



FISITA 2006 World Automotive Congress
Plenary Session - Safety

**Vehicle Safety:
Are Technologies the Answer
For the Future**
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Outline

1. Safety Problems

2. Role of Technologies in Safety

3. Current and Future Technologies

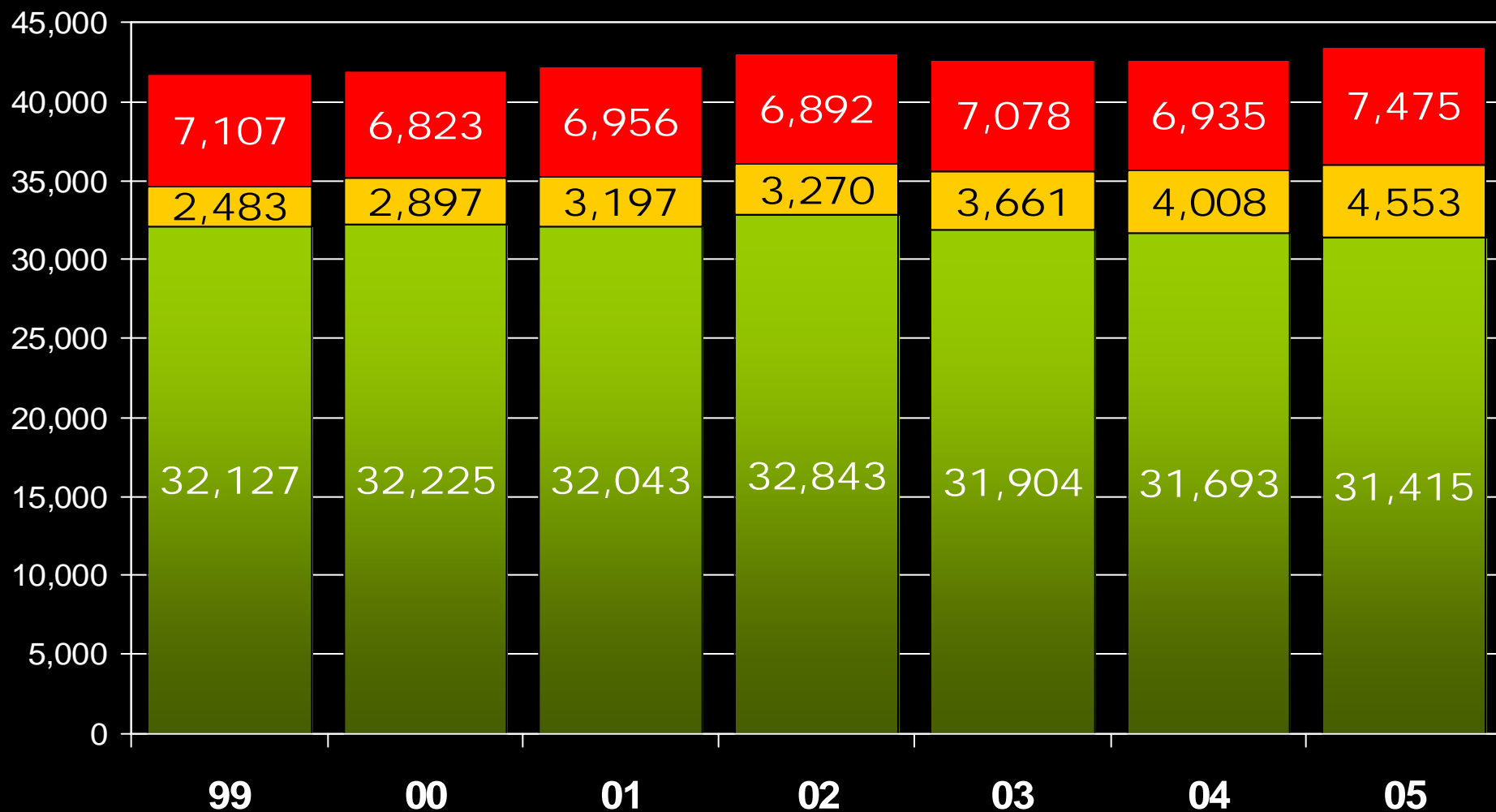
4. Accelerating Innovative Technologies

5. Conclusions



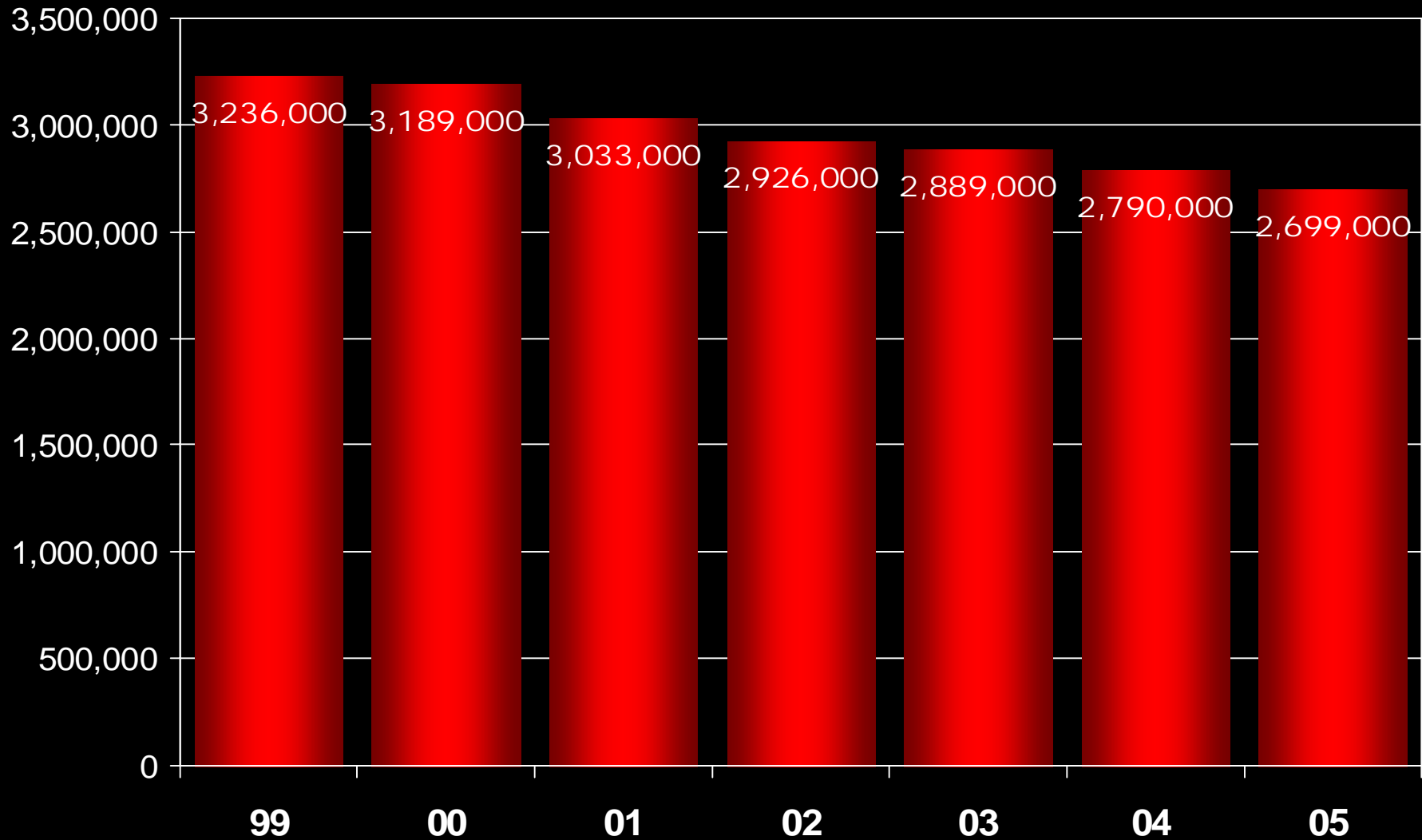
Motor Vehicle Fatalities

■ Passenger Vehicle Occupants ■ Motorcycle Riders ■ Truck & Bus Occupants/Non-Motorists





