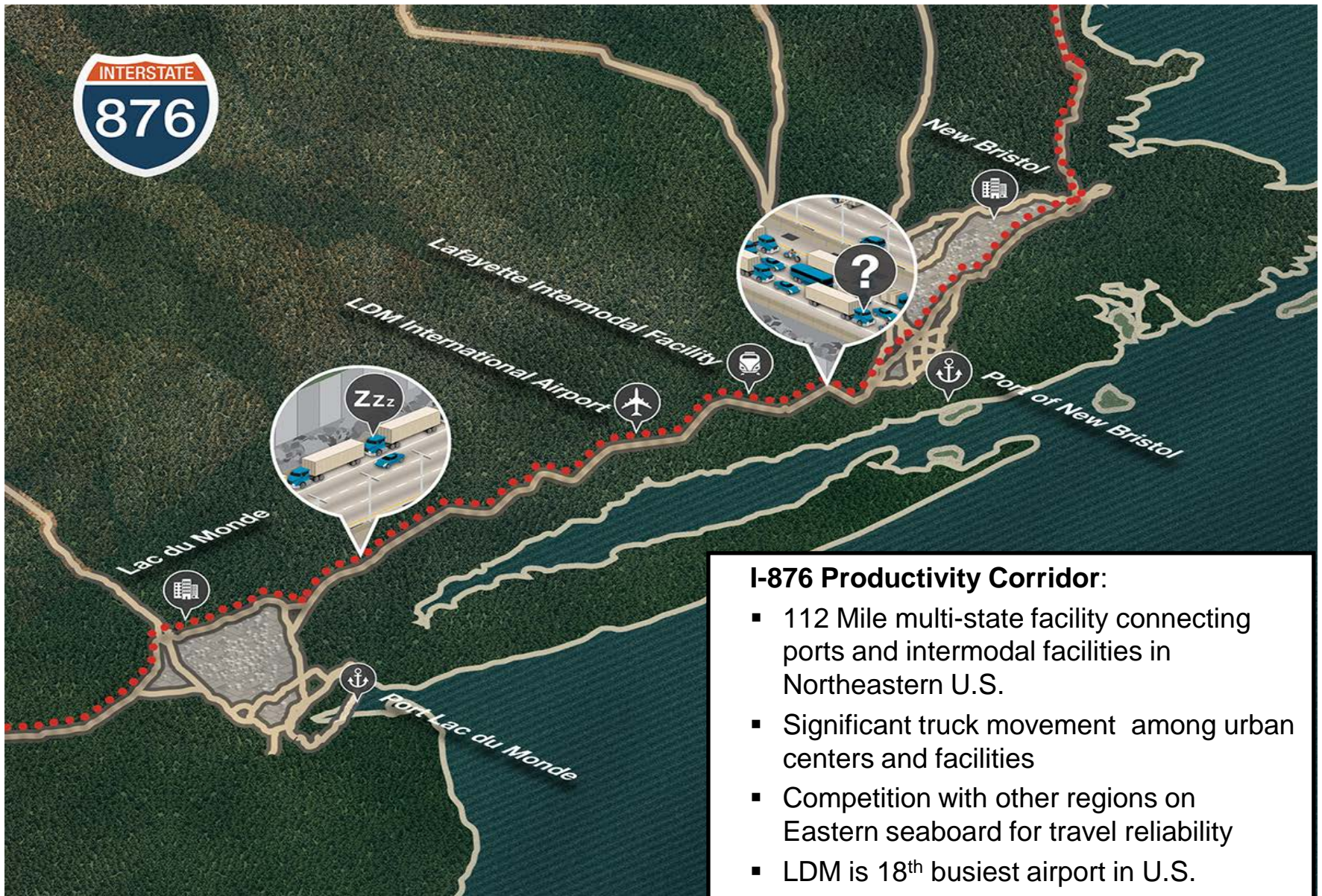




Example CV Pilot Deployment Concepts: I-876 Productivity Corridor

Randy Butler (FHWA)

I-876 Productivity Corridor



I-876 Productivity Corridor:

- 112 Mile multi-state facility connecting ports and intermodal facilities in Northeastern U.S.
- Significant truck movement among urban centers and facilities
- Competition with other regions on Eastern seaboard for travel reliability
- LDM is 18th busiest airport in U.S.

