People Saving People

Primary Safety and Passive Safety:
NHTSA's Approach to Road Safety

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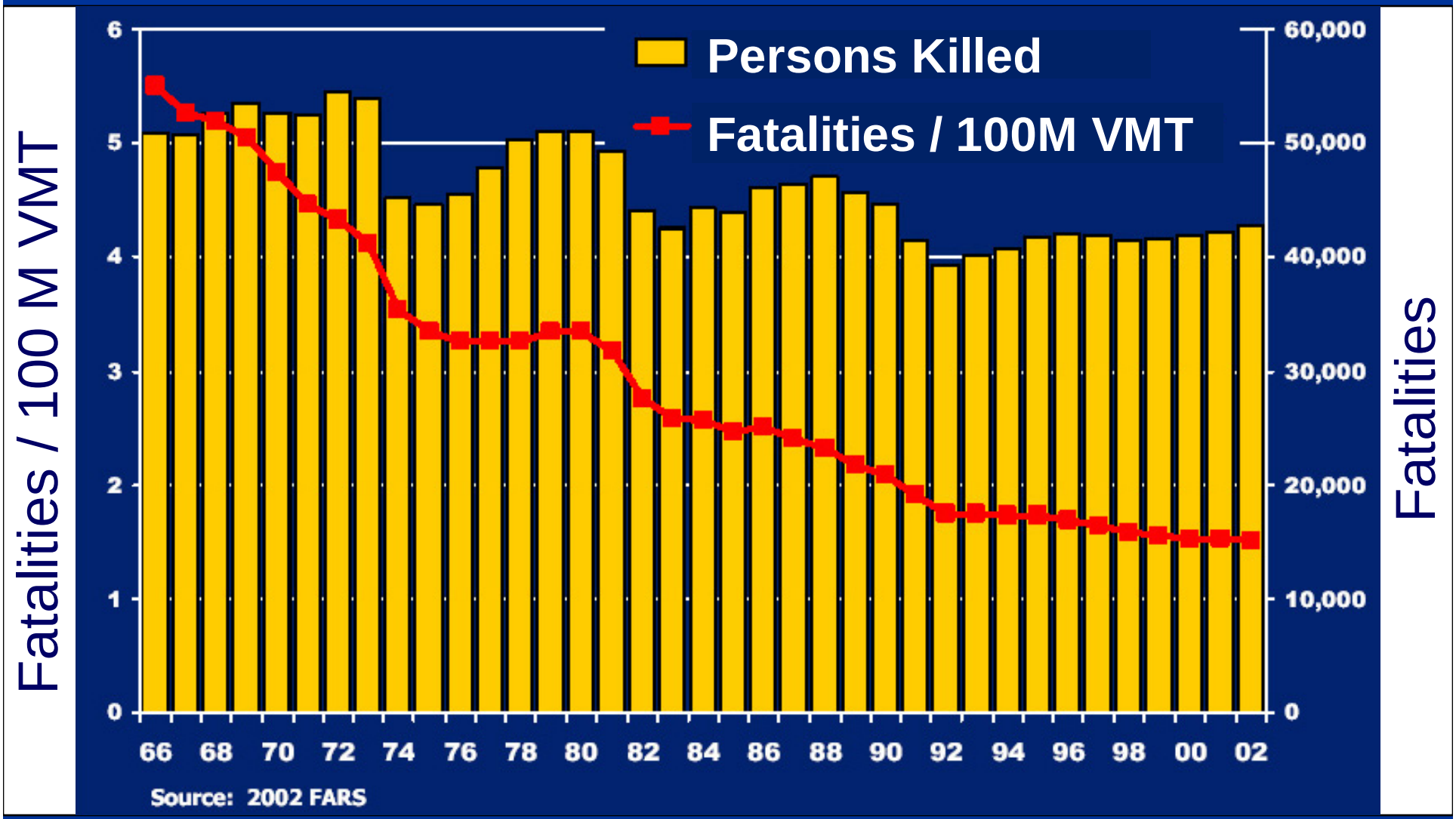
NHTSA Mission

- To Reduce Motor Vehicle Fatalities and Injuries and the Costs Associated With Crashes
- Carrying Out Needed Research, Implementing Education and Enforcement Programs
- Responsible for Issuing Safety Standards

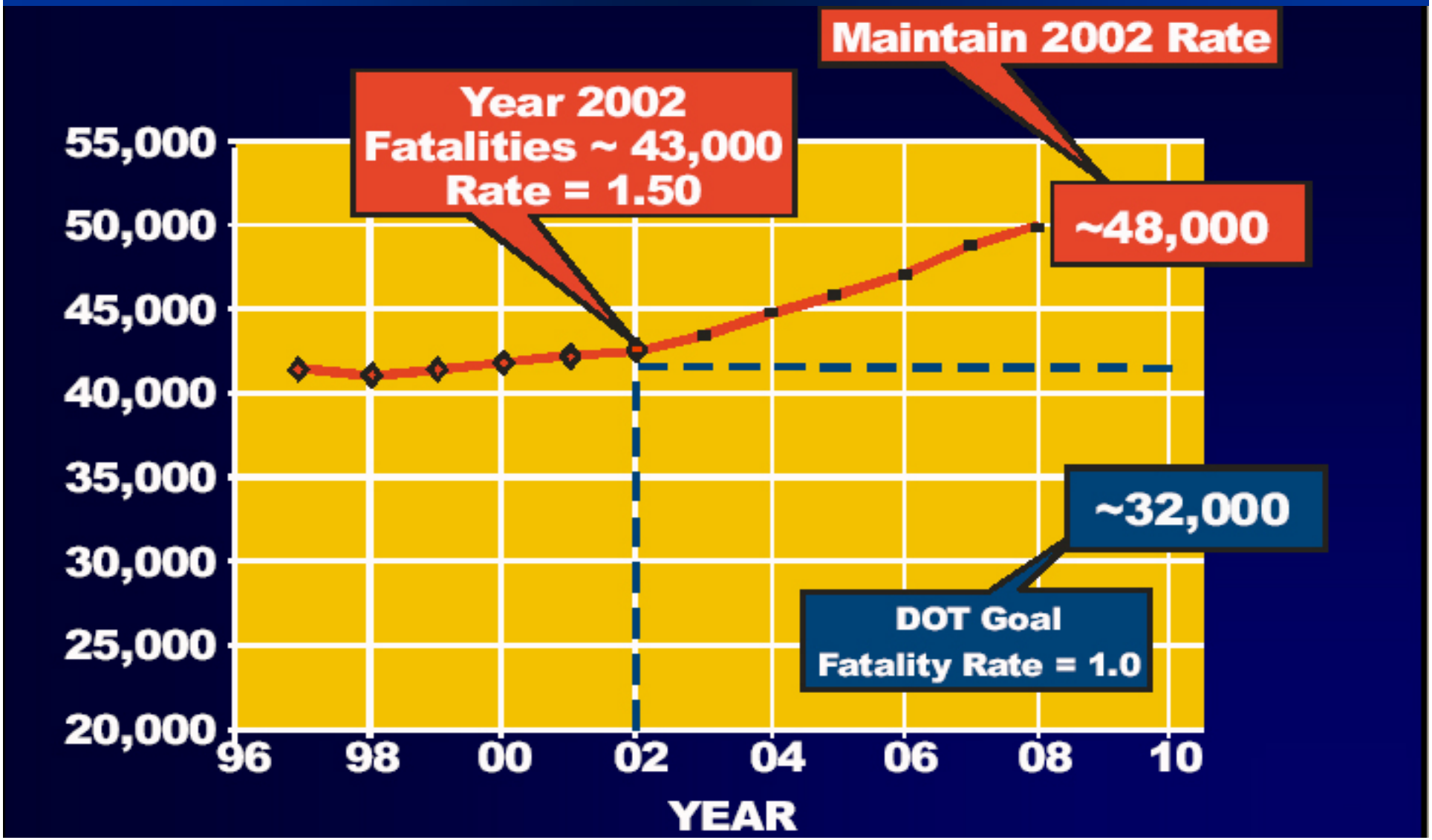
NHTSA Approach to Safety

- Engineering, Enforcement, Education
- Define Safety Need
- Supporting Research
- Science Based Regulations
- Performance Based Requirements
- Technically Feasible Solutions
- Ensure Cost Effectiveness
- Aggressive Enforcement

