

Vehicle Safety Research Overview

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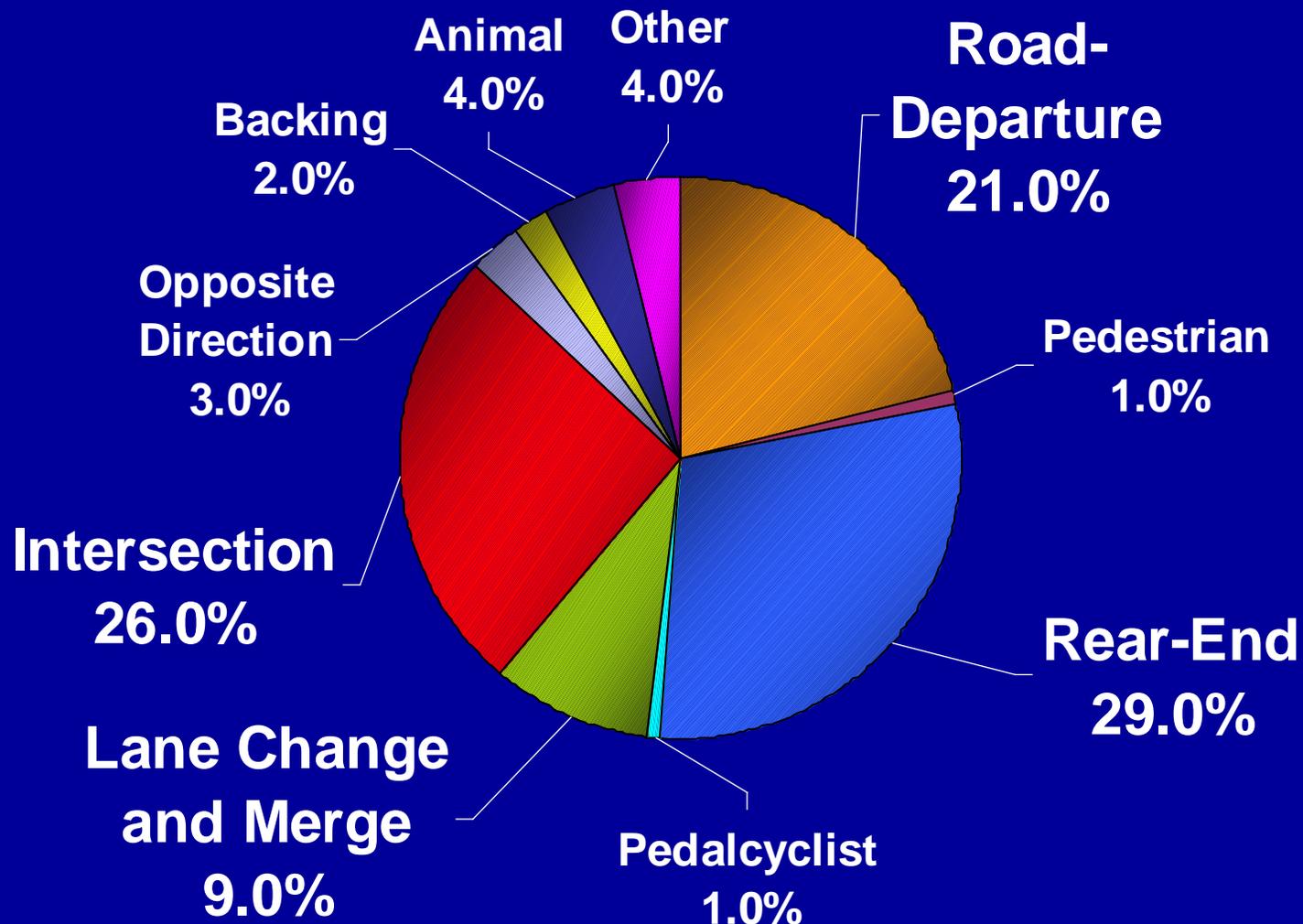




