

Federal Motor Carrier Safety Administration  
Office of Analysis, Research and Technology

Federal Highway Administration  
Office of Freight Management and Operations

**2008 Smart Roadside Workshop**

**Smart Roadside 101**

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# Outline

- ◆ Vision
- ◆ Motivation for program
- ◆ Objectives
- ◆ Benefits
- ◆ Approach
- ◆ Roles
- ◆ Guiding Principles
- ◆ Capabilities

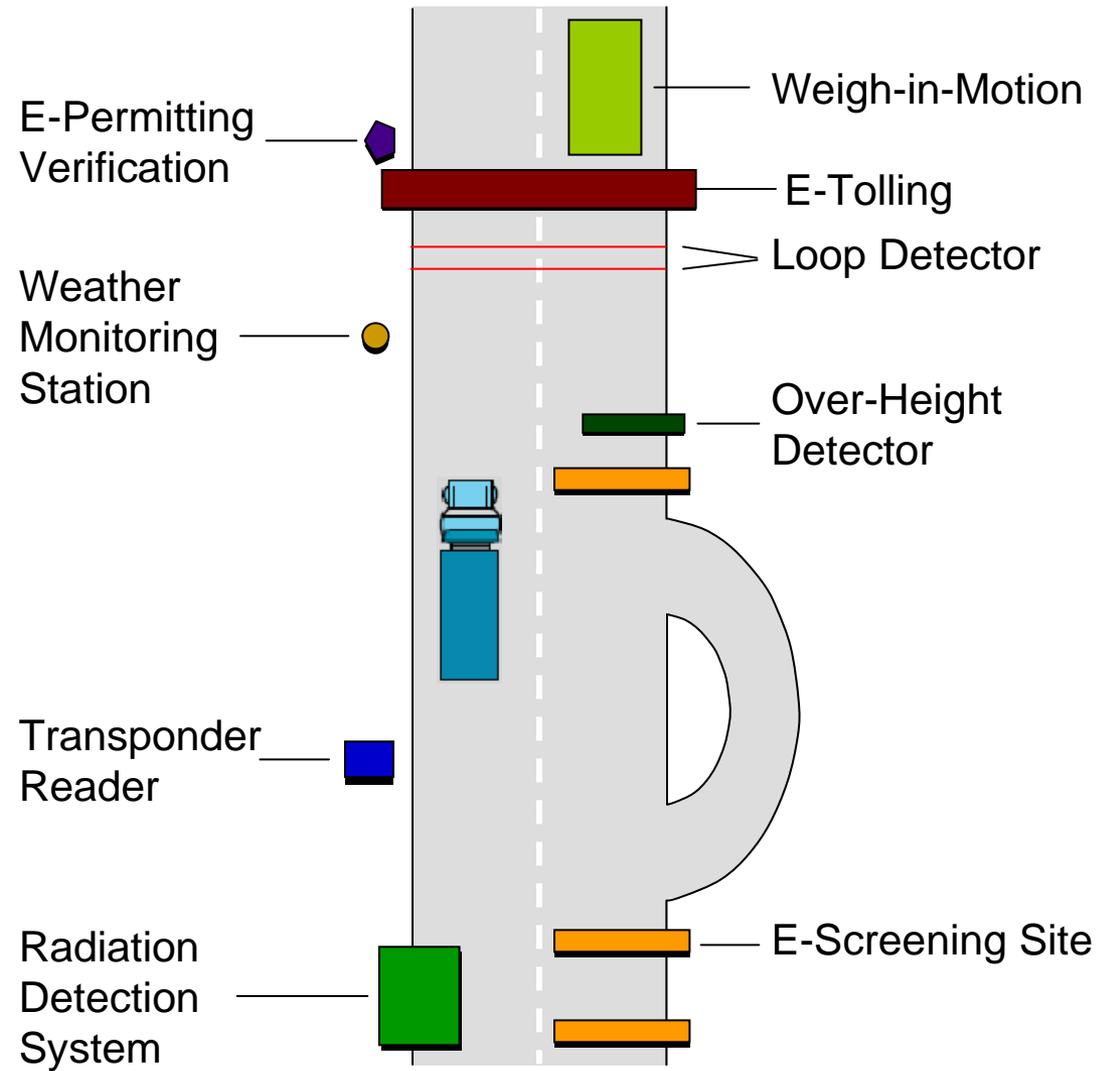


# Smart Roadside Initiative (SRI) Vision

Using interoperable technology and improved data sharing to improve safety, security, operational efficiency, and mobility on the nation's freight transportation system