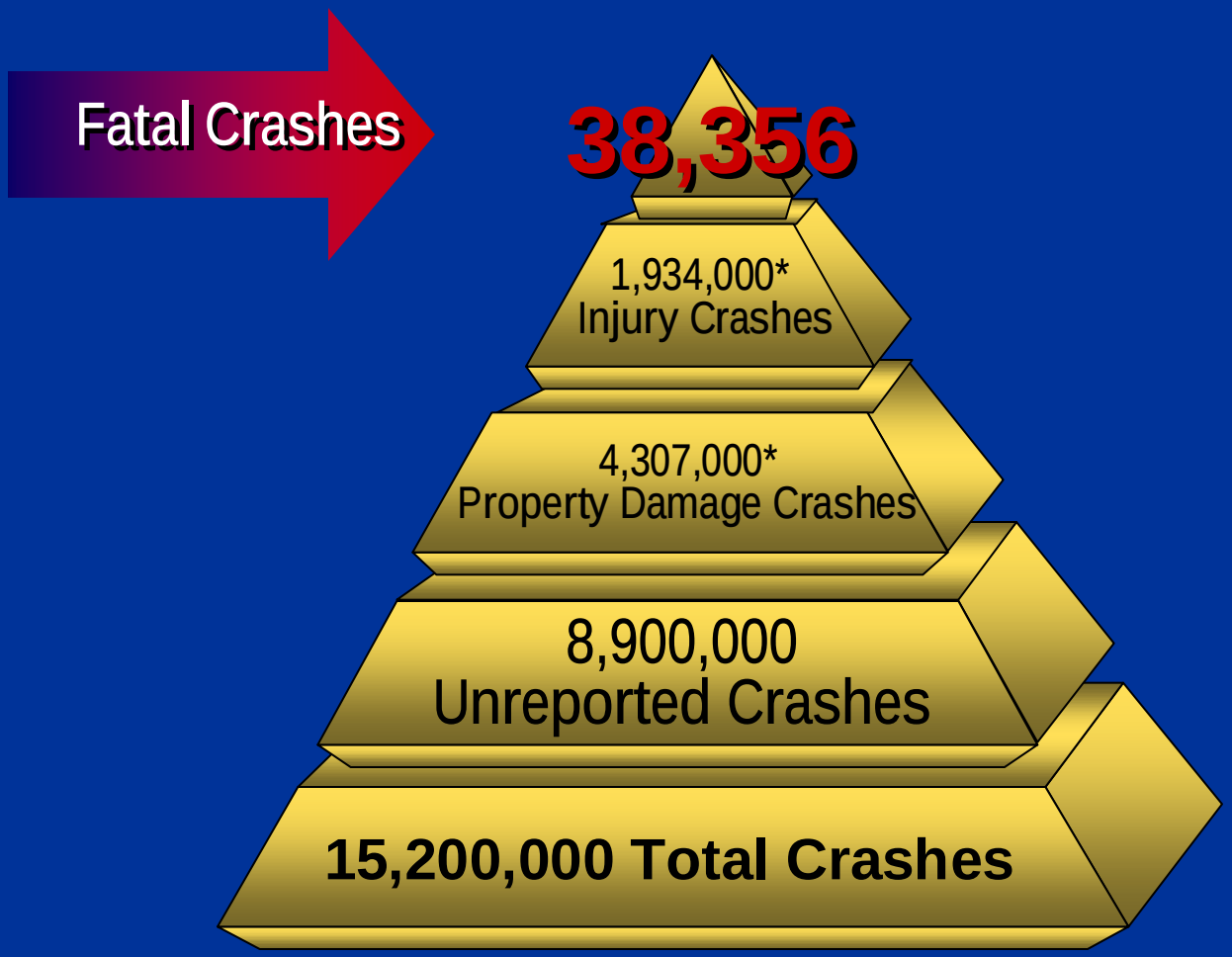
Person Killed and Fatalities per 100M VMT