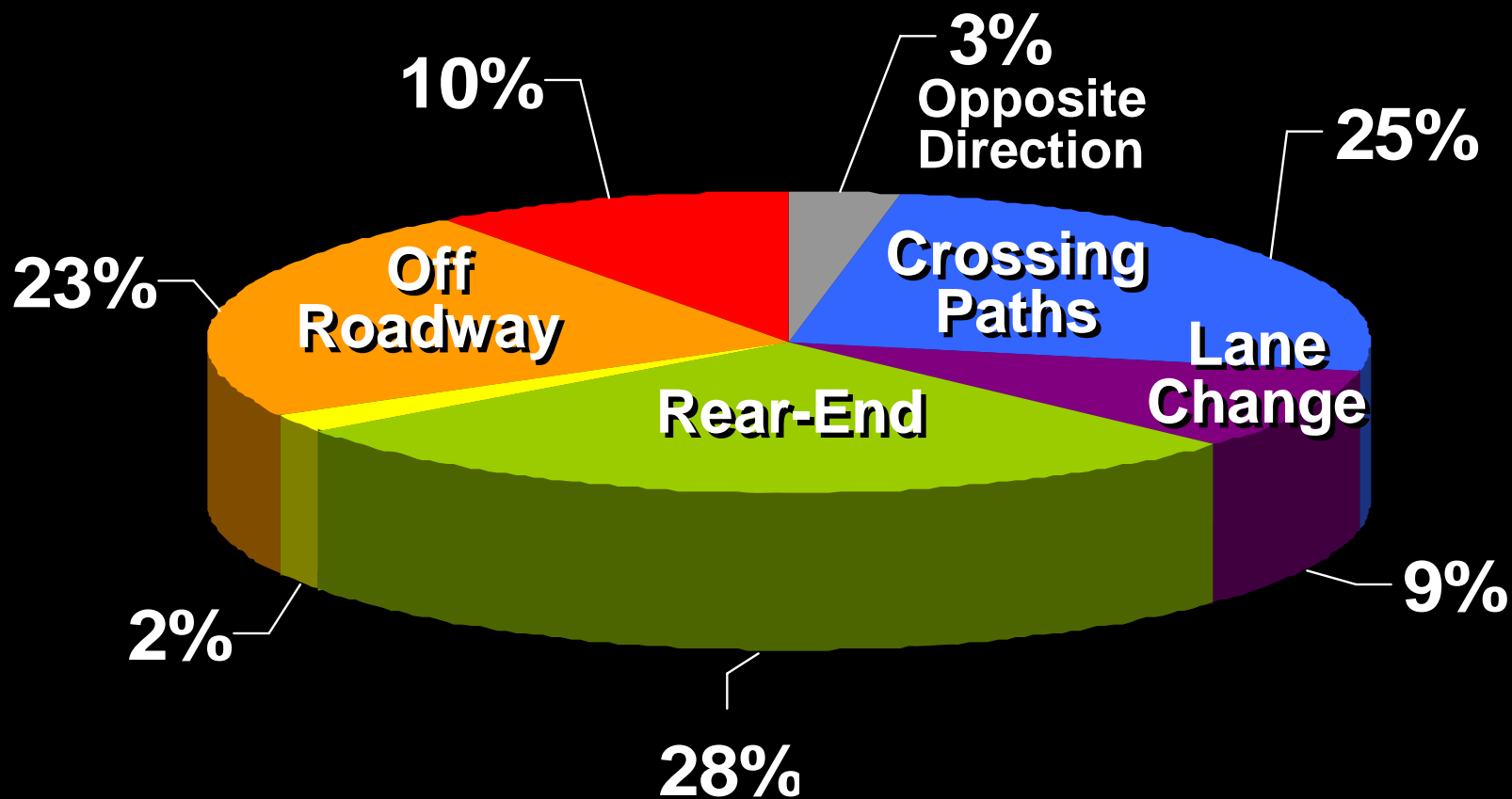
Motor Vehicle Injuries





Crashes of all Severities

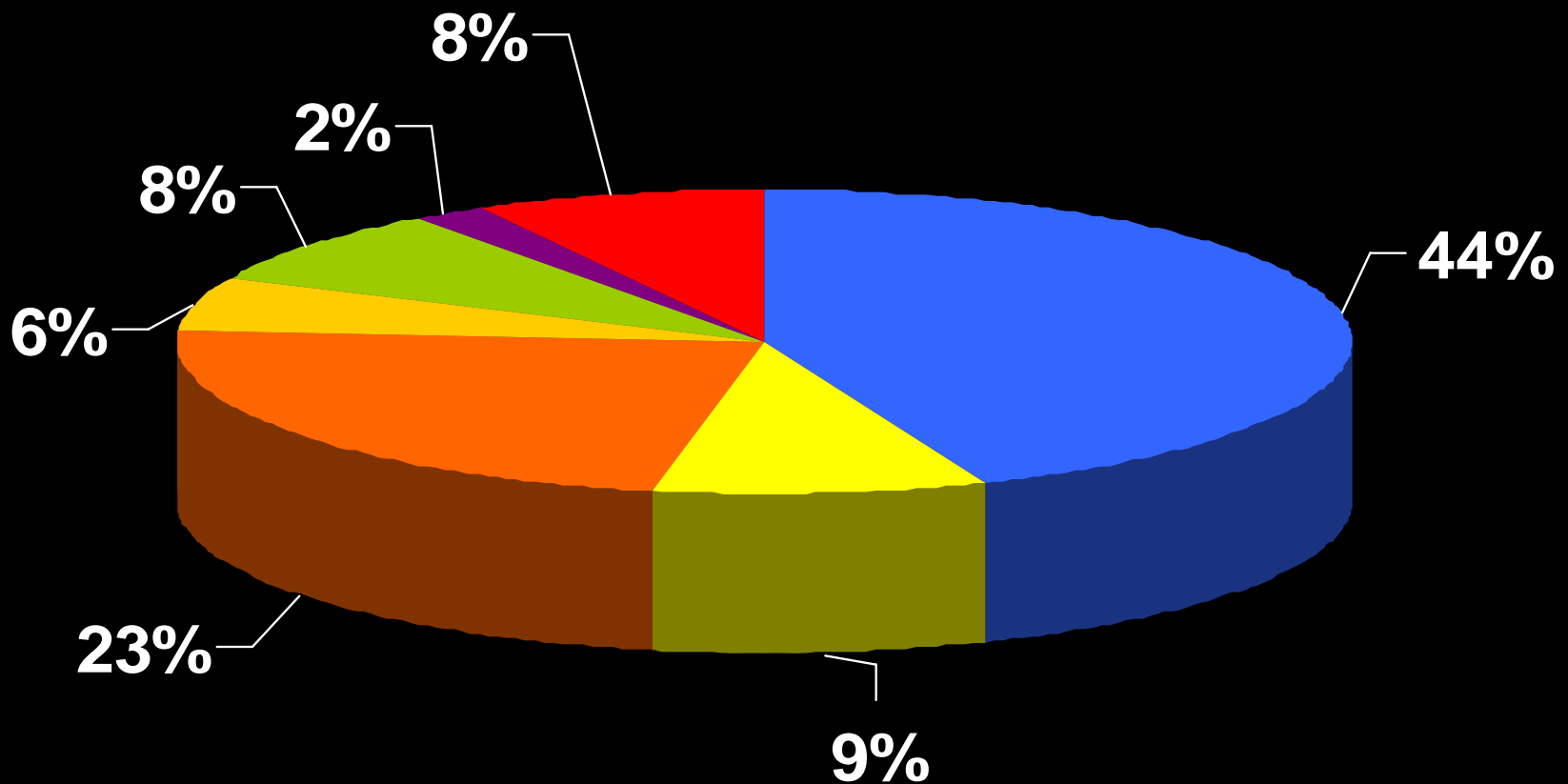
- Opposite Direction
- Crossing Paths
- Lane Changes
- Rear-End
- Ped/Cyclist
- Off Roadway
- Other





