



Session 11: ITS Research in the U.S. and Abroad

Update on FMCSA ITS Research

Presentation to:

ITS America 2007 Annual Meeting

Jeff Secrist

June 4, 2007



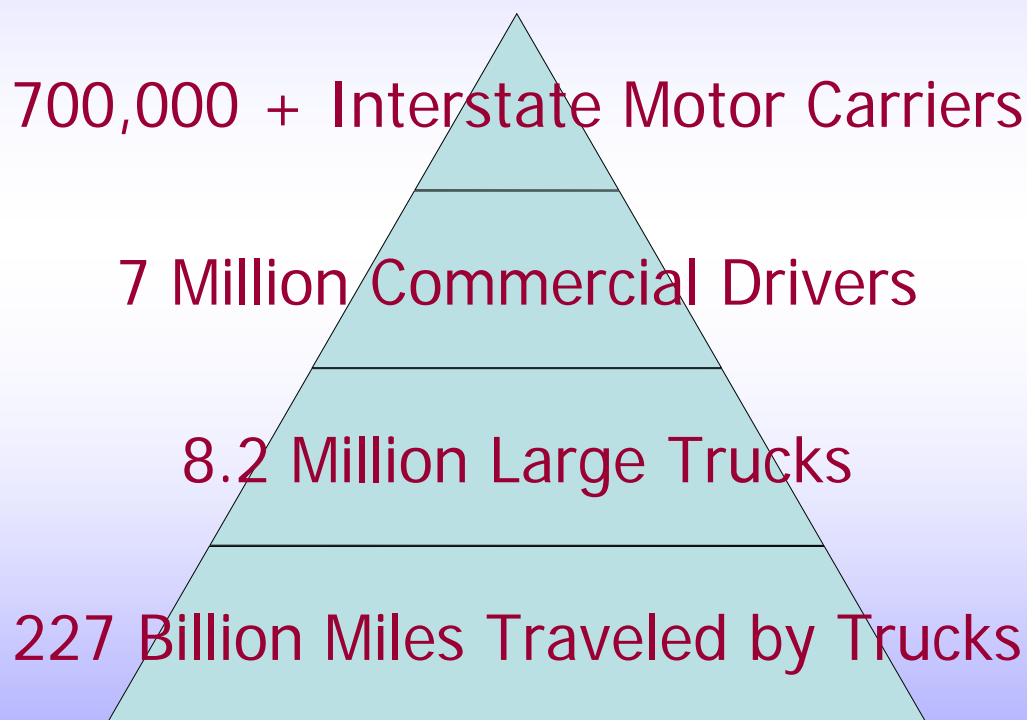
The Mission of FMCSA

- ◆ Reduce crashes, injuries, and fatalities involving large trucks & commercial buses





