



# MOVING TOWARD ZERO

2011 Technical Conference and Exhibit

April 3-6

Walt Disney World Swan Resort | Lake Buena Vista, FL, USA

# ITS Technology to Save Lives

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Research and Innovative Technology Administration  
U.S. Department of Transportation



# Secretary LaHood's Priorities

- **Safety:** improve public health and safety by reducing transportation-related fatalities and injuries.
- **State of Good Repair:** ensure the U.S. proactively maintains its critical transportation infrastructure in a state of good repair.
- **Economic Competitiveness:** promote transportation policies and investments that bring lasting and equitable economic benefits to the nation and its citizens
- **Livable Communities:** foster livable communities through place-based policies and investments that increase transportation choices and access to transportation services
- **Environmental Sustainability:** advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources



# U.S. and Global Problems

## Safety

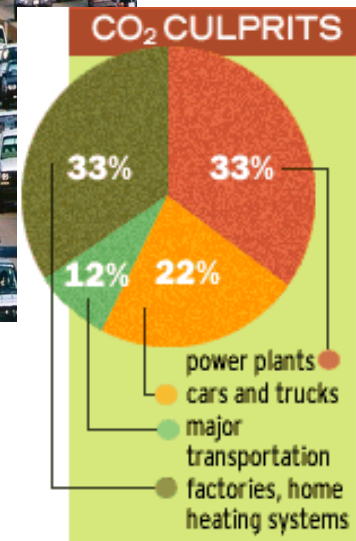
- 32,788 fatalities in 2010 (-3% from 2009)
- 1.09 fatalities per 100 million vehicle miles traveled (0.7% increase in VMT in 2010)
- 2.2 million injuries in 2009
- 5.5 million crashes in 2009
- \$230 billion total cost
  - \$32 billion medical cost
  - \$51 billion for impaired driving
- Leading cause of death for ages 4 to 34

## Accessibility and Mobility

- 4.8 billion hours of travel delay (34 hours per auto commuter)
- \$115 billion cost of urban congestion

## Environment

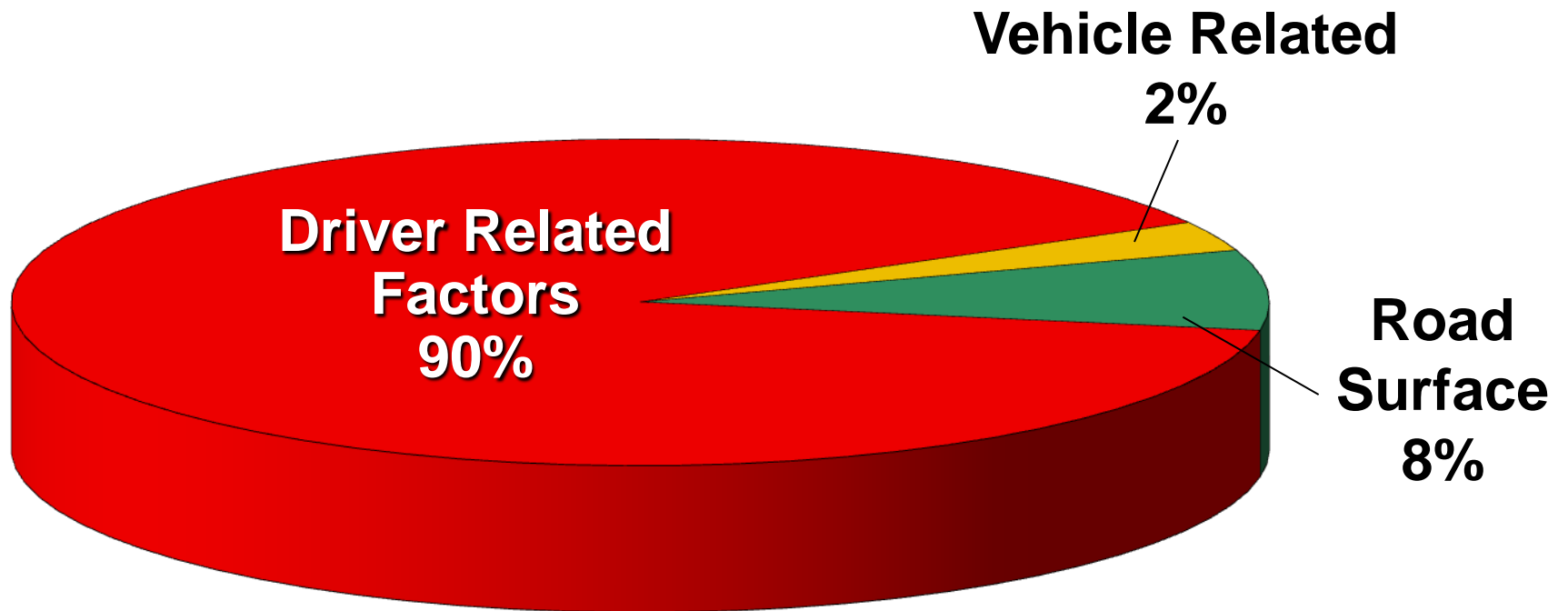
- Transportation contributes 28% of U.S. GHG emissions and energy consumption
- 3.9 billion gallons of wasted fuel



All statistics annual basis for U.S.

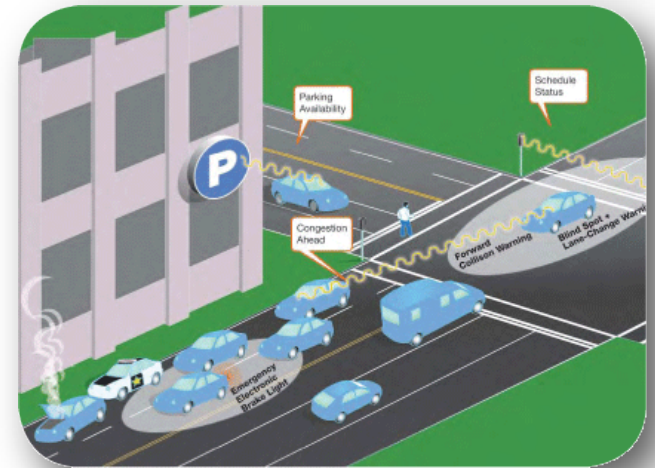
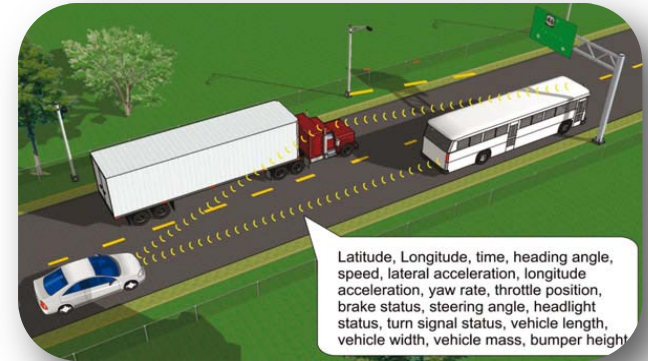
# Crash Causation

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# Vision for Future Transportation System

- Multi-modal surface transportation system— with connectivity as its central core.
- Vehicles (cars, trucks, buses, fleets of all kinds), the infrastructure and mobile devices, but remembering people and goods.
- Leveraging technology to maximize safety, mobility, accessibility, reliability sustainability and social equity—enabled through wireless communications—in all modes.
- First priority is safety: crash and injury prevention.
- Foster technological advances across borders—for benefit of all international partners.
- Open platform for innovation: vehicle-to-vehicle (V2V) and vehicle-to-Infrastructure (V2I) communications is the major driving technology.



