

Innovative Freight Planning and Technology

Georgia Planning Association
2018 Fall Conference
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**CDM
Smith**

WATER + ENVIRONMENT + **TRANSPORTATION** + ENERGY + FACILITIES



Motor Carrier System Plan

Overview

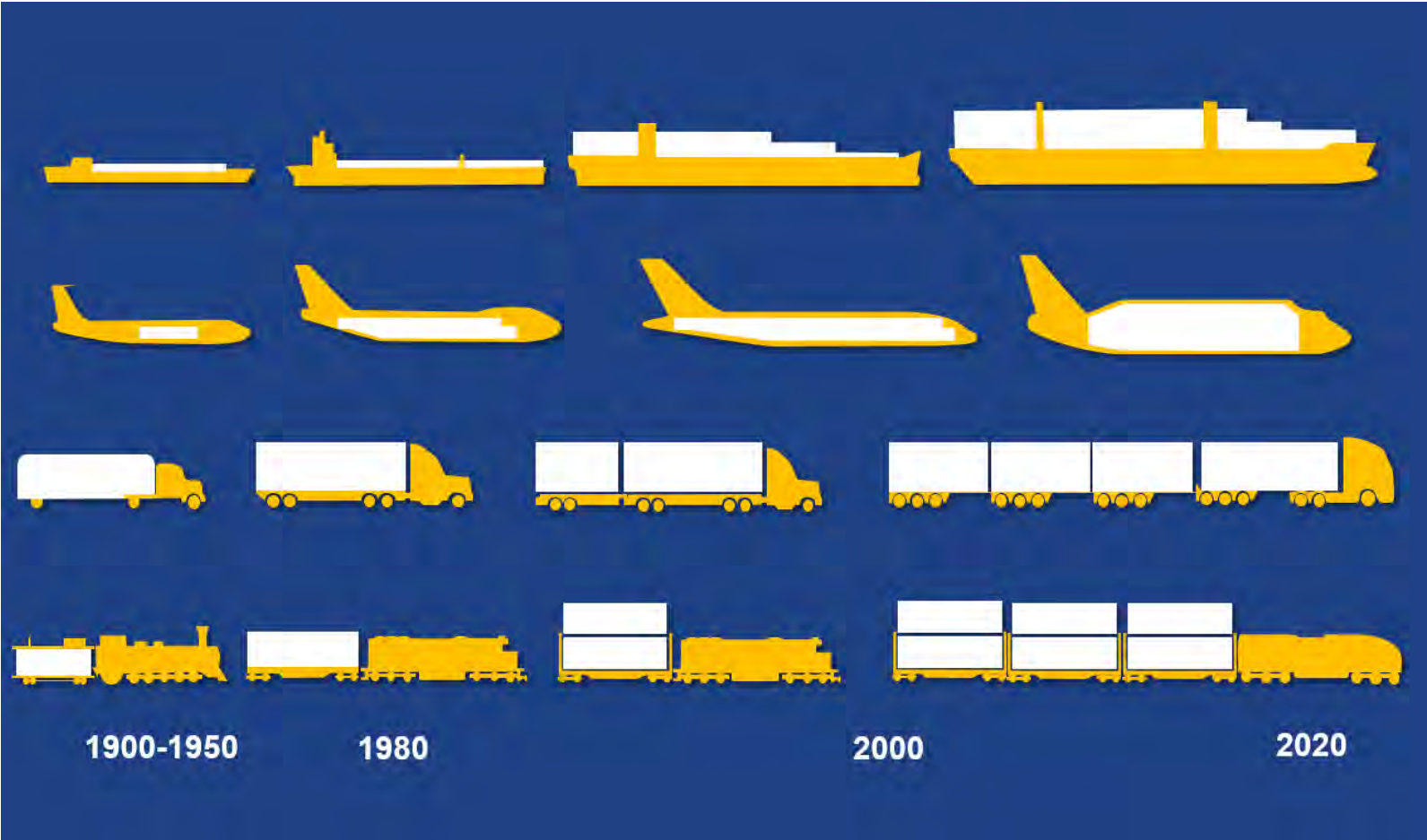


Background

The Evolution of Transportation

From...	To...
Moving vehicles	Moving people and freight
Individual modes and facilities	Complete end-to-end trip
Individual jurisdictions	Economic regions and trade corridors
Physical capacity	Operational performance, flexibility, and reliability
Travel time and vehicle operating costs	Business logistics and economic competitiveness
Reacting to economic growth and community and environmental impacts	Proactive planning for economic, community and environmental goals

Technology Trends - Freight Vehicles



Florida's Changing Industry Clusters

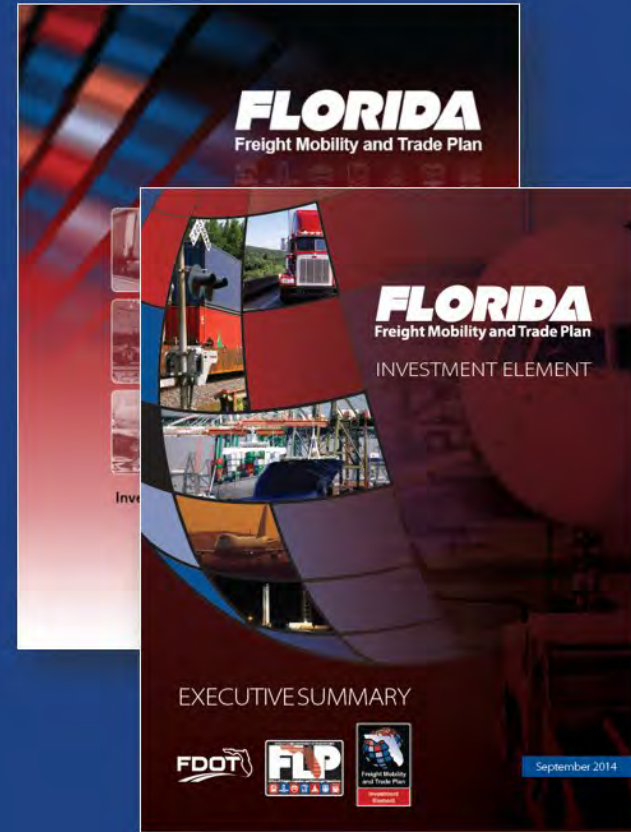
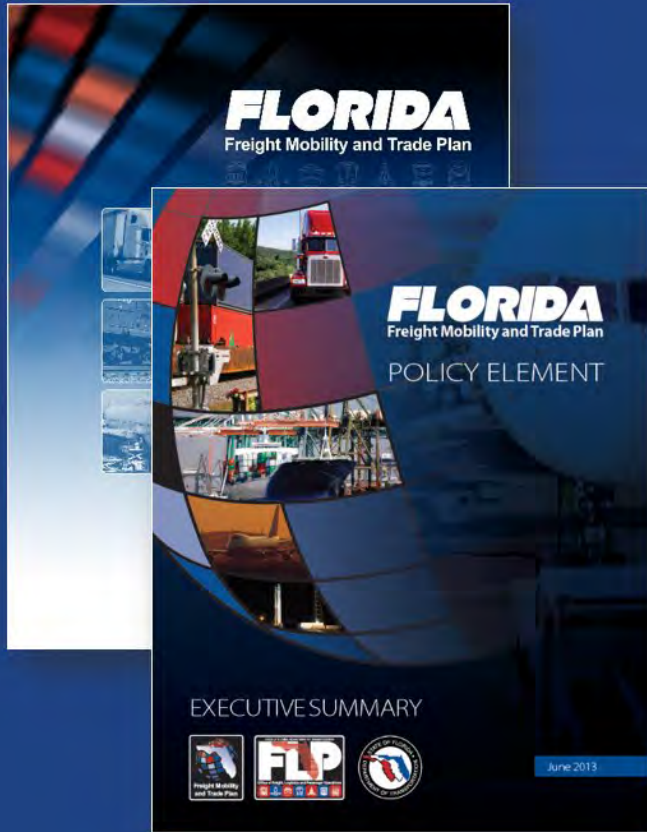


FDOT's Evolution

- New Freight, Logistics and Passenger Operations Office
- New State Freight, Logistics and Passenger Operations Administrator
- New full-time Freight Coordinators in each FDOT District
- Began several joint efforts with partner agencies
- Developed 1st Statewide Freight Plan