Scope of the Motor Carrier Industry



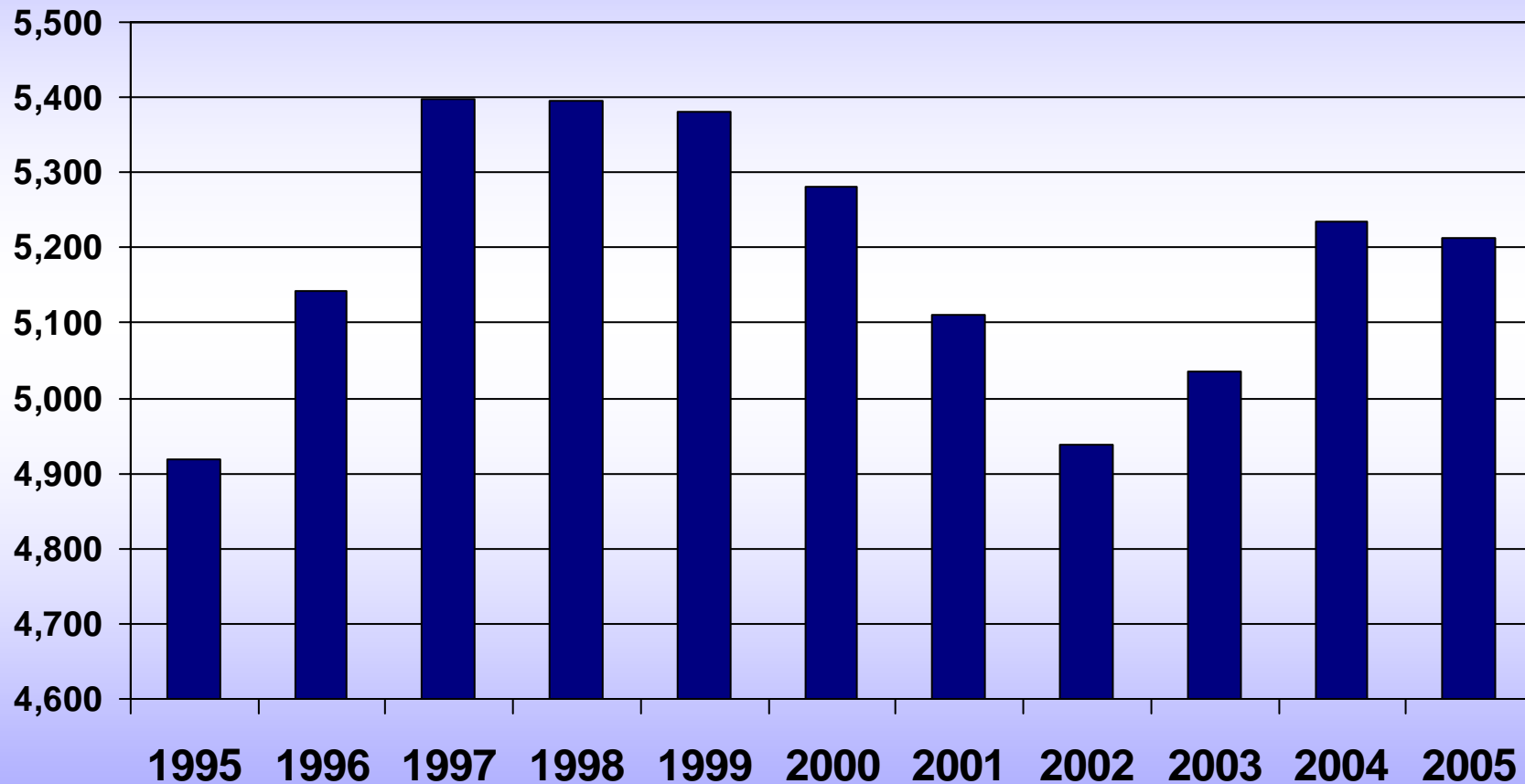


Scope of the Large Truck Problem





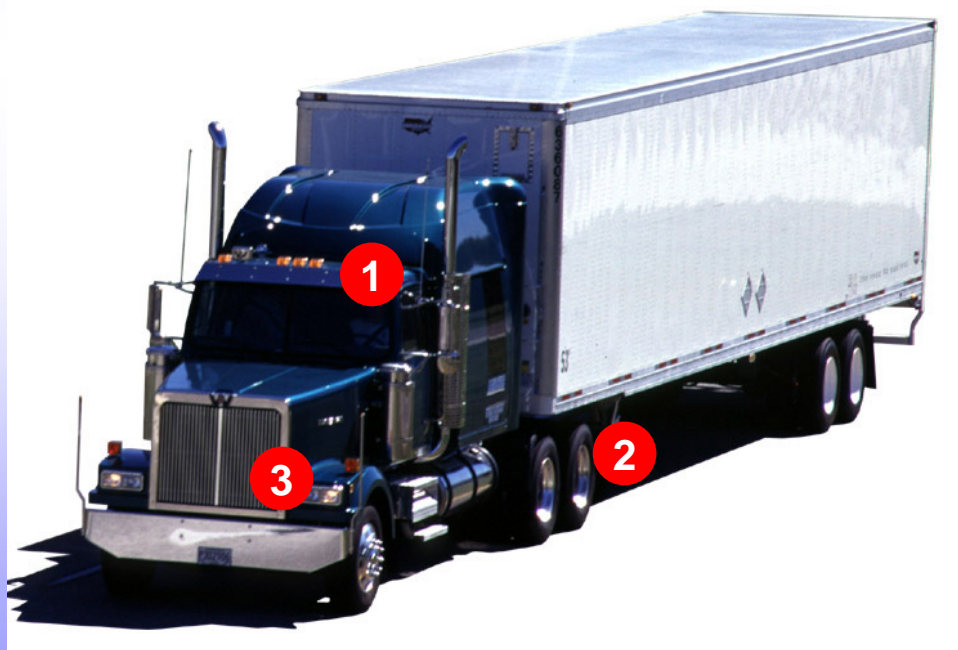
Large Truck Fatalities





On-Board Technology Initiatives

During the past several years, FMCSA has tested, evaluated, and encouraged the deployment of on-board safety systems to improve safety



- 1 Lane Departure Warning Systems**
- 2 Roll Stability Systems and Electronic Stability Systems**
- 3 Forward Collision Warning Systems with Adaptive Cruise Control**