# State of the U.S. DOT ITS Program

- Strong and getting stronger!
- More cross modal—rail and maritime
- Cars, trucks, buses, fleets, and vehicles of all kinds
- Commitment to dedicated short range communications (DSRC)
- Increased outreach and involvement of stakeholders: states, public, private, OEMs, suppliers and after-market
- Broadening of participation of public and private sectors and universities
- First ITS Fellow
- International cooperation and standards harmonization
- April 11, 2011



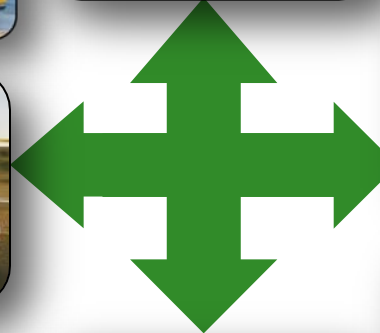
# ITS Research = Multimodal and Connected

Drivers and Operators

Maritime



Vehicles and Fleets



Rail

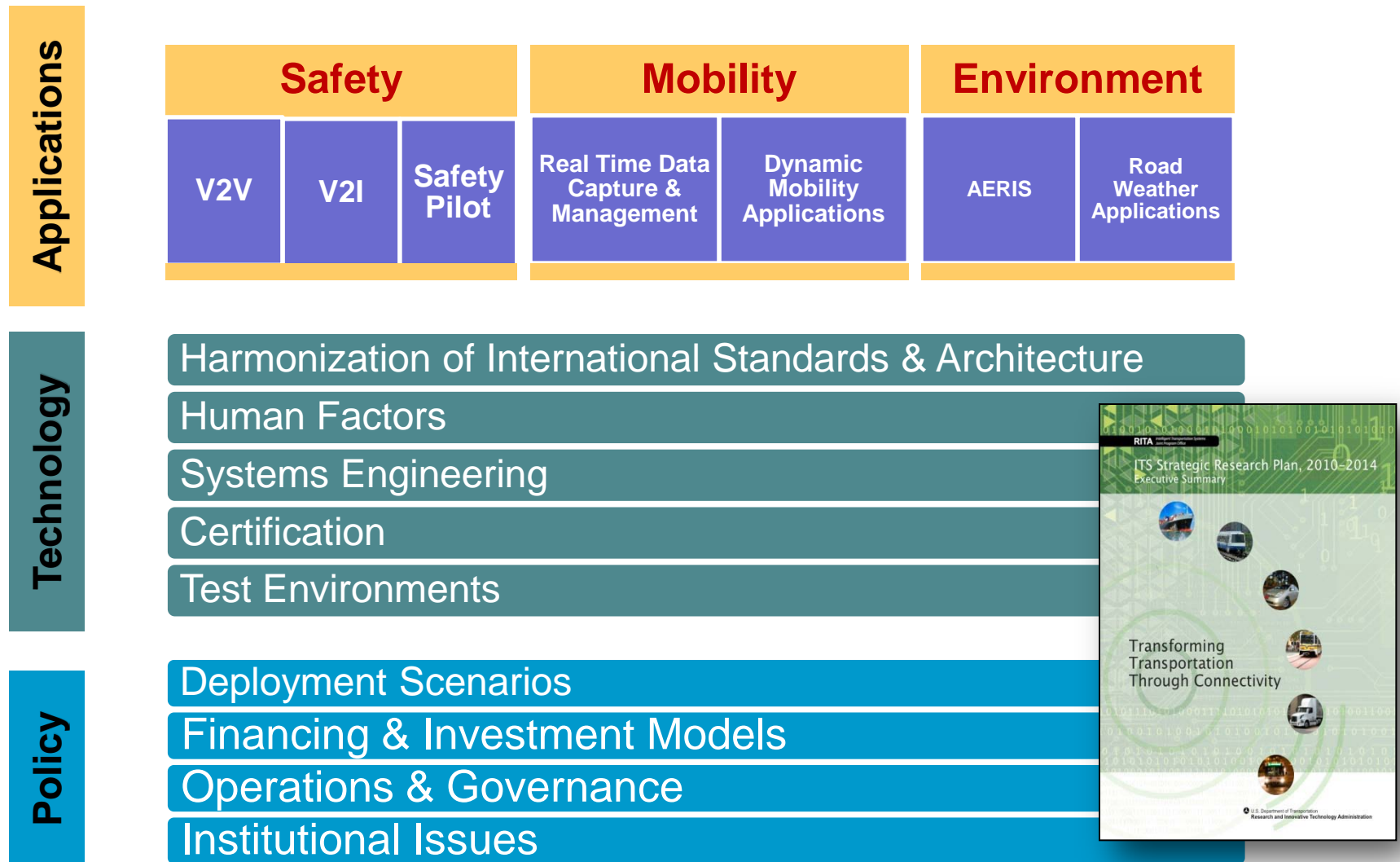


Infrastructure

Wireless Devices

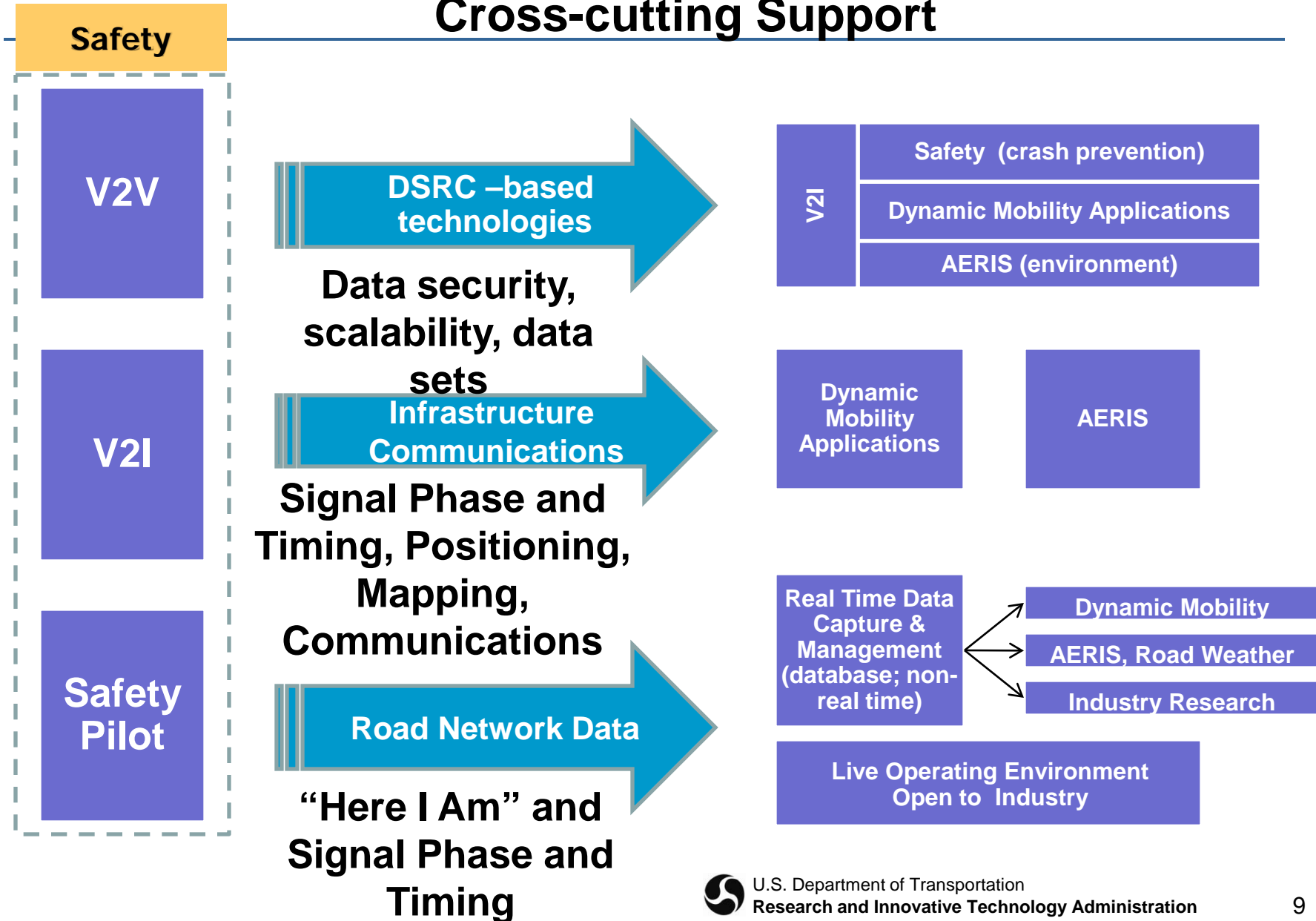


# ITS Strategic Research Program Components

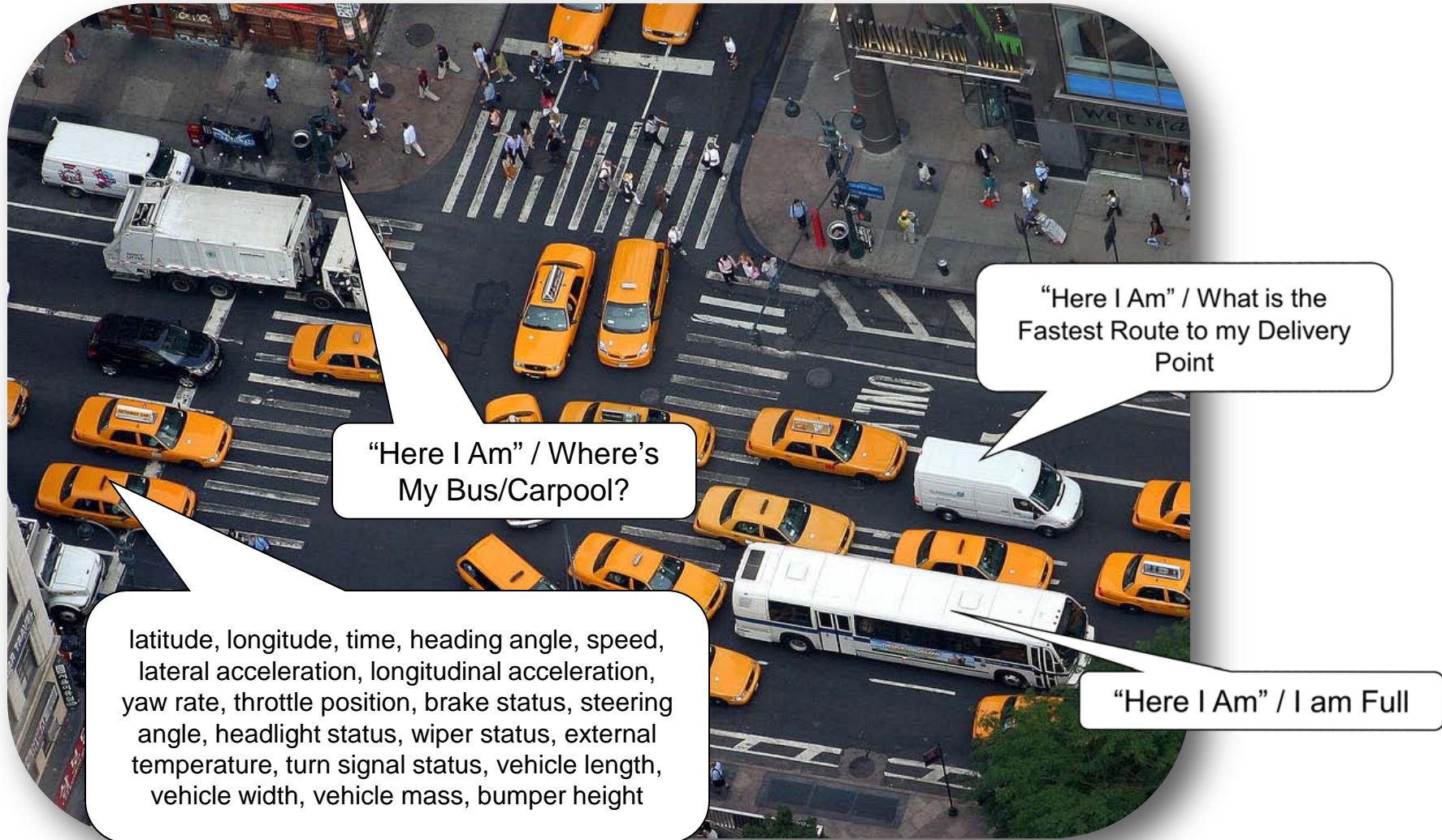




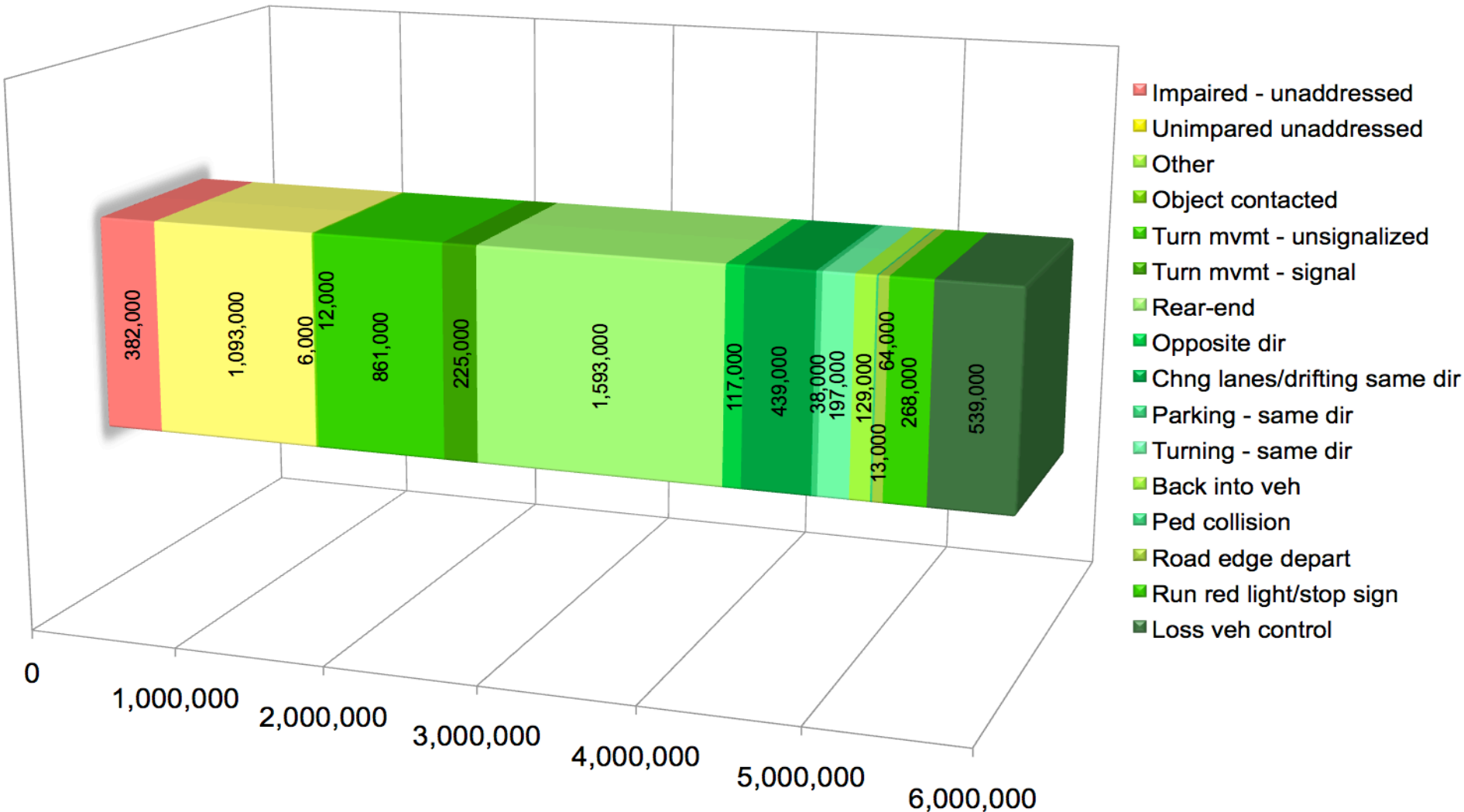
# Safety Program Activities Provide Cross-cutting Support



