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November 20, 2008

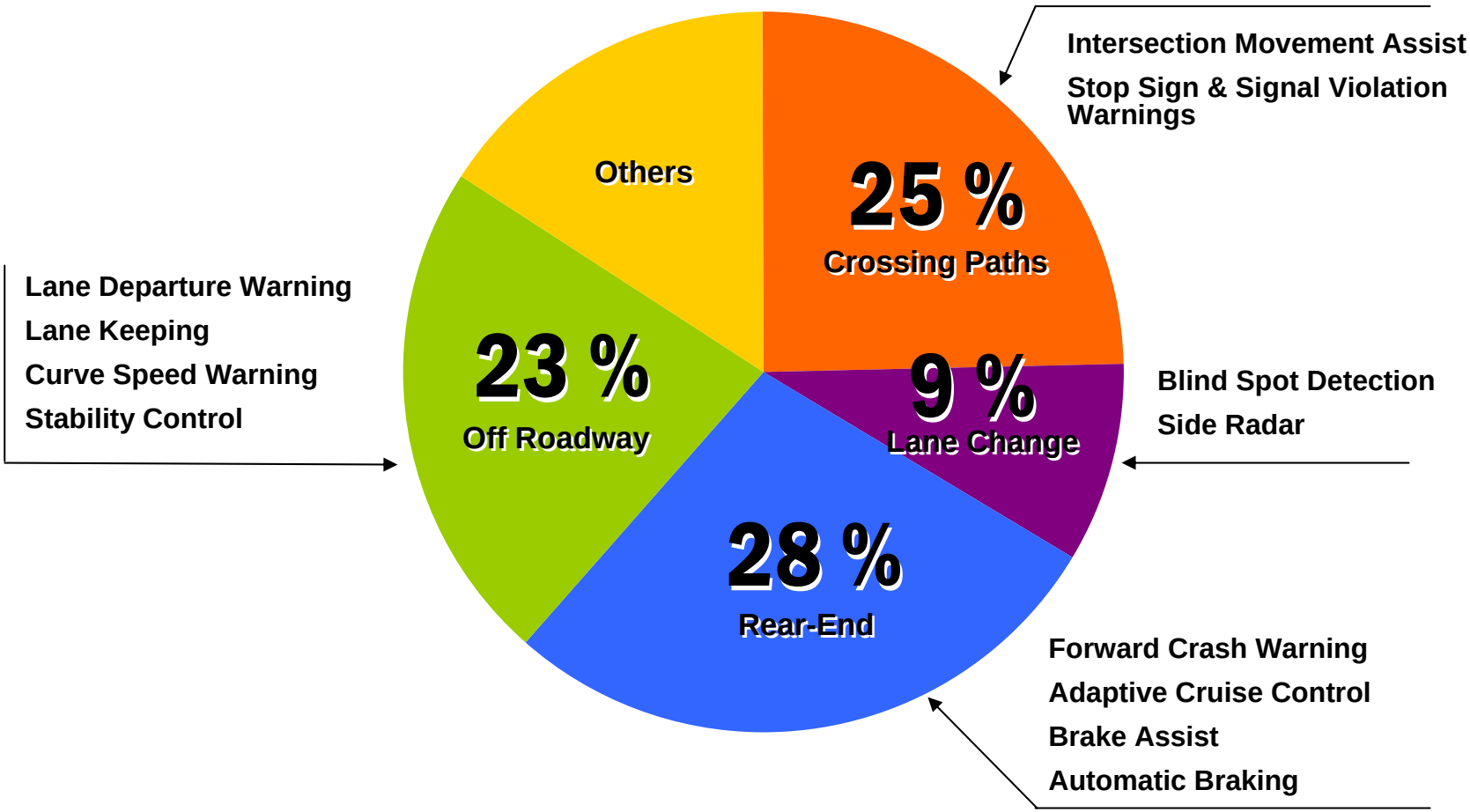
NHTSA Vehicle Safety ➲ ITS World Congress ➲

