



UNITED STATES
DEPARTMENT OF TRANSPORTATION

Establishing Connectivity in Transportation: Connected Vehicle research in the U.S.

63rd Annual Missouri Traffic and Safety Conference

Columbia, MO

May 16, 2012

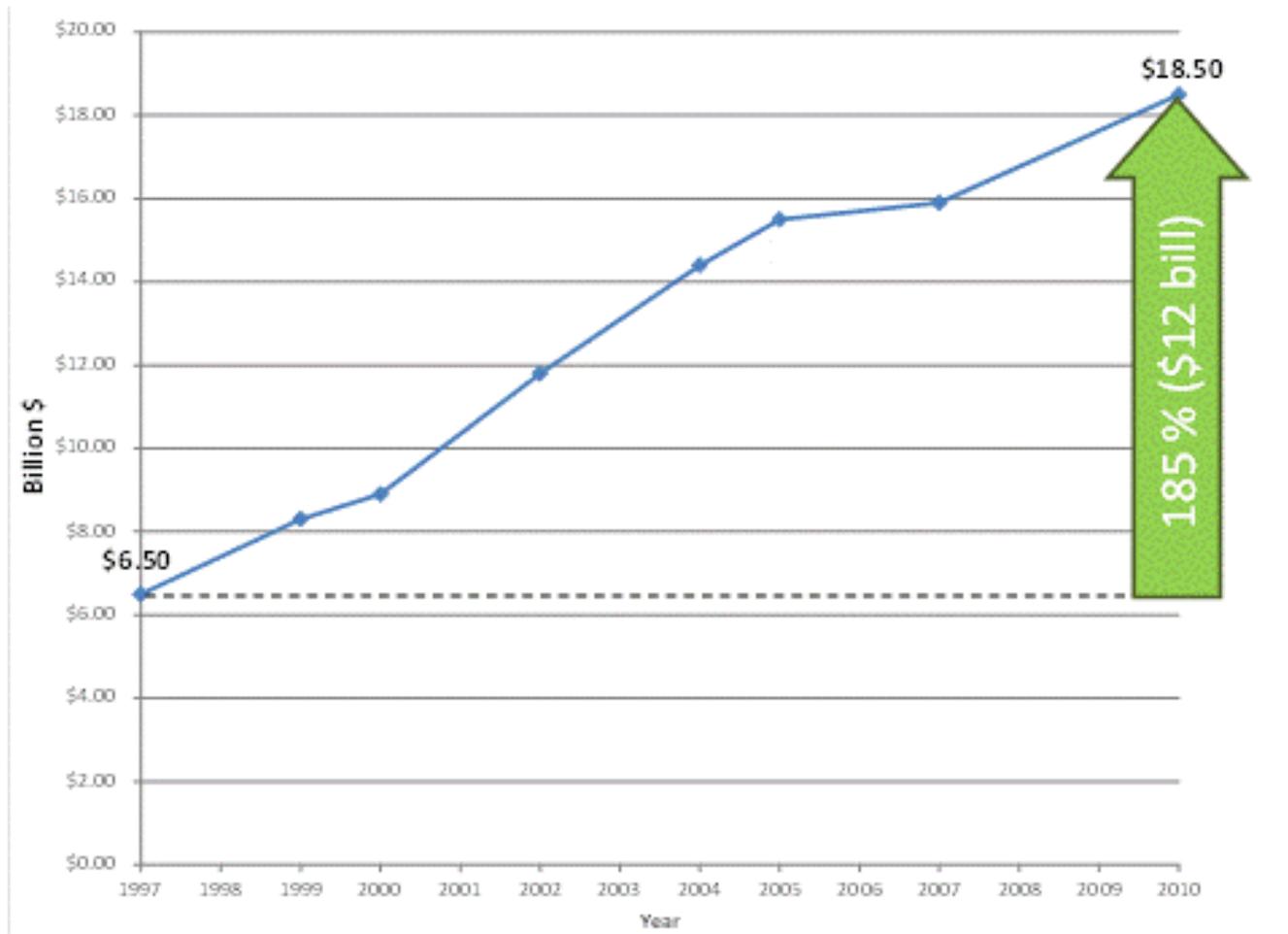
James Pol, PE, PMP

Team Leader, Program Management and Evaluation