# A World With Connected Vehicles and Travelers



# Potential to Address 75% of Crashes



# Opportunity for Transformational Safety: V2V and V2I

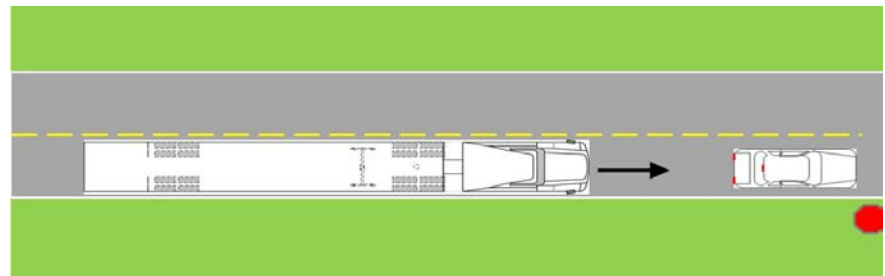
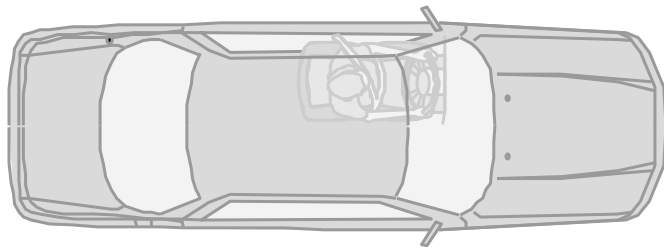
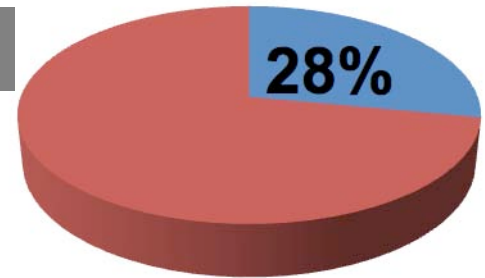
- **Greater situational awareness**
  - Vehicles can “see” nearby vehicles and know roadway conditions that are not visible
- **Reduce or even eliminate crashes through:**
  - Driver advisories
  - Driver warnings
  - Vehicle control



*V2V+V2I have the potential to address 80% of the vehicle target crashes involving unimpaired drivers\**

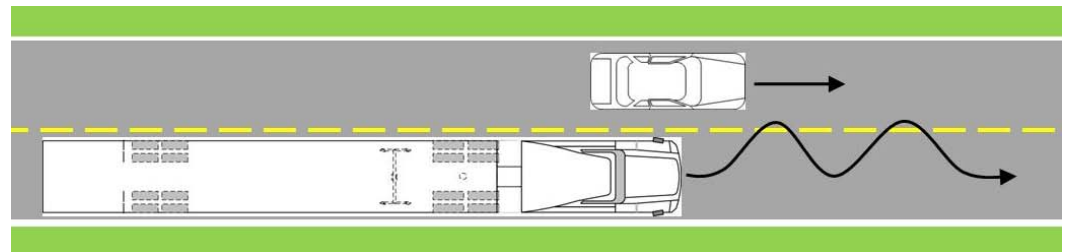
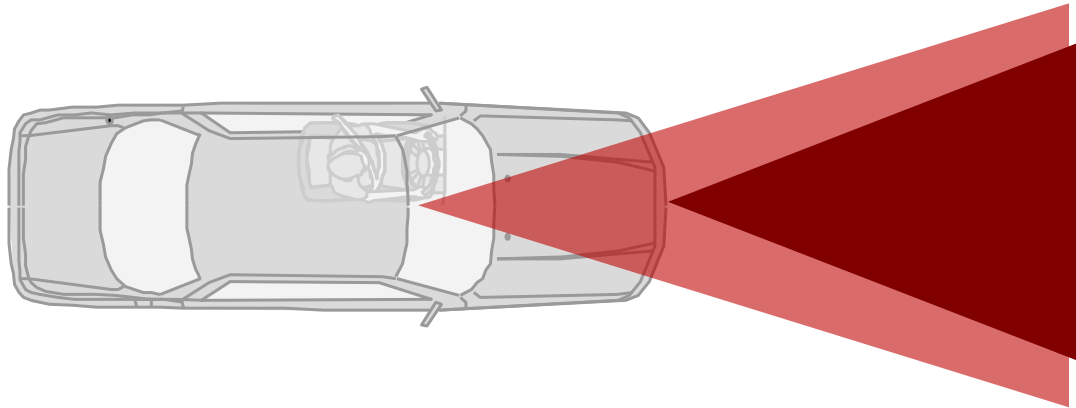
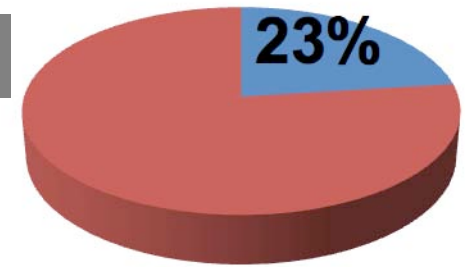
# Vehicle Based Solutions: Rear End Crashes