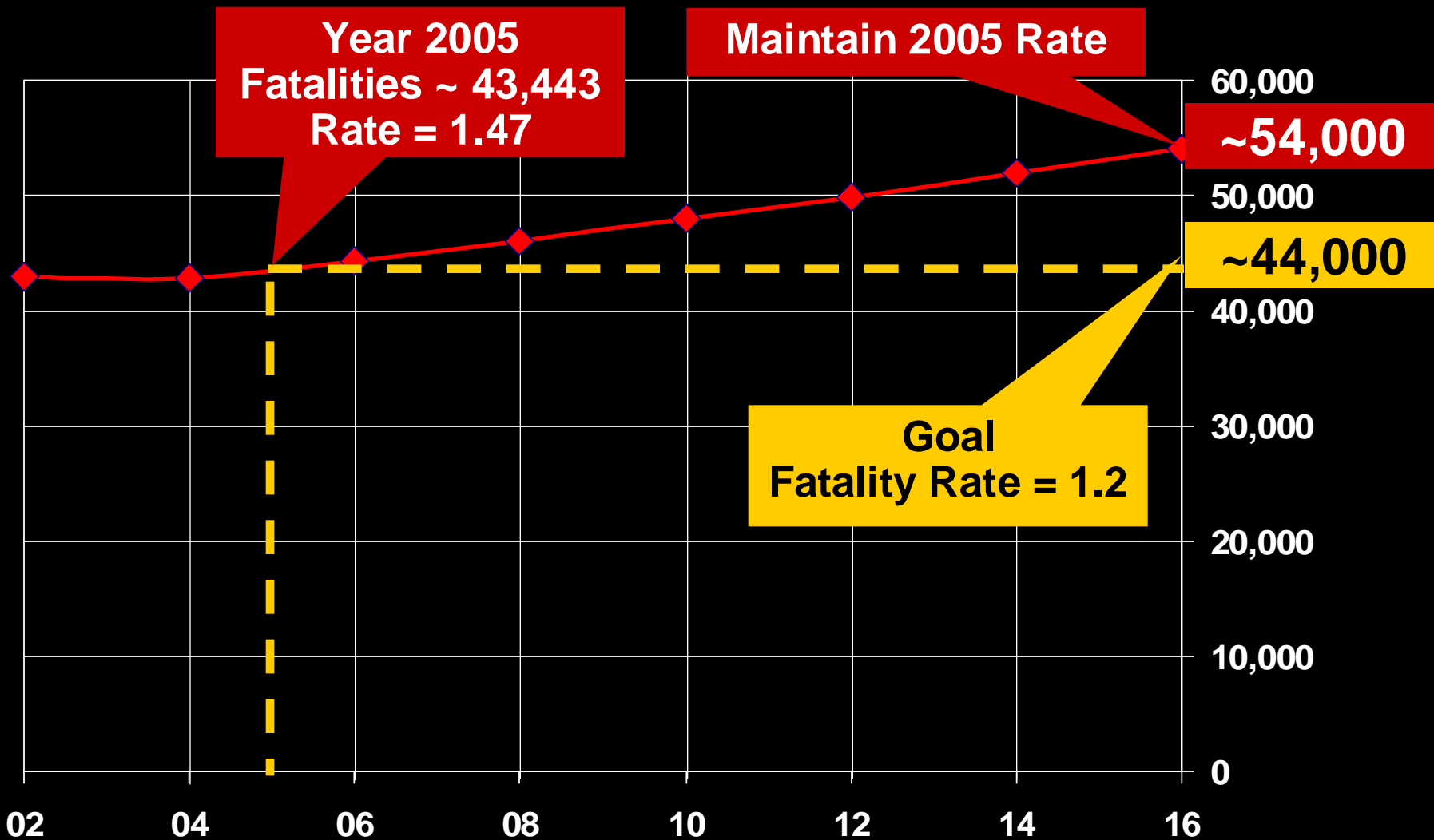
Crash Causal Factors

- Recognition Errors
- Erratic Actions
- Decision Errors
- Drunk
- Drowsy
- Vehicle Defects
- Bad Surface Conditions





Fatality Reduction Goal is Challenging





Integrated Safety Concept

Crash Time Line



Prevention

**Severity
Reduction**

**Injury
Mitigation**

**Medical
Attention**

Warn



Intervene



Protect



Notify

- . Pre-activated Restraints
- . Pedestrian Protection
- . Adaptive Structures
- . Adaptive Restraints

- . Enhanced Crash Notification
- . Tailored Medical Attention



Automotive Technologies Timeline

Occupant Protection Systems

Adaptive Restraint System

Whip-Lash Protection

Reversible Belt Tensioners & Load Limiters

Occupant Readiness Monitoring

Belt Minders

Child Seat Mounting Systems

Comprehensive Restraint Systems (belts & airbags)