Freight Mobility and Trade Plan Components

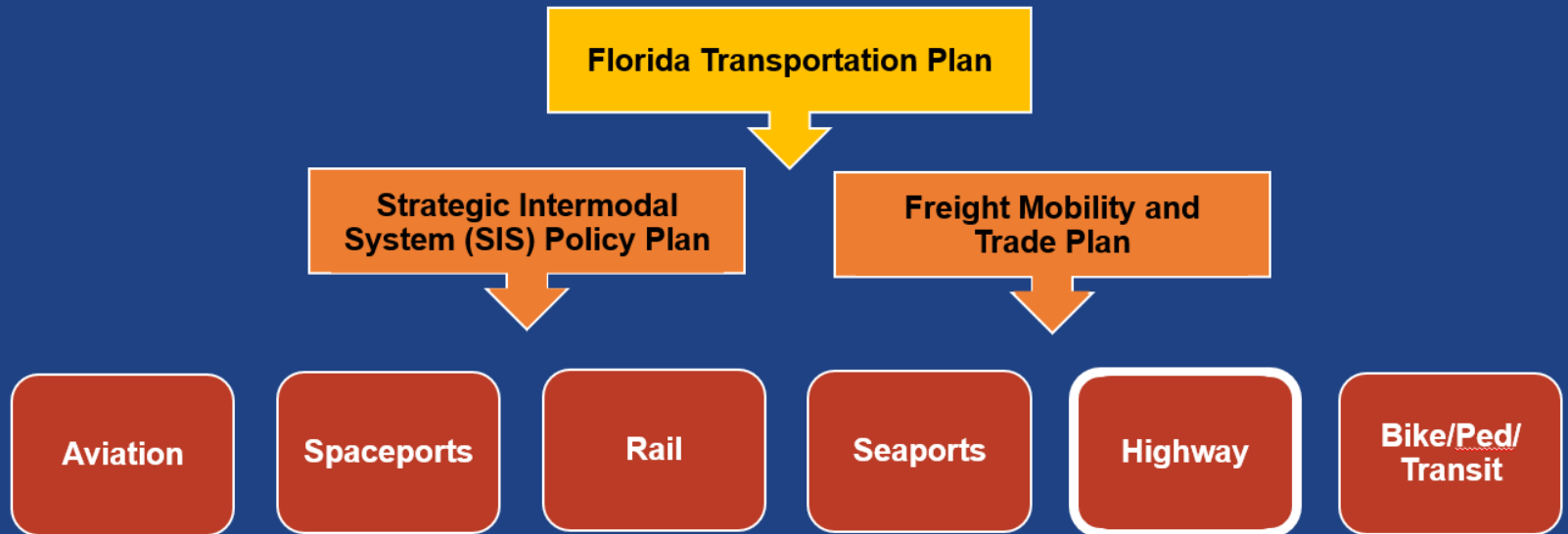


Institutionalizing Freight Planning


- Reviewing our performance with the FMTP Implementation Guide
 - Enhancement of FreightMovesFlorida.com
 - Participate in trade missions
 - Develop freight resources
 - Coordinate statewide and local freight planning
 - Provide internal supply chain training
 - Use District Freight Coordinators effectively
 - **Integrate freight goals and objectives**
- An important aspect is to make sure the goals and objectives set in the statewide freight plan are integrated into planning documents across FDOT

Planning at FDOT

- Needed to address transportation issues at a very high level, as well as down to specifics of individual programs and modes of transportation



Motor Carrier System Plan Organization



MOTOR CARRIER
MOTOR CARRIER SYSTEM PLAN
2017
JUNE 2017

Chapter 1 Provides an introduction and reviews best practices in motor carrier planning

Chapter 2 Provides an overview of the issues and trends facing motor carriers on a national, statewide, and regional basis

Chapter 3 Provides a summary of key performance aspects to help identify additional concerns to address

Chapter 4 Provides a complete policy framework of goals, objectives, and strategies to address all identified motor carrier issues

Chapter 5 Provides a summary of recommendations and identifies responsibilities for implementation

Motor Carrier System Plan Policy Framework

- Policy Framework included:
 - Identifying critical motor carrier issues
 - Developing goals consistent with statewide plans
 - Developing corresponding objectives to support, refine and define the goals
 - Supporting each objective are corresponding strategies to guide motor carrier implementation efforts
- Each set of goals, objectives, and strategies:
 - Developed after extensive outreach and collaboration with public and private stakeholders.
 - Represent a synthesis of the various views and issues expressed throughout public forums and internal working group meetings.

Motor Carrier Working Group

- Internal Working Group was the informal steering committee to advise the project team
 - Included staff from various FDOT offices, as well as partner agencies that impact trucking
 - Provided expertise in motor carrier concerns that impact their office
 - Reviewed draft materials before they were presented to stakeholders



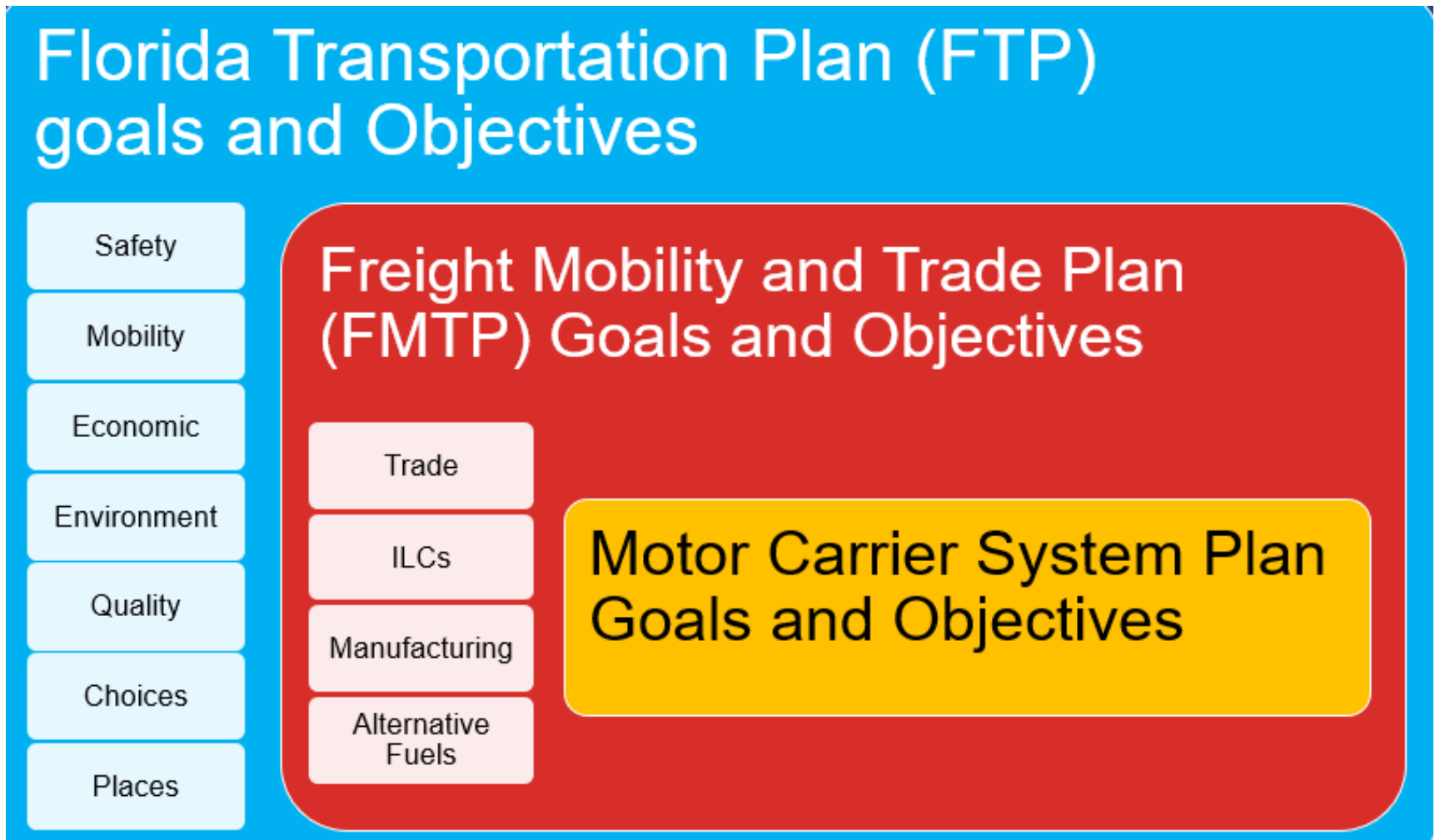
Stakeholder Outreach - Business Forums

- Four external Business Forums allowed industry stakeholders to provide additional expertise and input
 - Provided comments on motor carrier concerns that impacted them, their company, their region, etc.
 - Reviewed draft materials before they were incorporated into the final Motor Carrier System Plan



Motor Carrier Business Forum 3: Ft. Lauderdale

Consistency Matrix



Motor Carrier System Plan Goals

- **Safety and Security:** Identify, support, and implement freight highway safety improvements and initiatives.
- **Agile, Resilient, Quality:** Continue to invest in quality infrastructure that can be adapted to meet the needs of future freight vehicles and technology.
- **Efficient and Reliable Mobility:** Increase operational efficiency of goods movement and maintain reliable mobility for trucks.
- **Economic Competitiveness:** Support Florida's global competitiveness and increase the flow of domestic and international trade.
- **More Transportation Choices:** Increase the number of quality options for moving freight to, from, and within Florida.
- **Environment and Conserve Energy:** Balance the need for environmental protection and conservation with seeking motor carrier efficiencies.
- **Quality Places:** Coordinate early and often with local communities to ensure mobility for trucks that is consistent with local and regional priorities.

