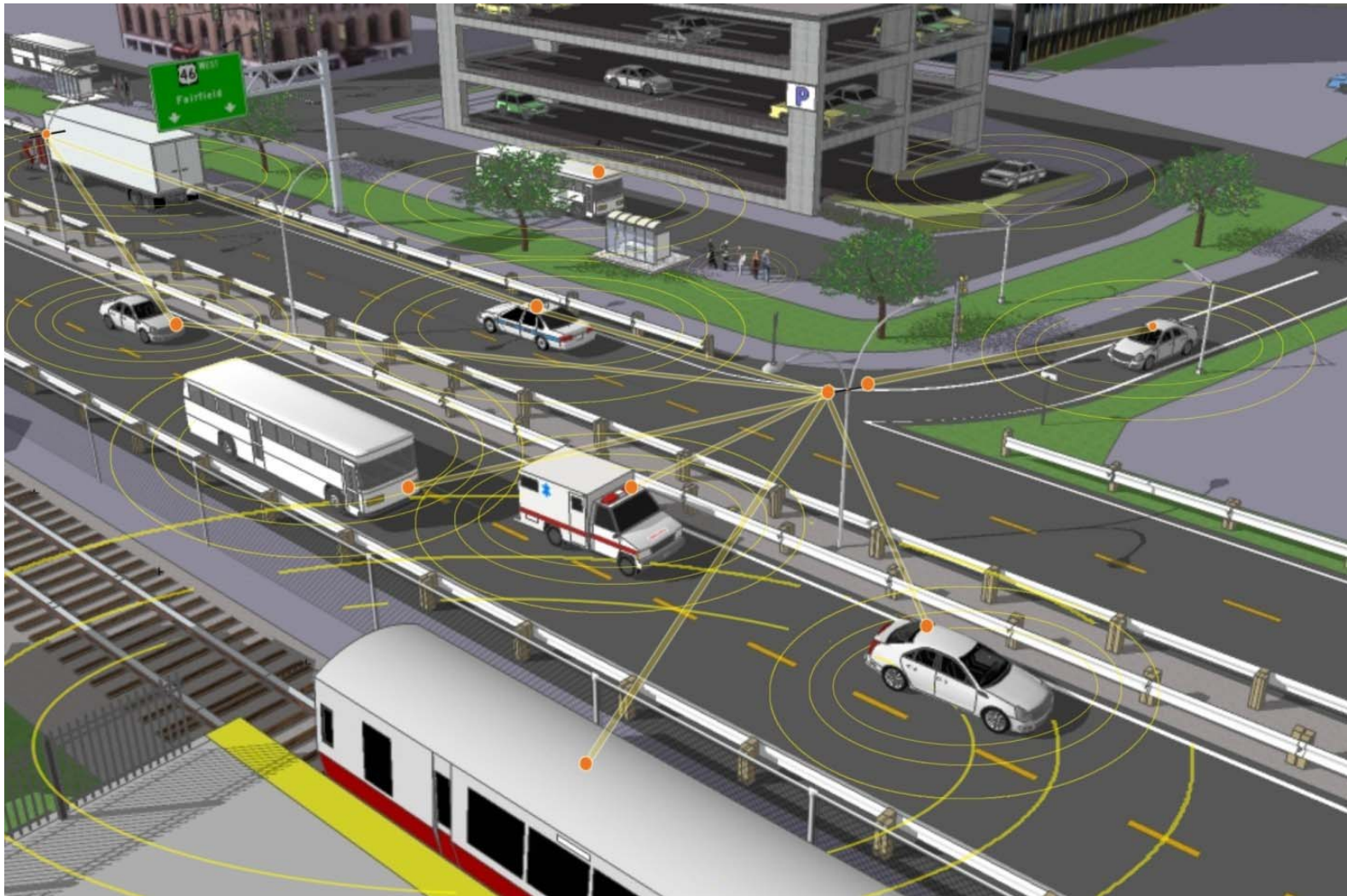


Image Source: Thinkstock/USDOT



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# Connected Vehicle Program Structure