Energy Absorbing Structures

2006

2010



Automotive Technologies Timeline

Driver Warning & Driving Assistance Systems



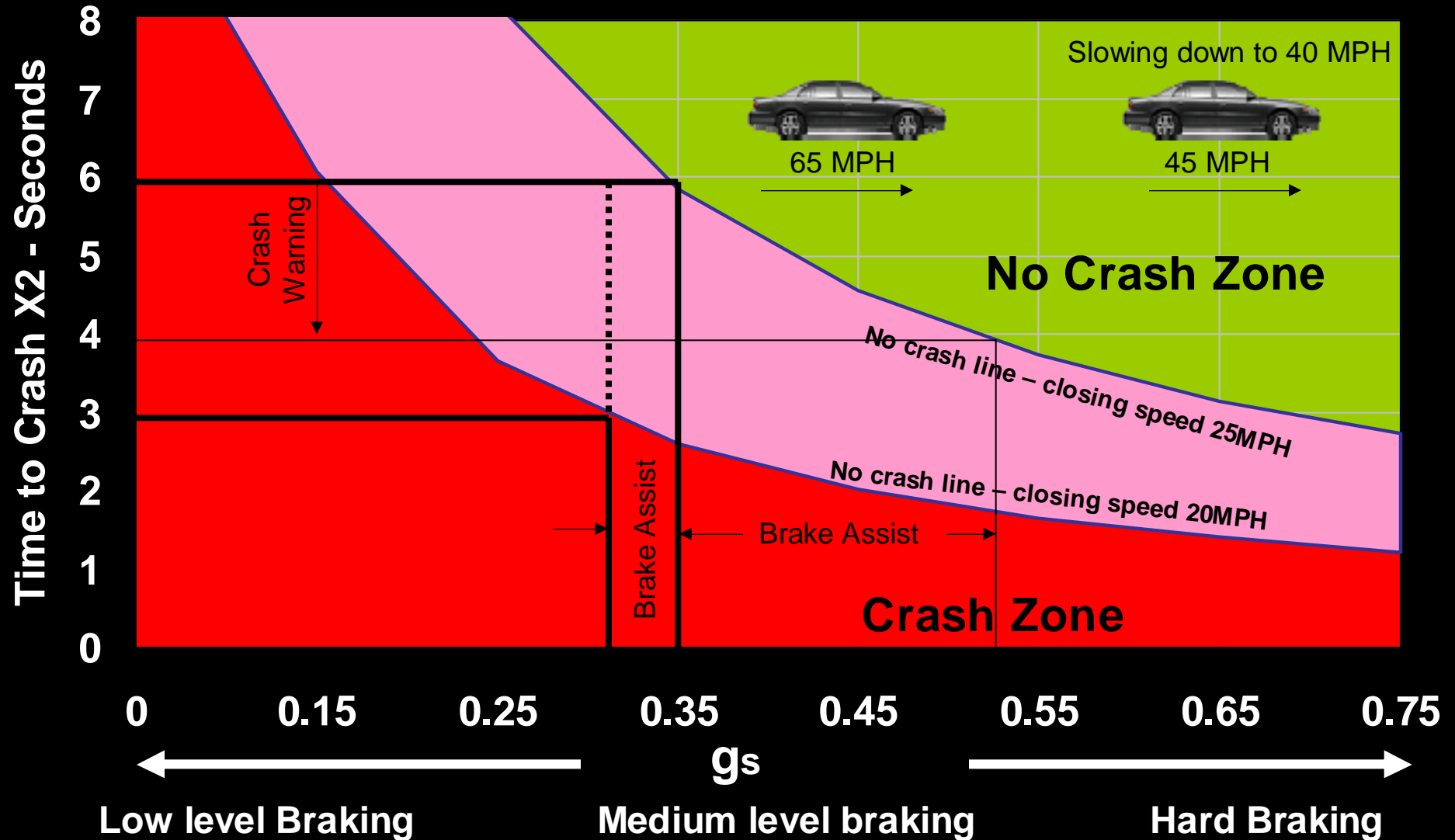


The Challenge

How do we know if these systems, and others, improve or degrade safety?



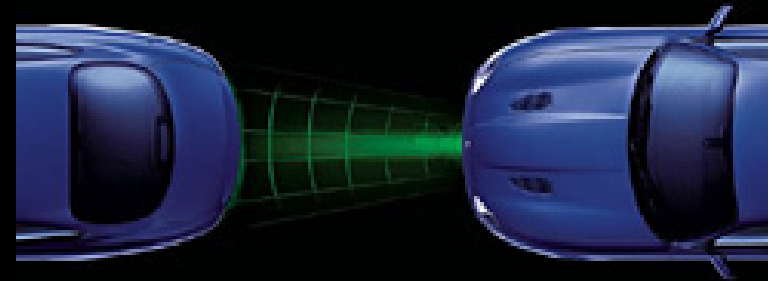
Effect of Rear-End Collision Avoidance Technologies