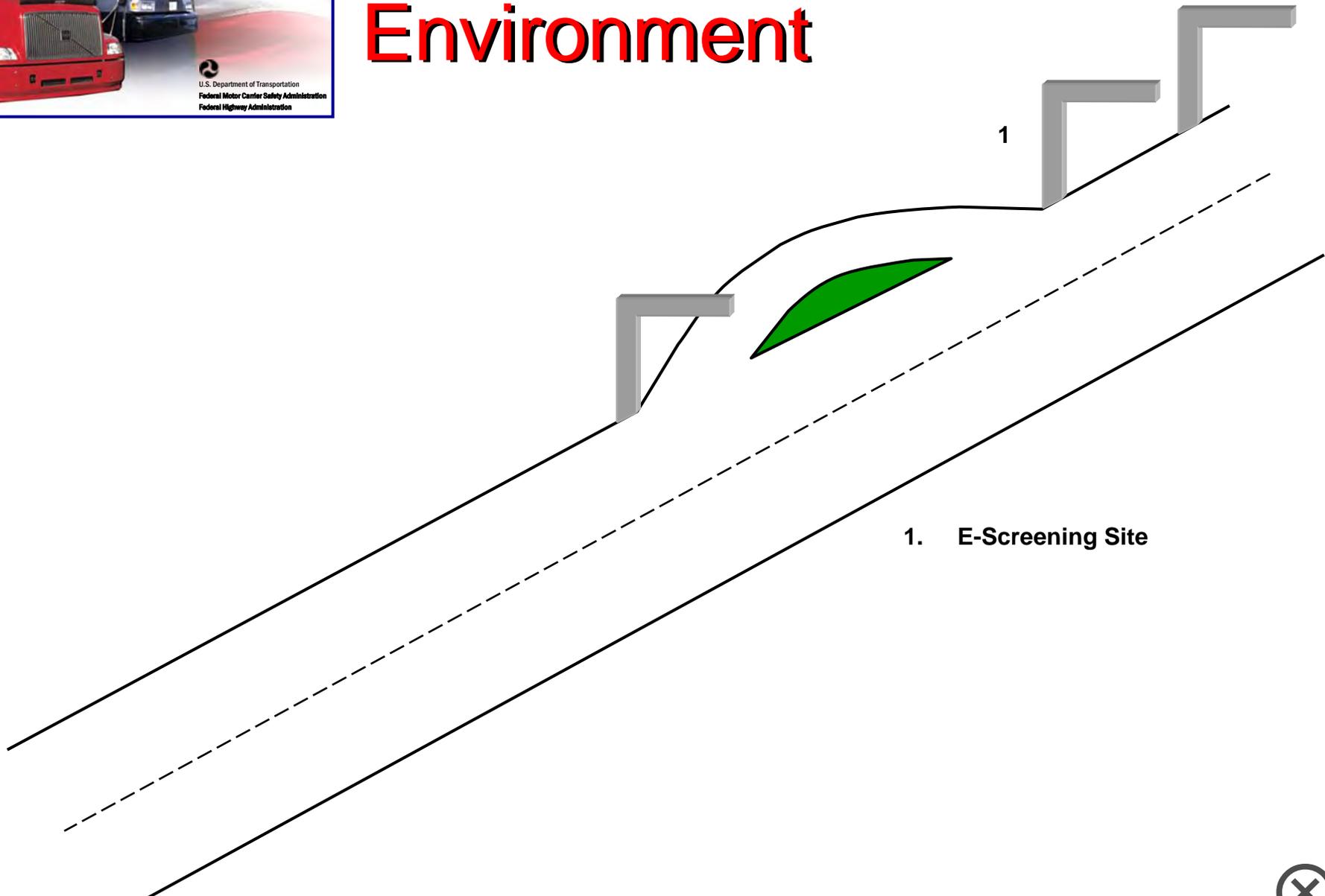


# Some Building Blocks Have Been Deployed



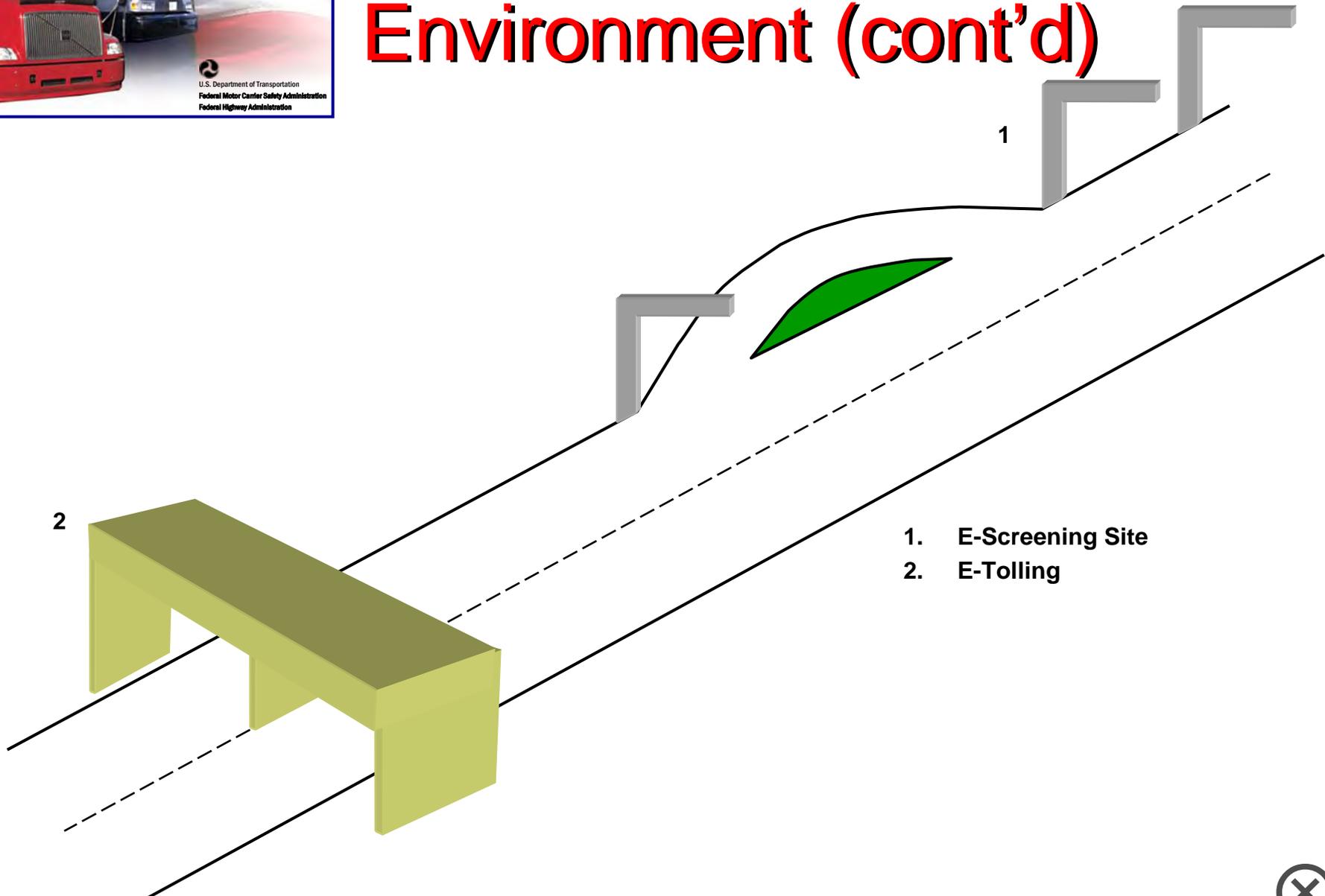


# Current Roadside Environment



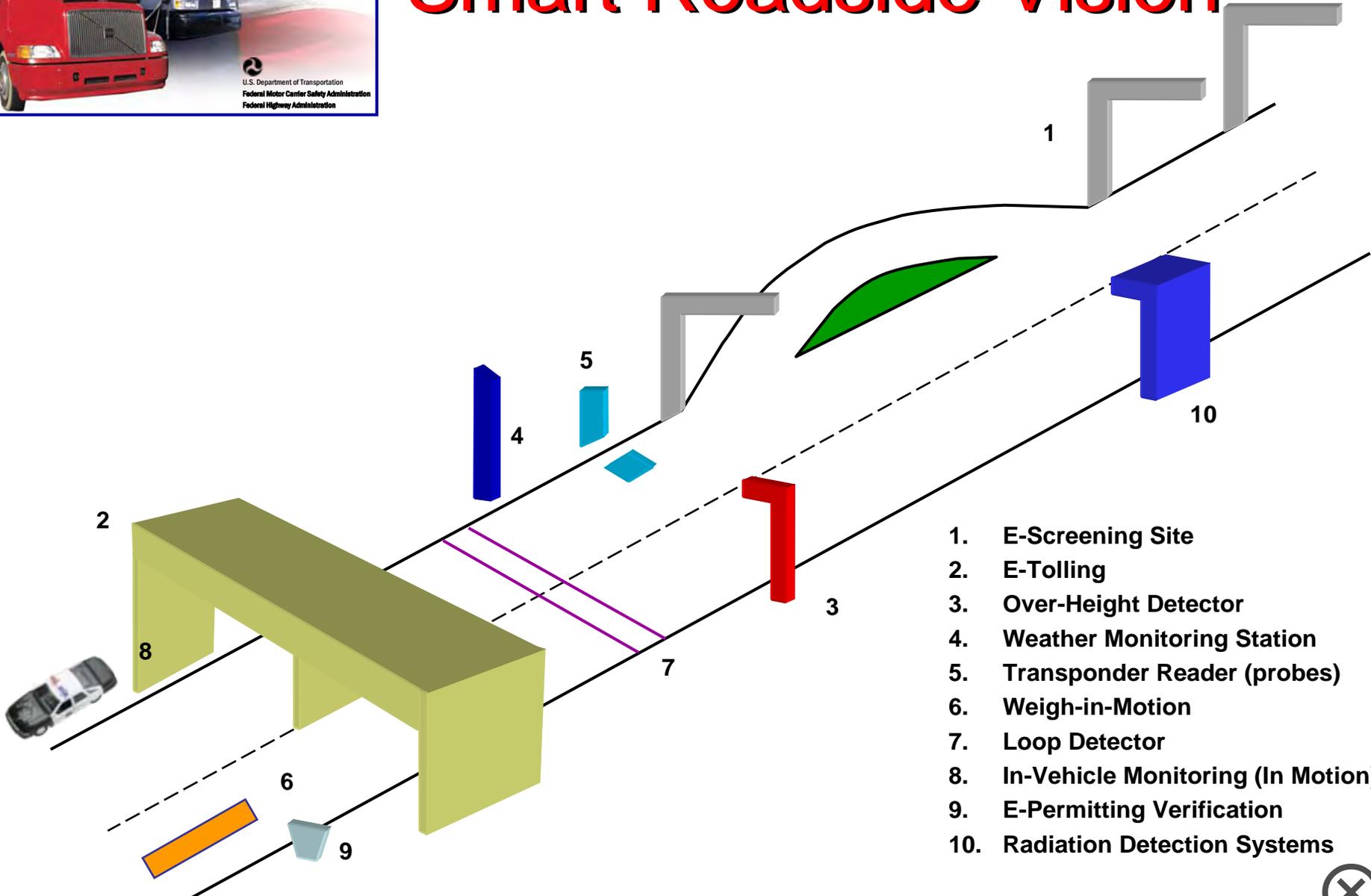


# Current Roadside Environment (cont'd)





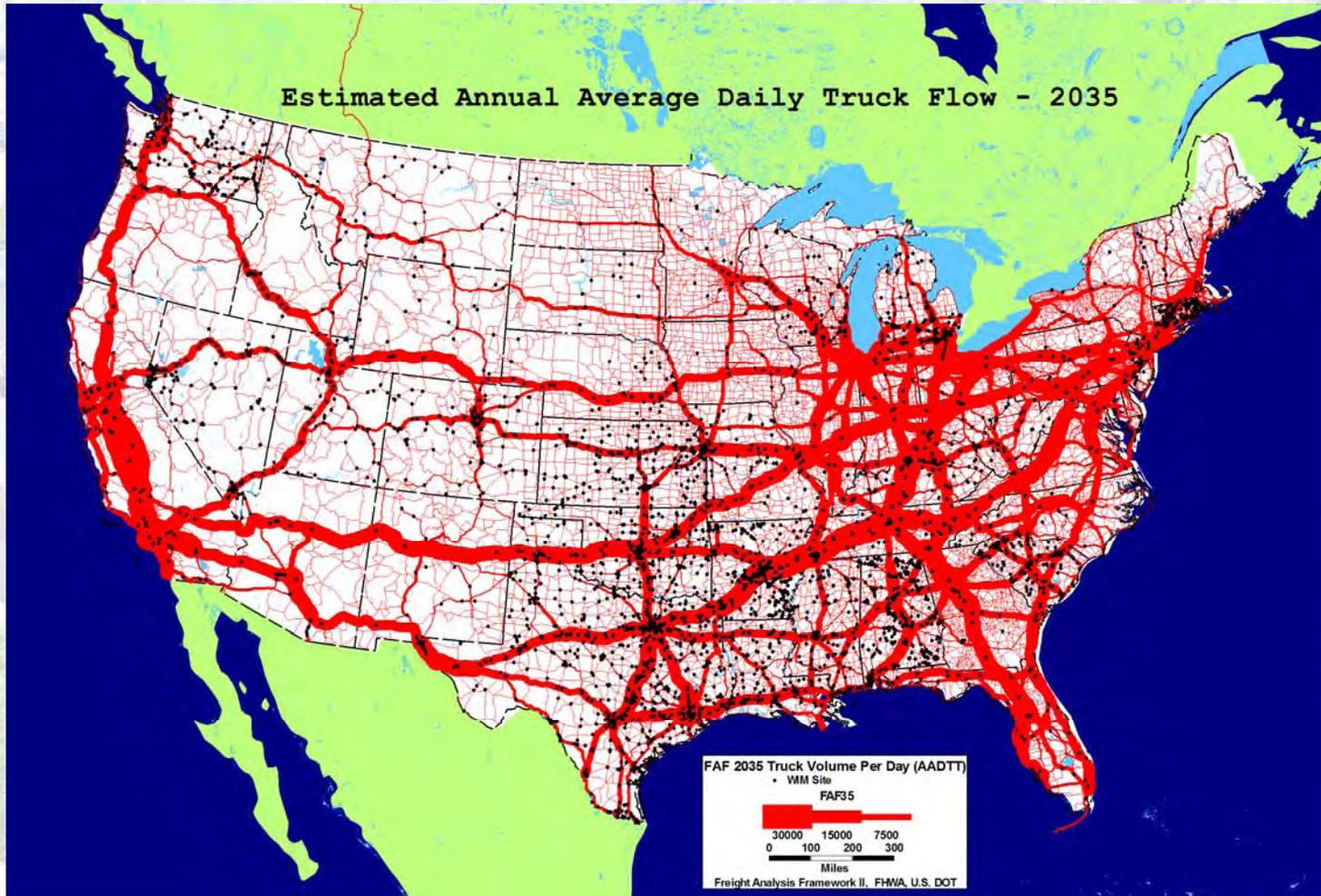
# Smart Roadside Vision



1. E-Screening Site
2. E-Tolling
3. Over-Height Detector
4. Weather Monitoring Station
5. Transponder Reader (probes)
6. Weigh-in-Motion
7. Loop Detector
8. In-Vehicle Monitoring (In Motion)
9. E-Permitting Verification
10. Radiation Detection Systems



# The Problem





# Impact of Crashes





# Potential Challenges Associated with Growth

- ◆ Increased number of highway fatalities and injuries
- ◆ Longer time between commercial vehicle inspections
- ◆ Increased congestion and delays; reduced reliability of transit times
- ◆ Increased transportation costs for freight
- ◆ Reduced global competitiveness for U.S. economy
- ◆ More rapid deterioration of infrastructure
- ◆ Worsening air quality



# Smart Roadside Initiative Objectives

- ◆ Management of the flow of commercial vehicle traffic;
- ◆ Prevention and response to crashes and other incidents;
- ◆ Focus of enforcement resources on high-risk carriers, vehicles, and drivers;
- ◆ Timely transport of goods to the marketplace;
- ◆ Reduction of unnecessary delays for commercial vehicles, leading to reduced energy consumption and emissions; and
- ◆ Preservation of the roadway infrastructure.