2008 Goal is Challenging



The Crash Epidemic



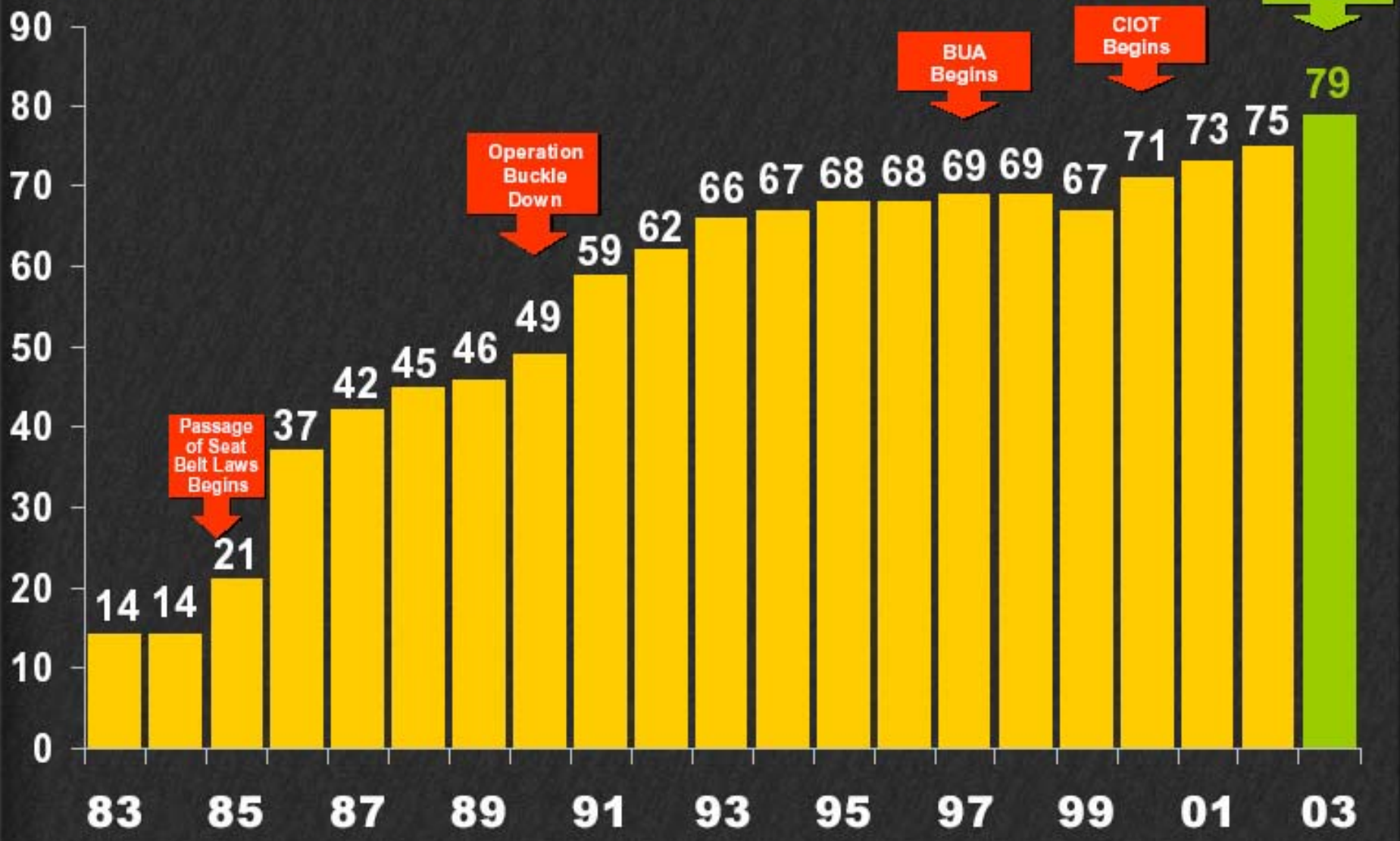
42,815
Fatalities

*Police-Reported

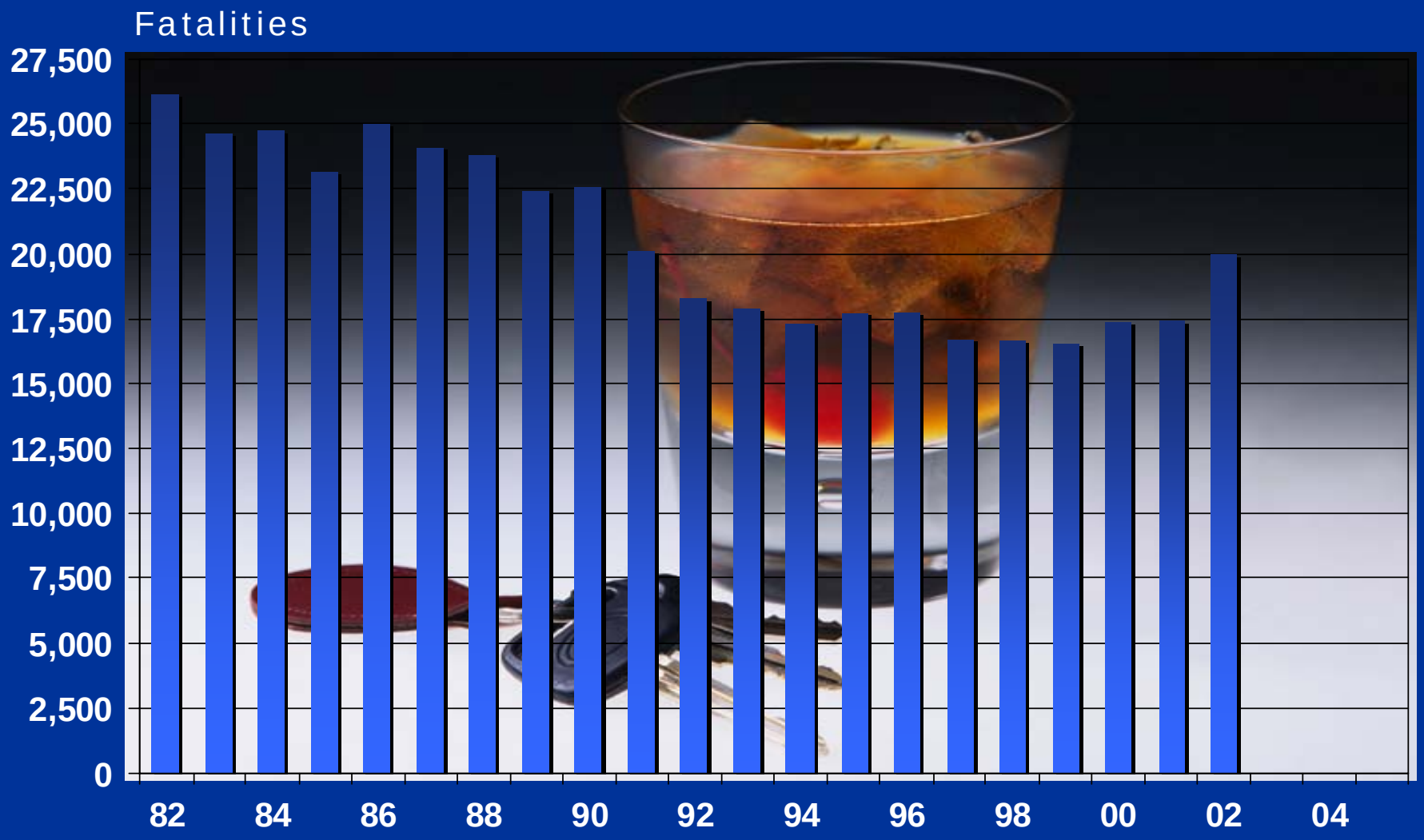
NHTSA Priorities

- **In September 2002, NHTSA formed four Integrated Project Teams (IPTs) to conduct an in-depth review of four priority areas**
  - Safety Belt Use
  - Impaired Driving
  - Rollover Mitigation
  - Vehicle Compatibility
- **Final Reports were released June 2003**

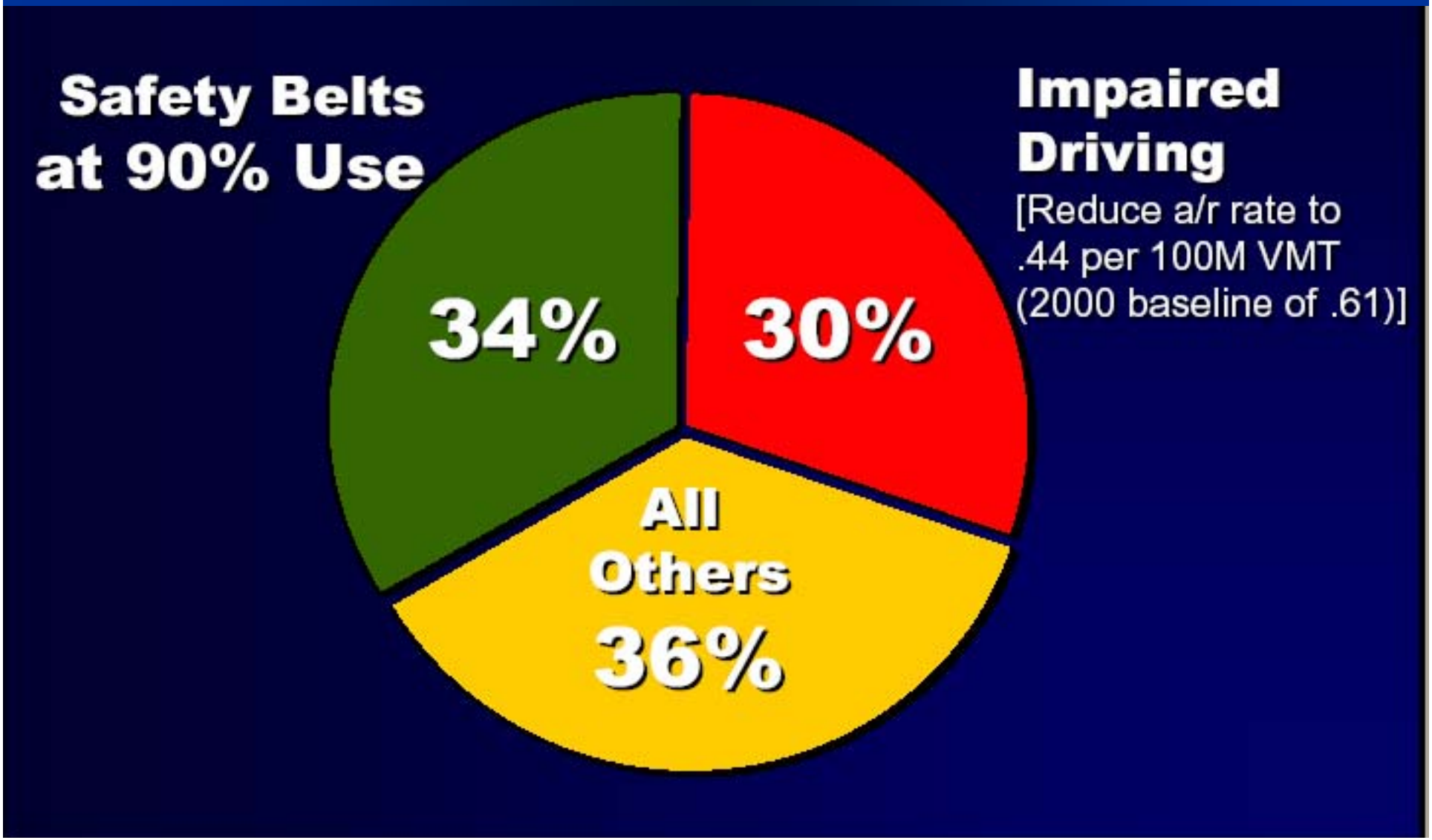
Safety Belt Use Rates
1983 – 2003 Percentage Use