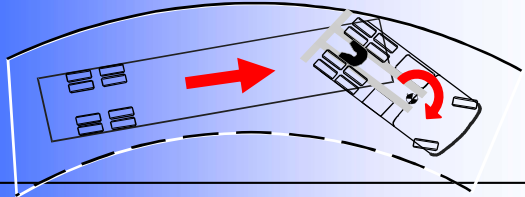
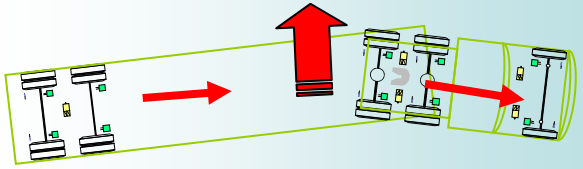
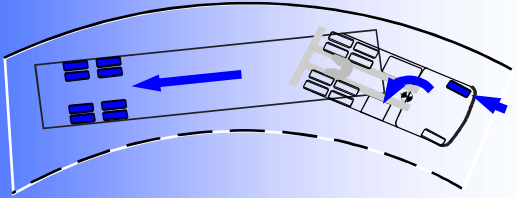
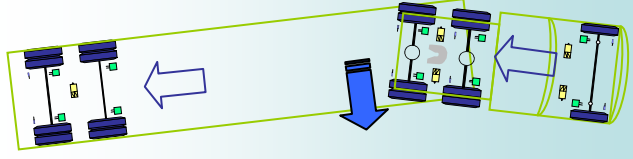
Lane Departure Warning Systems

- ◆ Camera watches road ahead – not driver
- ◆ Tracks road and vehicle position in lane
- ◆ Monitors for weaving and lane drifts
- ◆ Alerts driver before road departure
- ◆ Blocks warning automatically if:
 - Turn signal is used
 - Speed is less than threshold
- ◆ Mack Field Operational Test Results