Stakeholders Convene and Identify Key Transportation Challenges

- **Freight Productivity**

- Heavy congested freeways interferes with timely and reliable freight movement and hinders economic development
- Underutilized freight facilities, infrastructure, and mobile assets
- Frequent empty moves within the corridor create non-optimal utilization of assets
- Port, airport and inter-modal access subject to surge demand and long waits

- **Truck Safety**

- Truck-vehicle conflicts in hilly merge/weave sections near interchanges
- Truck-involved crashes caused by lane changing and blind spots



Stakeholder Set Three Key Improvement Targets

Goal	Performance Measure	Performance Target
Improve Truck Travel Times	Freight travel times	Reduce freight vehicles travel times by 17%
Reduce Number of Wasted Trips	Number of wasted truck trips	Reduce the number of wasted trips by 15%
Improve truck safety	Number of truck related conflicts	Reduce truck-related conflicts by 30%



Applications Considered for Improving Freight Reliability

V2I Safety

Red Light Violation Warning
 Curve Speed Warning
 Stop Sign Gap Assist
 Spot Weather Impact Warning
 Reduced Speed/Work Zone Warning
 Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

Emergency Electronic Brake Lights (EEBL)
 Forward Collision Warning (FCW)
 Intersection Movement Assist (IMA)
 Left Turn Assist (LTA)
 Blind Spot/Lane Change Warning (BSW/LCW)
 Do Not Pass Warning (DNPW)
 Vehicle Turning Right in Front of Bus Warning (Transit)

Road Weather

Motorist Advisories and Warnings (MAW)
 Enhanced MDSS
 Vehicle Data Translator (VDT)
 Weather Response Traffic Information (WxTINFO)

Environment

Eco-Approach and Departure at Signalized Intersections
 Eco-Traffic Signal Timing
 Eco-Traffic Signal Priority
 Connected Eco-Driving
 Wireless Inductive/Resonance Charging
 Eco-Lanes Management
 Eco-Proprietary Adaptive Cruise Control
 Eco-Traveler Information
 Eco-Ramp Metering
 Low Emissions Zone Management
 AFV Charging / Fueling Information
 Eco-Smart Parking
 Dynamic Eco-Routing (light vehicle, transit, freight)
 Eco-ICM Decision Support System

Improve Reliability

Agency Data

Probe-based Pavement Maintenance
 Probe-enabled Traffic Monitoring
 Vehicle Classification-based Traffic Studies
 CV-enabled Turning Movement & Intersection Analysis
 CV-enabled Origin-Destination Studies
 Work Zone Traveler Information

Mobility

Advanced Traveler Information System
 Intelligent Traffic Signal System (I-SIG)
Signal Priority (transit, freight)
 Mobile Accessible Pedestrian Signal System (PED-SIG)
 Emergency Vehicle Preemption (PREEMPT)
 Dynamic Speed Harmonization (SPD-HARM)
 Queue Warning (Q-WARN)
 Cooperative Adaptive Cruise Control (CACC)
 Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
 Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
 Emergency Communications and Evacuation (EVAC)
 Connection Protection (T-CONNECT)
 Dynamic Transit Operations (T-DISP)
 Dynamic Ridesharing (D-RIDE)
Freight-Specific Dynamic Travel Planning and Performance
Drayage Optimization

Smart Roadside

 Wireless Inspection
 Smart Truck Parking



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Connected Vehicle Applications Selected in Performance-Driven Approach