Alcohol-Related Fatalities Trend



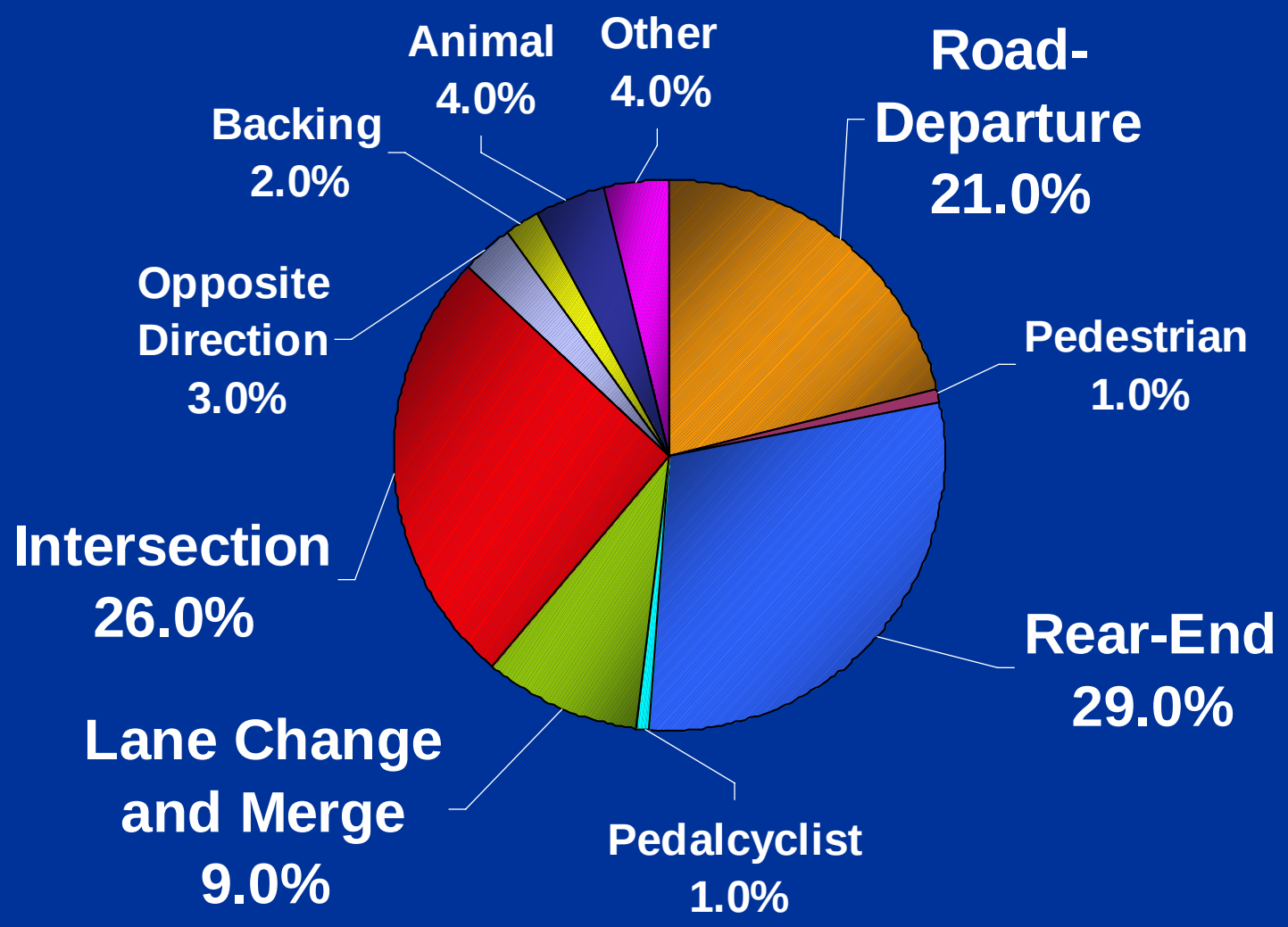
Predicted Lives Saved by Countermeasure



The Crash Safety Problem

- **Major Crash Types**
- **Fatalities and Injuries**
  - Front
  - Side
  - Rear
  - Rollover
  - Compatibility

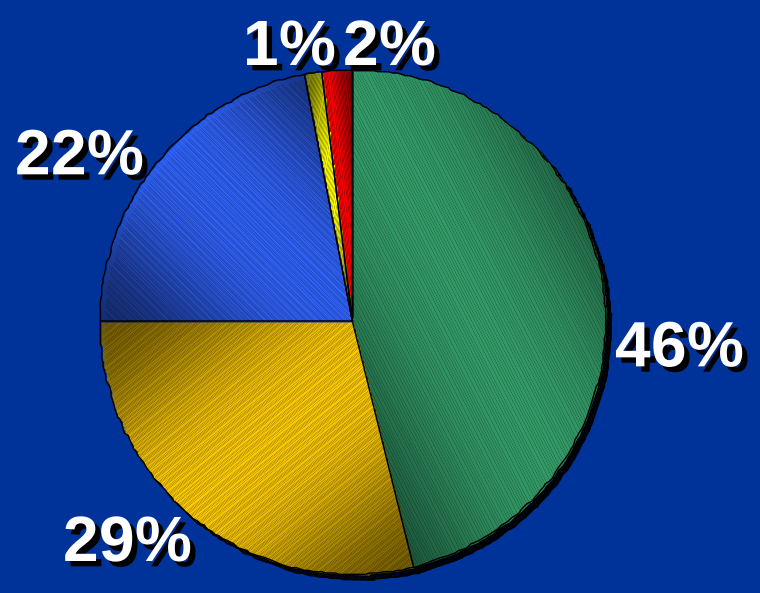
Crashes of all Severities, 2000 GES



Vehicles and Fatalities by Collision Type 2002

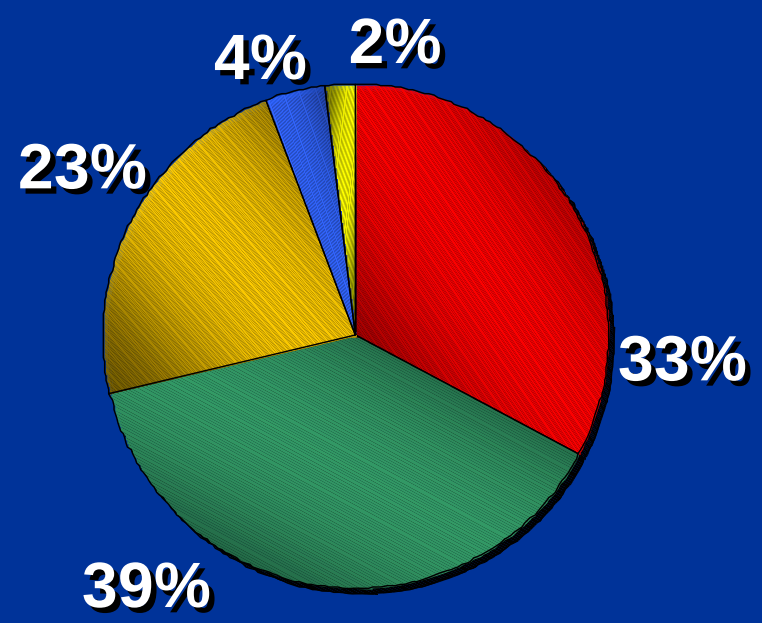
Passenger Vehicles in Crashes

Approx. 10.6 million vehicles involved



Passenger Vehicles Occupant Fatalities

32,335 total occupants killed



Rollover | Front | Side | Rear | Other

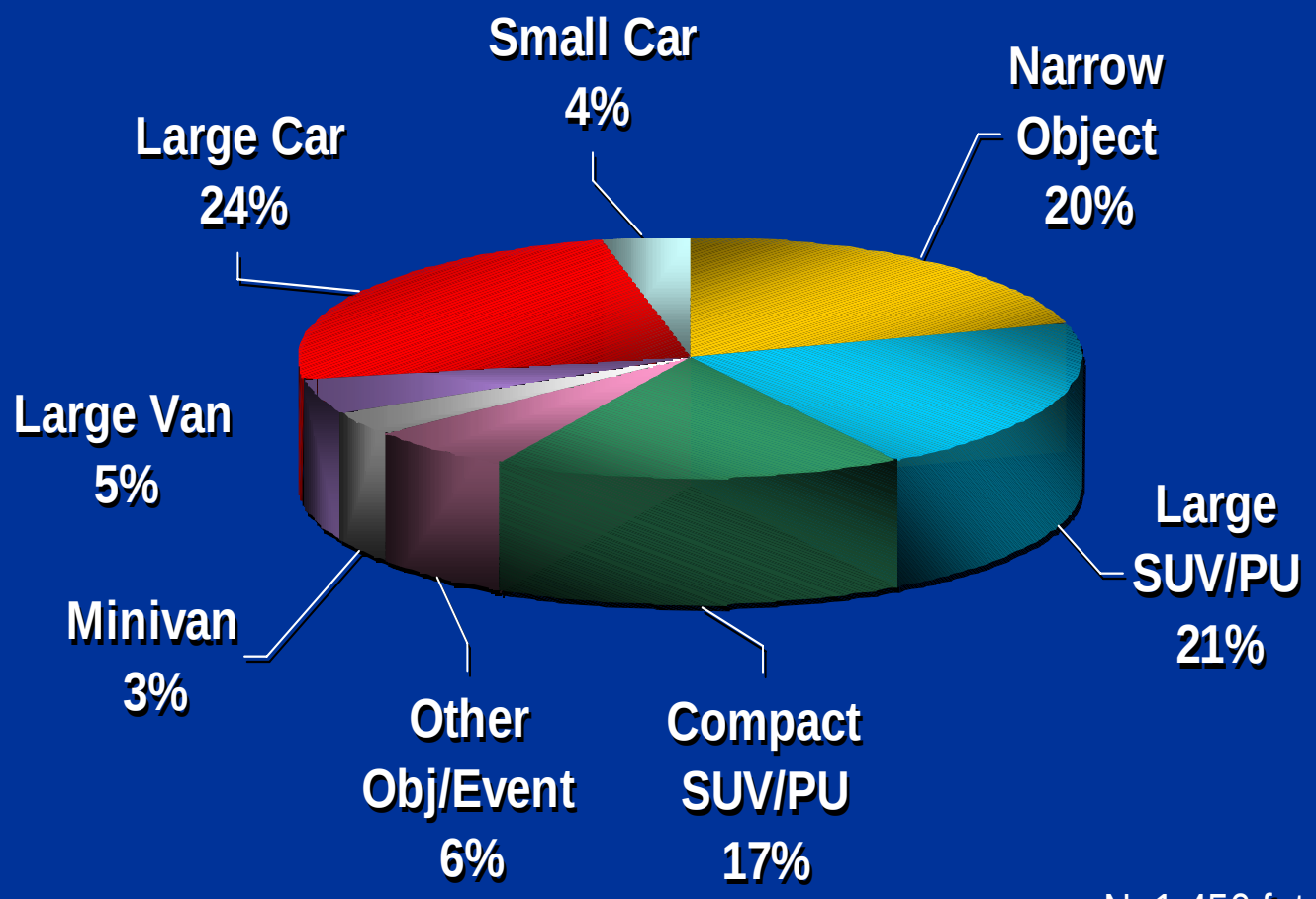
Vehicle Occupants Killed/Injured in Frontal Crashes