Vehicle Safety Research

	Enacted FY04'	Request FY05'
Safety Systems	\$11,078	
Biomechanics	\$15,191	
Heavy Vehicles	\$2,105	
IVI	[\$25,000]	
Tire Research	\$613	
Driver Simulation Research	\$3,509	
Driver / Vehicle Performance	\$3,450	
New Crash Avoidance Initiative	\$0	
VRTC	\$1,007	
Total Vehicle Safety Research	\$36,953	

Crashes of all Severities, 2000 GES

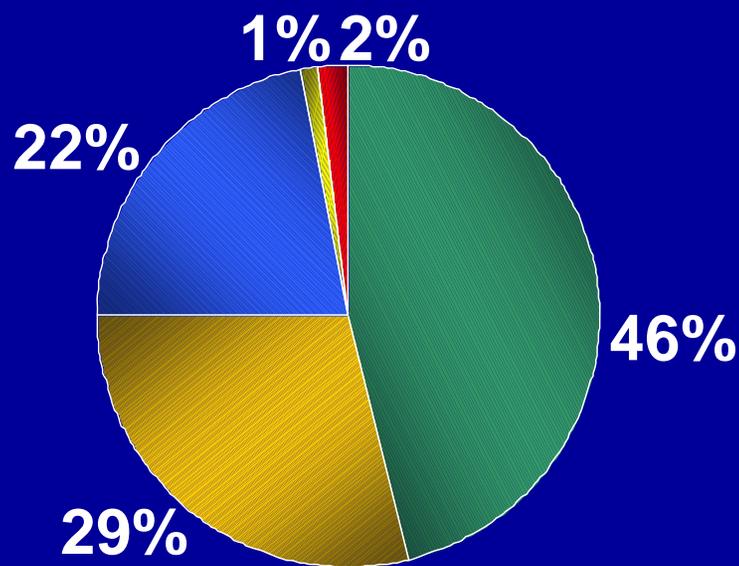




Vehicles and Fatalities by Collision Type 2002