Applications



**Safety**

V2V

V2I

**Mobility**

Real-time  
Data  
Capture

Dynamic  
Mobility  
Apps

**Environment**

AERIS

Road  
Weather  
Apps

Technology



International Harmonization of Standards & Architecture

Human Factors

Systems Engineering

Certification

Test Environments

Policy



Deployment Scenarios

Financing & Investment Models

Operations & Governance

Institutional Issues



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## Applications



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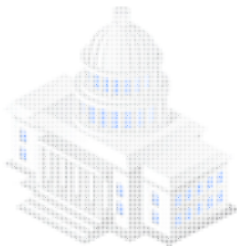
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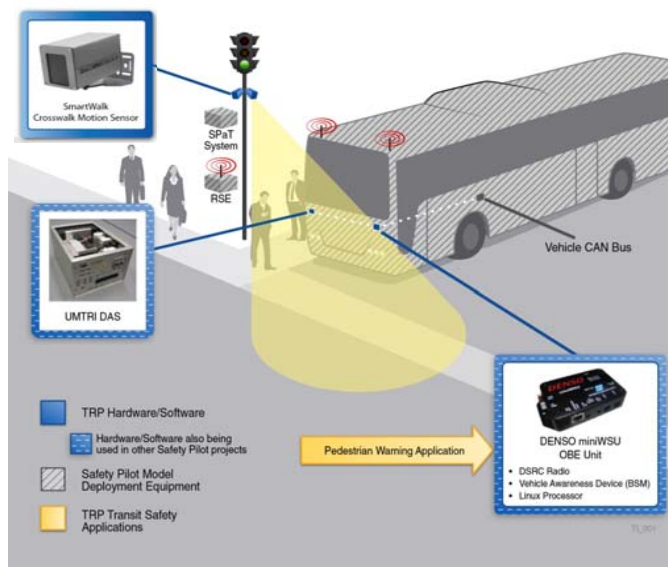
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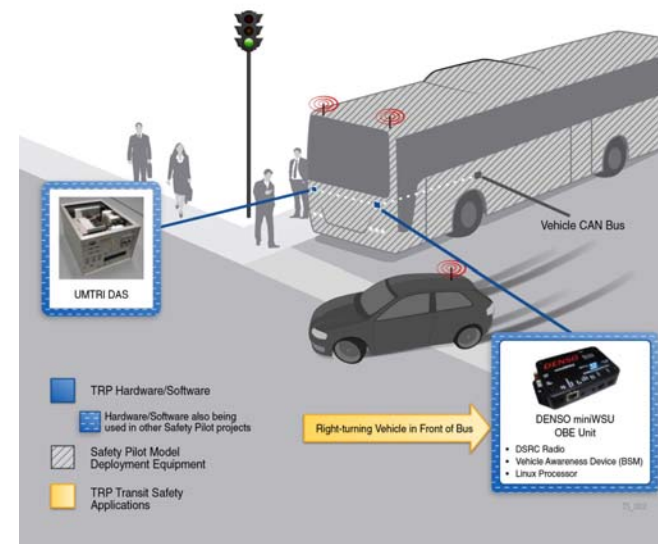
# Safety - Transit Safety Retrofit Package (TRP)

- Pedestrian in Signalized Crosswalk Warning (V2I)
- Vehicle Turning Right in Front of Bus Warning (V2V)
- Forward Collision Warning (V2V)
- Emergency Electronic Brake Lights (V2V)
- Curve Speed Warning (V2I)