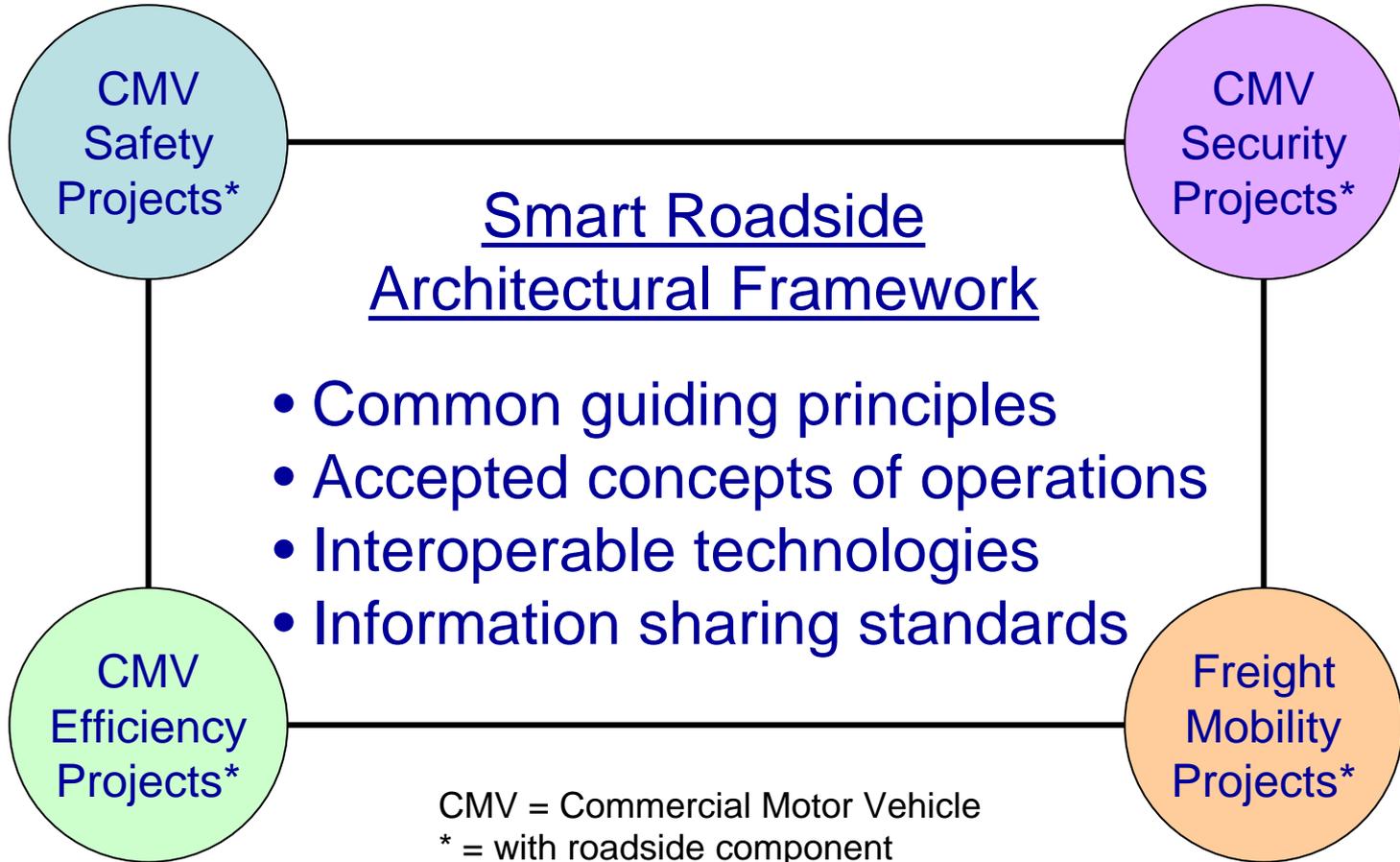


# Smart Roadside Initiative Anticipated Benefits

- ◆ Fewer commercial vehicle crashes and improved responses to crashes that do occur;
- ◆ Reduced and more reliable transit times for motor carriers;
- ◆ More efficient operations at intermodal facilities and border crossings;
- ◆ Reduced implementation and maintenance costs for supporting infrastructure;
- ◆ Enhanced preservation of infrastructure;
- ◆ Improved security and tracking for high-risk/regulated cargo;
- ◆ Increased quantity and quality of data for planning purposes; and
- ◆ Improved air quality.