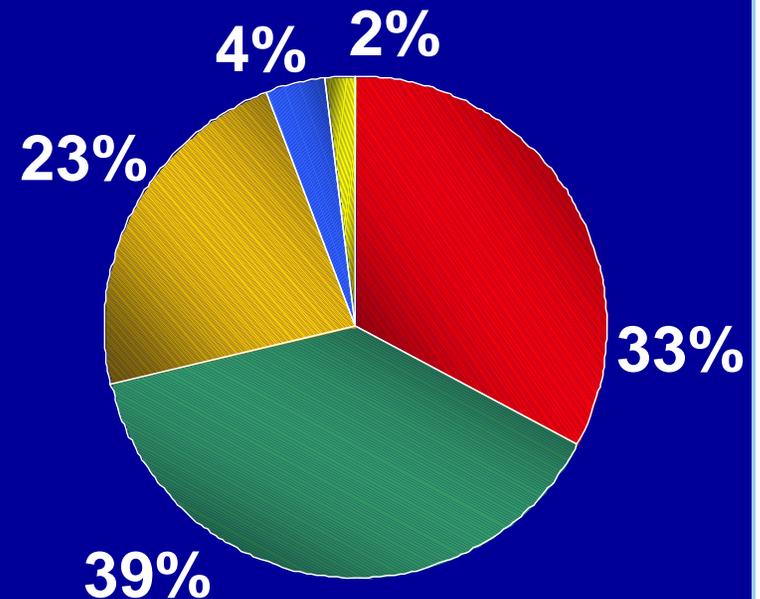
Passenger Vehicles in Crashes

Approx. 10.6 million vehicles involved



Passenger Vehicles Occupant Fatalities

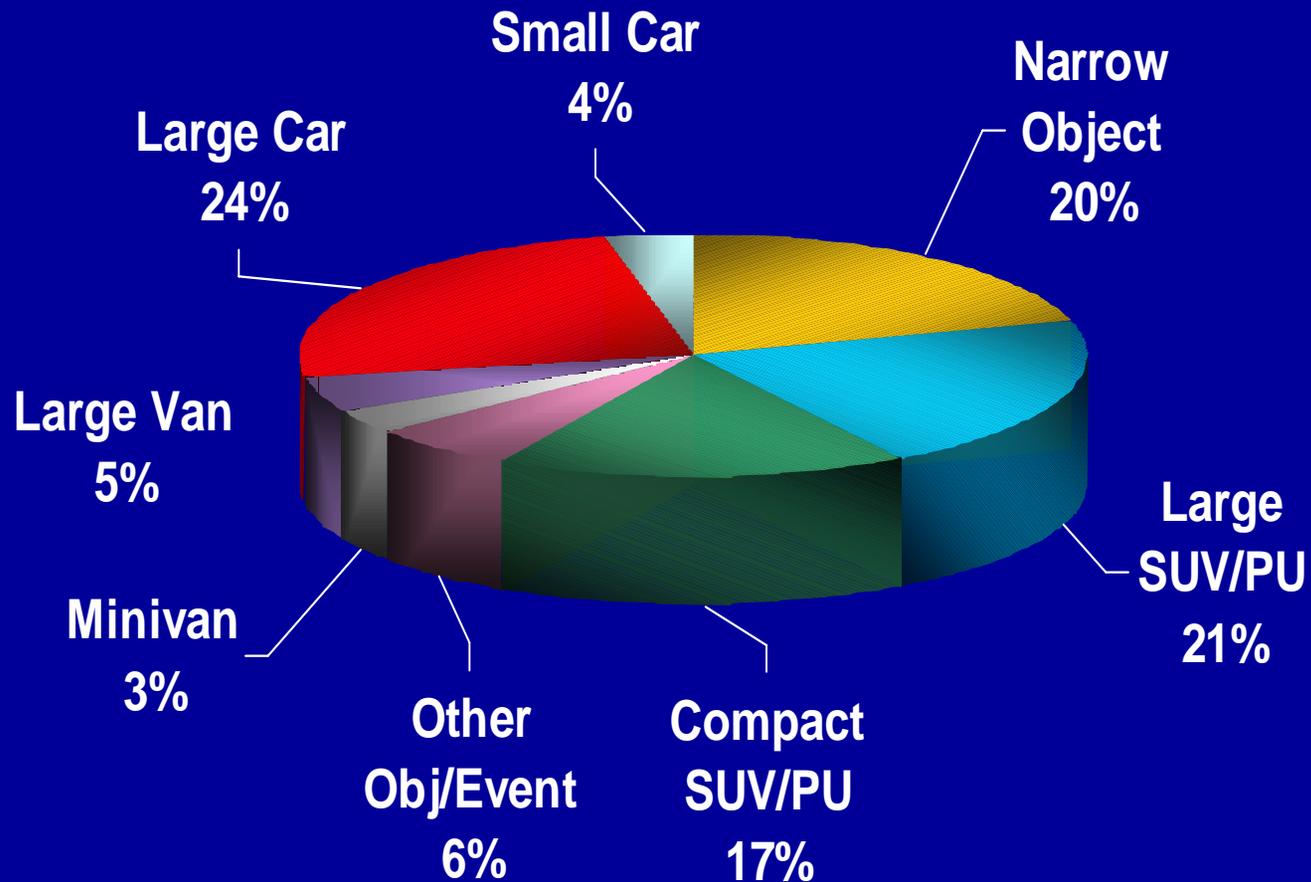
32,335 total occupants killed



Rollover **Front** **Side** **Rear** **Other**

Current Side Crash Safety Problem Fatalities

Near Side Belted Fatalities by Crash Partner

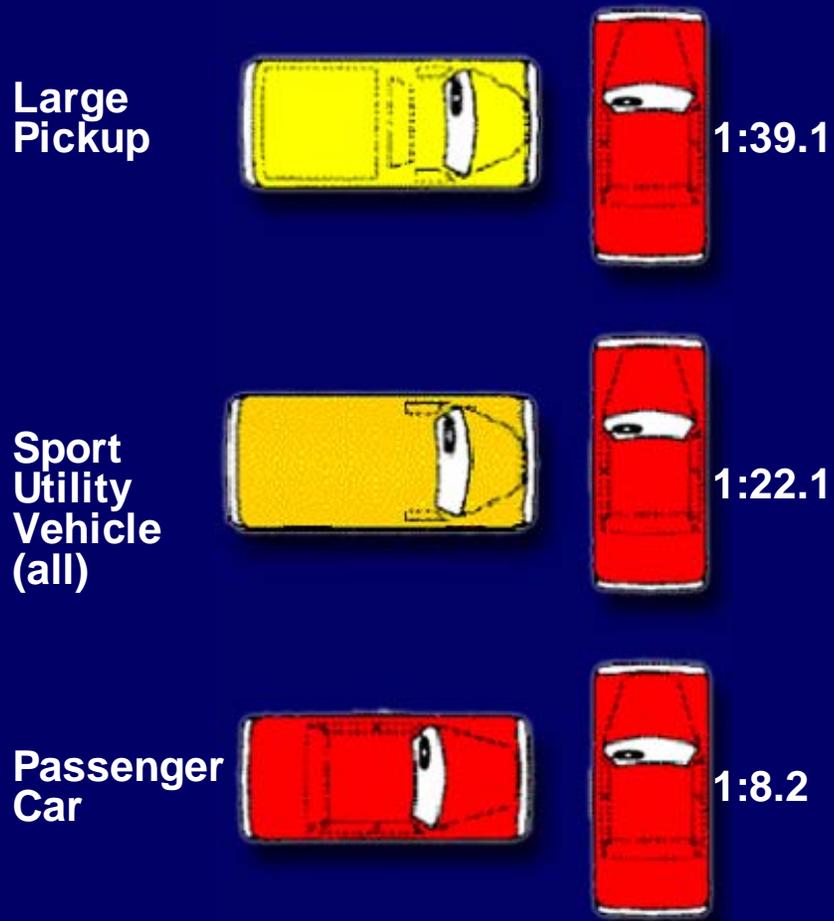