Critical Motor Carrier Issues

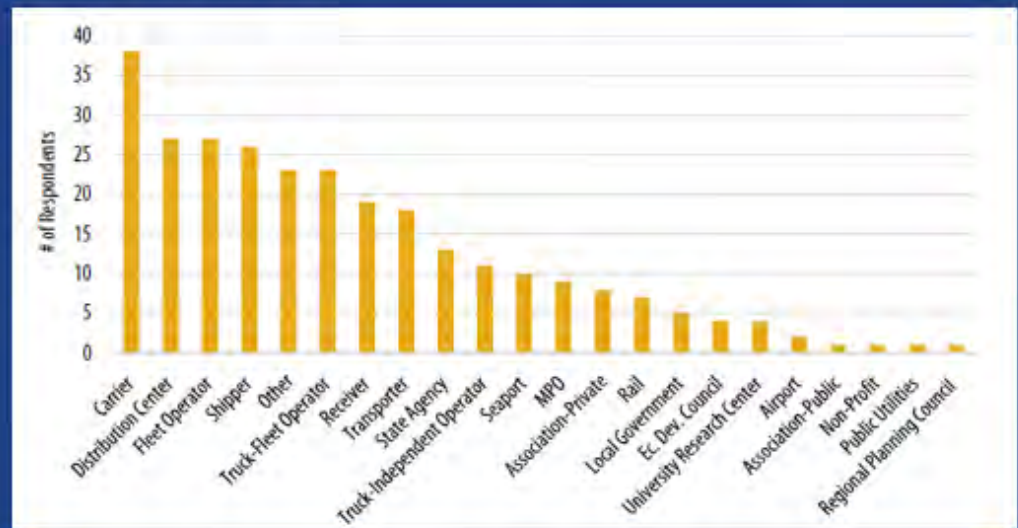
- Hours of Service
- Compliance, Safety, Accountability (CSA)
- Driver Shortage
- Driver Retention
- Truck Parking
- ELD Mandate
- Driver Health/Wellness
- Economy
- Infrastructure/ Congestion/ Funding
- Driver Distraction
- Empty Backhaul
- Alternative Fuels
- Regulatory Consistency/ Harmonization with Neighboring States
- Truck Size and Weight
- Technology Implementation
- Last Mile Connectivity
- Data

Critical Motor Carrier Issues

- FDOT acknowledged early in the process that it may have limited ability to address some of the critical issues identified.
 - For example, several issues identified in the ATRI survey relate to Federal regulations that FDOT cannot impact directly.
- FDOT wanted to take a comprehensive approach to determine what could be addressed that is beyond the scope of what has traditionally been done to improve goods movement on Florida's roadways.

Critical Issues Survey - Respondents

- An important early step was the identification of critical issues
- To gain input from stakeholders beyond those in attendance at the in-person Business Forums, FDOT hosted an online survey
- 144 Respondents
- Participants were asked to identify their perspective



Critical Issues Survey

- Participants were asked to:
 - Review and rate the importance of each issue
 - Provide suggestions for any potential actions to address each issue
 - Identify any additional issues to consider going forward
- Ratings ranged from 2.7 to 3.7 out of a possible score of 4, with 4 meaning “Very Important” and 1 meaning “Not Important”.
- Ratings were all fairly close – so no issue stood out as an absolute priority to address or remove
- Based on how much the comments overlapped, it highlighted how many of the identified issues are deeply intertwined with each other.

Critical Motor Carrier Issues – Fact Sheets

- Prepared a series of fact sheets to provide a baseline of understanding on identified motor carrier issues before working toward solutions
- These fact sheets provided
 - General introduction
 - How it impacts Florida
 - Related legislation and regulations
 - Additional commentary to explain the context.



Policy Framework Survey - Acceptability Survey

- Conducted during Business Forums
- Survey sent to FLP Partner Database including all prior participants in prior Motor Carrier meetings.
- Rank ranged from
 - Acceptable (3)
 - Minor Reservations (2)
 - Major Reservations (1)

Identify, support, and implement freight highway safety improvements and initiatives.

- **Objective:** Provide more safe and secure places for truck parking both on and off the Interstate System
 - **Draft Strategy:** Partner with Turnpike and other efforts to define needs, gauge feasibility of solutions, and develop more public land into truck parking or partner with private sector to provide.
 - **Draft Strategy:** Provide security at truck parking
 - **Draft Strategy:** Provide more options for oversize truck parking

Current
Survey
Rating



Motor Carrier System Plan Goal Set - Example

- Goal that is consistent with goal of FTP
 - Freight Highway Safety Improvements
- Corresponding specific objectives
 - 1.3 Provide safe and secure truck parking
- Implementation strategies
 - 1.3.1 Define needs, gauge feasibility of solutions, develop more public land into truck parking, and partner with private sector.

GOAL 1

Safety and Security: Identify, support, and implement freight highway safety improvements and initiatives

Objective 1.1: Reduce the number of serious injuries and fatalities involving commercial motor vehicles

Strategy 1.1.1: Partner on implementation of the Strategic Highway Safety Plan and related initiatives

Strategy 1.1.2: Partner with cell phone carriers, insurance companies, and vehicle manufacturers on distracted driving reduction programs

Strategy 1.1.3: Investigate the need for additional pre-signage, within Manual on Uniform Traffic Control Devices (MUTCD) guidelines, to emphasize distance to upcoming exits and intersections to commercial motor vehicles

Strategy 1.1.4: Coordinate with the trucking industry to identify safety concerns

Objective 1.2: Encourage greater consistency and standardization in permitting and enforcement

Strategy 1.2.1: Ensure consistent interpretation and enforcement statewide

Strategy 1.2.2: Recommend the Federal Motor Carrier Safety Administration remove non-preventable and not-at-fault crashes from the Compliance, Safety, Accountability (CSA) system

Objective 1.3: Provide more safe and secure places for truck parking both on and off the Interstate System

Strategy 1.3.1: Define needs, gauge feasibility of solutions, develop more public land into truck parking, and partner with private sector

Strategy 1.3.2: Review sufficient security at truck parking and enforcement of proper uses

Objective 1.4: Prevent and mitigate trucking-related security risks

Strategy 1.4.1: Collaborate with Florida Highway Patrol (FHP) and other law enforcement agencies to identify and address risks

Strategy 1.4.2: Combine data sources with other security systems to reduce cargo theft, human trafficking, fraud, and non-compliance

Objective 1.5: Develop transportation infrastructure to effectively allow freight flows to help prepare for, respond to, and recover from emergencies

Strategy 1.5.1: Increase the resiliency of freight roadways to extreme weather and other environmental conditions

Key Motor Carrier Roles and Responsibilities

- Motor Carrier System Plan implementation strategy needed to:
 - clarify existing roles
 - identify appropriate lead offices or agencies to assume responsibility for the various strategies.
- Exercise occurred over of several Motor Carrier Working Group meetings and informal conversations
 - participants discussed their current and ongoing efforts
 - discovered commonalities
 - discussed potential implementation barriers
- Implementation strategy process helped to:
 - Educate and remind staff of the impacts of their work on other offices
 - Promoted relationship-building to increase cooperation in the future.

Key Motor Carrier Roles and Responsibilities - Sample

- Recommendations were included below the list of strategies
- Recommendations were suggested by
 - Motor Carrier Working Group
 - Online surveys
 - Captured during the Business Forums and other public meetings
- Recommendation suggestions allowed the lead office or agency partner to consider more detailed actions and methods suggested directly by those involved in the development of the Plan.

Freight and Multimodal Operations (FMO)

Overview

The Freight and Multimodal Operations (FMO) Office is responsible for assisting in the development of Florida's rail system, both passenger and freight, motor carrier system support, and championing Florida's multimodal freight programs.