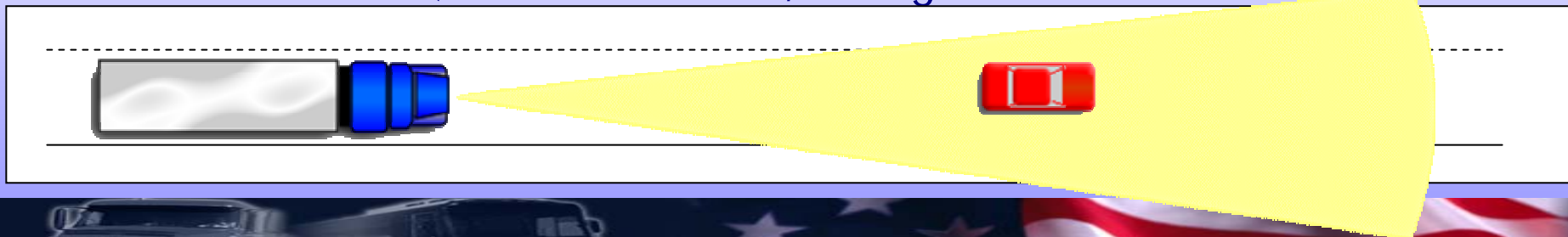
Stability Control Systems

Road Surface Coefficient of Friction	Ice Low	Wet Asphalt	Dry concrete High
<p>Driving Scenario Example</p>	<ul style="list-style-type: none"> • Driving speed exceeds the threshold • Lateral force exceeds surface friction • Vehicle begins to slide/jackknife 	<ul style="list-style-type: none"> • Driving speed exceeds the threshold • Surface friction sufficient to resist • Vehicle prone to roll over 	
<p>Stability System Action</p>	<p>System applies individual brakes to:</p> <ul style="list-style-type: none"> • Reduce speed / correct orientation • Reducing tendency to jackknife/slide 	<p>System applies all brakes to:</p> <ul style="list-style-type: none"> • Reduce speed • Reducing tendency to roll over 	



Forward Collision Warning Systems

- ◆ Detection within 500 ft.
 - Lead vehicle within 3 seconds following distance; no tones, yellow light
 - Lead vehicle within 2 seconds following distance; distance closing = tone, orange light
 - Lead vehicle within 1 second following distance; distance closing = tone, red light
 - Lead vehicle within ½ second following distance; continuous tone, red light



Adaptive Cruise Control



With lead vehicle, SmartCruise works to maintain a safe constant time gap...



- ◆ Use data from the CWS and truck through SAE J1939
- ◆ Work to maintain separation of 2¼ to 3¼ seconds behind followed vehicle
- ◆ Decelerates truck by de-fueling the engine, engaging the engine retarder, allowing an automatic transmission to downshift



Deployment Planning

- ◆ Work in partnership opportunities
- ◆ Support decision-making by providing additional information and data
 - Voluntary functional specifications
 - Technology and Maintenance Council Recommended Practices
 - FMCSA Website Safety and Security System Technology Product Guides
- ◆ ATRI/FMCSA On-Board Safety Technology Webinars



What's Next?

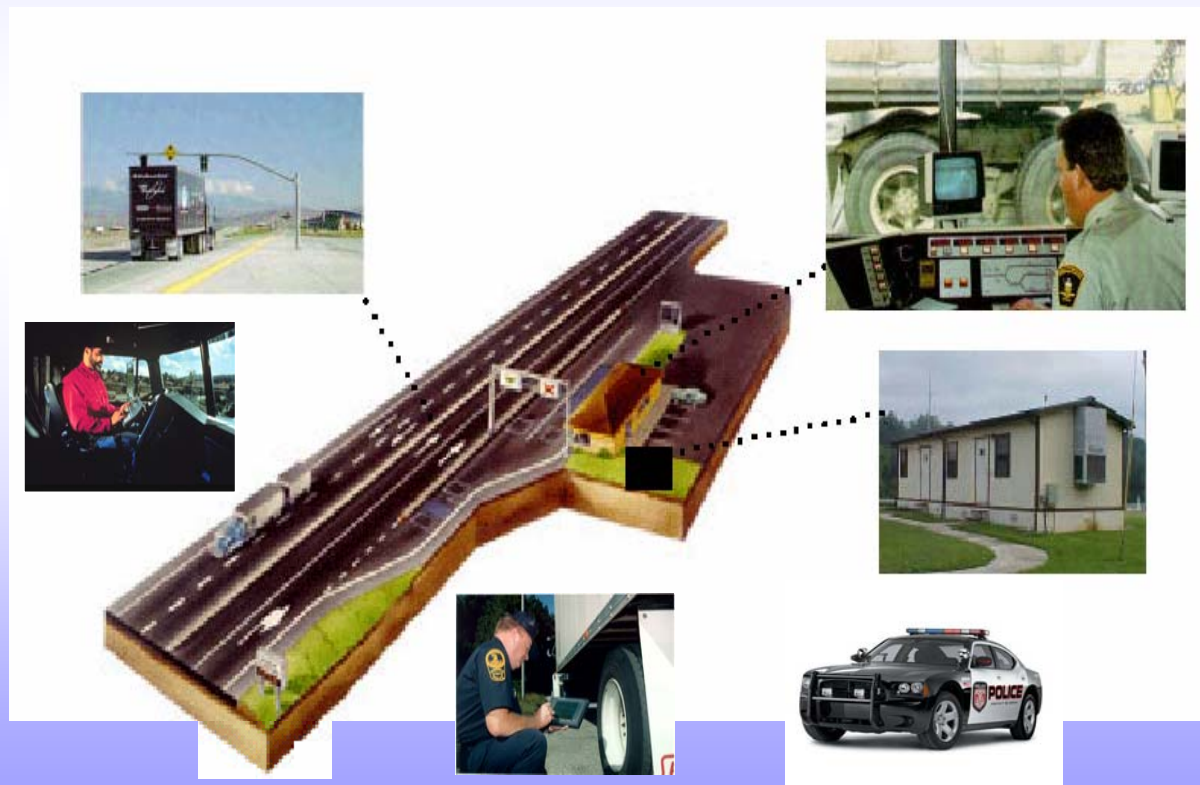
- ◆ Assess integration issues
- ◆ Continue industry collaboration and information sharing
- ◆ Compute costs and benefits for industry
- ◆ Future testing for more rigorous evaluations