1999 FARS Side Crashes – Model Year 1995+ (light vehicles $\leq 10,000$ lbs, no rollover)

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

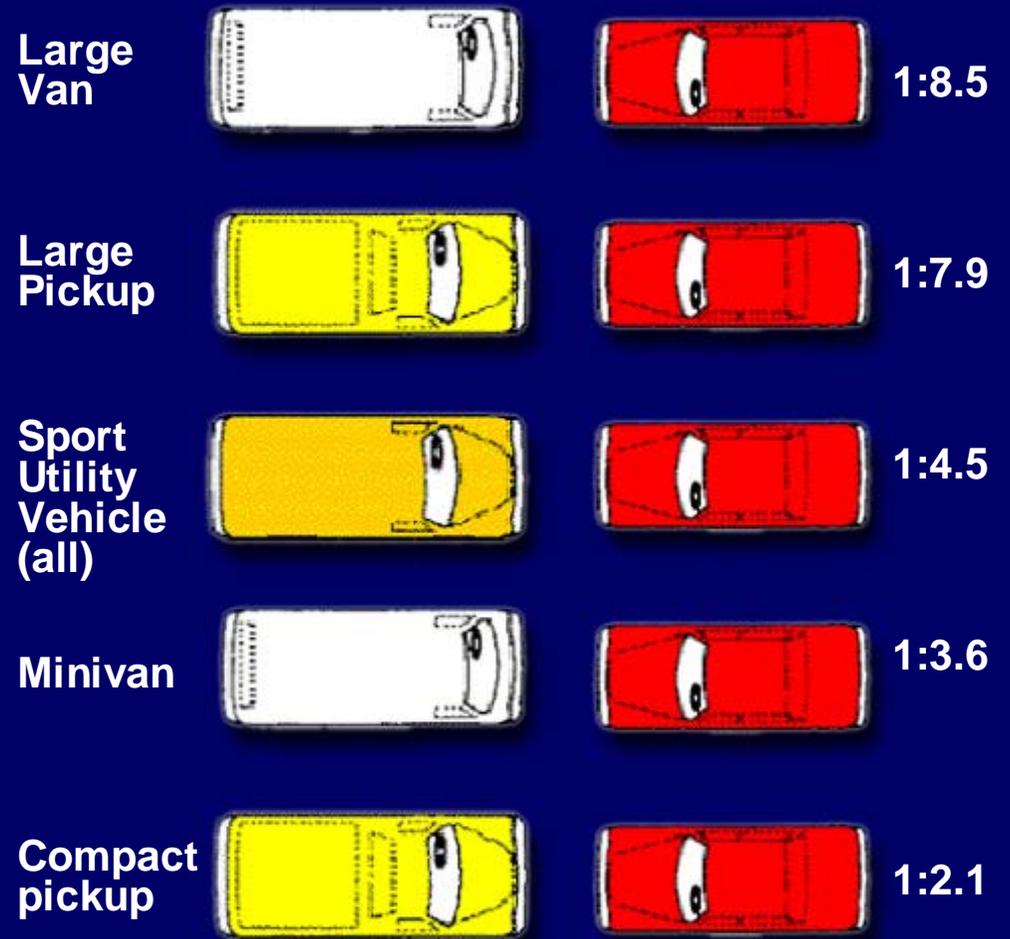
Driver Fatality Ratios

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 \geq 1990



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



Vehicle Compatibility



Side Crash Protection





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



IVI Problem Areas and Status

- **Rear-end Collisions**
- **Road Departure Collisions**
- **Intersection Collisions**
- **Lane Change and Merge Collisions**
- **Heavy Vehicle Collisions**
- **Driver Distraction and Workload**
- **Driver Impairment & Fatigue**



Views on ITS Technologies

- **ITS products could improve safety**
- **Need to assess effectiveness and potential problems**
- **Develop methodologies for assessing the safety impact**
- **Role of government in deployment**