# Smart Roadside Initiative Framework for Interoperability and Information Sharing on the Road

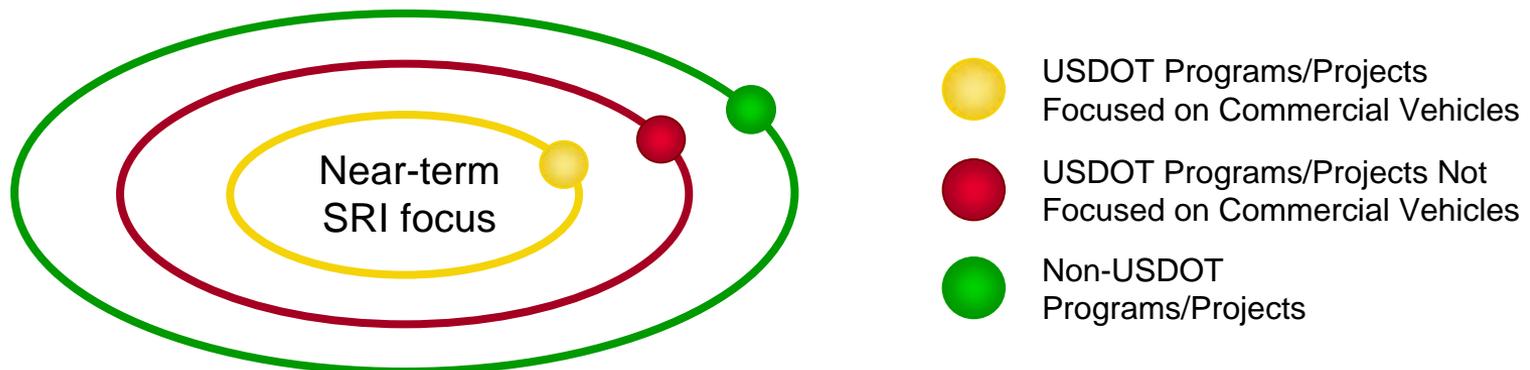




# Smart Roadside Initiative Explores Opportunities To...

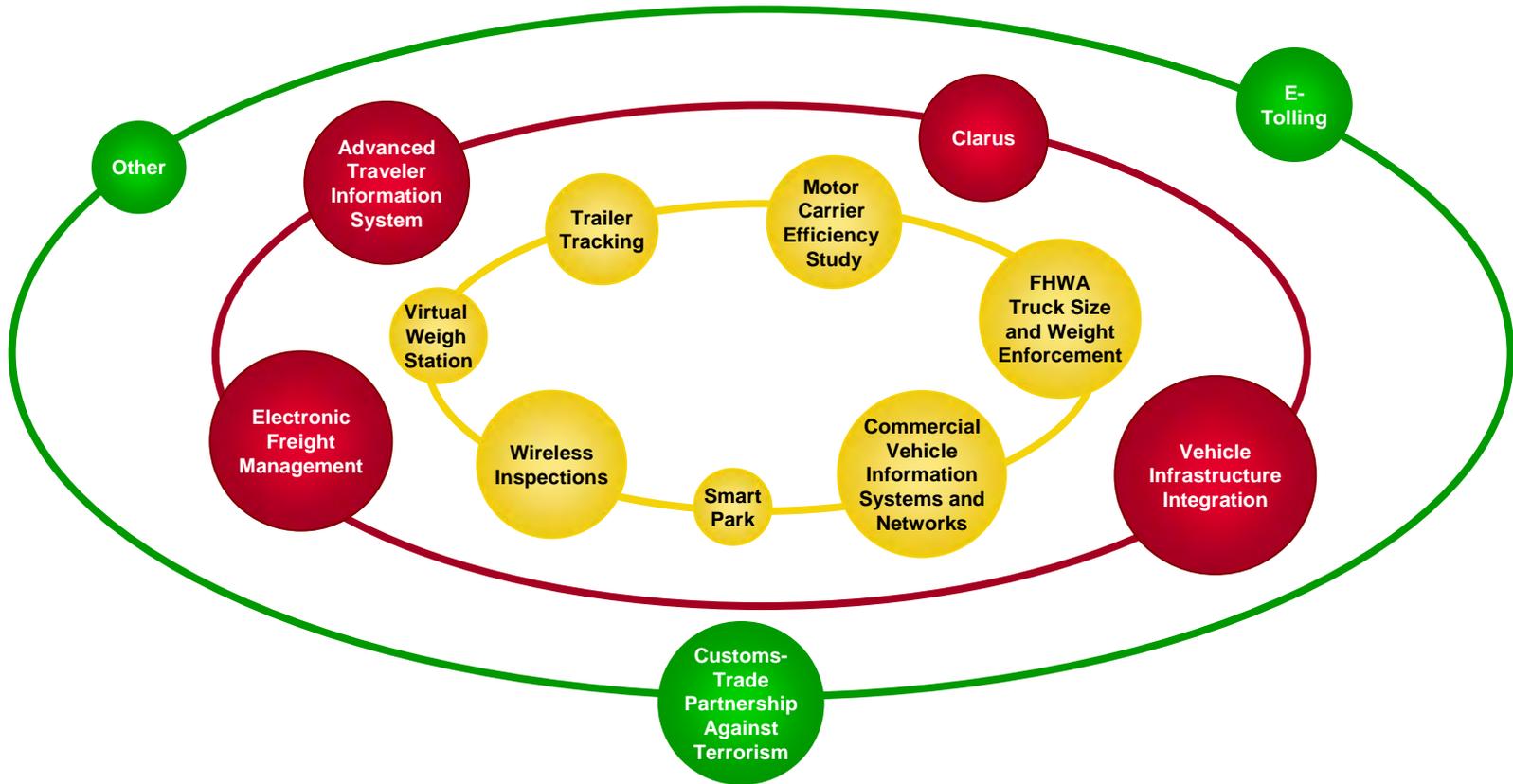
- Improve interoperability
- Reduce deployment costs by leveraging investments for multiple uses
- Share information collected
- Use commercial vehicles to collect data for general use (e.g., weather data)
- Use data collected for general use to improve commercial vehicle operations (e.g., traffic data)

through coordination and collaboration about roadside activities and projects.





# Collaboration and Coordination with Programs and Projects: Will Start on the Inner Ring



● USDOT Programs/Projects Focused on Commercial Vehicles

● USDOT Programs/Projects Not Focused on Commercial Vehicles

● Non-USDOT Programs/Projects



# Smart Roadside Initiative Approach

- ◆ Coordinate research; share results
- ◆ Communicate about the initiative and related projects across a wide range of stakeholders
- ◆ Develop architectural framework for designing and implementing smart roadside solutions
- ◆ Plan a strategy and map out a deployment schedule



# Smart Roadside Initiative Federal Roles

- ◆ In support of the Smart Roadside Initiative, FMCSA and FHWA will:
  - Fund selected tests, demonstrations, and deployments
    - Coordinate with state and industry representatives to identify promising applications of Smart Roadside infrastructure
  - Coordinate the development of the necessary architecture and standards
  - Develop the appropriate guiding principles
  - Document the business case for the Smart Roadside
  - Develop/implement a deployment strategy
  - Maintain a Smart Roadside roadmap and projects database to coordinate FMCSA, FHWA, and other related programs/projects
  - Facilitate stakeholder collaboration
- ◆ Seek collaboration with the Department of Homeland Security and the Environmental Protection Agency



# Smart Roadside Initiative Stakeholders' Roles

- ◆ Envision an active role for public- and private-sector stakeholders in the Smart Roadside Initiative
  - American Association of State Highway and Transportation Officials (AASHTO)
  - American Association of Motor Vehicle Administrators (AAMVA)
  - American Bus Association (ABA)
  - American Trucking Associations and Technology Maintenance Council (ATA/TMC)
  - Commercial Vehicle Safety Alliance (CVSA)
  - Intelligent Transportation Society–America (ITSA)
  - Intermodal Association of North America (IANA)/Intermodal Freight Technology Working Group (IFTWG)
  - National Private Truck Council (NPTC)
  - Owner Operators and Independent Drivers Association (OOIDA)
  - United Motor Coach Association (UMA)



# Smart Roadside Initiative Stakeholders' Roles

- ◆ Provide input to FMCSA and FHWA on the Smart Roadside Initiative via the Smart Roadside ad hoc team
  - Develop guiding principles
  - Identify potential solution sets that could be included in the Smart Roadside Initiative
  - Suggest priorities
  - Guide development of Smart Roadside deployment strategy
  - Comment on Smart Roadside business case
  - Provide inputs to Smart Roadside roadmap
- ◆ Conduct Smart Roadside demonstrations/operational tests
- ◆ Fund and deploy Smart Roadside-related systems/technologies at in vehicles and at roadside



# Smart Roadside Initiative Guiding Principles Process

- ◆ Determine how they will be used.
- ◆ Derive from ITS/CVO Guiding Principles, Fair Information Guiding Principles, and Interoperability Guiding Principles developed under the auspices of ITS America for ITS/CVO and CVISN programs. Update as needed.
- ◆ Solicit feedback from stakeholders.