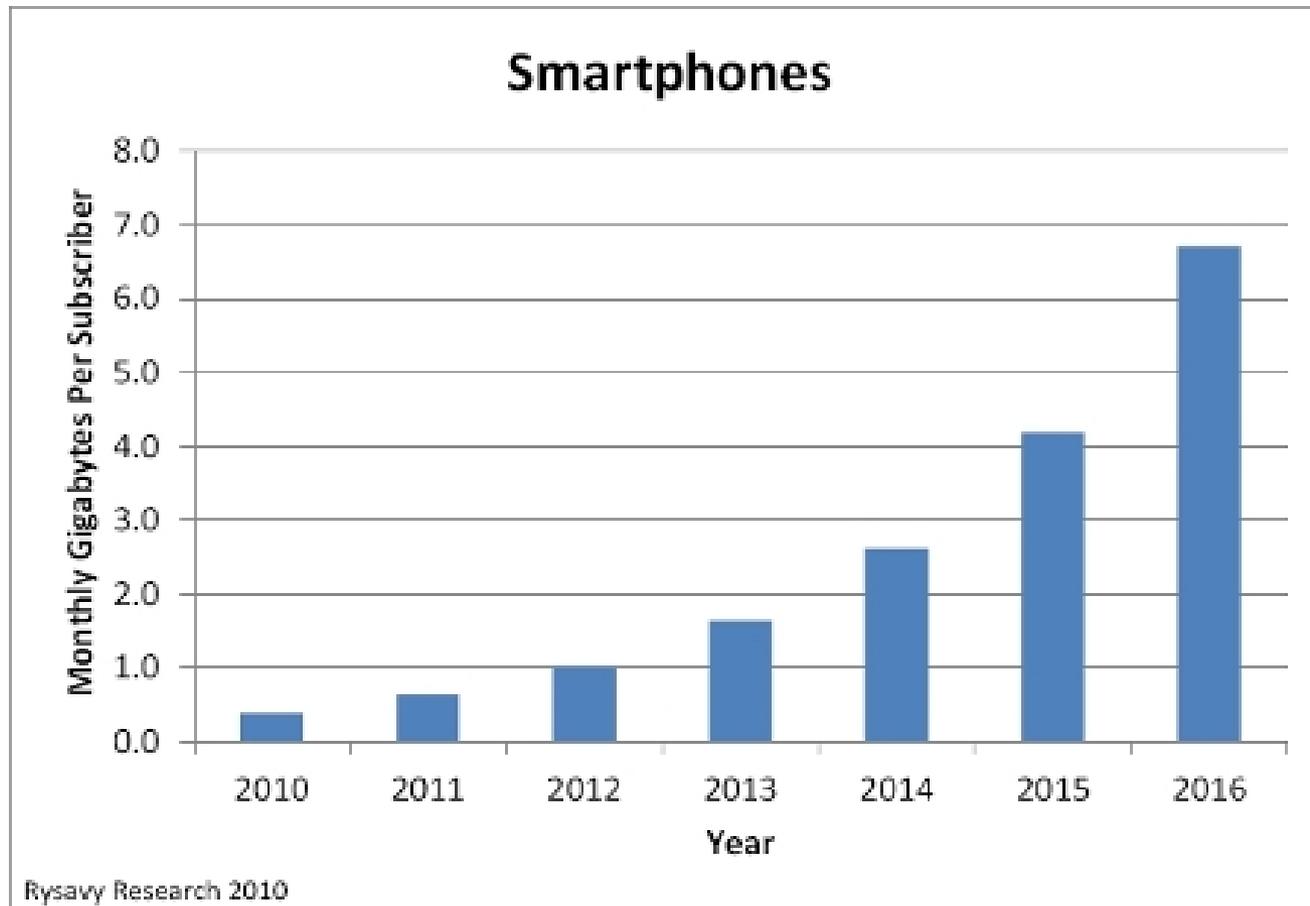
USDOT Intelligent Transportation Systems (ITS) Joint Program Office

Tracking Our Success

- Investment in ITS has nearly **tripled**



Consumer Forces on Communications and ITS



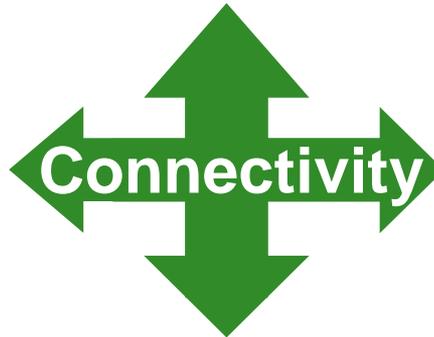
Blog entry dated March 16, 2011. <http://reboot.fcc.gov/blog>