32,788 Annual Crashes



# Vehicle Based: Lane Departure Crashes

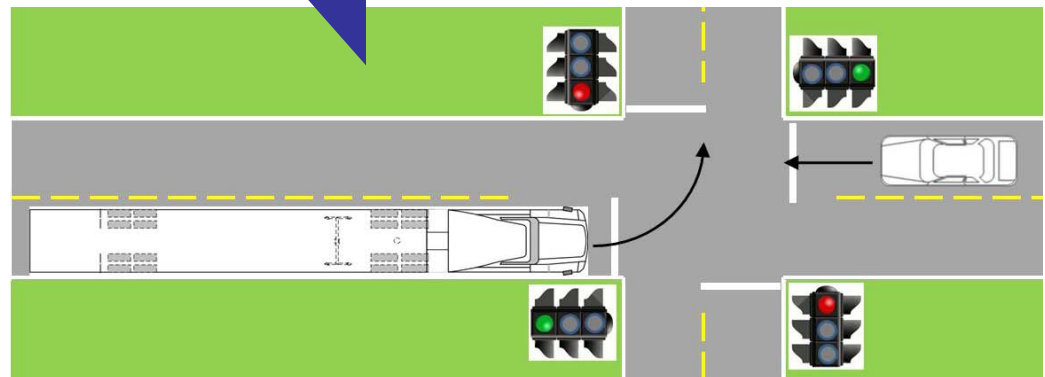
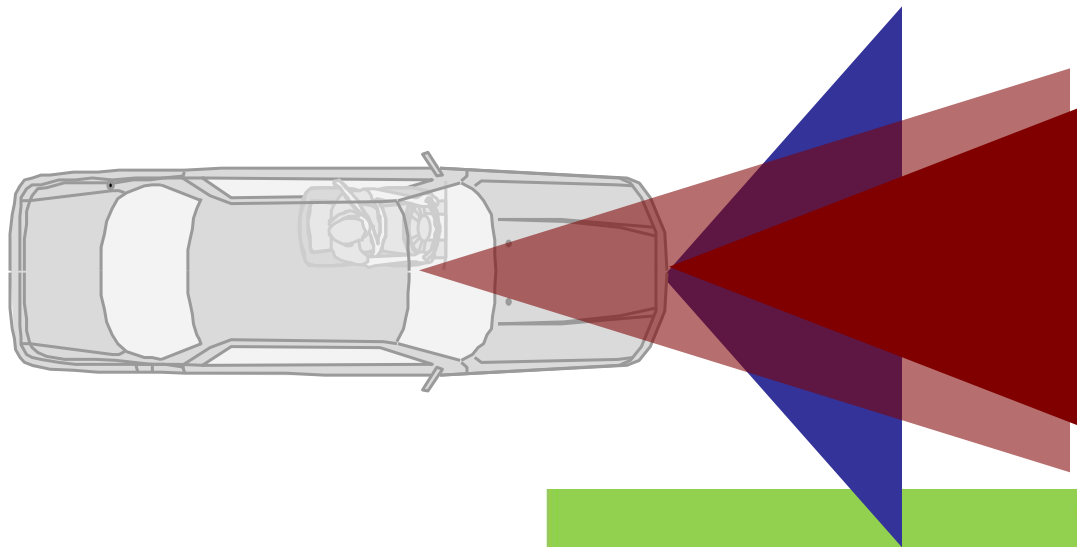
32,788 Annual Crashes



# Vehicle Based: Intersection Crashes

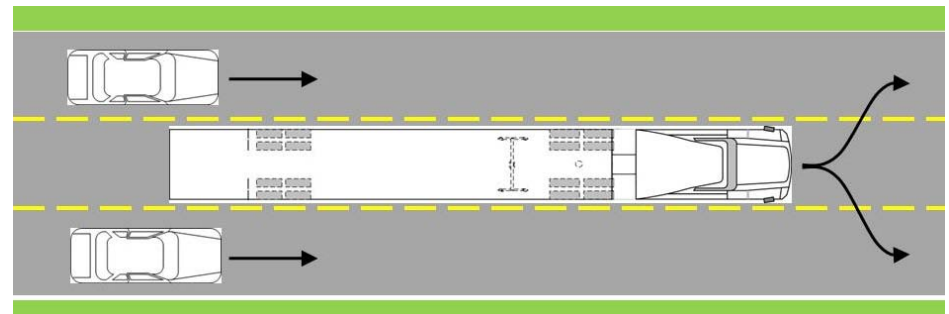
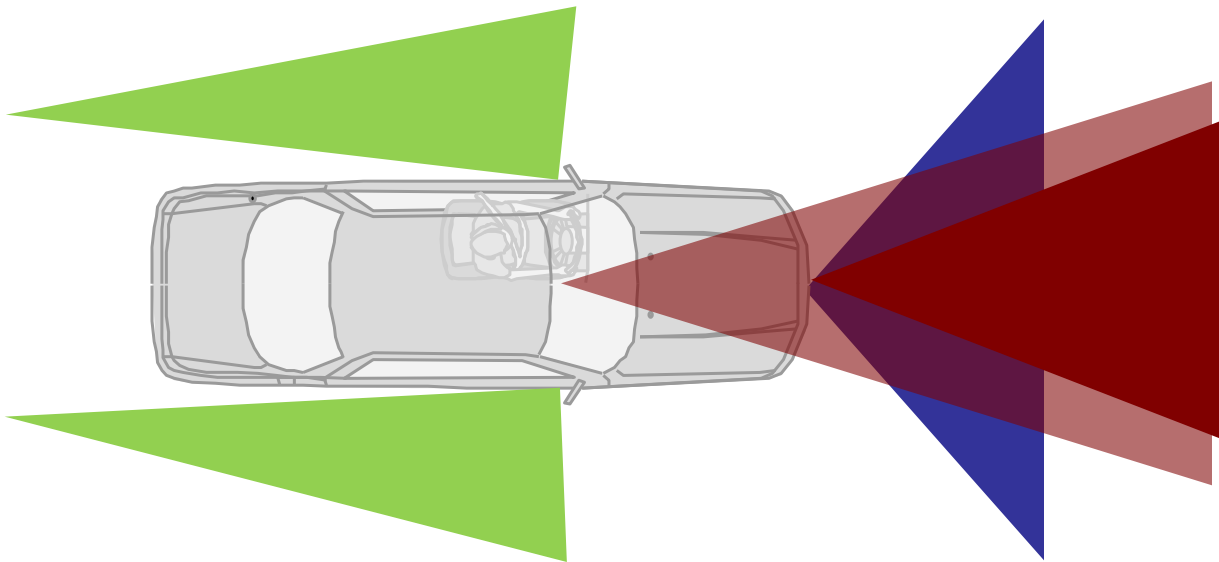
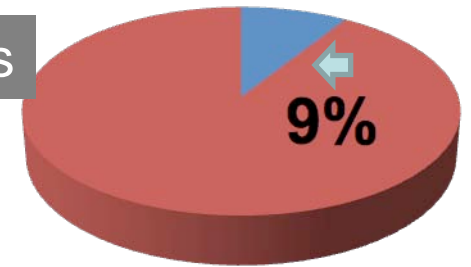
32,788 Annual Crashes