Roles in Motor Carrier System Plan Implementation

Lead Roles

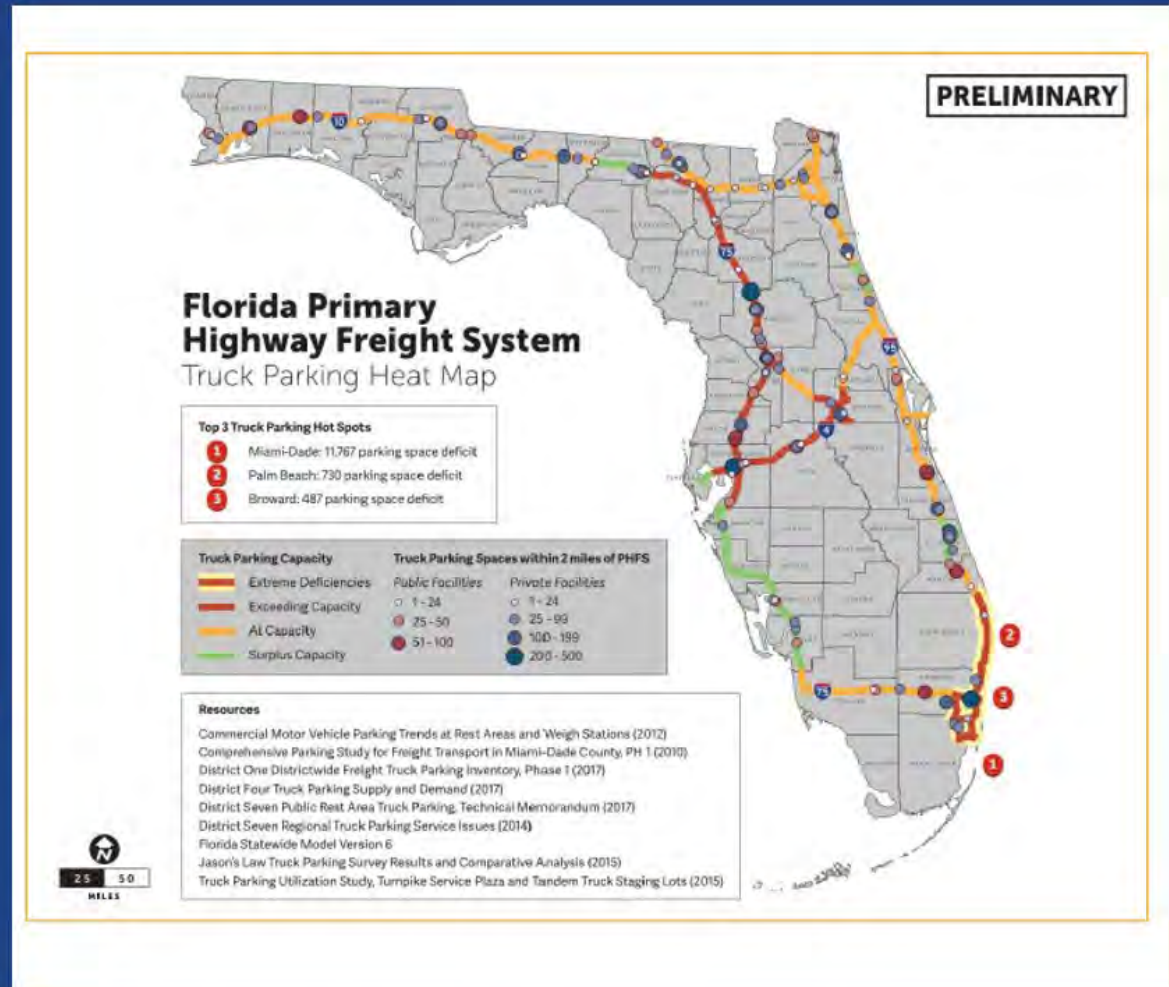
- Strategy 1.1.2: Partner with cell phone carriers, insurance companies, and vehicle manufacturers on distracted driving reduction programs
- Strategy 1.1.4: Coordinate with the trucking industry to identify safety concerns
- Strategy 1.2.2: Recommend the Federal Motor Carrier Safety Administration remove non-preventable and not-at-fault crashes from the Compliance, Safety, Accountability (CSA) system
- Strategy 1.3.1: Define needs, gauge feasibility of solutions, develop more public land into truck parking, and partner with private sector
- Strategy 1.4.1: Collaborate with Florida Highway Patrol (FHP) and other law enforcement to identify and address risks
- Strategy 2.2.1: Partner to develop coordinated truck parking availability information and signage
- Strategy 2.2.3: Develop business-friendly approaches to evaluating and implementing technology through partnerships, studies, and pilot programs
- Strategy 2.3.2: Work with freight data providers to address proprietary concerns regarding Florida's public records requirements
- Strategy 3.1.2: Research options to move goods faster and reduce conflicts with passenger traffic and other modes
- Strategy 3.2.1: Develop a statewide list of identified truck mobility improvement needs
- Strategy 3.2.3: Identify connections between key freight activity centers and networks eligible for funding
- Strategy 4.1.1: Support size and weight standardization where appropriate
- Strategy 4.2.3: Support projects that improve the efficiency of goods movement at the statewide level
- Strategy 4.3.1: Work with motor carriers and the insurance industry to overcome barriers for young truck drivers

Implementing the Strategies in the Motor Carrier Plan

Freight and Multimodal Operations Truck Parking Heat Map
White Paper

October 2017



Implementing the Strategies in the Motor Carrier Plan

- Worked with the FDOT Statewide Rest Area Coordinator to increase the priority of providing truck parking at rest areas
 - identify areas with truck parking capacity needs
- Conducted outreach with District offices where rest areas were planned in the Work Program to facilitate design for additional truck parking

Rest Area Facilities Computation Form

A = _____ = 20 Year ADT
(allow for local commuter traffic)

K = _____ = Ratio of Design Hourly Volume to ADT
(generally 0.155)

D = _____ = Directional distribution of Design Hourly Volume
(generally 0.6)

T = _____ = Percent of overall traffic represented by Trucks & Recreational Vehicles (RV's)
(generally 0.25)

		Insert Factor	Total
H =	Peak Hourly Directional Traffic (Design Hourly Volume, DHV)	$A \times K \times D =$	H =
C =	Traffic Composition, Peak Hourly Volume C ₁ = Cars (100% - T = _____ %)) C ₂ = Trucks & RV's (T = _____ %)) TOTAL of Cars, Trucks & RV's =	_____ % x H = _____ % x H = C ₁ + C ₂ =	C ₁ = _____ C ₂ = _____ C = _____
D₀ =	Vehicles stopping at Rest Area, Peak Hourly Volume D ₀ = Cars (a) At rest area near commercial or recreational facilities - 5% (b) At rest area on typical rural route - 10% (c) At welcome centers - 15% D ₂ = Trucks & RV's - 15% TOTAL of Cars, Trucks & RV's =	_____ x C ₁ = _____ x C ₂ = D ₁ + D ₂ =	D ₁ = _____ D ₂ = _____ D ₀ = _____
E =	Parking Spaces, Peak Hourly Volume E ₁ = Cars (a) At rest area - 15 to 20 minutes average stop (0.25 - 0.33 hr.) (b) At welcome centers - 20 to 30 minutes average stop (0.53 - 0.5 hr.) E ₂ = Trucks & RV's - 30 minutes average stop (0.5 hr.)	_____ x D ₁ = 0.5 x D ₂ =	E ₁ = _____ E ₂ = _____
F =	Persons per hour using comfort facilities, Peak Hourly Volume	2.25 x D ₀ =	F = _____
G =	Toilet and Urinal Fixtures (a) Men (2.5 minutes average use) (generally ¹ / ₂ toilets, ¹ / ₂ urinals) (b) Women (3.25 minutes average use)	0.04 x F = 0.5 x G = 0.75 x G =	G = _____ Men = _____ Women = _____

* If this number is uneven, reduce to next lower even number

Implementing the Strategies in the Motor Carrier Plan

- Met with FDOT Statewide Scale Operations Manager to discuss improving utilization of existing truck parking at Weigh In Motion stations
 - 627 Truck Parking Spaces available at 20 locations
 - FHP Commercial Vehicle Enforcement Officer
 - Level 1, 2 & 3 inspections for truck inspection bay
 - No showers and limited vending machines at existing Truck Comfort Stations.
- WIM Re-branding
 - Memorandum of agreement with Florida Highway Patrol. Truck drivers would be off-limits in the truck parking area.
 - Reduce parking lot lighting levels by 50%. Similar to lighting at private truck stops.

Closing Comments



https://freightmovesflorida.com/

Freight Moves Florida

FREIGHT MOVES FLORIDA

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Why Florida Freight For The Movement Of Your Goods & Services?

As a leading international trade center, Florida offers easy access to international markets, particularly Latin America. Goods valued at nearly \$160 billion flow through Florida's airports and seaports each year, and the state has the 2nd largest Foreign Trade Zone (FTZ) network in the country.

Florida can help establish and boost your international business efforts. Miami International Airport is the largest U.S. gateway for Latin America and the Caribbean and is one of the busiest international passenger and freight airports in the world.

As the Western Hemisphere's commercial gateway, Florida's logistics & distribution industry is poised to grow further with the Panama Canal expansion. As it stands, Florida has the #2 Infrastructure in the U.S. and can help you get your products & services anywhere.

<https://freightmovesflorida.com>



Truck Platooning

Truck Platooning Goals

- Goal 1: Enable two-truck platoons for participating logistics companies to reduce fuel consumption and emissions
- Goal 2: Improve freight travel times and traffic flow along freight-intensive city streets and interstates

What is Truck Platooning?