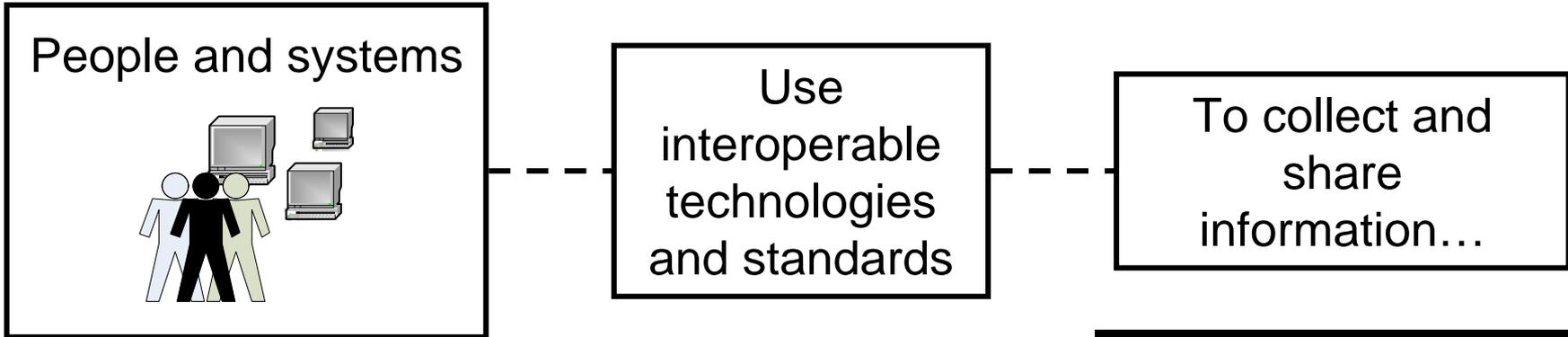
# Smart Roadside Initiative Draft Guiding Principles

- ◆ Privacy
- ◆ Disclosure
- ◆ Relevance
- ◆ Quality
- ◆ Integrity
- ◆ Access
- ◆ Security
- ◆ Interoperability
- ◆ Performance-Driven
- ◆ Commitment

You are invited to join a working session to discuss Smart Roadside Guiding Principles at 5:30 this evening.



# Smart Roadside: Draft Capabilities Summary





# Why?

- ◆ Fewer commercial vehicle crashes
- ◆ Reduced transit times
- ◆ More efficient operations
- ◆ Reduced costs for supporting infrastructure
- ◆ Enhanced preservation of infrastructure
- ◆ Improved security
- ◆ Better data for planning purposes
- ◆ Improved air quality

# DRAFT Smart Roadside Capabilities



◆ Carriers

◆ Drivers

◆ Shippers

◆ Enforcement officers

◆ Planners

◆ Analysts

◆ Others



◆ Information

◆ Inspection

◆ Planning

◆ Dispatch

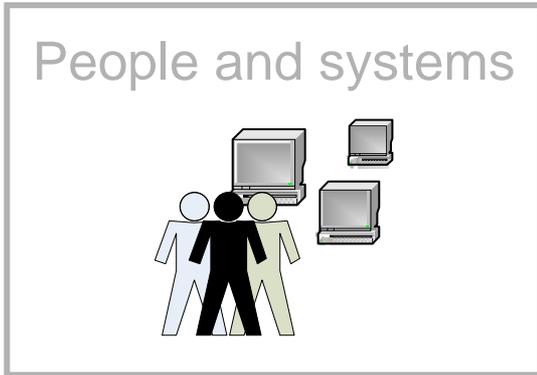
◆ Tracking

◆ Traffic management

◆ Others



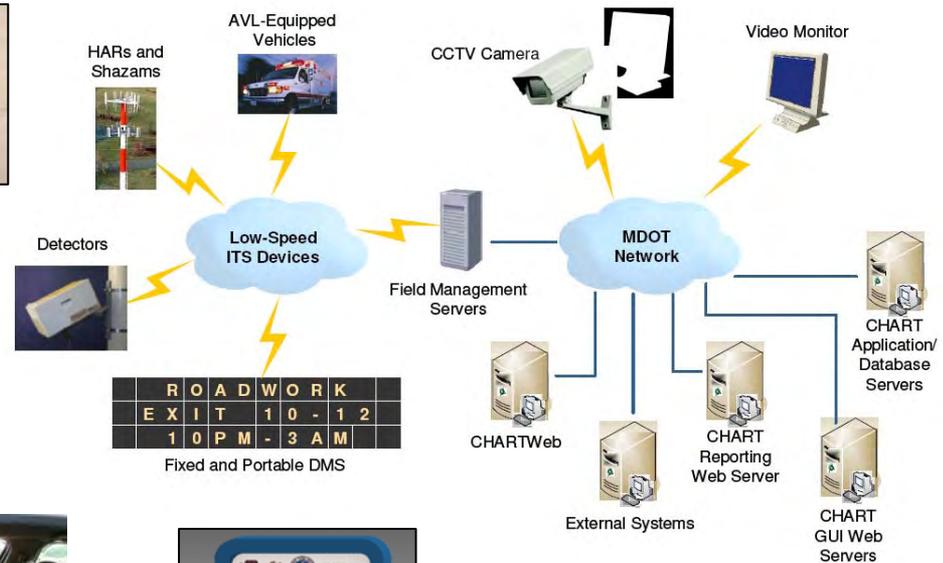
# DRAFT Smart Roadside Capabilities



Use interoperable technologies and standards

To collect and share information about

- ◆ On vehicles
- ◆ Along the road
- ◆ At facilities
- ◆ In back-office systems
- ◆ Elsewhere