Improve Freight Productivity

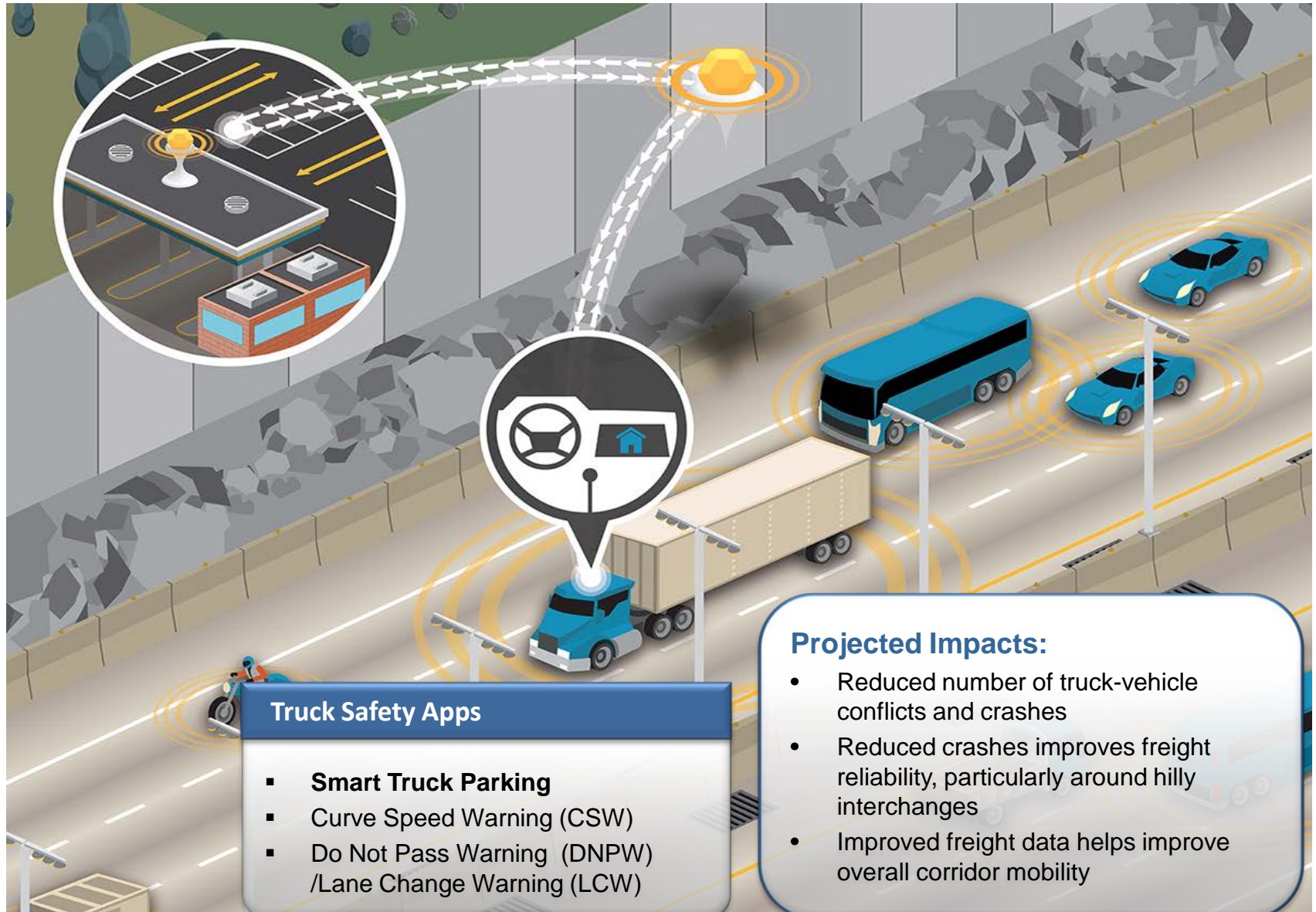
- Freight Advanced Traveler Information System (FRATIS)
- Drayage Optimization (DRG-OPT)
- Freight Signal Priority (FSP)