	Passenger Car	Light Trucks
Persons Killed	10,471	6,399
Person Injured	811,000	368,000

Side Crash Protection

Current Side Crash Safety Problem Fatalities

Near Side Belted Fatalities by Crash Partner

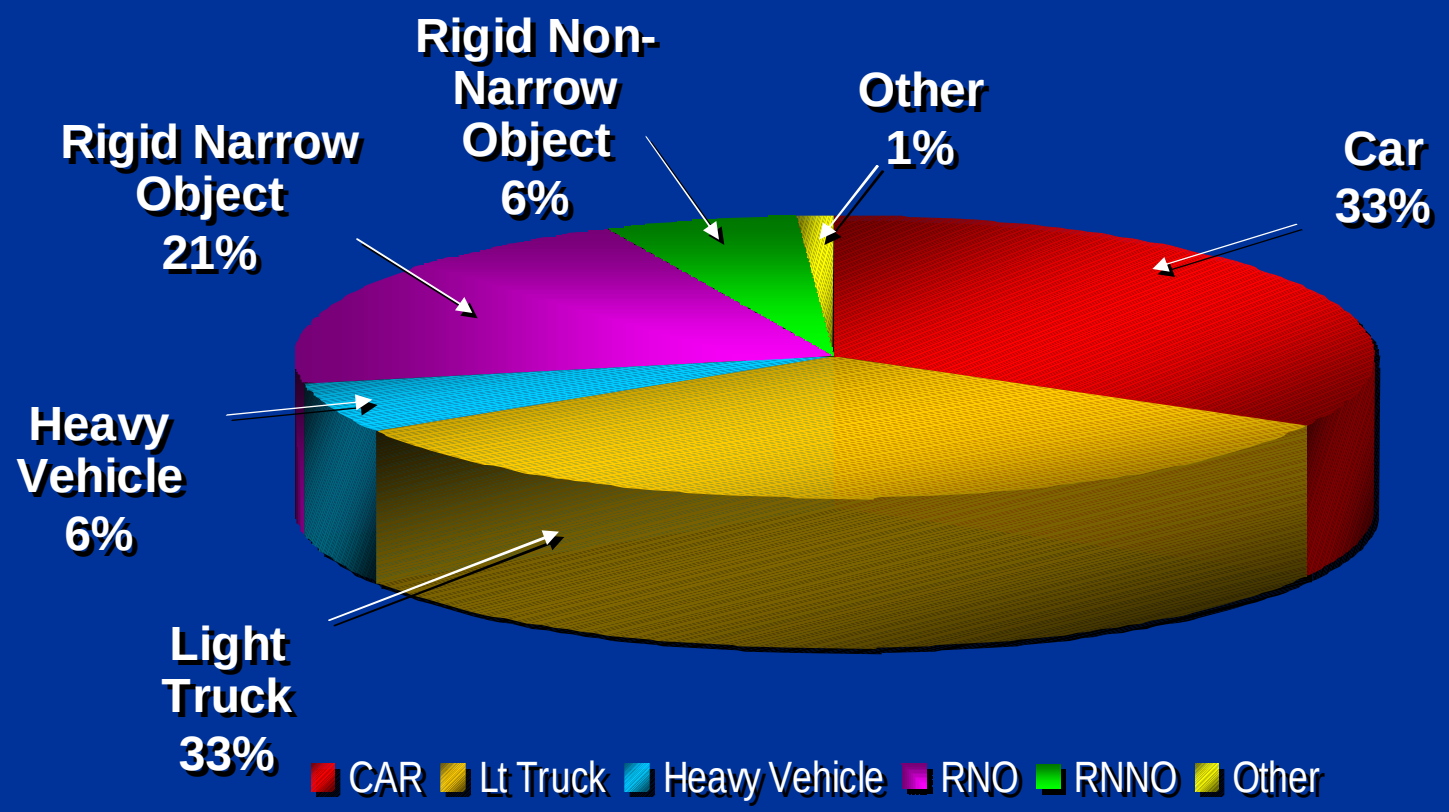


1999 FARS Side Crashes – Model Year 1995+ (light vehicles ≤10,000lbs, no rollover)

N~1,450 fatalities (total)/year
N~805 fatalities (belted)/year

Current Side Crash Safety Problem Injuries

Occupants with AIS 3+ Injuries - Belted & Unbelted



NASS '95-'99 Weighted…Model Year 1995+ (light vehicles ≤10,000lbs, no rollover)

3,272 Occupants (total)/year

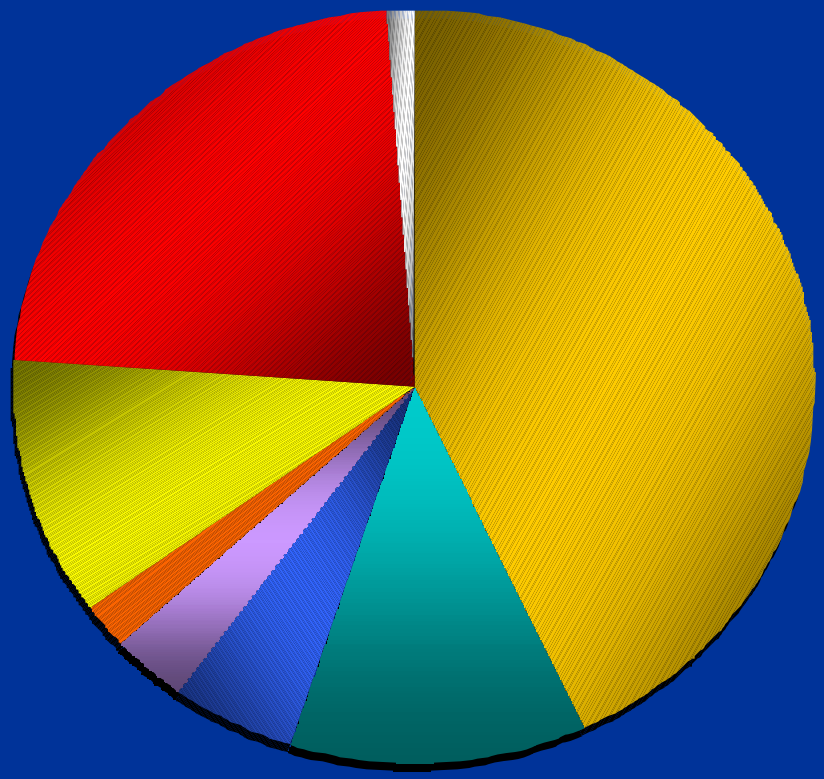
Annual Estimate of Struck Side Occupants

(Non Rollover Towaway Side Crashes)

1991-2000 NASS Weighted Data / Occupant > = 56” in Height

1%	Head/Abdomen/ Chest
2%	Chest/Abdomen
3%	Head/Chest
5%	Unknown
11%	Abdomen
12%	Other
23%	Head
43%	Chest