Video provided by University of Berkeley PATH Truck Platooning Research:

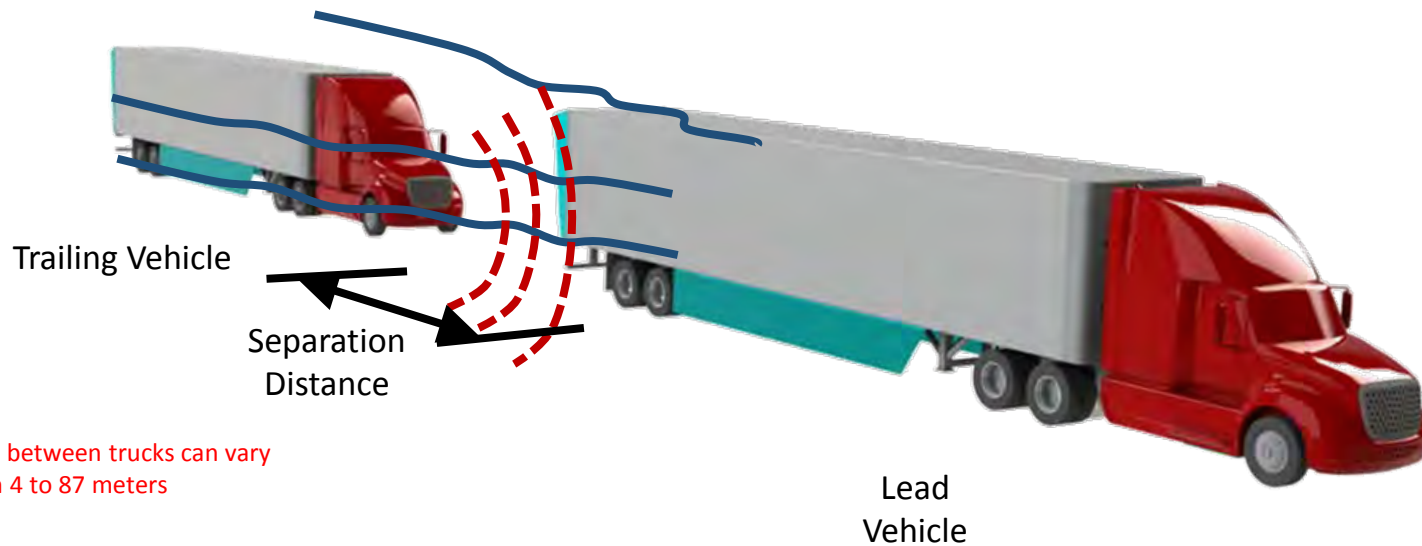
<https://www.youtube.com/watch?v=DnLlycxlees&t=16s>

Truck Platooning Concept

As vehicles approach, they influence the flow-field around each other

Low-speed air-wake of lead vehicle
influences trailing vehicle
(lower airspeed = lower drag)

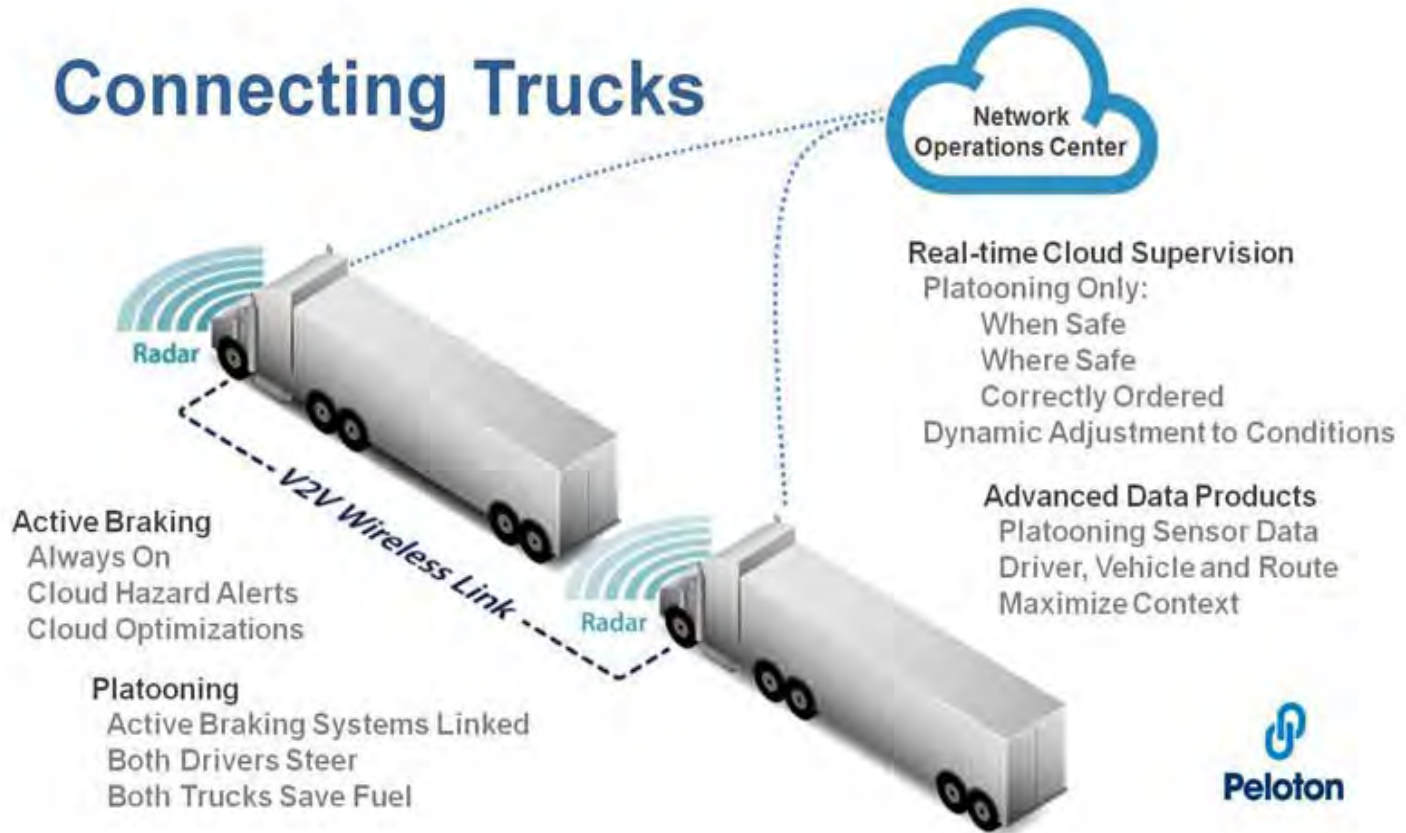
High-pressure zone in front of trailing
vehicle influences lead vehicle
(pushes on the front vehicle)



Distance between trucks can vary
between 4 to 87 meters

Truck Platooning Concept

Connecting Trucks



Truck Platooning – Definitions

- Cooperative Adaptive Cruise Control (CACC)
 - With CACC, the lead truck is wirelessly connected to following trucks and sending messages that affect throttle, brakes, and brake lights (longitudinal control)
 - Drivers are still behind the wheel to steer and identify hazards (lateral control)
 - Following trucks automatically increase separation if another vehicle intersects platoon
- Driver Assistive Truck Platooning (DATP)
 - DATP is a wireless technology that links two tractor-trailer trucks together such that the following truck mirrors the lead truck's braking and acceleration, thus allowing for shorter following distances
- Urban versus Long Haul Truck Platooning
 - Urban – Low speed truck platooning (example from container yard to warehouse through intersections)
 - Long Haul – Long distances where speed exceeds 50 MPH

Who are the Stakeholders?

- Logistics companies
 - Operations staff and dispatchers
 - Truck drivers
- City traffic engineers/technicians
- State DOTs – highway engineers
- Logistics customers
- Law enforcement and public safety officials
- Traveling public