ITS Research = Multimodal and Connected

Vehicles and Fleets



Drivers/Operators



Wireless Devices



Infrastructure



What is the Connected Vehicle Program

- Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) wireless communications for:
 - **Crash prevention**
 - **Improved mobility**
 - **Environmental sustainability**
- Connected vehicle capability addresses over 80% of unimpaired crash scenarios
- Encompasses autos, buses, and trucks
 - Partnership among RITA, NHTSA, FHWA, FMCSA, and FTA



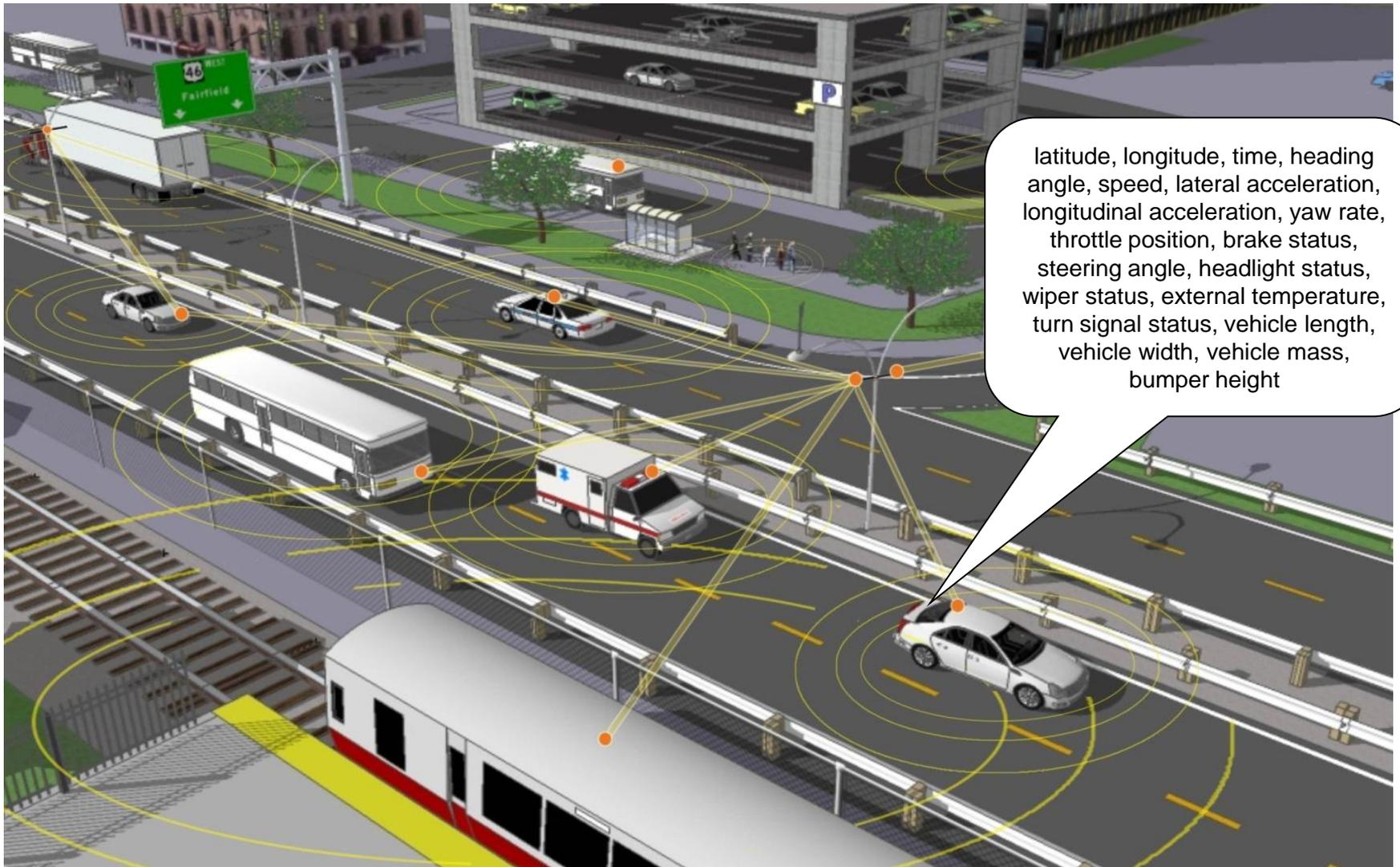
What is the Connected Vehicle Program

- Uses wireless communications
 - Dedicated short-range communications (DSRC) technology using FCC-dedicated spectrum that is essential for safety applications