Improve Truck Safety

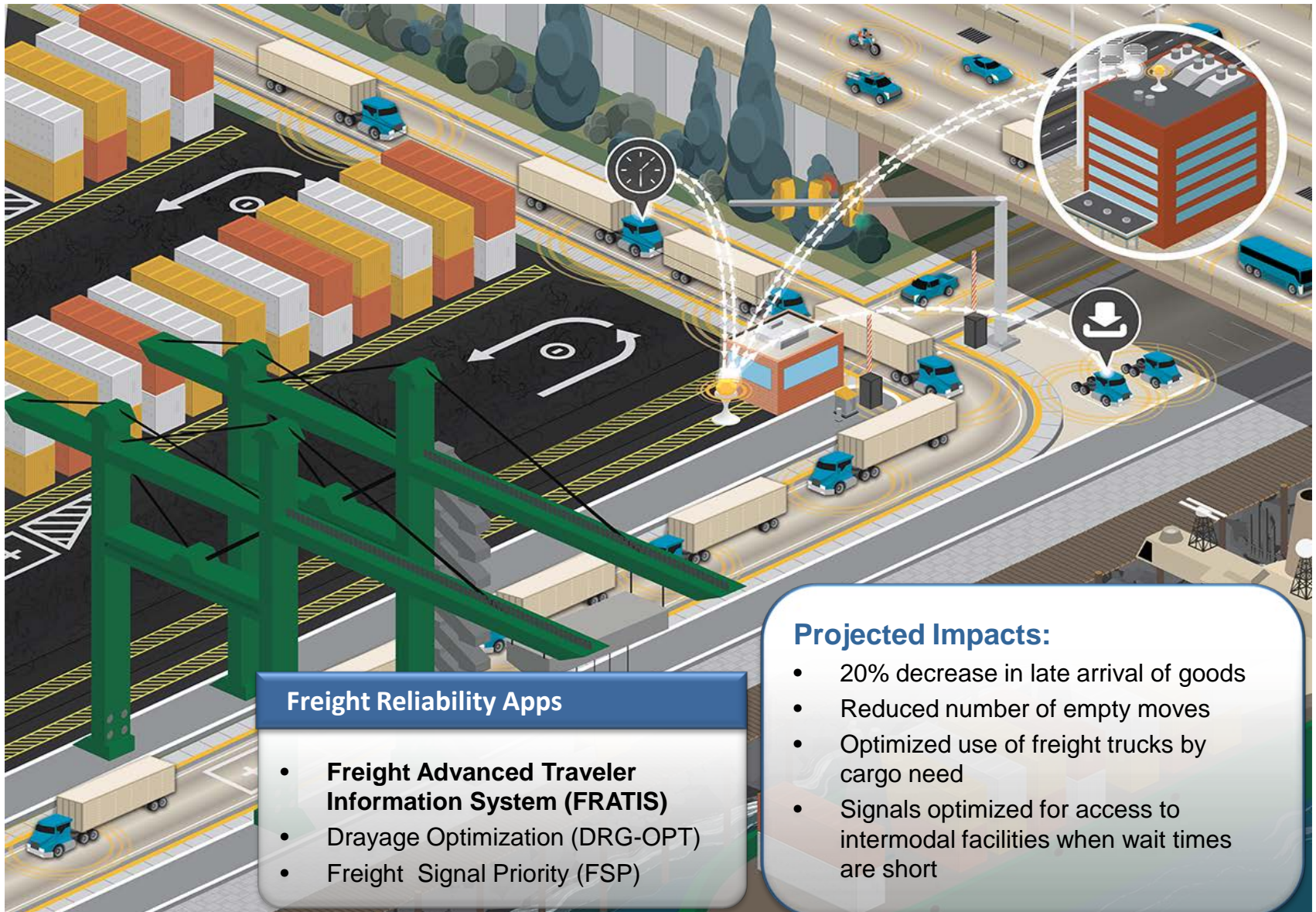
- Smart Truck Parking
- Curve Speed Warning (CSW)
- Do Not Pass Warning (DNPW) /Lane Change Warning (LCW)



Projected Synergies and Impacts from Truck Safety Apps in the Deployment Concept



Projected Synergies and Impacts from Freight Reliability Applications in the Deployment Concept



- Freight Reliability Apps**
- **Freight Advanced Traveler Information System (FRATIS)**
 - Drayage Optimization (DRG-OPT)
 - Freight Signal Priority (FSP)

- Projected Impacts:**
- 20% decrease in late arrival of goods
 - Reduced number of empty moves
 - Optimized use of freight trucks by cargo need
 - Signals optimized for access to intermodal facilities when wait times are short

Integrated Concept for I-876 Corridor