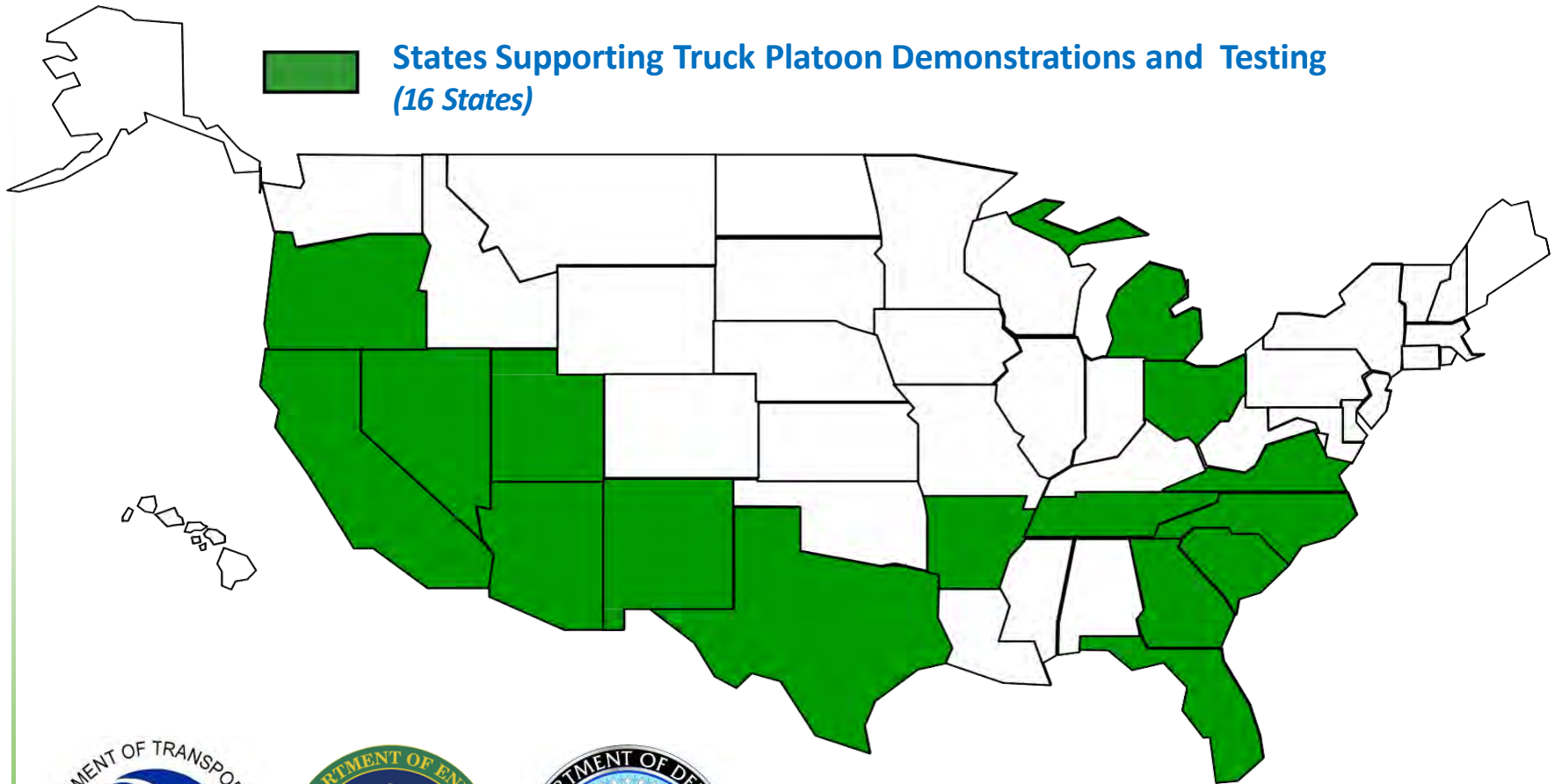
Safe Truck Platooning Deployment Considerations

- Legislation to allow truck platooning:
 - Legislative changes to following distance statutes.
 - Uniformity of operations to support interstate commerce
- Operational considerations to support future deployment:
 - Best lane of operation – left, right, center
 - Vehicle cut ins
- Driver training
- Consensus on vehicle markings:
 - Means to identify trucks platooning (flashing yellow beacon light)
 - Signs indicating platooning in progress on side of truck
- Weather
- Time of day
- Law enforcement training
- Public training
- Additional considerations:
 - Equipment required for trucks
 - Equipment required for trailers and chassis

Equipment Required Trucks to Platoon

- DSRC-based V2V communications capability
- Disc brakes
- Antilock braking system (ABS) on truck
- ABS braking on trailer or chassis with container
- Compatible radar-based collision mitigation system (CMS)
 - Bendix Wingman
 - Mobile Eye
- Automatic manual transmission
- Must meet high maintenance standards
- Freight signal priority and platoon intent freight signal priority

U.S. Truck Platoon Activities—Public Sector



Source: Office of Research and Information Technology

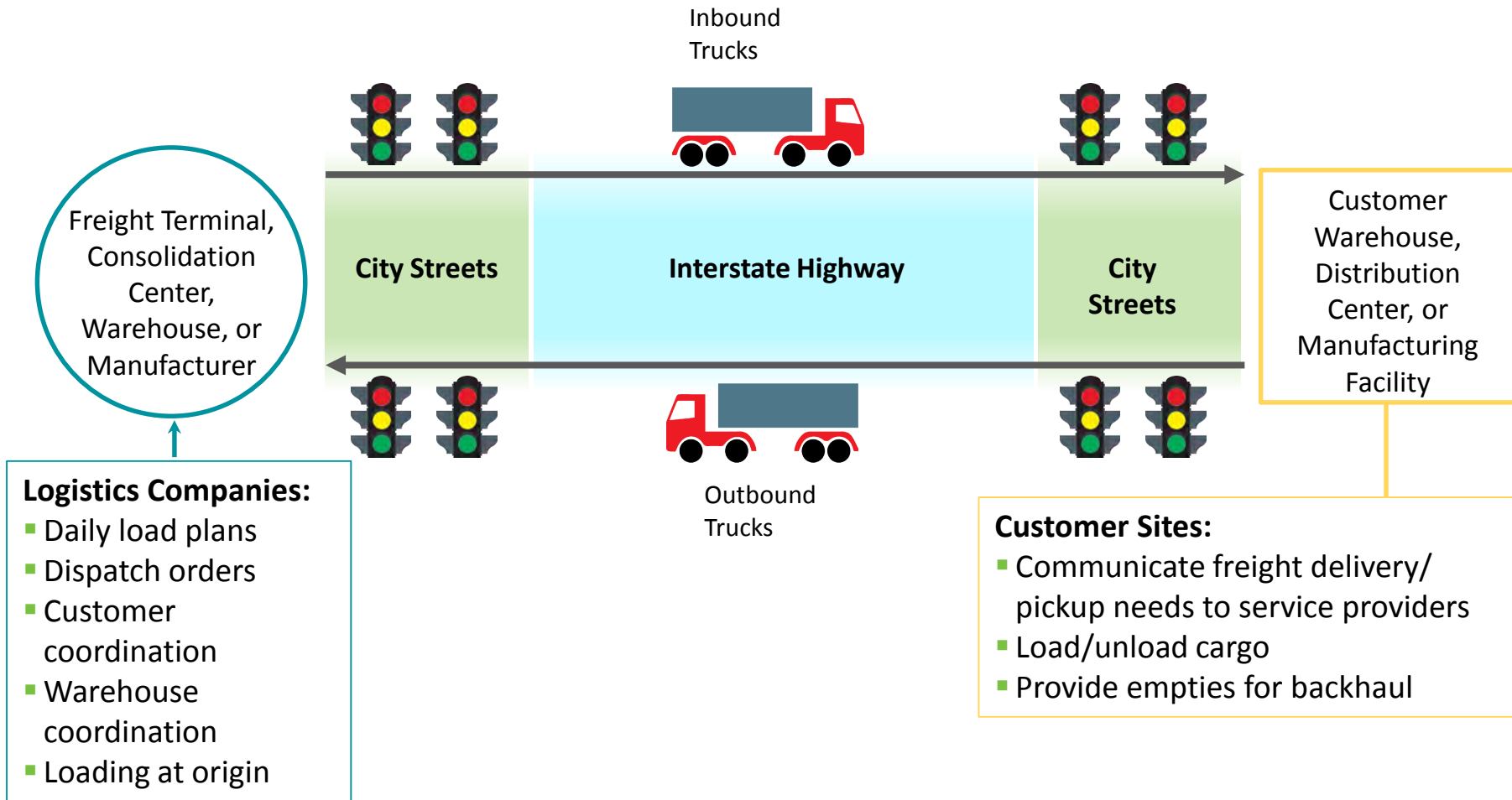
Truck Platooning Potential Benefits

- Reduce fuel consumption and emissions for participating logistics companies by enabling two-truck platoons.
 - Approximately 4 percent for the lead truck and about 10 percent or more for trailing trucks.
- Enable logistics operational efficiencies by maximizing loaded moves for participating logistics companies to reduce costs of freight distribution
- Improve freight traffic flow and operational efficiency along a freight-intensive highway corridor
- Potential for reduced highway congestion
- Possible safety improvements from faster reaction times and supporting systems (collision avoidance, air-disc brakes).