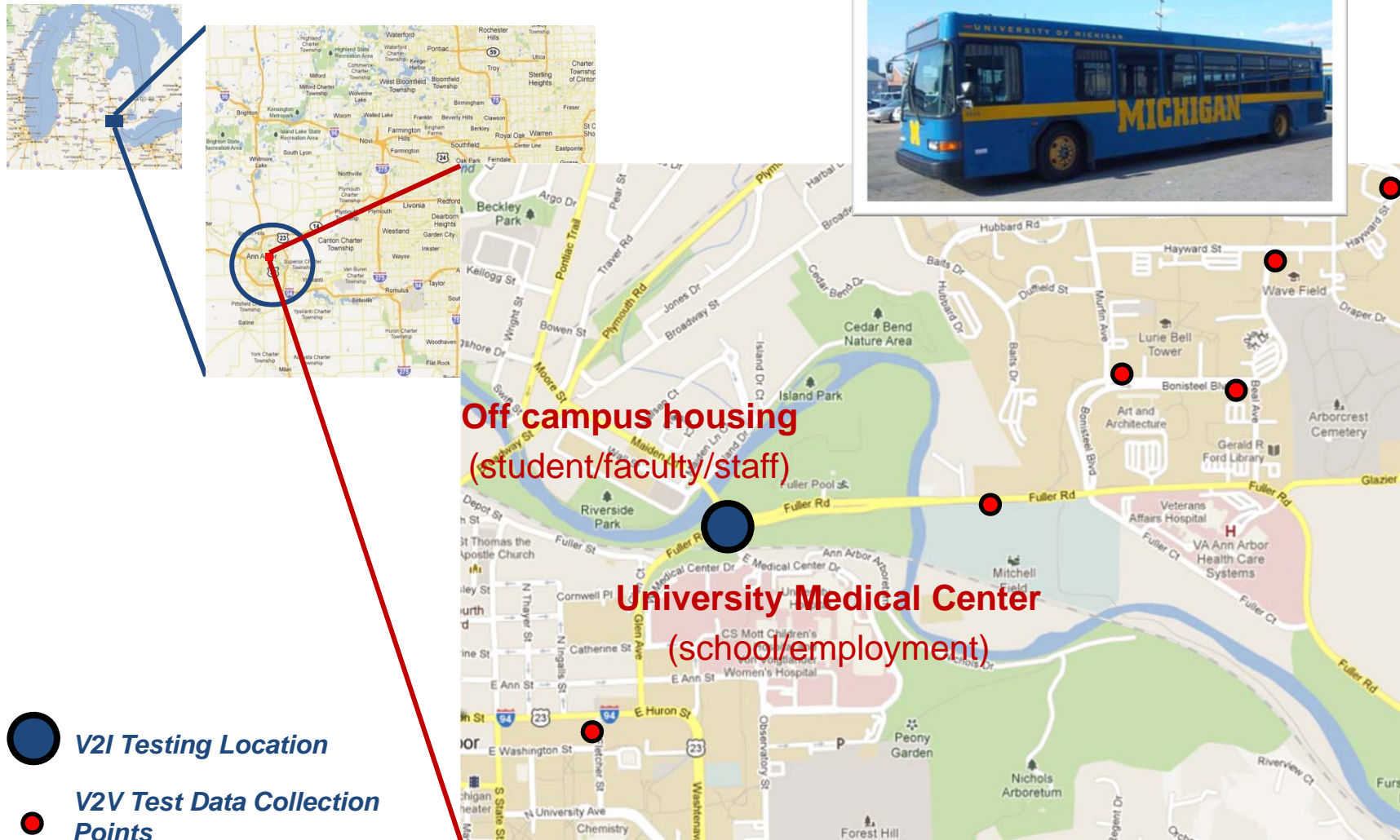
## Pedestrian in Signalized Crosswalk



## Right-Turn-In-Front



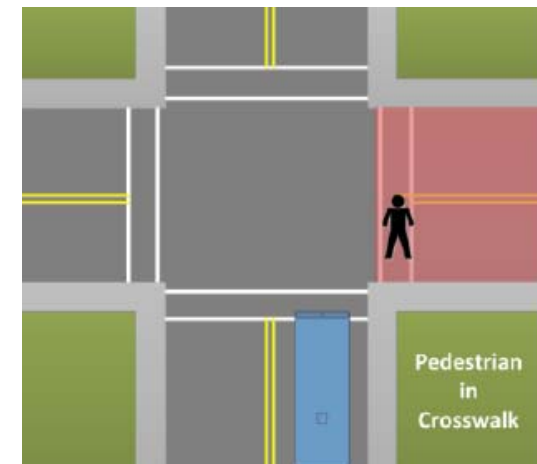
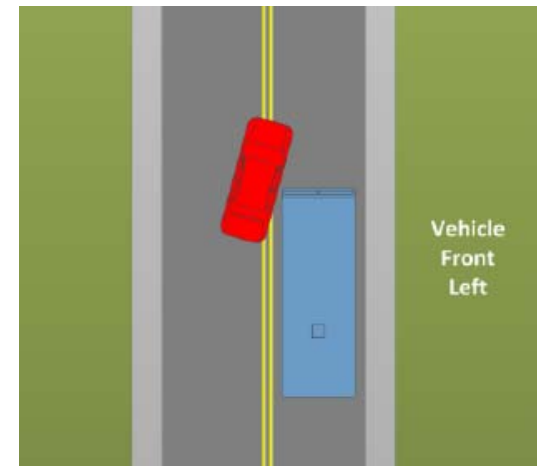
# Safety Pilot Model Deployment: Transit Applications Test Locations