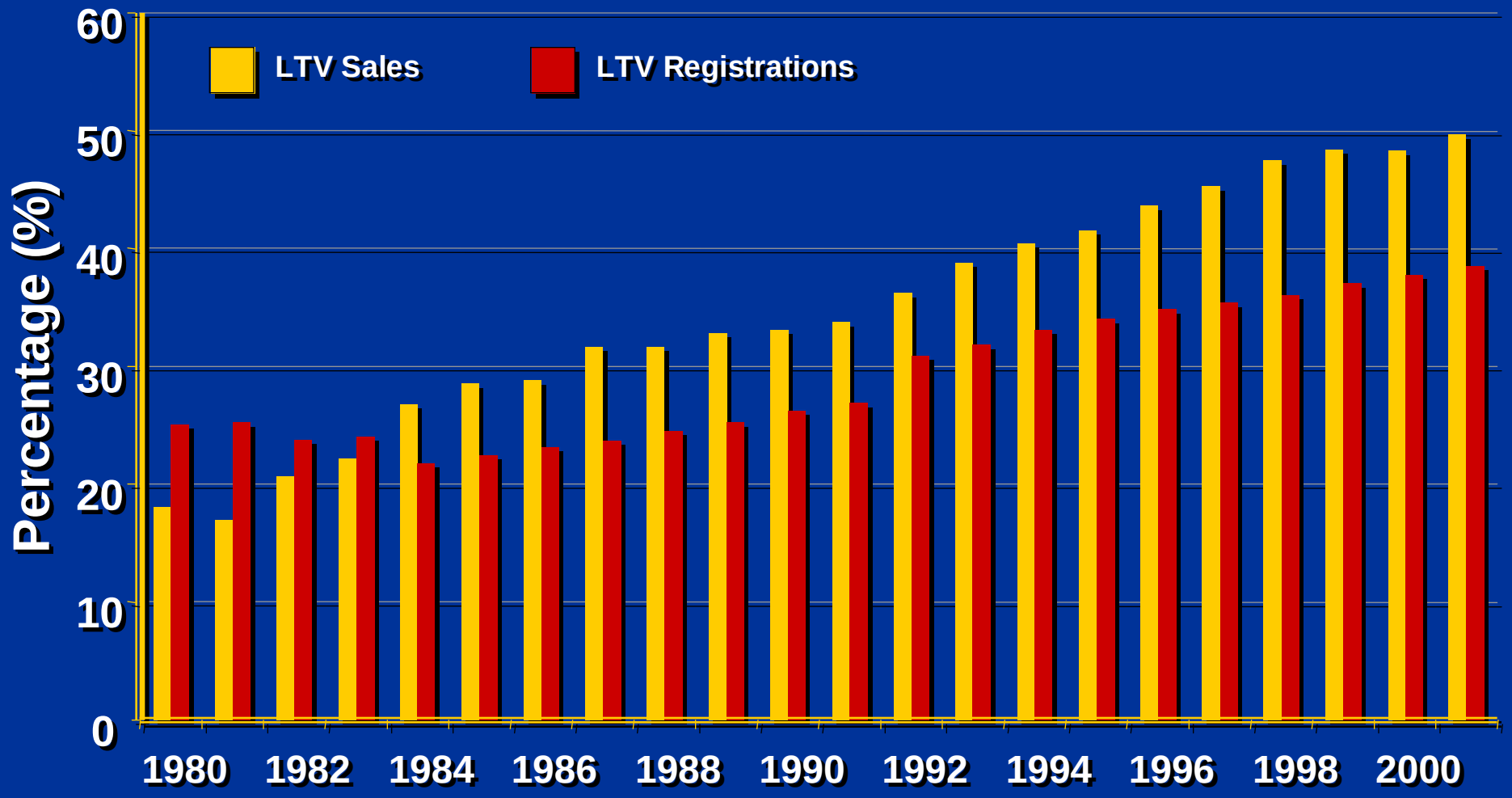
Distribution of Body Regions Injured Male Occupants



Address Increased Risk of Head Injuries From Crashes Involving LTVs and Narrow Object