- Other communications types for non-safety applications
- Research is maturing such that NHTSA has committed to an agency decision regarding whether the safety technology is sufficiently developed to support rulemaking

Fully Connected Vehicle



latitude, longitude, time, heading angle, speed, lateral acceleration, longitudinal acceleration, yaw rate, throttle position, brake status, steering angle, headlight status, wiper status, external temperature, turn signal status, vehicle length, vehicle width, vehicle mass, bumper height



Why It Matters

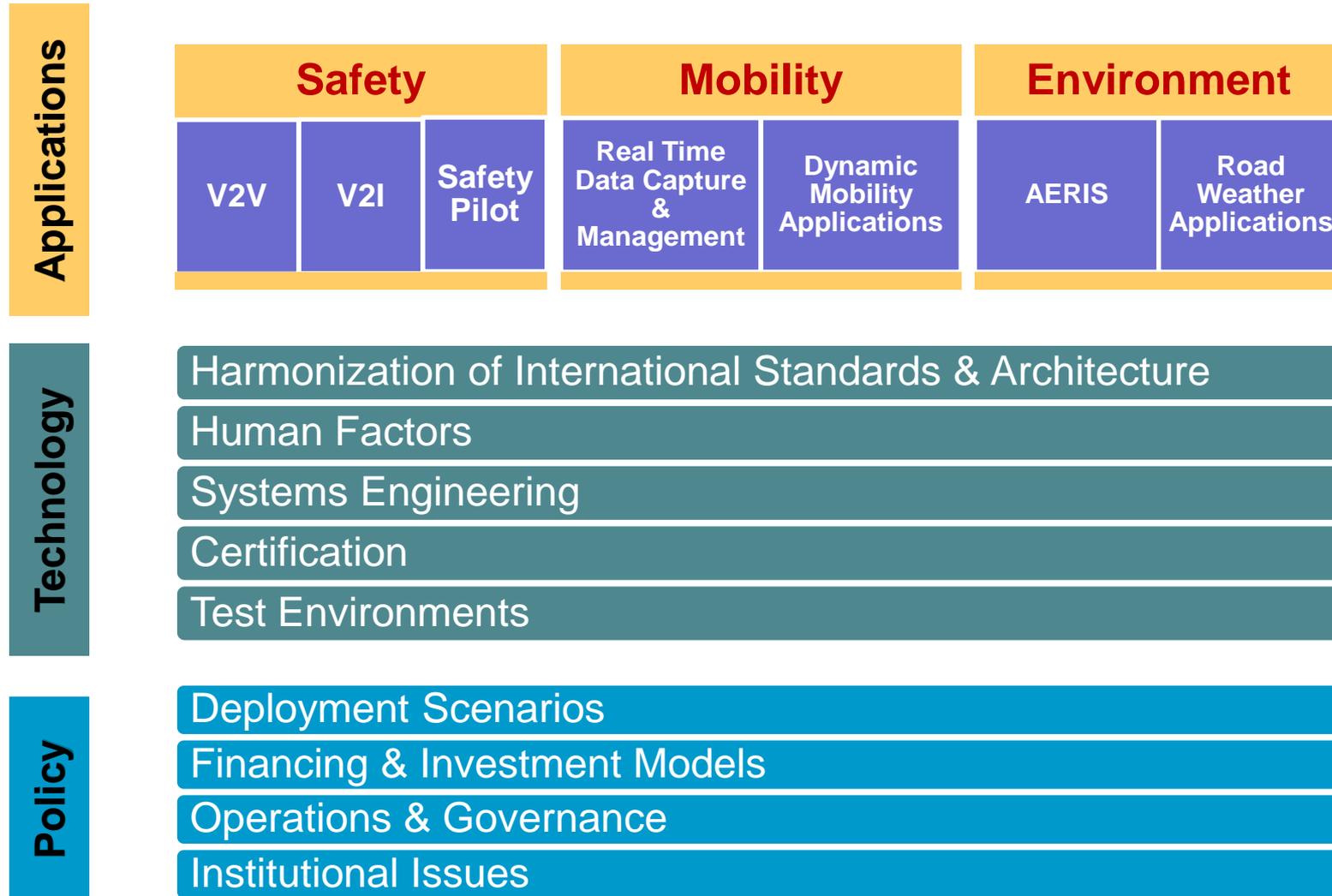
Up to **80%** of non-impaired crash types may be impacted by connected vehicle technology

Source: NHTSA

Based on initial estimates & studies. Actual benefits are not determined at this time.