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# Transit Safety Research Next Steps

- Complete TRP development and testing
- Evaluate impacts of TRP safety applications
- Identify and prioritize additional near-term safety applications
- Explore TRP utilization in Mobility and Environment areas
- Collaborate with V2I, V2V and X2P research for transit adaptation
- Promote industry awareness and professional capacity building



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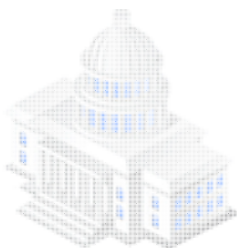
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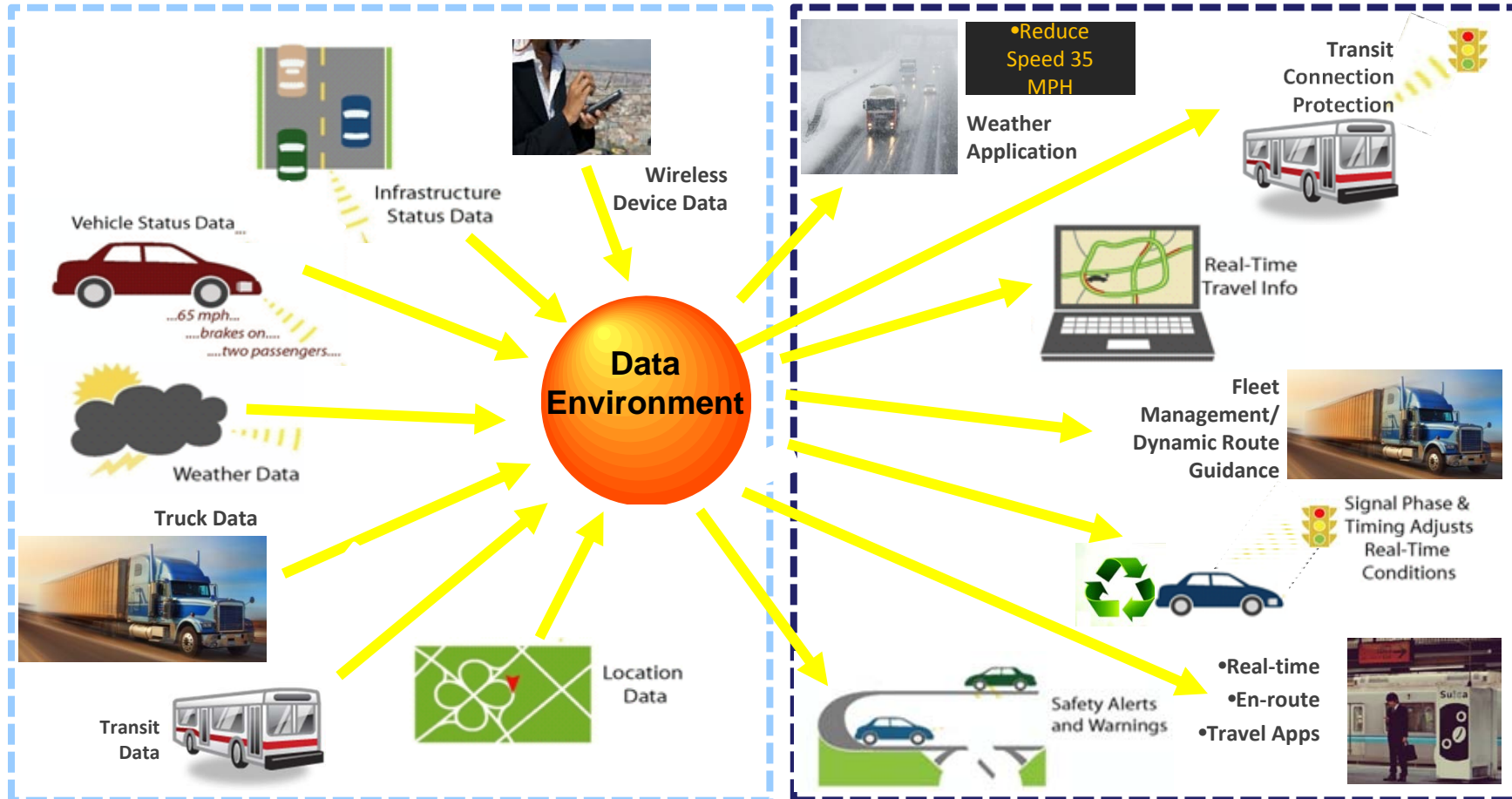
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# Mobility