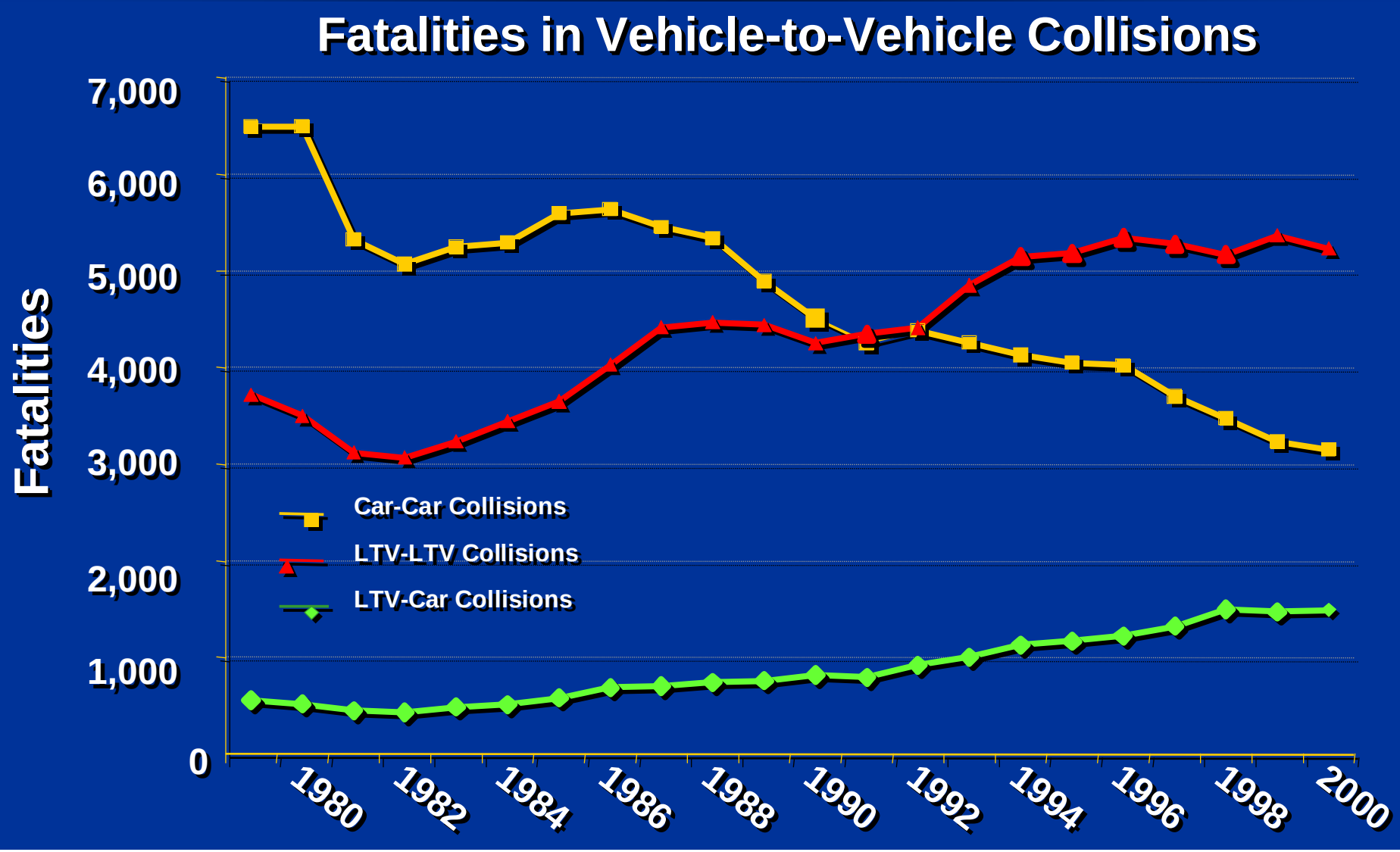
Compatibility Problem

US LTV sales have leveled off at just under 50 %



Compatibility Problem

Car – LTV fatalities appear to have leveled off just above 6,000 annually

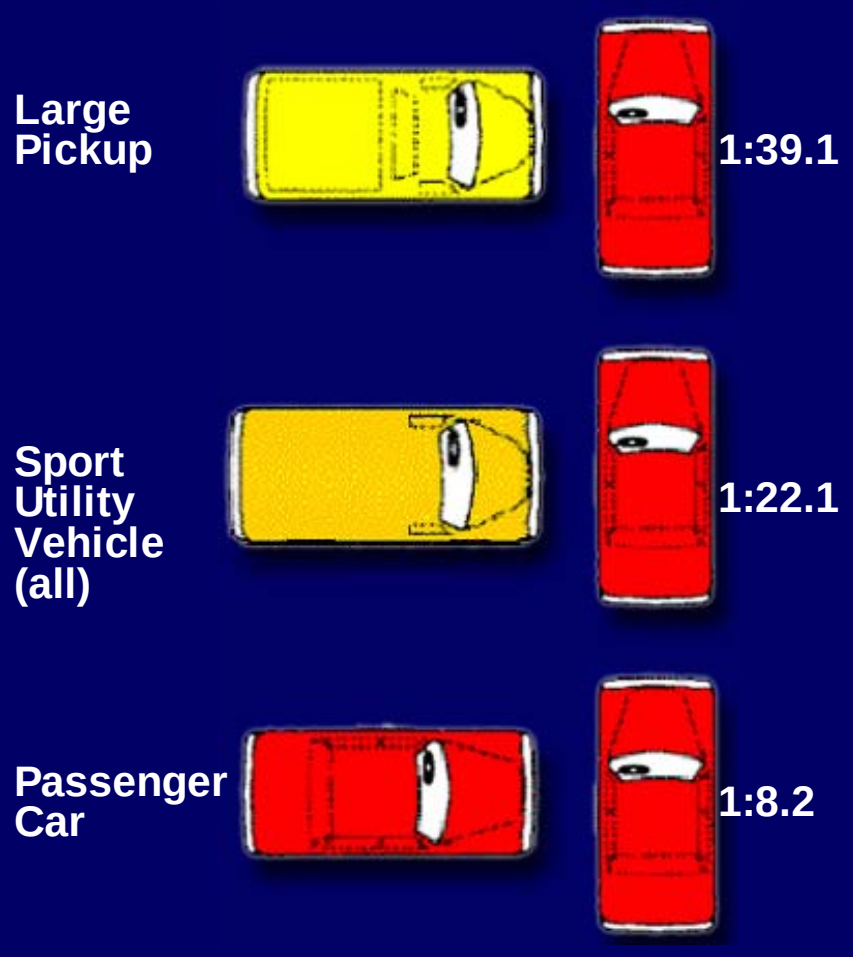


Vehicle Compatibility

Vehicle Compatibility

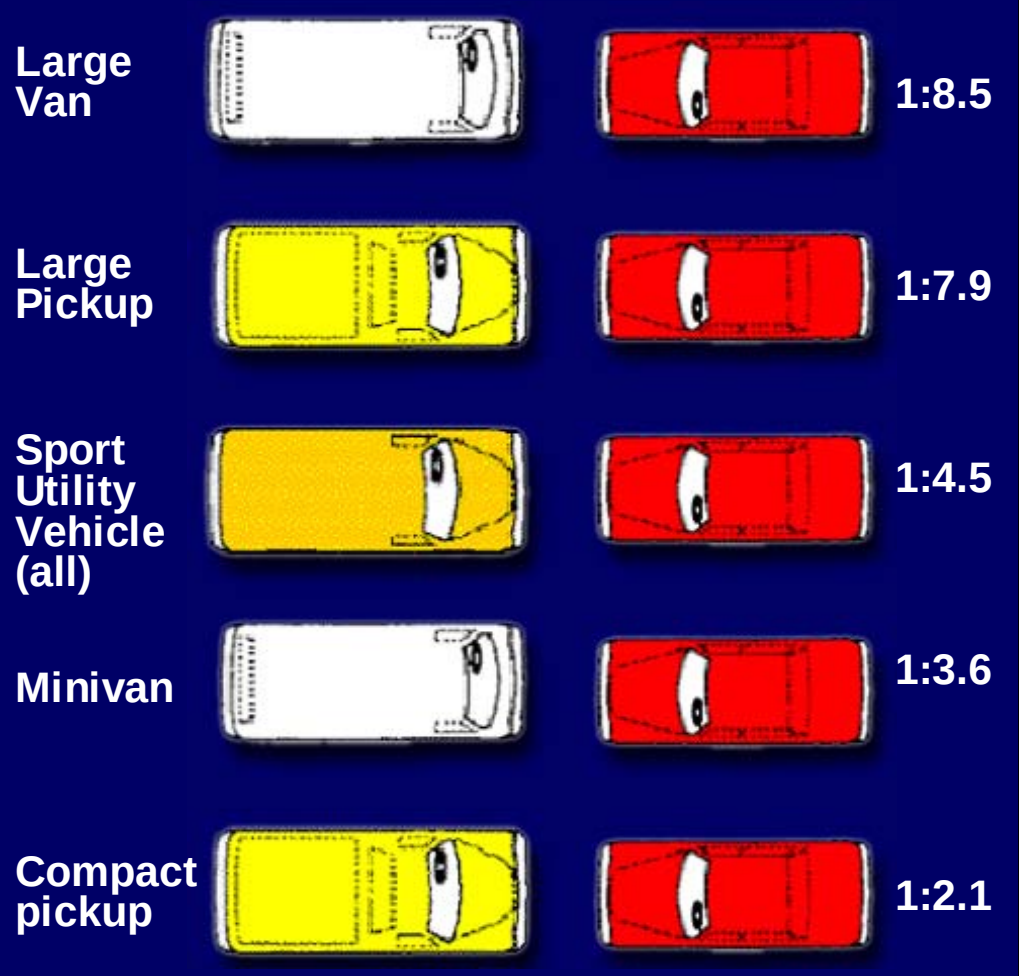
Driver Fatality Ratios

for Side Impact Crashes into Passenger Cars



Driver Fatality Ratios

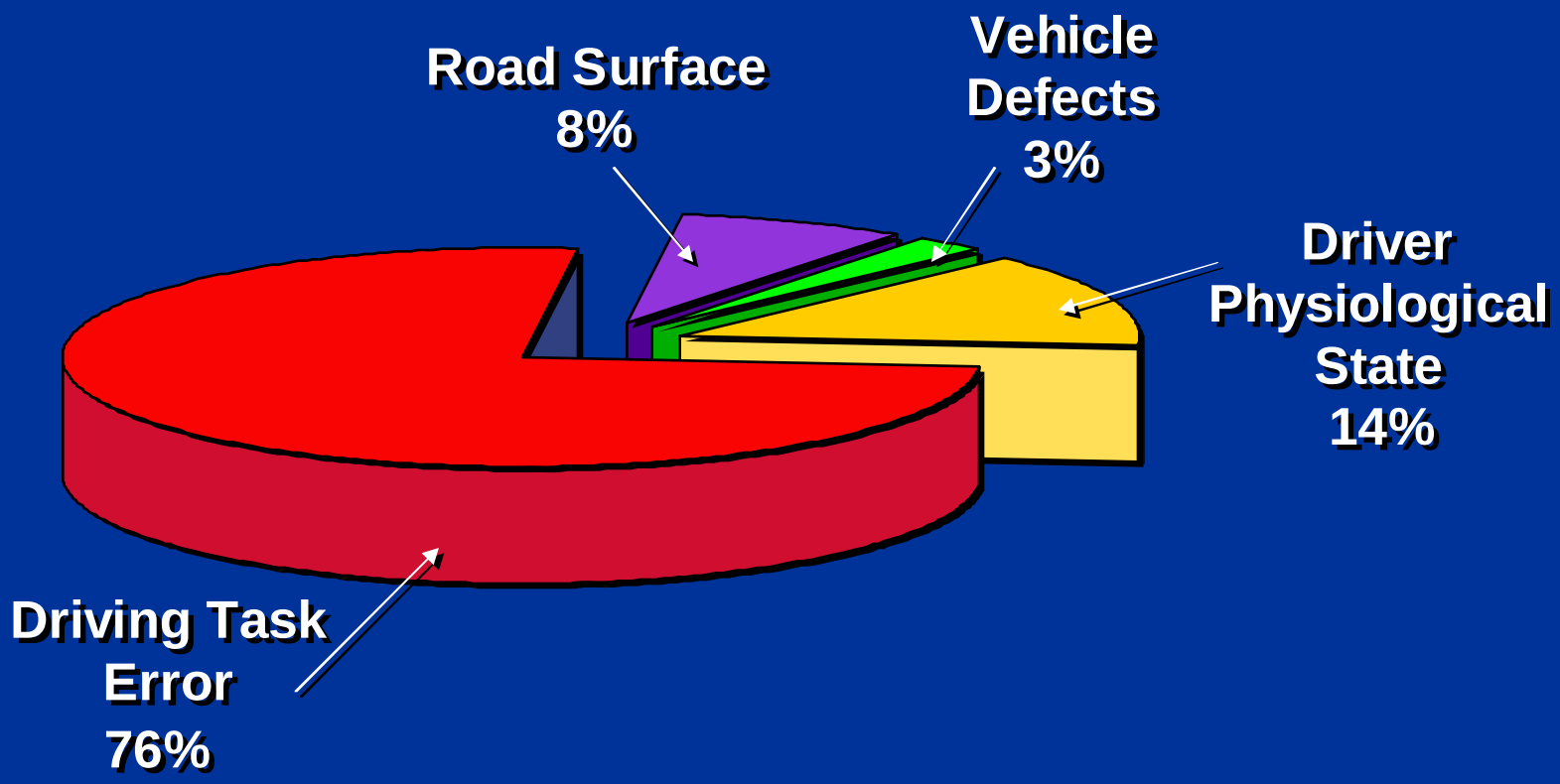
for Frontal-Frontal LTV-to-Car Crashes



1995-2001 FARS, Driver Fatality Ratios Both Vehicles MY >= 1990

The Safety Problem

Causal Factor Distribution



Rollover

Technical Highlight:
Programmable Steering Machine

Example:
Fishhook Maneuver Effectiveness

Major on Going Activities

- **Safety Systems (Crashworthiness) Research**
- **Biomechanics**
- **Crash Avoidance and Driver / Vehicle Performance Research**
  - Rollover / Handling and Stability
  - Driver - Vehicle Safety Research
  - Driver Distraction Research
  - Advanced Safety Systems Research
  - Tire Research
- **Heavy Vehicle Safety Research**