Safety is Good Business

National Commercial Motor Vehicle Technology Corridor

Tennessee I-40/I-81/I-26 Corridor:

Fixed and mobile state-of-the-art facilities for testing and evaluation of CMV enforcement technologies



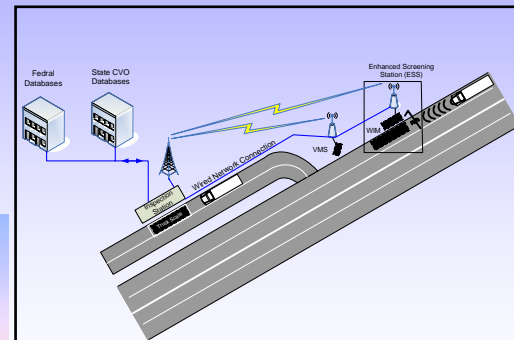


Benefits

- ◆ National Showcase for CMV Enforcement Technologies
- ◆ Builds on TDOS' recent *2006 Motor Carrier Safety Leadership Award*
- ◆ Venue to test and prove technologies in an actual roadside environment
- ◆ Ready location for future field operational tests and implementation



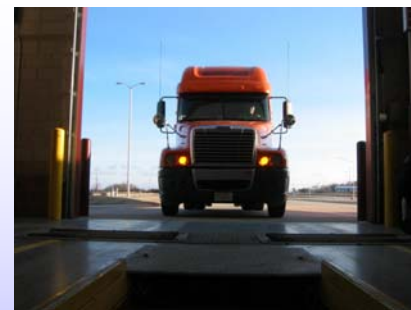
Overview of Projects



◆ Wireless Truck and Bus Inspections



◆ Performance-Based Brake Tester



◆ Smart Infrared Inspection System





CMV Roadside Technology Corridor Ribbon-Cutting Event

◆ **Date: August 7, 2007**

◆ **Technologies**

- WRI
- PBBT
- SIRIS
- CVISN
- Current inspection tools

◆ **Invited Participants**

- DOT and FMCSA Senior Staff
- TDOS and TDOT Commissioners Senior Staff
- Congressional Staff





Motor Carrier Efficiency Study (SAFETEA-LU, 5503)

- ◆ Study to identify freight inefficiencies; evaluate the safety and productivity benefits of wireless technologies and conduct, as appropriate, field tests
- ◆ Program Elements
 - Fuel monitoring and management systems
 - Radio frequency identification technology
 - Electronic manifest systems
 - Cargo theft prevention
 - Roadside inspection systems
- ◆ Phase I, Freight Study, awarded in September 2006
- ◆ Phase II, Field Operational Tests, December 2007





Enhanced Rear Signaling for Commercial Motor Vehicles

- ◆ Rear-end crashes are one of the most frequent accident configurations in heavy vehicles
- ◆ Countermeasures will be evaluated by installing them on a test truck and observing driver behavior
- ◆ Final report (November 2006)