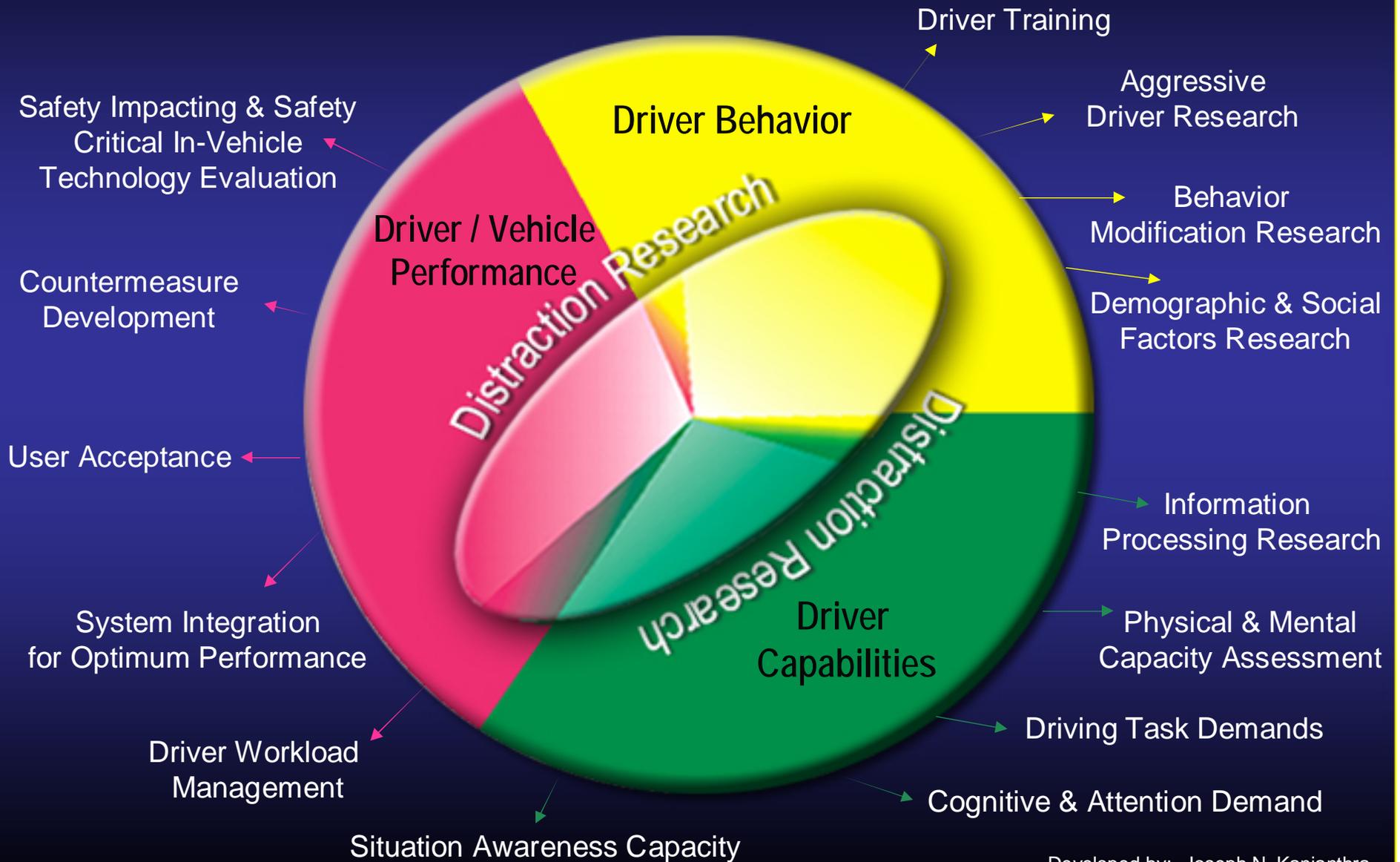
Crash Avoidance Research Activities

- **Distraction**
 - Cell Phone Research
 - Telematics/Infomatics
- **Vehicle Rollovers**
 - Dynamic Test Procedures Development
 - Research on Consumer Information
- **Enhanced Rear Lighting & Signaling**
- **Glare Reduction**
- **Improving Visibility**
- **Tires**
- **Heavy Vehicles**