Motor Vehicle Traffic Crashes 2007

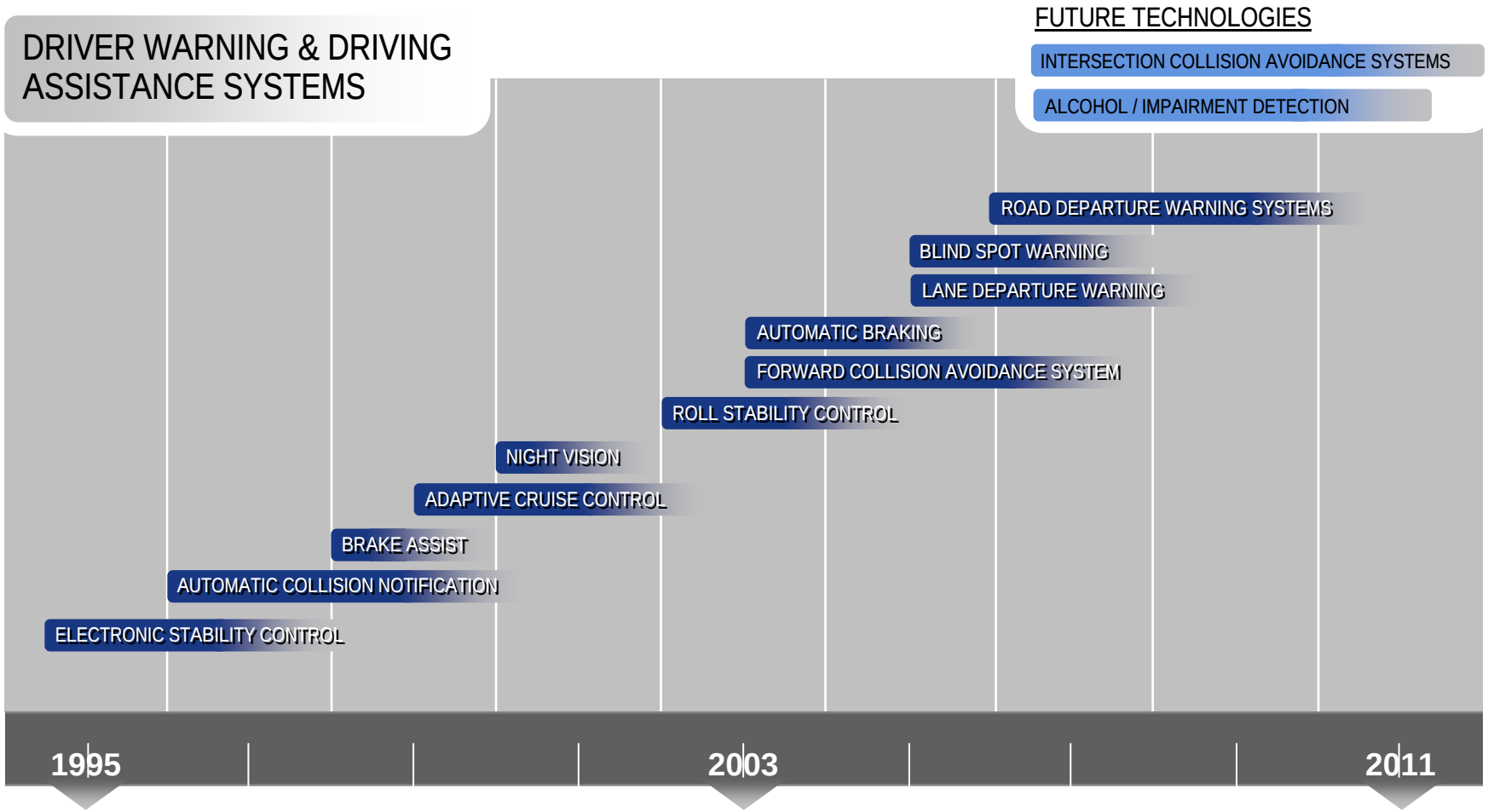
- **6,024,000 crashes**
- **41,059 fatalities**
- **1.37 fatalities per 100 million VMT**
- **2.49 million injures**

Crashes of all Severities

2007 GES



Automotive Technologies Timeline



Cooperative vs. Vehicle Based Systems

- **Performance**
  - Demonstrated effectiveness for Vehicle-Based technologies (e.g, FCW, LDW)
  - Issues with false alarm rate and some crash scenarios
  - V-V may work in more crash scenarios but requires DSRC
- **Deployment**
  - Cooperative systems introduce challenges from interoperability and compatibility issues
  - Vehicle Based Systems have immediate Effectiveness
  - V-V less expensive