25%



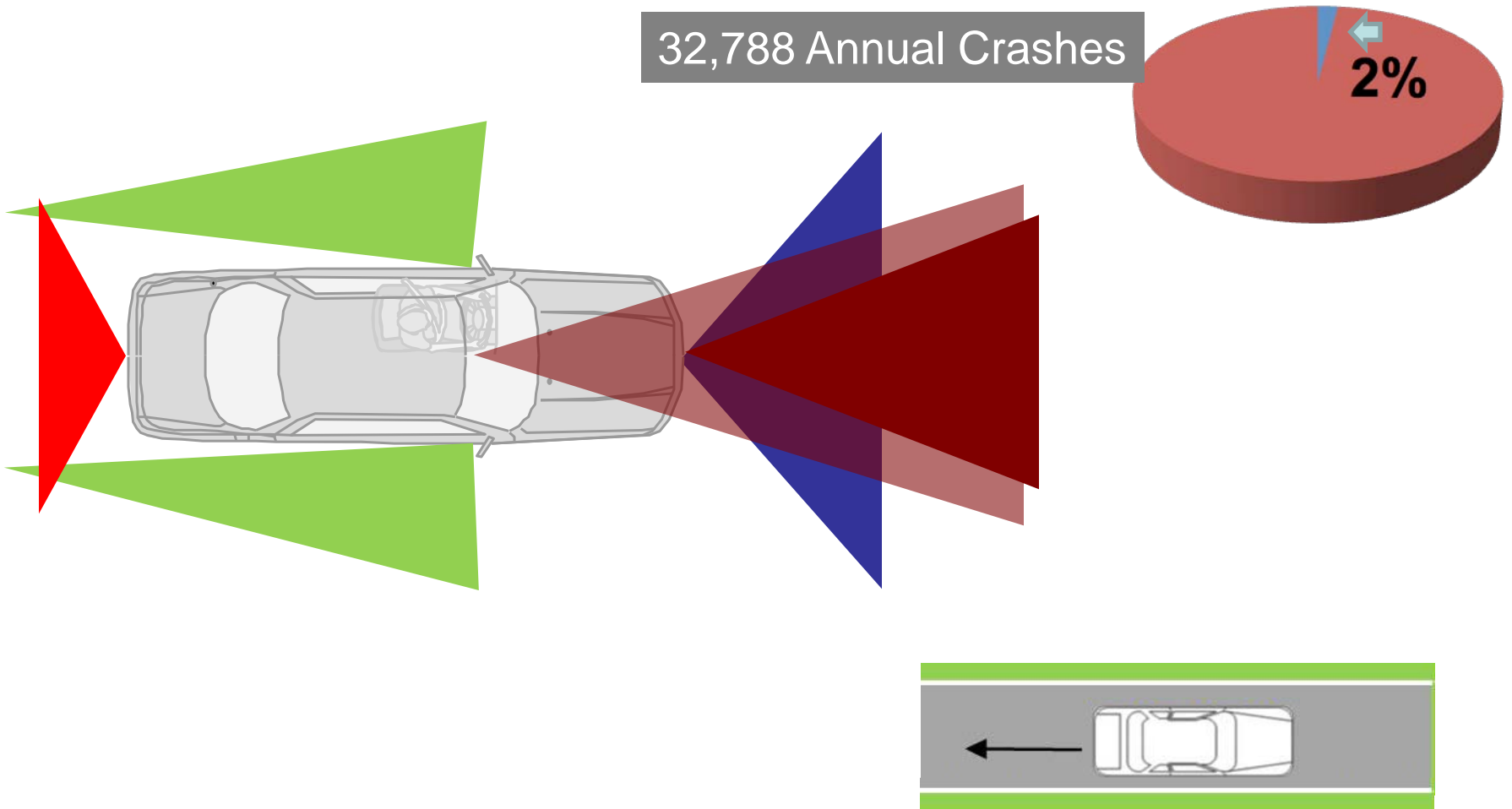
# Vehicle Based: Lane Change Crashes

32,788 Annual Crashes



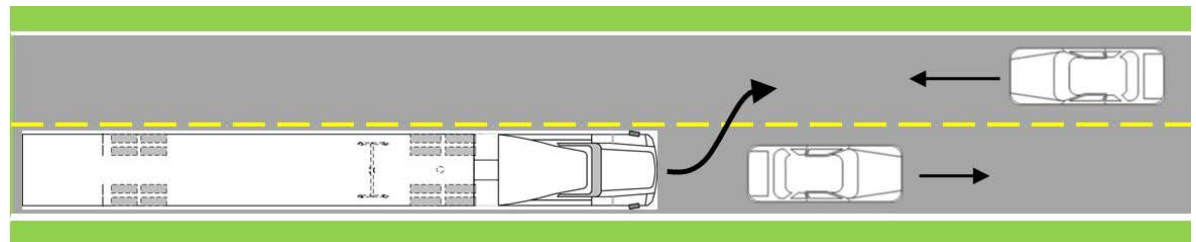
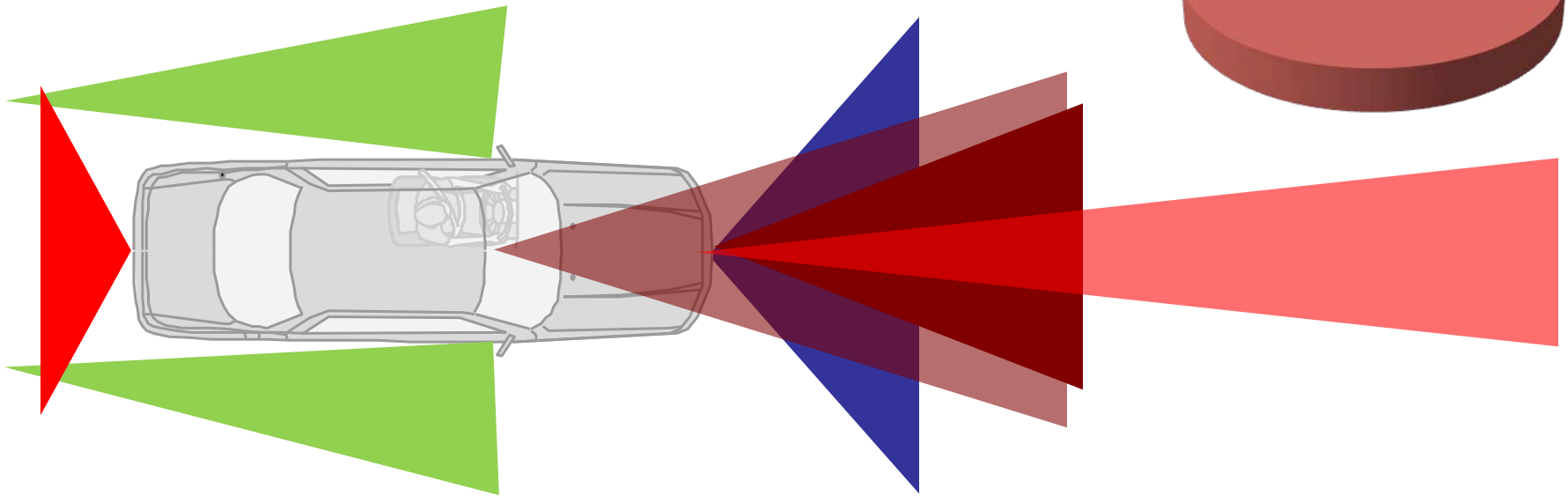
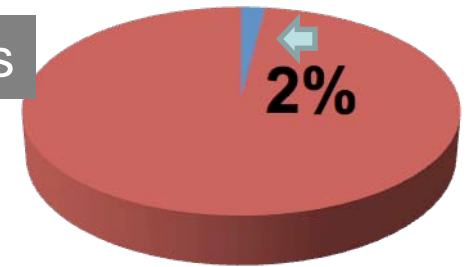


# Vehicle Based: Back Over Crashes



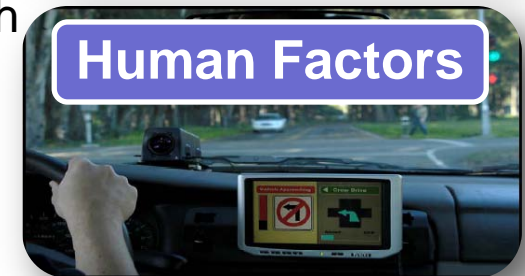
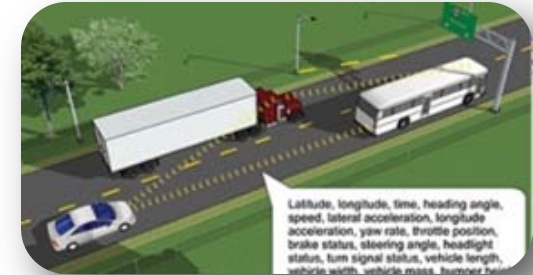
# Vehicle Based: Opposite Direction