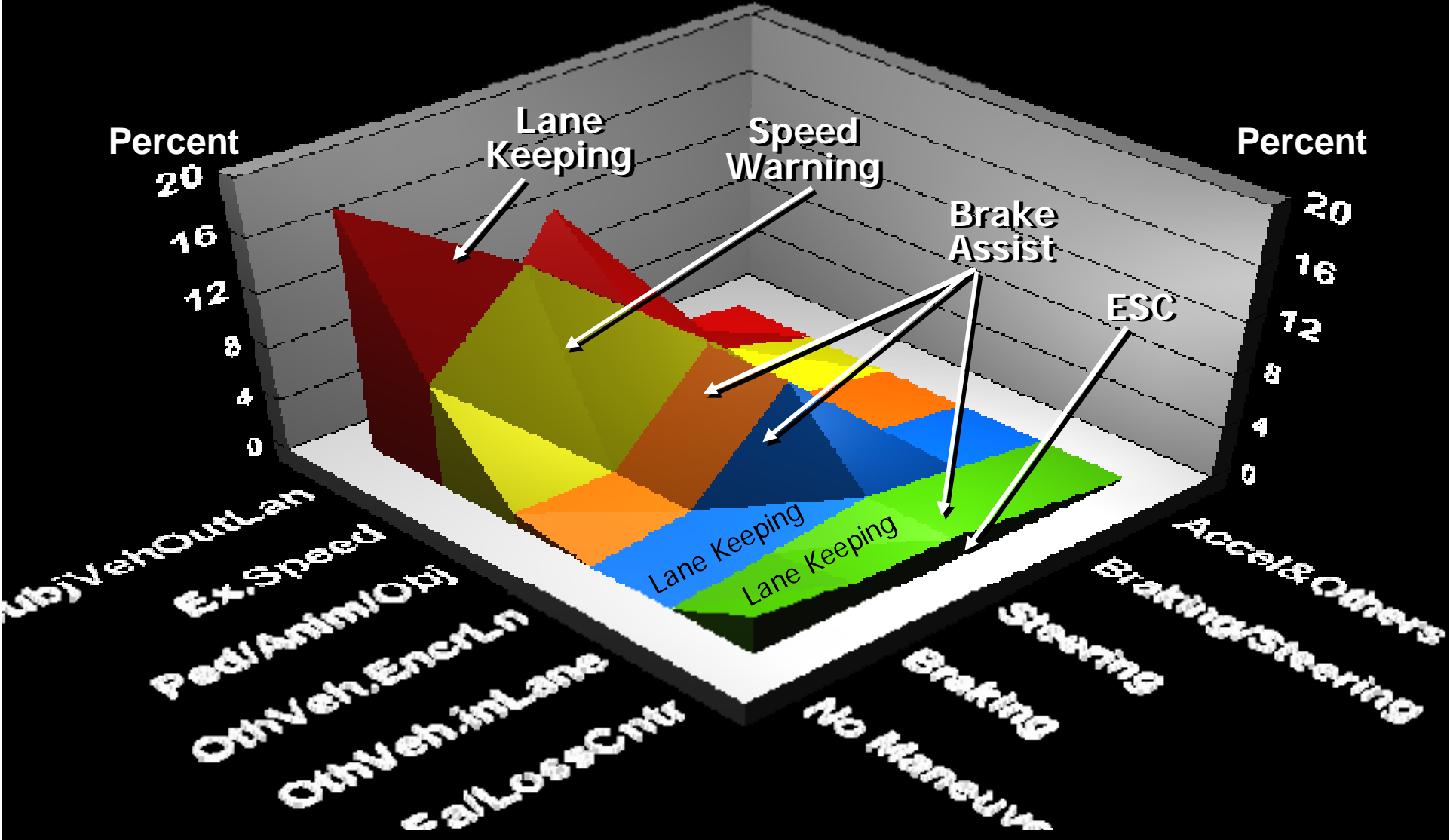


Advanced Collision Avoidance Technologies (ACAT)