Rollover Research



Driver Vehicle Safety Research

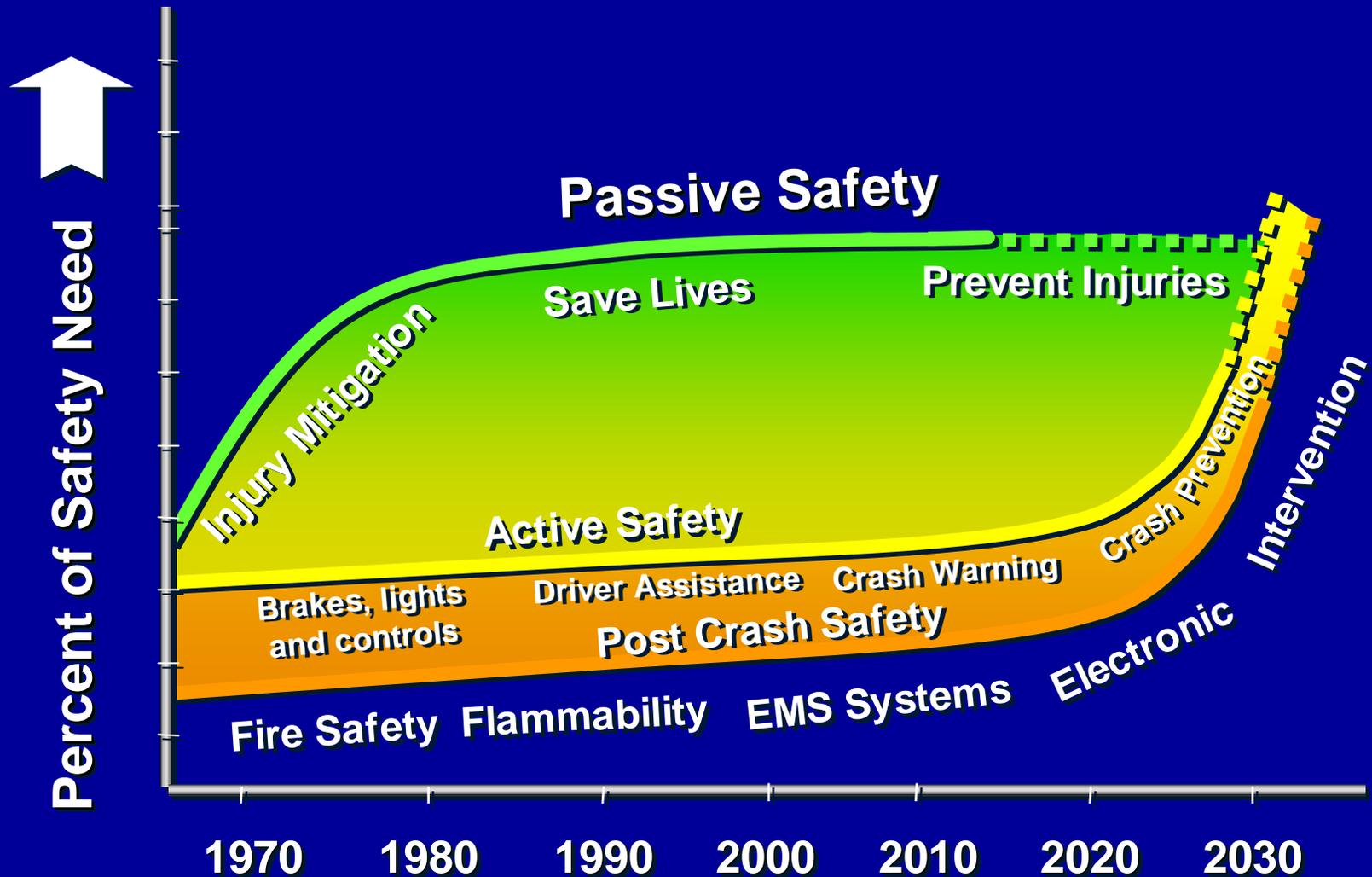




Driver – Vehicle Performance

- **Distraction Research**
- **Human Factor Research**
- **Impairment Research**
 - Drowsiness
 - Alcohol / Drugs
 - Physical Impairment
- **Use of NADS**

The Safety Need



Total Safety





Deployment of Near-Term Technologies

- **Develop Description of the Safety Problem (Situations and Statistical Distributions)**
- **Establish tests that address Relevant Subsets**
- **Establish Safety Relevant Measures of Test Performance**
- **Implement (Test and Evaluate Production Systems)**



Final Comments

- **General Expectations**
 - Expanding Mobility Demands
 - Expanding Convenience Demands
- **Demographics Changes**
- **Safety Not only Sells, It is Expected**
- **Period of Rapidly Changing Technology**
- **We Need to Know Where Technology Is Going**
- **Decision Time Decreasing**