SmartPark: Real-Time Truck Parking Information

- ◆ Demonstrate technology to provide information on parking availability in real time to truckers
 - Disseminating parking availability information
 - Forecasting availability based on history
 - Diverting truckers from filled parking areas to parking areas with available capacity along a corridor or within a region
- ◆ FMCSA awarded contract in late Spring





Tire Pressure Monitoring Systems

- ◆ Goals
 - Update/expand previous market research study
 - Design/conduct field operational test
 - Hold a symposium and public meeting (late 2007)
- ◆ Outcomes
 - Determine effectiveness of system in real-world
 - Document costs and benefits
 - Encourage deployment of systems



Driver Related Projects

- ◆ Employer Notification Service
 - Burden to discover driver history is on motor carriers
 - Design and prototype national ENS System
 - Started pilot test in Colorado and Minnesota (Dec. 2006)
- ◆ Commercial Drivers' License 3rd Party Testing Anti-Fraud
 - Goal – reduce fraud in CDL process
 - Develop IT-based strategies to monitor testing
 - Pilot test software (Summer 2006)
 - Finished final report (Dec. 2006)



CVISN Deployment Program

- ◆ CVISN is a nationwide initiative managed by FMCSA designed to:
 - Improve safety and productivity of commercial vehicles and drivers
 - Improve efficiency and effectiveness of commercial vehicle safety programs through targeted enforcement
 - Improve commercial vehicle data sharing within states and between states and FMCSA
 - Reduce state and industry regulatory costs



CVISN Deployment Program Funding

- ◆ SAFETEA-LU provides FMCSA \$25 million/year
- ◆ Deploy “Core” capabilities nationwide
 - States must have accepted CVISN Program Plan
 - Receive no more than \$2.5 million
- ◆ Define, develop, and implement “Expanded” capabilities
 - Certified by FMCSA as completing Core deployment
 - Receive no more than \$1 million
- ◆ FY'06: \$24.75 million
- ◆ FY'07: \$25 million

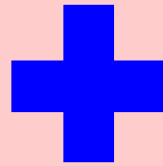


Core CVISN – Expanded CVISN

Core CVISN

Expanded CVISN

Safety
Information
Exchange

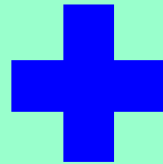


Driver Information
Sharing

Expanded Safety
Information Sharing

The collage includes a US Government logo, a driver's license for 'Iowa Commercial Driver License' (CDL No. 999999996), and a network diagram. The diagram shows 'Private Sector Business Users' and 'Public Users' connected to 'State Gov't Enforcement Users' and 'State Gov't Non-Enforcement Users'. These users interact with an 'FMCSA Web Portal' which provides 'Services, Data, Applications, Systems' to 'FMCSA & USDOT Users'. An 'External Data' source is also shown connected to the system.

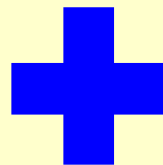
Electronic
Screening



Smart
Roadside



Credentials
Administration



Expanded
E-Credentialing


The screenshot shows the New York State 'One Stop Credentialing and Registration' website. It includes a header with 'New York State' and 'One Stop Credentialing and Registration'. The main content area has a form for 'New York State' with fields for 'First Name', 'Last Name', 'Address', 'City', 'State', and 'Zip'. There are also sections for 'Registration Information' and 'Application Information'. The website is designed for users to manage their credentials and registration online.