Safety Systems (Crashworthiness) Research

- Airbag Evaluation
- Advanced Frontal Protection
- Child Restraint Systems (CRS)
- Vehicle Crash Compatibility
- Side Impact Protection
- Rollover Crashworthiness
- Advanced Restraint Systems

Safety Systems (Crashworthiness) Research
(continued)

- **New & Advanced Technologies**
  - Adaptive Airbag
  - Pre-crash sensing
  - Tailored Inflation
  - Occupant Detection Systems
- **School Bus Research**
- **Crash Data Recorder Research**
- **Post Crash Research**

Vehicle Compatibility Initiatives

- **Vehicle Strategies**
  - Partner Protection
  - Self Protection
  - Lighting / Glare
  - Reform CAFE
- **Roadway Strategies**
  - Improve Structural Engagement with Roadside Hardware
  - Increase Awareness
- **Deployment Strategies**
  - Consumer Information

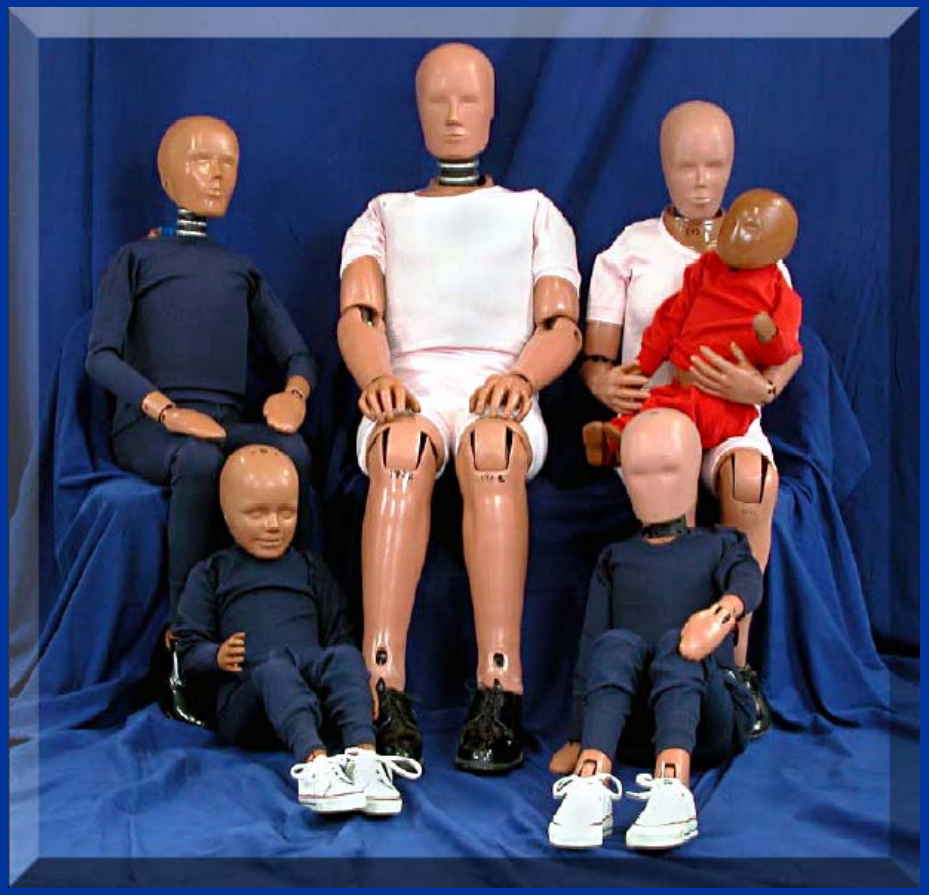
Human Injury Research

- Human Injury Tolerance
- CIREN
- Disability Injuries
- Internal Injuries

Biomechanics Activity

- Crash Test Dummy Federalization
- Biofidelity Assessment
- Durability & Repeatability
- Reproducibility
- Dummy Drawings
- Dummy Parts Inventory
- Injury Criteria Development

Family of Dummies

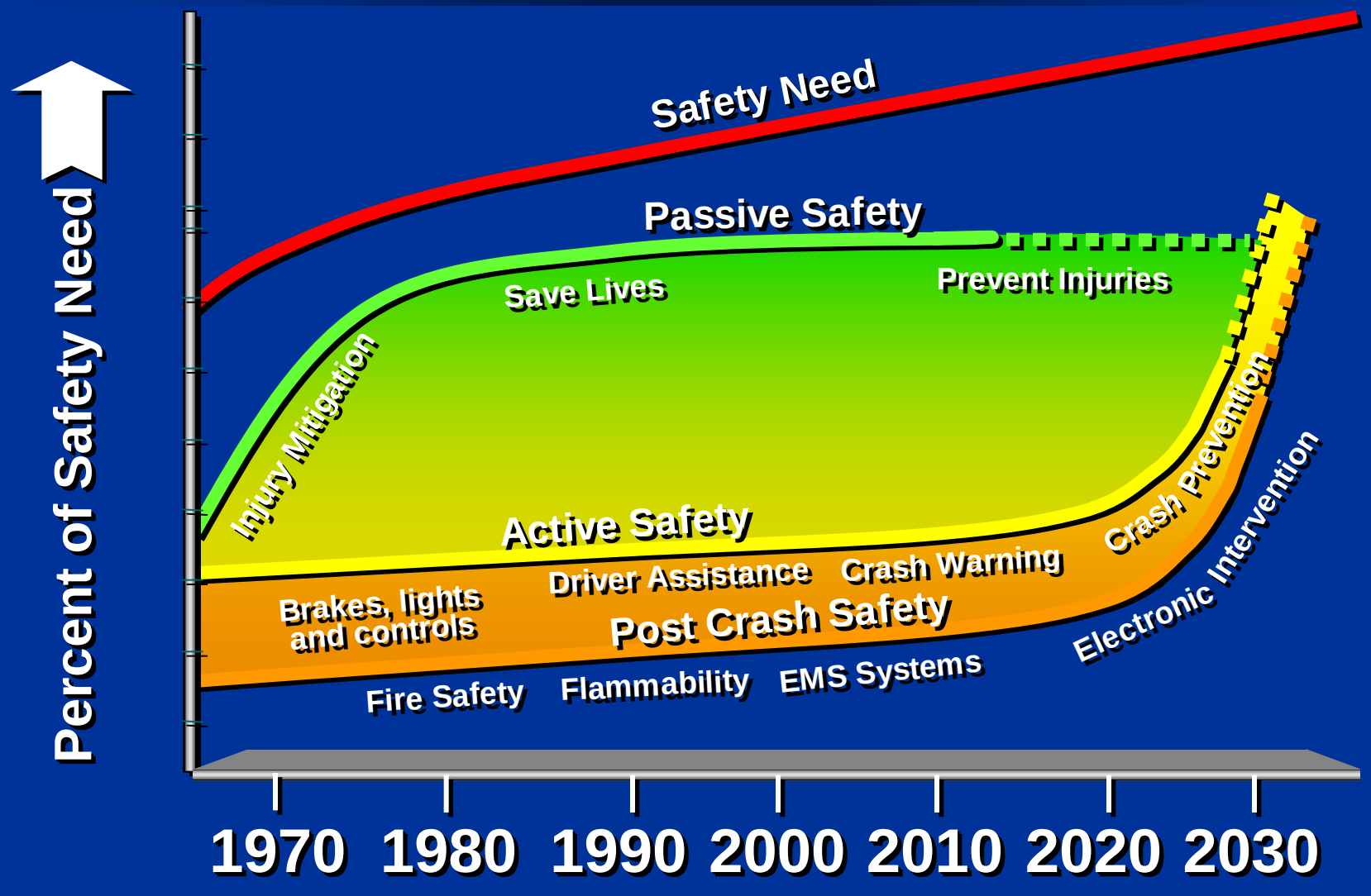


Heavy Vehicle Safety Research

- **Improved Stopping Capabilities**
  - Air Disc Brakes
  - Electronically Controlled Braking
  - Side and Rearward Visibility
  - Pre-Crash Recorder Research
  - Truck Occupant Protection

Solving Problems

The Safety Need



Safety of the Future

- Evolution of Advanced Technology
- Vehicle/Driver/Environment as Total System
  - Need Constant Communications Among All Components
- Society Must Accept Some Control by Vehicle
- Proper Testing and Evaluation Procedures Needed
- Facilitate Deployment Through a Variety of Methods

Total Safety

Developed by: Joseph N. Kanianthra

Conclusions

- **Safety Needs Novel Approaches**
  - Collaborative research
  - Innovative regulatory approaches
  - Consumer information and education
  - Closer cooperation between Government and Industry