## Real-time Data Capture and Management (DCM)

## Dynamic Mobility Applications (DMA)



# Mobility - DMA Concepts

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- Enable Advance Traveler Information Systems (Enable ATIS)
- Freight Advanced Traveler Information Systems (FRATIS)
- Intelligent Network Flow Optimization (INFLO)
- Multimodal Intelligent Traffic Signal Systems (MMITSS)
- Response, Emergency Staging and Communications, Uniform Management, and Evacuation (RESCUME)
- Integrated Dynamic Transit Operations (IDTO)



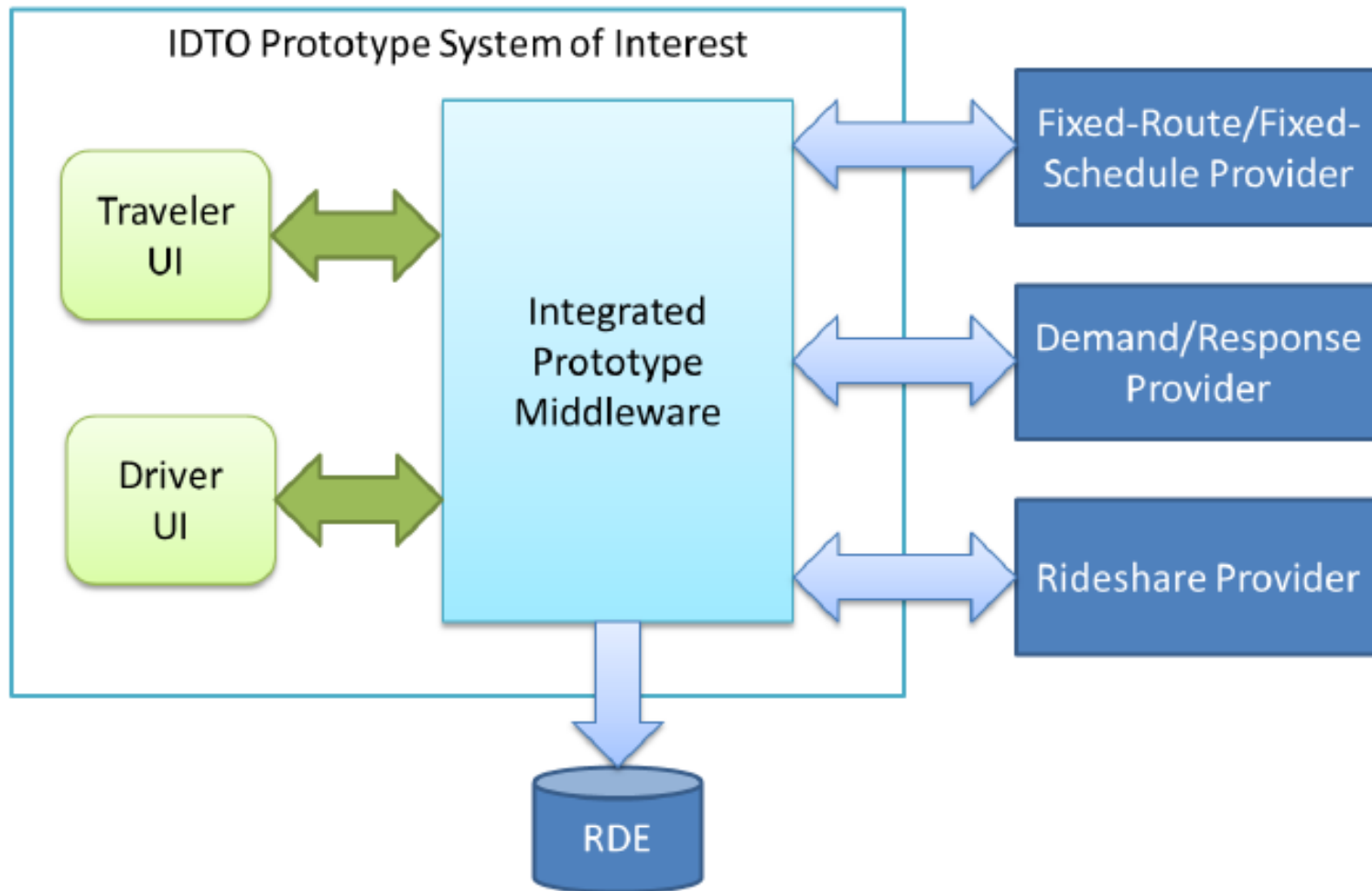
# IDTO Prototype Development and Testing Sites