# DRAFT Smart Roadside Capabilities

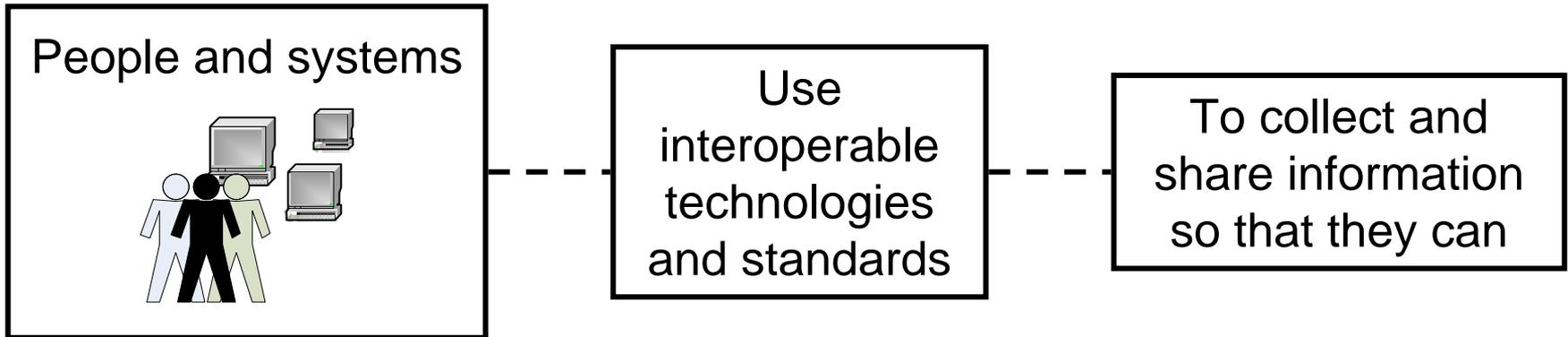


- ◆ Companies
- ◆ Drivers
- ◆ Vehicles
- ◆ Freight
- ◆ Roads
- ◆ Incidents
- ◆ Facilities
- ◆ Conditions
- ◆ Others





# Smart Roadside: Draft Capabilities



Plan

Control

Schedule

Identify entities

Select

Check

Collect payment for

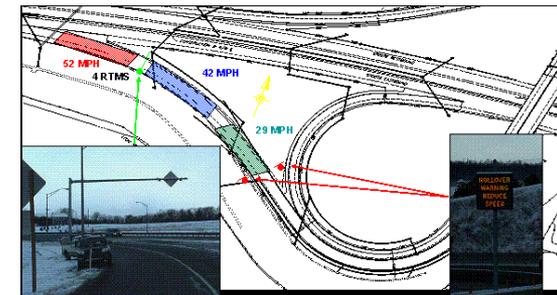
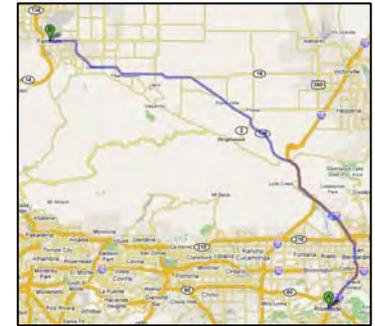
Analyze

Perform other commercial vehicle  
and freight-related functions



# So that they can: Plan ...

- ◆ Route
- ◆ Traffic management strategy
- ◆ Congestion pricing
- ◆ Lane/road usage
- ◆ Maintenance and construction
- ◆ Enforcement strategy
- ◆ Others





# Control ...

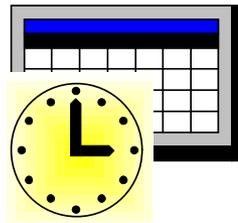
- ◆ Variable message signs
- ◆ Traffic signals
- ◆ Facility access
- ◆ Other devices on the road





# Schedule ...

- ◆ Enforcement activities
- ◆ Access to services
- ◆ Incident response
- ◆ Maintenance activities
- ◆ Lane closures
- ◆ Other activities



**Traffic Speed Data**  
This data will automatically refresh every five minutes.

Location	Average Speed	Last Reported
I-270 @ Comus Rd North	61.7 MPH	3/18/2008 3:08:21 PM
I-270 @ MD 109 North	62.7 MPH	3/18/2008 3:05:46 PM
I-270 @ MD 118 North	65 MPH	3/18/2008 3:03:57 PM
I-270 @ MD 118 South	59.8 MPH	3/18/2008 3:08:12 PM
I-270 @ MD 80 North	63.6 MPH	3/18/2008 3:07:58 PM
I-270 @ MD 85 South	65.3 MPH	3/18/2008 3:04:35 PM
I-270 @ Weigh Station North	65.1 MPH	3/18/2008 3:04:11 PM
I-270 @ Weigh Station South	Over 65 MPH	3/18/2008 3:04:02 PM
I-270 at Doctor Perry Rd North	Over 65 MPH	3/18/2008 3:05:33 PM
I-270 between Grosvenor Ln & MD 187 Southbound	Over 65 MPH	3/18/2008 3:07:36 PM
I-270 btn Park Mills Rd & Scenic Overlook North	Over 65 MPH	3/18/2008 3:06:49 PM
I-270 N/B approaching MD 85 North	Over 65 MPH	3/18/2008 3:07:08 PM
I-270 North at MD 121 North	Over 65 MPH	3/18/2008 3:06:17 PM
I-270 S/B @ I-370 S/B Local Lanes	57.1 MPH	3/18/2008 3:06:53 PM
I-270 S/B @ I-370 N/B Local Lanes	54.9 MPH	3/18/2008 3:04:03 PM
I-270 S/B @ I-370 S/B Express Lanes	64.3 MPH	3/18/2008 3:06:53 PM
I-270 S/B @ I-370 N/B Express Lanes	61.5 MPH	3/18/2008 3:04:03 PM





# Identify entities ...

- ◆ Vehicles
- ◆ Carriers
- ◆ Drivers
- ◆ Shipments
- ◆ Others





# Select ...

- ◆ Vehicle
- ◆ Road segment
- ◆ Facility
- ◆ Other on-road options



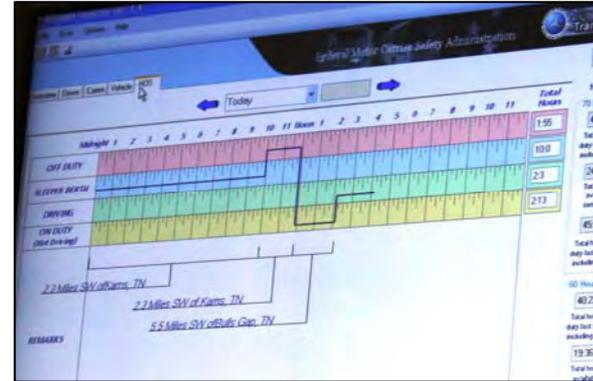
TRUCK ADVISORY  
NARROW LANES  
ON OC BRIDGE





# Check ...

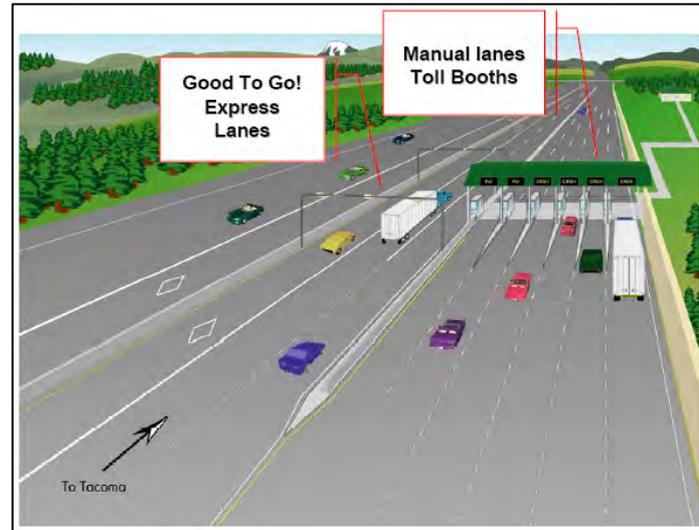
- ◆ Safety status
- ◆ Credentials
- ◆ Cargo status
- ◆ Immigration status
- ◆ Vehicle location
- ◆ Security
- ◆ Weight
- ◆ Other “measures”