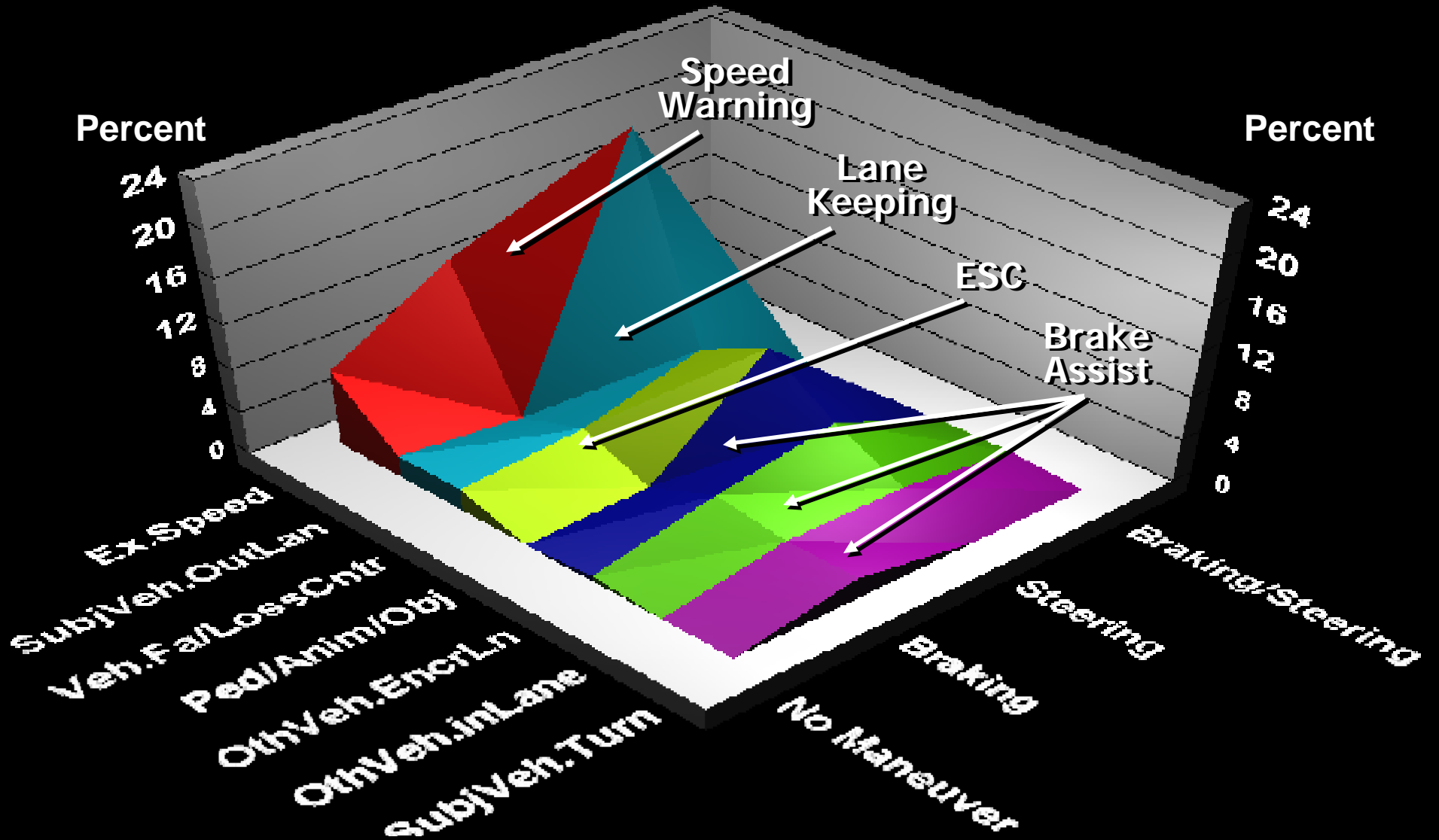
- **Determine the safety impact of new and emerging technologies**
- **This information may be used to help consumers understand:**
 - What advanced safety features are available?
 - Any unintended consequences?
 - How effective are they?
- **Emerging Technologies**
 - Electronic Stability Control
 - Adaptive Cruise Control
 - Night Vision Systems
 - Curve Speed Warning
 - Lane Departure Warning
 - Alcohol Monitoring
 - Brake Assist Systems
 - Pre-crash sensing