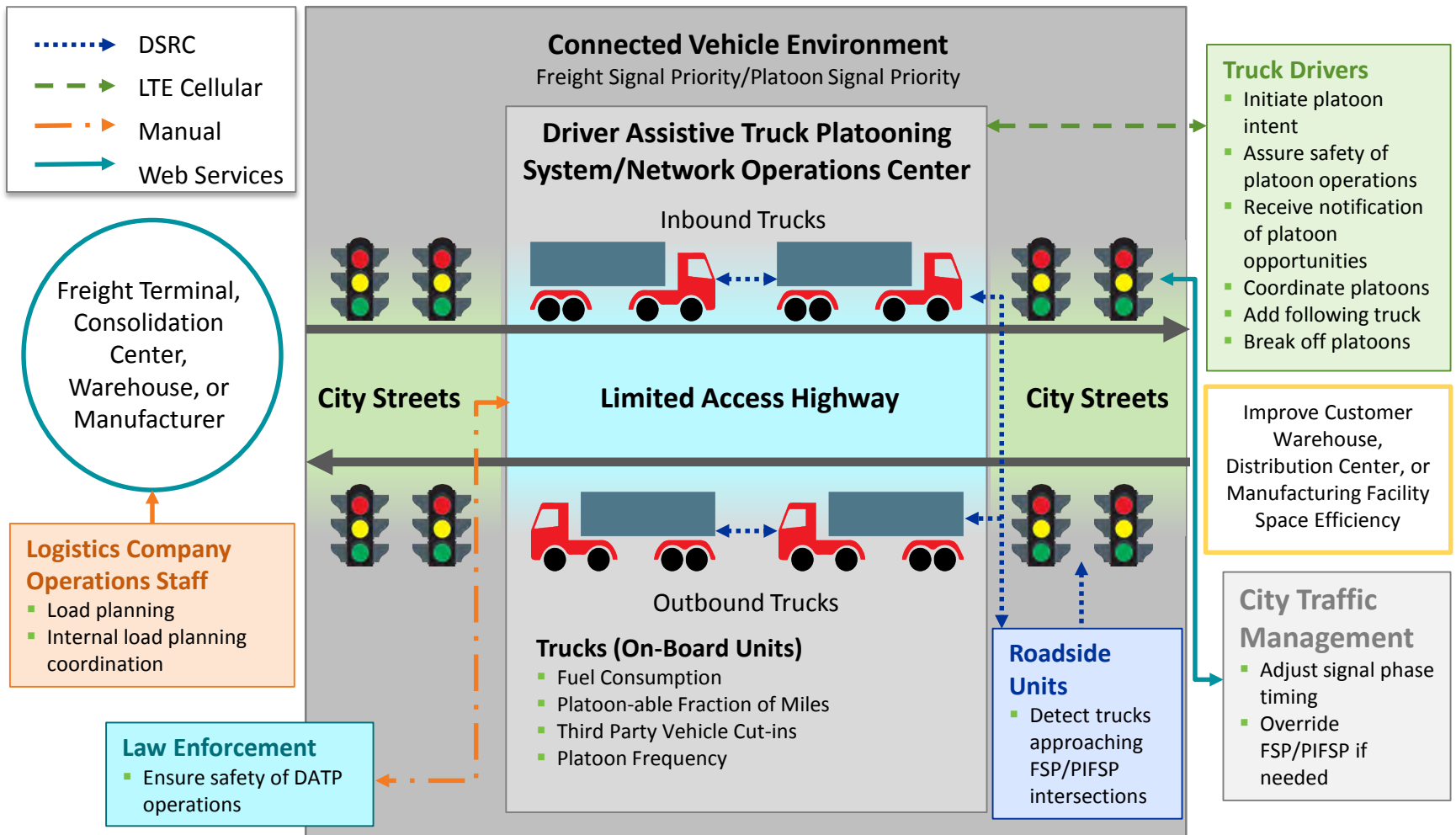
Potential Effects on Travel Demand Forecasting

- Highway Capacity
 - In the future, corridors with vehicles and are both connected an automated will all for significantly closer safe vehicle spacing, which can dramatically increase roadway capacity
- Less Congestion
 - Capacity improvements result in less delays and better travel time reliability.
 - Truck increased throughput and speed
 - Larger effect on trucks than cars
 - Bottleneck relief was significant

Current "System"



Proposed "System"



U.S. Truck Platoon Activities—Private Sector

Several entities conducting truck platoon demonstrations and testing:

- Daimler—Freightliner/Western Star
- Peloton – After Market
- Volvo (Caltrans, UC-Berkley PATH)
- Navistar—International (TxDOT, Texas A&M Trans. Inst.)