# Collect payment for ...

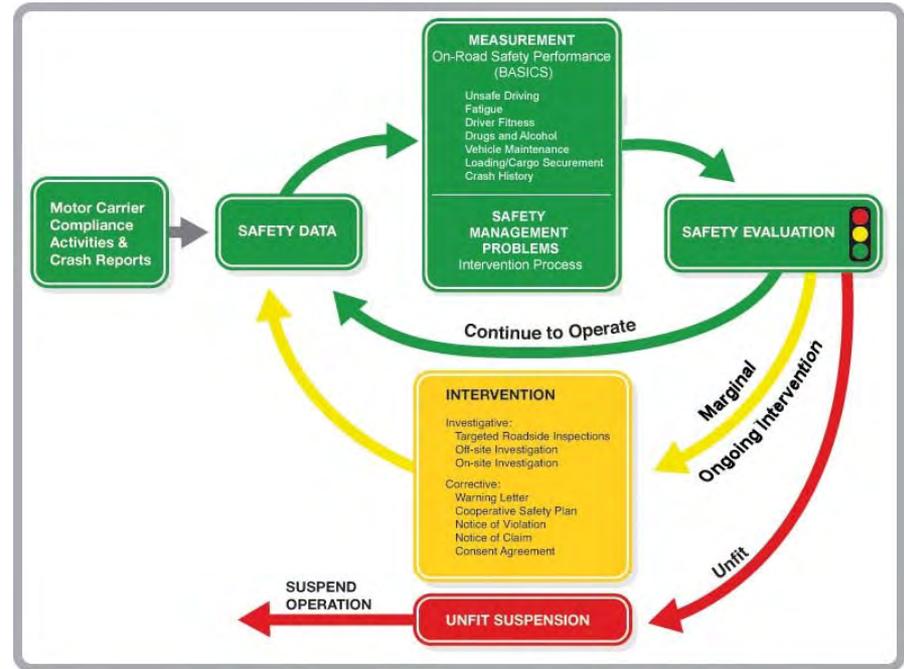
- ◆ Tolls
- ◆ Permits
- ◆ Services
- ◆ Others





# Analyze ...

- ◆ Safety performance
- ◆ Trends
- ◆ Other aspects





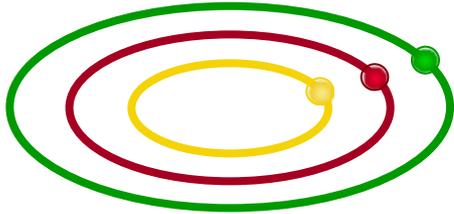
**And perform other commercial vehicle and freight-related functions.**

- ◆ We've started the list of "Smart Roadside" functions.
- ◆ We need you to help us refine and expand the list.
- ◆ That's what this workshop is about.



# Smart Roadside Initiative

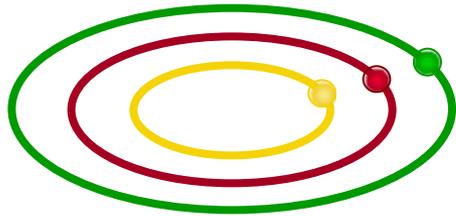
Coordinate, Communicate,  
and Collaborate



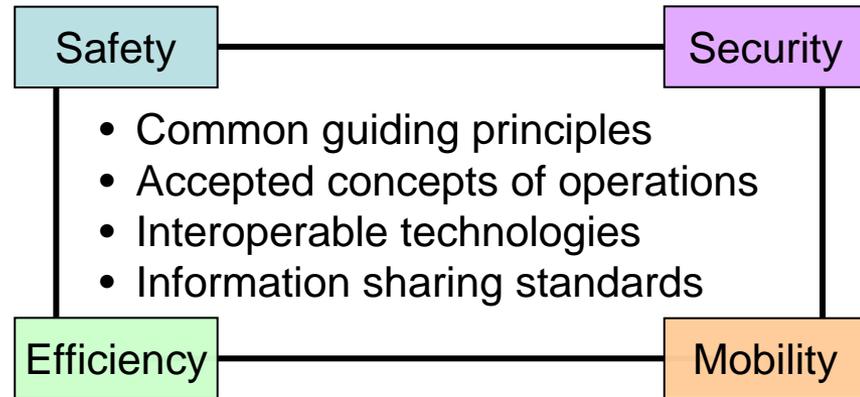


# Smart Roadside Initiative

Coordinate, Communicate,  
and Collaborate



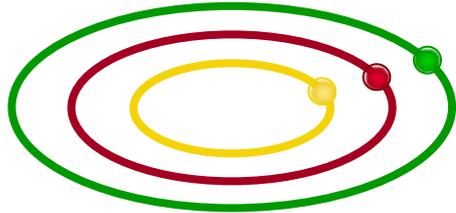
Smart Roadside  
Architectural Framework



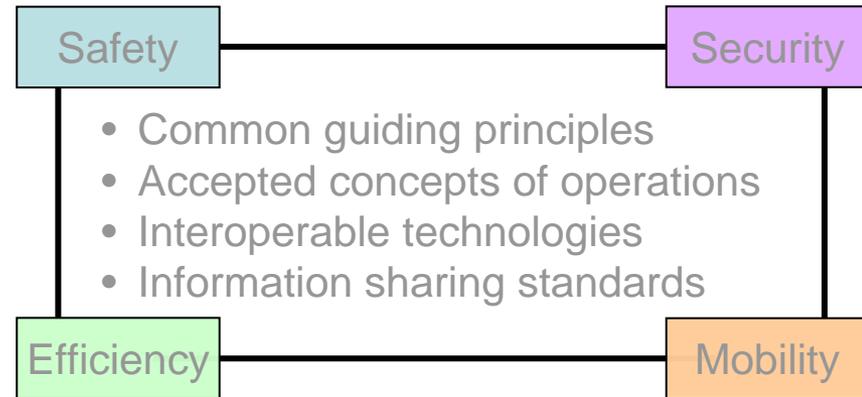


# Smart Roadside Initiative

Coordinate, Communicate,  
and Collaborate



Smart Roadside  
Architectural Framework



Use Interoperable Technologies  
and Share Information





# Smart Roadside Initiative

Coordinate, Communicate,  
and Collaborate

Smart Roadside  
Architectural Framework

**Improve safety, security,  
operational efficiency, and  
mobility on the nation's freight  
transportation system**

Use Interoperable Technologies  
and Share Information



# For more information...

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