Collision with Fixed Object

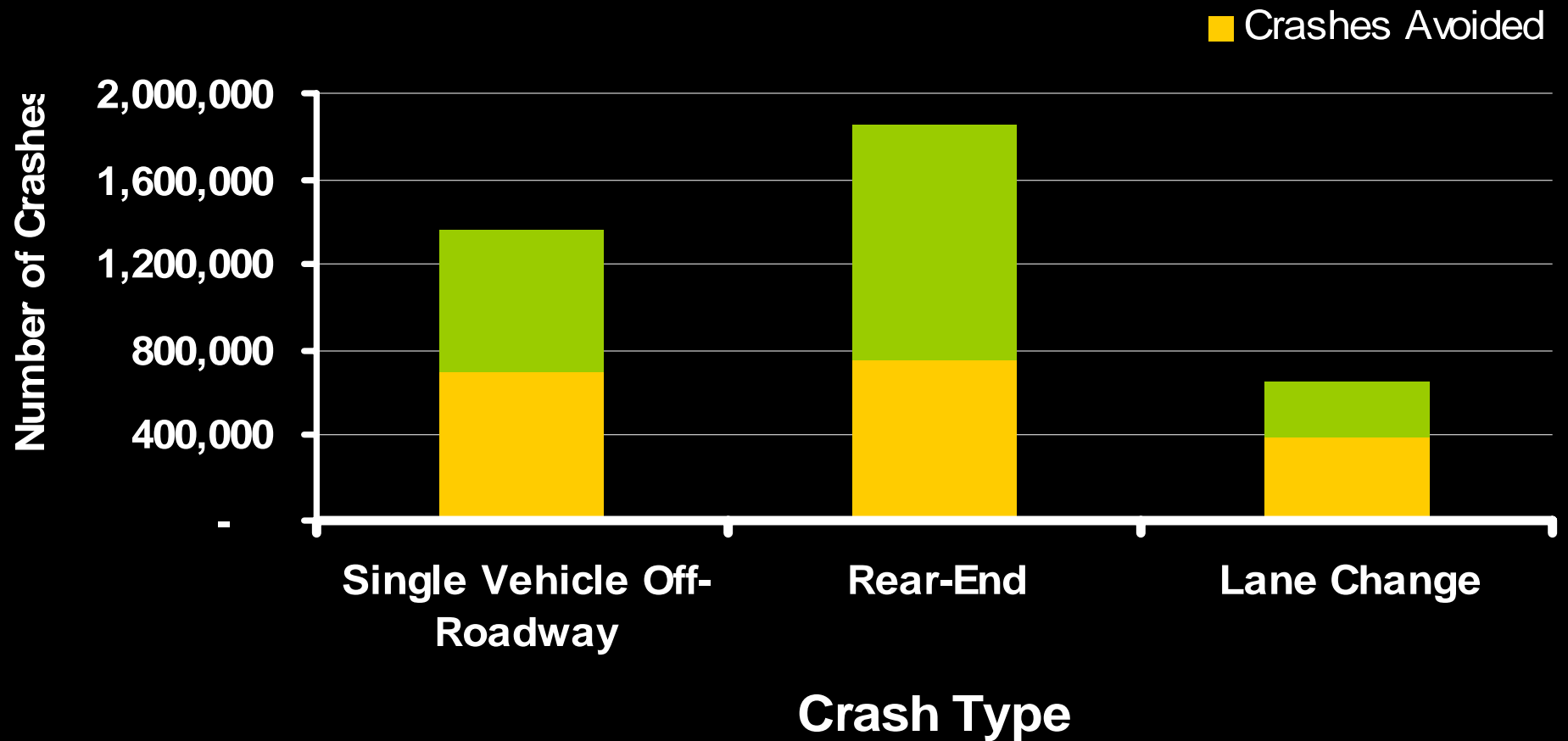


Rollover





Safety Benefits Estimation of Crash Avoidance Systems Based on Experimental Data



No. of Crashes = No. Police-Reported Crashes

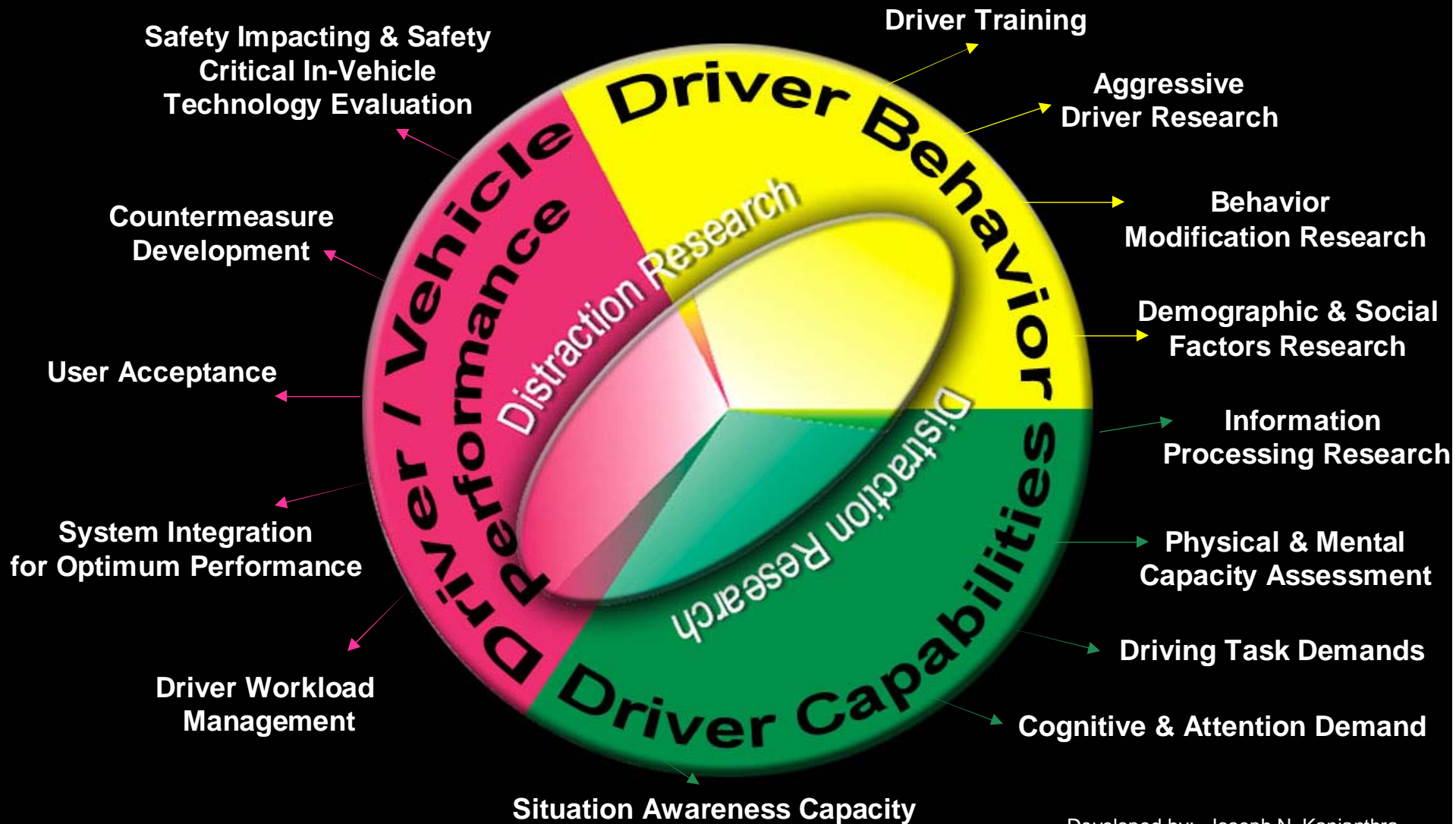


Total Safety





Driver Vehicle Safety Research





Acceleration of Safety Technologies

- **Safety Needs Novel Approaches**
 - Crash Scenario Based Test Procedures
 - Use of Market Forces
 - Innovative regulatory approaches
 - Consumer information and education
 - Closer cooperation between Government and Industry