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- 1<sup>st</sup> Location: Columbus, Ohio
- Partners: Battelle (prime), COTA, OSU (CABS, Taxi-CABS, and OSU Transit Lab), Capital Transportation, Zimride, TransSystems
- 2<sup>nd</sup> Location: Orlando, Florida (LYNX)



# Conceptualization of IDTO System

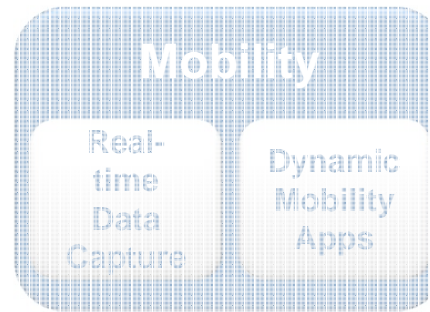
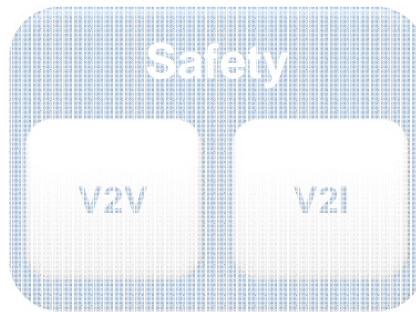




# Sample User Interface for Mobile User



## Applications



## Technology



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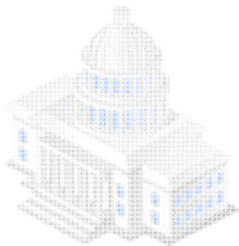
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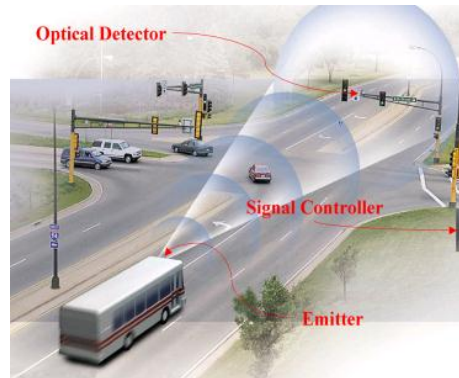
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# Environment - AERIS Concepts

- Eco-Signal Operations
- Dynamic Eco-Lanes
- Dynamic Low Emissions Zones
- Eco-Traveler Information
- Support for Alternative Fuel Vehicle Operations



Source: Federal Transit Administration (FTA)



Source: <http://busride.com/wp-content/uploads/2010/06/transit-0109c.jpg>



Source: Tappan Zee Bridge/I-287 Environmental Review



# For Additional Information

- ITS Joint Program Office website: <http://www.its.dot.gov/index.htm>
- Connected Vehicle webpage: [http://www.its.dot.gov/connected\\_vehicle/connected\\_vehicle.htm](http://www.its.dot.gov/connected_vehicle/connected_vehicle.htm)
- Transit Connected Vehicle Research webpage: [http://www.its.dot.gov/factsheets/transit\\_connectedvehicle.htm](http://www.its.dot.gov/factsheets/transit_connectedvehicle.htm)



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