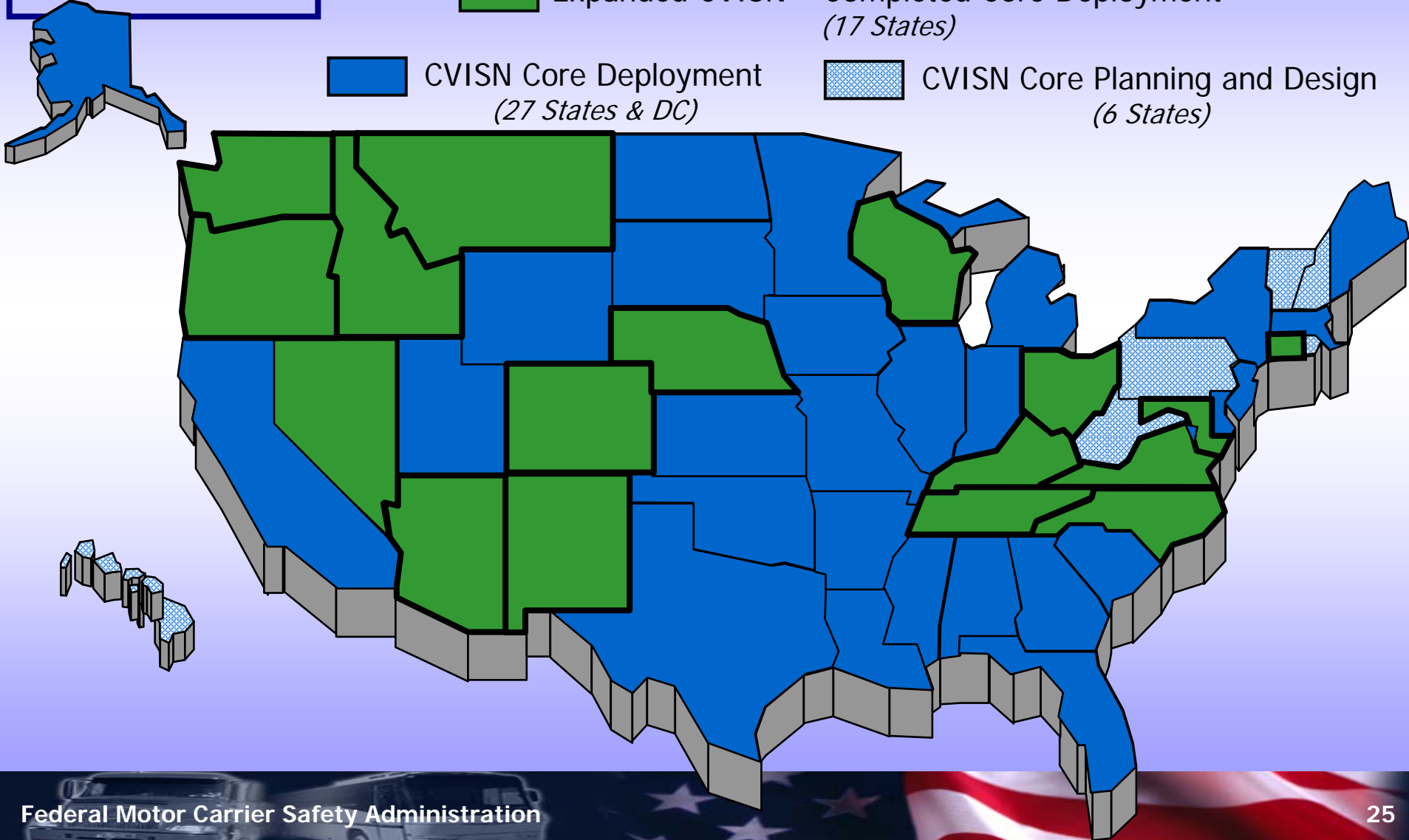


Status of States

 Expanded CVISN – Completed Core Deployment
(17 States)

 CVISN Core Deployment
(27 States & DC)

 CVISN Core Planning and Design
(6 States)