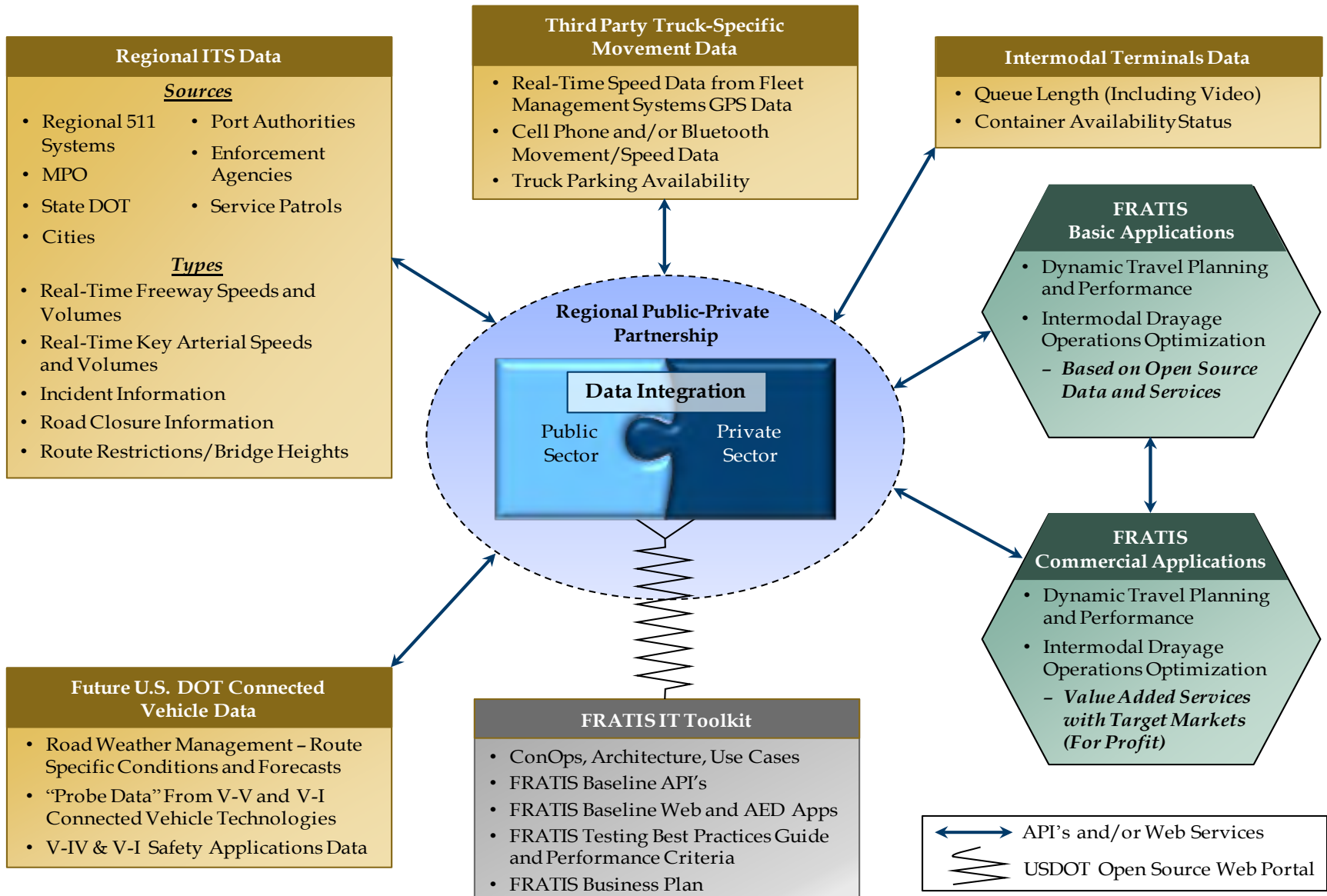


Truck Parking
Freight Advanced Traveler Information
System + Truck Parking

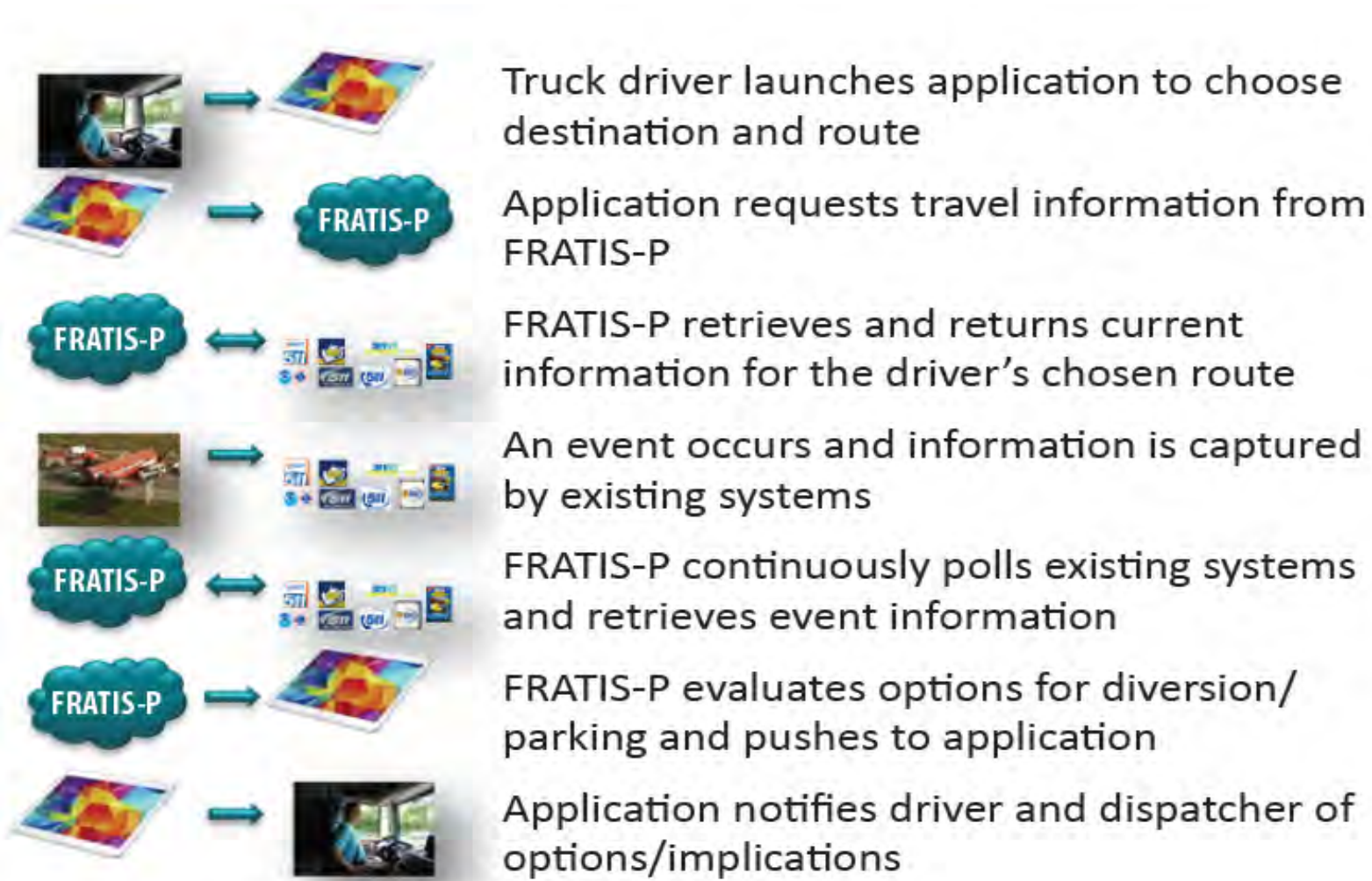
FRATIS + Truck Parking

- Truck Travel Predictive Services (TTPS)
 - Predicts travel distance and arrival time and distance based on:
 - Driver's current location
 - Current traffic conditions
 - Historical traffic patterns
 - Estimated hours of service remaining
 - Considers persistent trends (seasons, holidays, and months of operation)
 - Temporal trends (construction)
 - Dynamic trends (weather)
- Leverage existing data streams between existing public and private sector systems
 - Create a collaborative systems environment
 - Deliver FRATIS-P on multiple types of devices
 - Cell Phone, Tablets, Telematic Devices
 - Incentivize the adoption and use of the system
- Integrate the planned technologies with public sector ITS and sensor information systems
 - Available in current highway system
 - Lower costs and increase ROI on investment

Integration of ITS Data



FRATIS Deployment with FMCSA “One Button” Rule



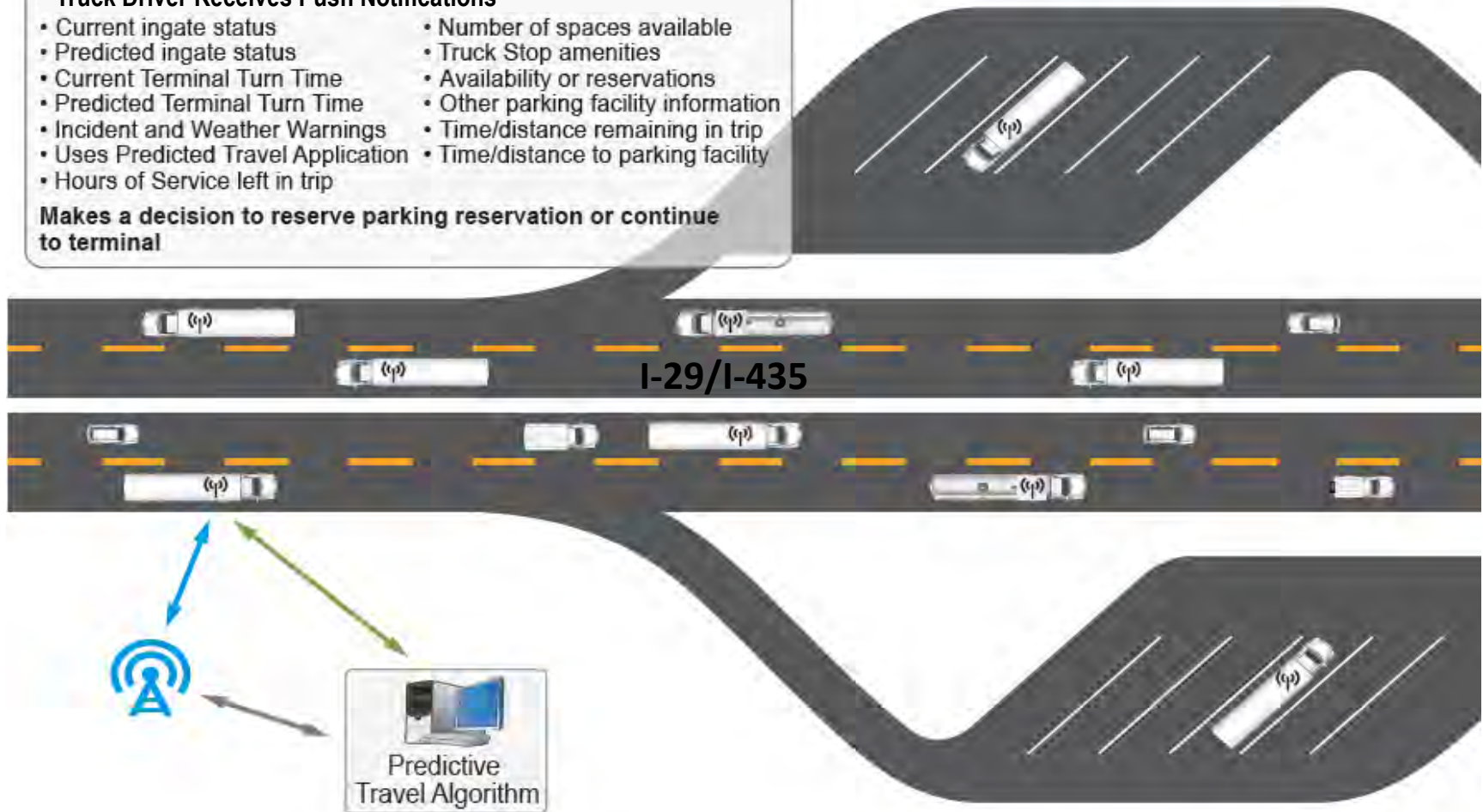
Example Truck Parking Push Notifications.....

Predictive Algorithms Provide Best Solution

Truck Driver Receives Push Notifications

- Current ingate status
- Predicted ingate status
- Current Terminal Turn Time
- Predicted Terminal Turn Time
- Incident and Weather Warnings
- Uses Predicted Travel Application
- Hours of Service left in trip
- Number of spaces available
- Truck Stop amenities
- Availability or reservations
- Other parking facility information
- Time/distance remaining in trip
- Time/distance to parking facility

Makes a decision to reserve parking reservation or continue to terminal



Benefits to Trucking Companies and Drivers

- Improve **productivity and efficiency** of the fleet
- Empower drivers with real-time information for **faster and better decisions**
- Generate near optimal truck **planned work itinerary** taking into consideration travel times with traffic, waiting times at the terminal, weather conditions, etc...
- Drivers will be able to **navigate to their destinations** and be rerouted in case of heavy traffic, incidents and congestion in their current route

Mid America Association of State Transportation Officials (MAASTO) Truck Parking Information Management System (TPIMS)

- MAASTO Regional Truck Parking Information Management System
 - Funded through a \$25 million federal TIGER grant and state matching funds.
 - Intended to reduce time searching for parking and to provide safe truck parking alternatives.
 - Will be deployed in Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Ohio and Wisconsin.
 - Will monitor truck parking availability and provide real-time information to truck drivers.
- Capable of providing information through multiple methods, including:
 - Dynamic signs, smart phone applications and traveler information websites.



Questions