Safety Applications

V-V

- Forward Collisions
- Road Departure
- Intersection
- Lane Change/ Merge

V-I

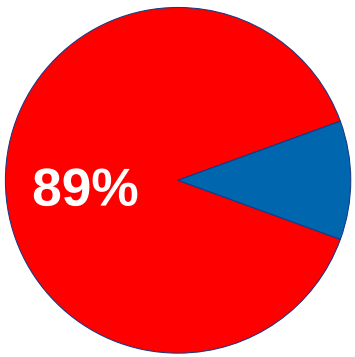
- Intersection
- Road Departure

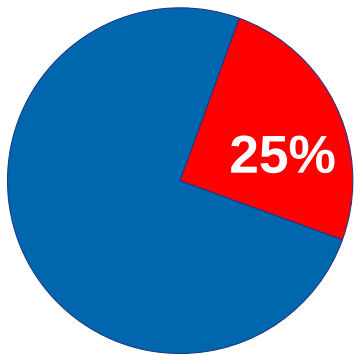
Driver Information

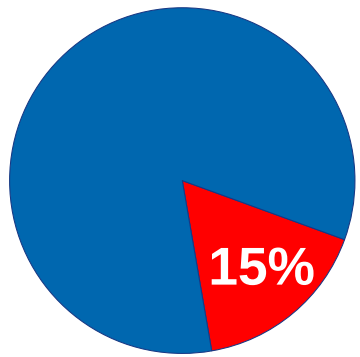
- Hazard Warning
- Weather
- Navigation

Requires DSRC

Communication Options







Percent of All Crashes Addressed

Current Activities: Vehicle Safety Communications-Applications (VSC-A) Program

- **Partnership**
  - CAMP (Ford, GM, Honda, Mercedes, Toyota) and USDOT cooperative agreement
- **Focus on DSRC**
  - FCC spectrum allocation
  - Relative Positioning
- **Applications – Address most significant crash problems**
  - Emergency Electronic Brake Light (EEBL)
  - Forward Collision Warning (FCW)
  - Intersection Movement Assist (IMA)
  - Blind Spot Warning + Lane Change Warning (BSW +LCW)
  - Do Not Pass
- **Anticipated outcomes through 2009**
  - Build / demonstrate V-V communications + positioning
  - Evaluate with objective test procedures
  - Estimate Safety Benefits

Looking Forward

- **Planning**
  - World Congress Demonstration
  - Request for Information
  - International Vehicle Communications Workshop
    - 8:30 Friday, November 21 @ Javitz Center
    - Goal: facilitate global understanding about what needs to be done and how to move forward Cooperative Systems

Next Steps
Develop Advanced Applications

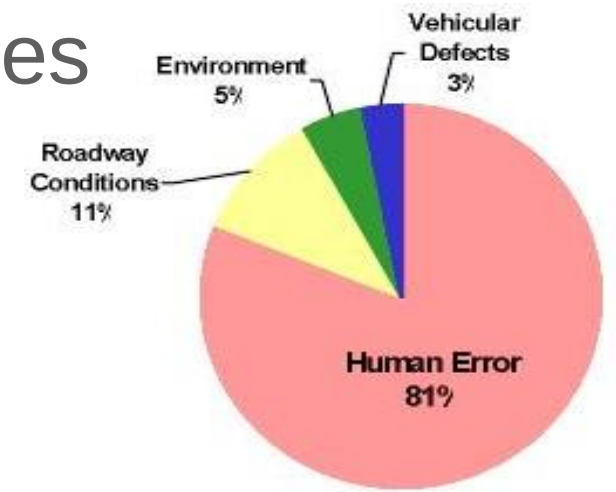
- **Current Applications**
  - Emergency Electronic Brake Light (EEBL)
  - Forward Collision Warning (FCW)
  - Intersection Movement Assist (IMA)
  - Blind Spot Warning + Lane Change Warning (BSW +LCW)
  - Do Not Pass
- **Next Generation**
  - Integrated Safety
  - Collision Avoidance
  - Head-on Collisions
  - Pedestrian

Priority Issues for Vehicle Communications

- **Message sets**
  - Standard messages not functions for safety applications
  - Forward compatibility
  - Prioritization scheme and management
- **Interoperability Certification**
  - Compatibility (verify compliance)
  - Data Quality (accuracy, latency, reliability, …)
- **Security**
  - Framework
  - Implementation and management
  - Privacy Policies
    - Balance driver expectations with security and functionality requirements
- **Enforcement Mechanisms**
  - Spectrum misuse (power control, protocols)
  - Malicious Intent

Human Factors Research

- **Human Machine Interface (HMI) is critical to ensure:**
  - Effective crash prevention and mitigation
  - No unintended consequences
    - Increased driver workload
    - Risk compensation
  - Consumer acceptance



Source: Syntheses Report: Examination of Target Vehicular Crashes and Potential ITS Countermeasures, Wassim Najm, et al, DOT HS 808 263

Conclusion

- **Vehicle Communications will enable advanced and effective safety applications**
- **DSRC and Relative Positioning are needed to provide active safety applications**