32,788 Annual Crashes



# Safety Pilot 2011-2013

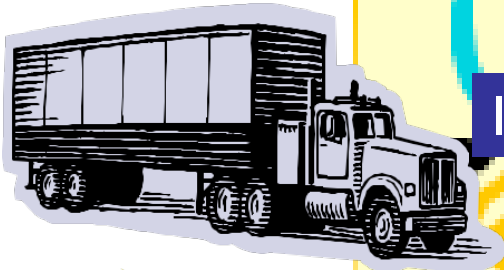
- Major field test and real world implementation
  - Multiple vehicle types: cars, fleets, trucks, buses
  - Fully integrated systems & aftermarket devices
  - Prototype security mechanisms
  - Certification processes
- Goals
  - Support real world V2V & V2I applications with data rich environment
  - Establish benefits data in support of NHTSA 2013 Agency Decision
  - Public awareness & determine user acceptance
- Outcomes
  - Benefits and user acceptance data for supporting future federal actions
  - Archived road network data for supporting mobility, environmental, and other research
  - Multiple supplier sources for devices and infrastructure
  - Better understanding of the operational policy issues associated with the deployment of V2V and V2I



# Safety Pilot: Model Deployment



Integrated Vehicles



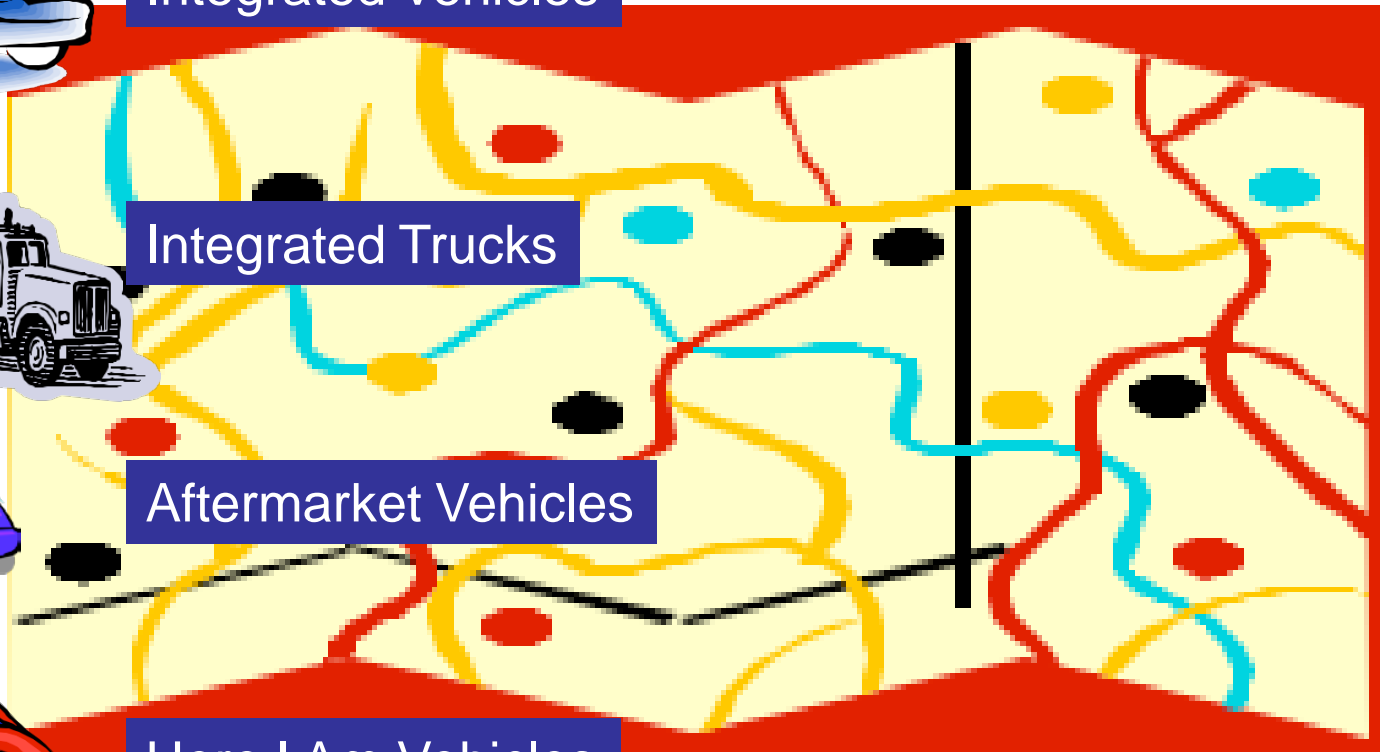
Integrated Trucks



Aftermarket Vehicles

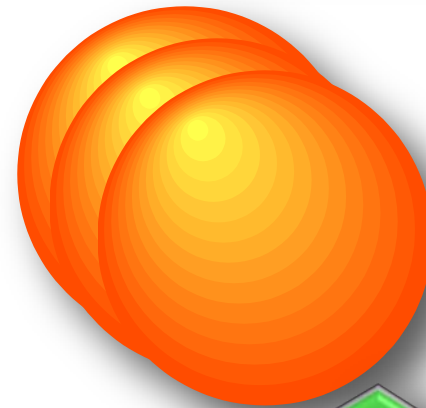
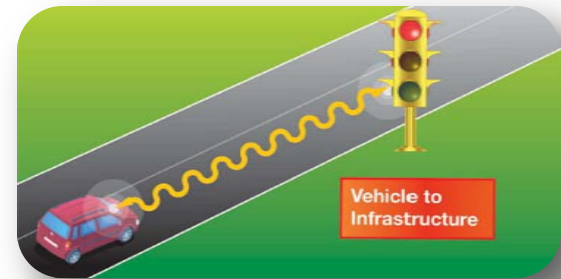


Here I Am Vehicles



# Build V to I Safety, Mobility, and AERIS Data Environments and Applications

- V to I for Safety – Accelerate Signal Phase and Timing (SPAT) Based Applications, Smart Roadside, and Transit
- Prototype the Data Environment of the Future – All Vehicles as Probes and Open Data
- Prototype, Field Test and Analyze Mobility Applications
  - Use Open Source Software Approach to accelerate deployment
- Define and Test AERIS Applications



Signal Systems  
Transit Management  
Freight  
R.E.S.C.U.E.M.E  
ATIS  
Speed Harmonization



AERIS



U.S. Department of Transportation  
Research and Innovative Technology Administration

# Deployment Acceleration

- U.S. DOT is striving to accelerate deployment and innovation in partnership with stakeholders and implementers
- Mainstreaming ITS technologies that have known benefits
- Performance measurement and rigorous evaluation
- Collaboration among transportation agencies and industry
- Considering Competitive Challenge Opportunities
  - Low cost
  - High visibility
  - Intended to assist deployers



# We Need You: Policy and Technology

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## Technological Issues

- **What are infrastructure requirements for V2V data security?**
  - Is DSRC required or are other communication technologies adequate?
  - How much and what type of infrastructure is needed?
- **Is positioning technology adequate?**
  - *Relative positioning* (V2V) versus *absolute positioning* (V2I); differing GPS manufacturers
- **Will system scale to accommodate all vehicles?**
- **Will DSRC radio channel switching for safety and other applications work? Or, will a separate safety radio be required?**