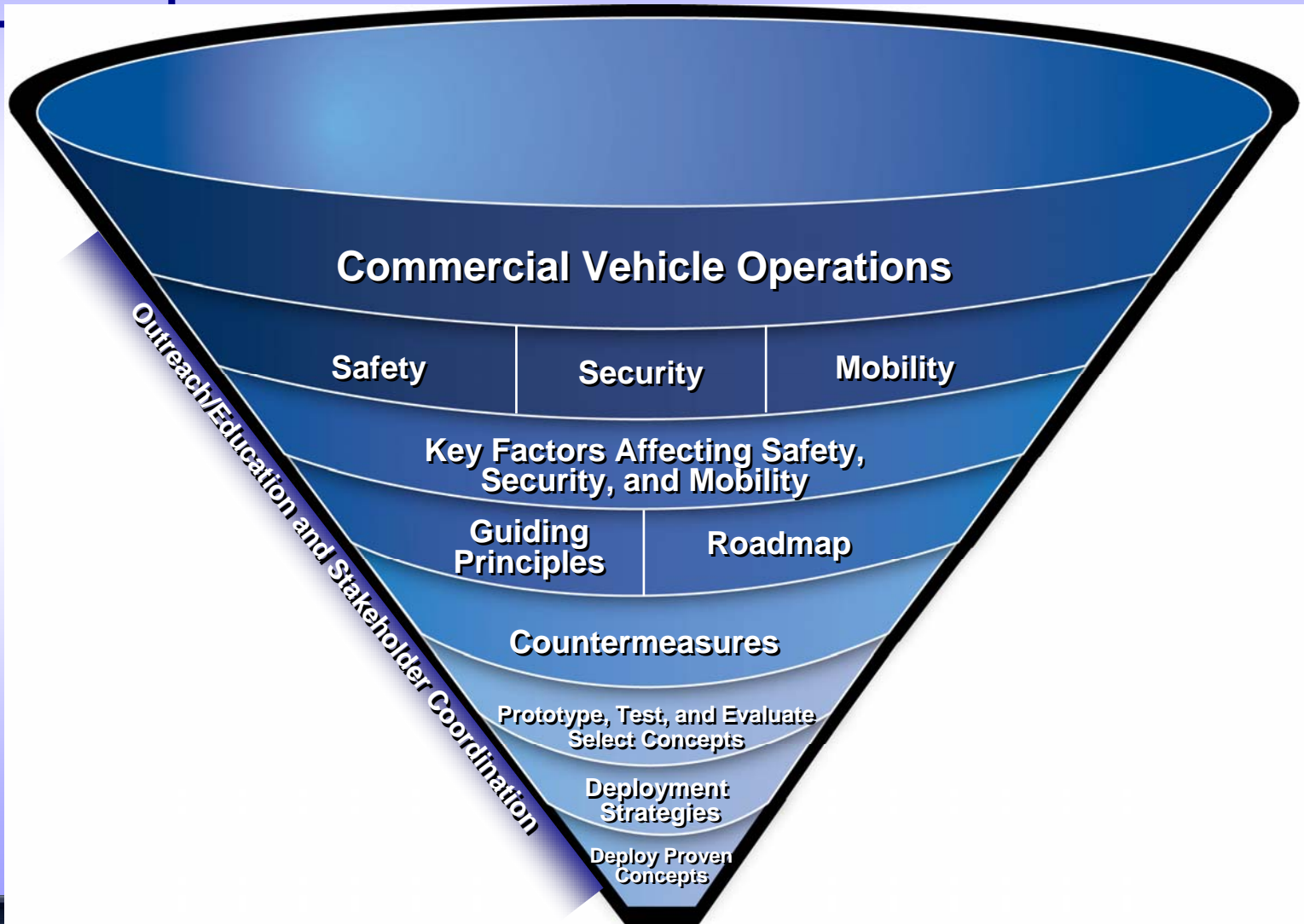


Smart Roadside for Commercial Vehicle Operations – Vision

- ◆ Through the application of vehicle- and infrastructure-based technologies:
 - Commercial motor vehicles operate more safely, efficiently, and securely
 - Roadside enforcement and compliance operations are streamlined and/or improved
 - Commercial vehicles/freight moves efficiently across domestic and international boundaries, as well as into, out of, and through freight facilities
 - Infrastructure is preserved and construction resources are targeted more effectively



Smart Roadside Initiative Logical Approach





Future Projects

- ◆ Advance FMCSA's safety mission
- ◆ Adopt, test, and deploy technologies and best practices
- ◆ Focus on driver, commercial vehicle, and motor carrier operations
- ◆ Contribute to a safe and secure commercial transportation system



Thanks for your attention!

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