ITS Research Program Components



Key Program Objectives

- 2013 Decision on Vehicle Communications for Safety (light vehicles)
- 2014 Decision on Vehicle Communications for Safety (heavy vehicles)
- Future Guidance on Infrastructure Implementation



NHTSA Agency Decision

- Possible decision options include:
 - **Rulemaking** on minimum performance requirements for vehicle communications for safety on new vehicles
 - Inclusion in NHTSA's **New Car Assessment Program** to give car makers credit for voluntary inclusion of safety capability in new vehicles
 - **More research** required



NHTSA Agency Decision (continued)

- **Data will determine NHTSA's action for the 2013 decision point:**
 - Simulation and modeling efforts based upon previous field operational tests
 - Data collection from V2V test track testing
 - Empirical data obtained from **Safety Pilot**
 - Driver clinics (user acceptance)
 - Model deployment activities (safety effectiveness)
- **A key factor for the NHTSA decision will be the need for, and timing of, necessary infrastructure for communication security (still undefined)**



User Acceptance -- Driver Clinics

- 6 locations across the U.S.
- 100 drivers per location
- Experience crash warnings
 - Forward Crash Warning
 - Emergency Brake Light
 - Blind Spot Warning
 - Lane Change Warning
 - Intersection Assist
 - Do Not Pass Warning



Model Deployment

- Major road test and real-world implementation taking place from 2011 thru 2013, involving:
 - Approximately 3,000 vehicles
 - Multiple vehicle types
 - Fully integrated systems and aftermarket devices
 - Roadside infrastructure
 - System-wide interoperability testing
- Also to test
 - Prototype security mechanisms
 - Device certification processes



Integrated Vehicles



Integrated Trucks



Aftermarket Devices



Basic Safety Devices



Roadside Infrastructure

Safety Pilot Objectives

- **Generate empirical data for supporting 2013 and 2014 decisions**
- Show **capability of V2V and V2I applications** in a real-world operating environment using multiple vehicle types
- Determine **driver acceptance** of vehicle-based safety warning systems



Safety Pilot Objectives (Continued)

- Assess options for accelerating the safety benefits through aftermarket and retrofit safety devices
- Extend the performance testing of the DSRC technology
- Collect lots of data and make it available for industry-wide use
- Let others leverage the live operating environment



Connected Vehicle Safety Program Partners and Contractors

Vehicle Manufacturers



USDOT



Academia



Public Agencies



Industry



Associations/Standards Developers



For More Information

The screenshot shows the RITA website header with the logo and name, and the U.S. Department of Transportation Research and Innovative Technology Administration. The main navigation bar includes links for About, Research, Tech Transfer, Library, Press Room, Communities, and Contact Us. The page title is "Intelligent Transportation Systems Joint Program Office" and it is dated "Updated May 10, 2011 11:44 AM".

The main content area features a large image of a highway with a text overlay: "Imagine that . . . transit and truck drivers receive regular updates, allowing them to stay on schedule -- and stay in business." Below this is a "Message to Stakeholders from RITA Administrator Peter Appel" section, a "Spotlight" section with three news items, and an "Our Current Research" section with sub-categories for Applications, Mode-Specific, and Cross-Cutting. The "Mode-Specific" category lists: Vehicle-to-Vehicle Safety, Vehicle-to-Infrastructure Safety, Real-Time Data Capture, Dynamic Mobility Applications, Environment, and Road Weather.

On the right side, there is a profile for "Shelley J. Row, P.E., PTOE Director, ITS Joint Program Office" with a "Biography" link. Below that is a "Procurement Opportunities" section with a "More >>" link. Further down is a "Public Meetings" section with a "View >>" link. The "ITS Video Challenge" section includes a video thumbnail and the text: "Grab your camera and share the story of your community's ITS deployment." with a ">> Official Rules" link.

At the bottom right, there is a "Stay Connected" section with links for Facebook, Twitter, Email, and RSS.

www.its.dot.gov

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