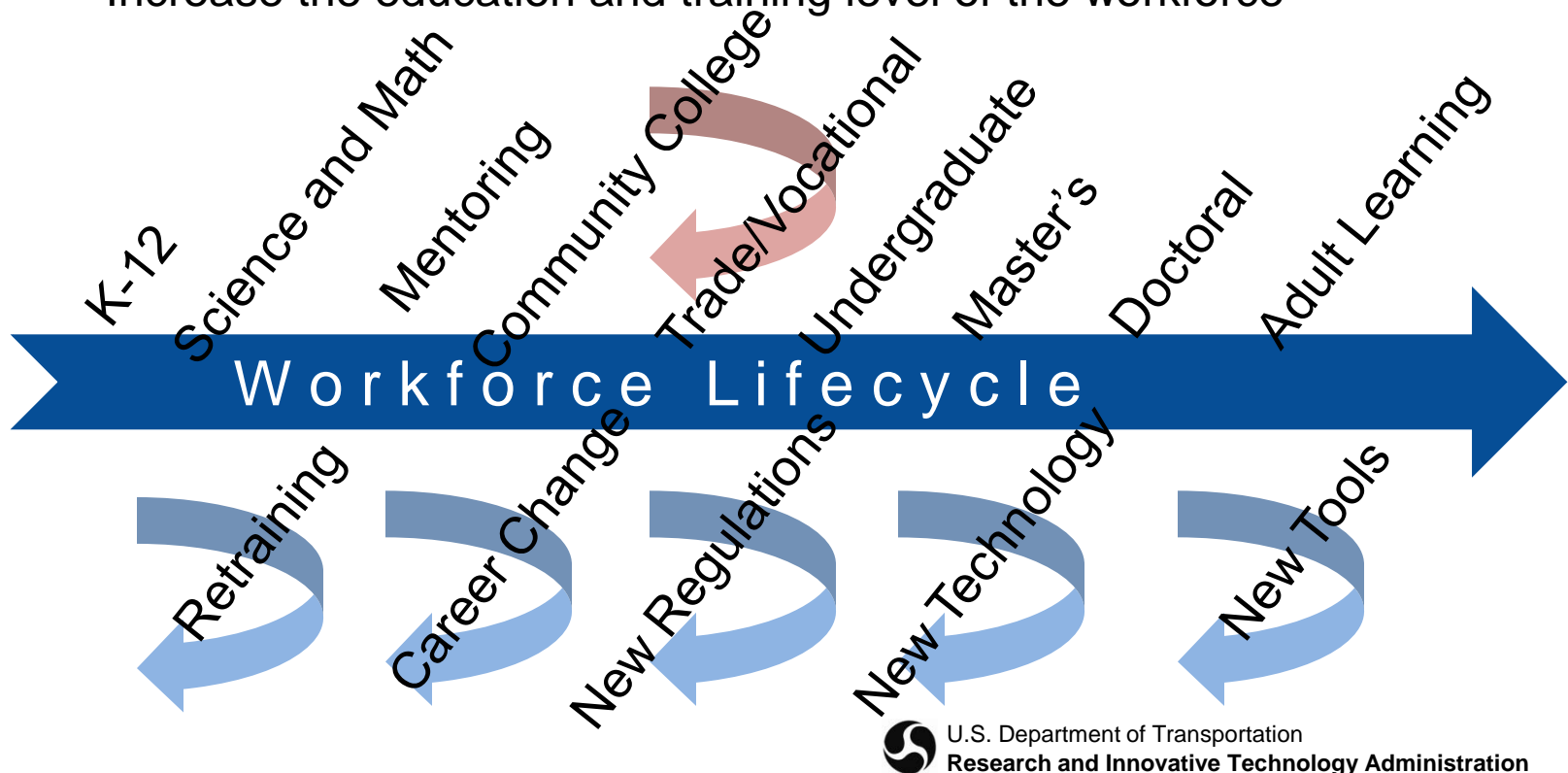
## Policy Issues

- Privacy
- Cybersecurity
- Governance
- Funding
- Deployment approach
- Data ownership
- Certification
- Sustainability
- Risk
- Liability
- Others



# Commitment to Workforce Development

- Not just technology or policy – the people are important
- We are serious about the need to attract, recruit, orient, retain, develop, and mentor a diverse, engaged, collaborative, and high performance workforce:
  - In collaboration with stakeholders, launch a multimodal workforce development initiative that anticipates demographic shifts
  - Increase the education and training level of the workforce







HOME

FIND CHALLENGES

<http://connectedvehicle.challenge.gov>

Home » U.S. Department of Transportation » Connected Vehicle Technology Challenge

# Connected Vehicle Technology Challenge

From: [U.S. Department of Transportation](#)  
Category: Energy & Environment, Personal and Public Safety, Science & Technology

Details

Discussions (4)

Submissions (12)

Blog (1)

Rules

Post a submission

- Detailed description
- How to enter
- Important dates
- Judges
- Judging criteria
- Prizes

New wireless technology enables connectivity for vehicles of all kinds—cars, trains and even bicycles. Vehicles can “talk” to each other, traffic signals, and mobile devices. What should they say?



## Connected Vehicle Technology Challenge

### Detailed description

America’s transportation system is among the best in the world, but Americans face crash risks, congestion, environmental impacts, and other detriments that erode our quality of life. Smart ideas on how to apply advanced wireless technology can make the transportation system safer, more efficient and even “greener.”

An advanced open source wireless technology called Dedicated Short-Range Communications (DSRC) allows vehicles of all kinds, whether traveling slowly or even over 60 mph, to communicate with each other, stationary roadside equipment, and mobile devices. Thus far, the majority of applications have been aimed toward crash avoidance.



**Submissions**  
End in about 1 month



**137**  
supporters

I support this challenge!

### Share

0



Tweet

Facebook

Email

### Supporters



**Arachnid**

less than a minute ago

**Closes  
May 1,  
2011**

# ITS Video Challenge: Tell Your Story



## ▪ The Challenge

- Grab your camera and show us how ITS deployment is making a difference in your community
- Sponsored by RITA, FHWA and FTA.

## ▪ How To Enter

- Tell your story highlighting an ITS success story: how did you do it? How did you convince the decision makers? Did you measure the benefits? Who were your partners? How can someone reach you to try to replicate it in their community?
- Include highway, freight, transit, pedestrian, bicycle, rail, urban, rural, north, south, east and west!
- Post your video on YouTube and send us the link ([open@dot.gov](mailto:open@dot.gov)) before July 1, 2011
- Describe your deployment, success in highlighting benefits, be creative!

## ▪ Judging and Awards


- USDOT and stakeholders such as AASHTO, APTA and ITS America
- Winners will be recognized in various ways and top prizes will include travel to the ITS World Congress in Orlando, October 2011

## ▪ More Information

- See [www.its.dot.gov](http://www.its.dot.gov) very soon!



# Thank You!



**RITA** U.S. Department of Transportation  
Research and Innovative Technology Administration

Intelligent Transportation Systems  
Joint Program Office

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RITA Updated March 22, 2011 1:06 PM

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**Message to Stakeholders from RITA Administrator Peter Appel**

RITA is working with our colleagues and stakeholders to implement the Intelligent Transportation Systems (ITS) Strategic Research Plan, 2010 - 2014. [Read more...](#)

**Spotlight**

- ITS Trucking Technology Featured in Journal of Commerce Blog 3/10/11
- U.S. DOT Provides Updates to Recent Safety Pilot Procurements 3/7/11
- ITS JPO Announces New Vacancy for Transportation Specialist: Data and Road Weather 3/3/11

[More News>>](#)

**Our Current Research**

[Applications](#)
[Mode-Specific](#)
[Cross-Cutting](#)

- ▶ Vehicle-to-Vehicle Safety
- ▶ Vehicle-to-Infrastructure Safety
- ▶ Real-Time Data Capture
- ▶ Dynamic Mobility Applications
- ▶ Environment
- ▶ Road Weather

[More >>](#)

Welcome

**Dr. Robert Bertini**  
Deputy Administrator  
RITA



[Biography](#) | [Video](#)

**Procurement Opportunities**

As we implement the ITS Research Strategic Plan, open procurements may become available through a variety of solicitations. [More >>](#)

**Public Meetings** [View >>](#)

**Connected Vehicle Technology Challenge**

When vehicles talk to each other  
**what should they say?**

[>> Take the challenge!](#)

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