



Increasing Automotive Safety Through Innovative Engineering

Society of Automotive Engineers

Jeffrey Runge, M.D.

Administrator

**National Highway Traffic
Safety Administration**

May 11, 2004

Congratulations



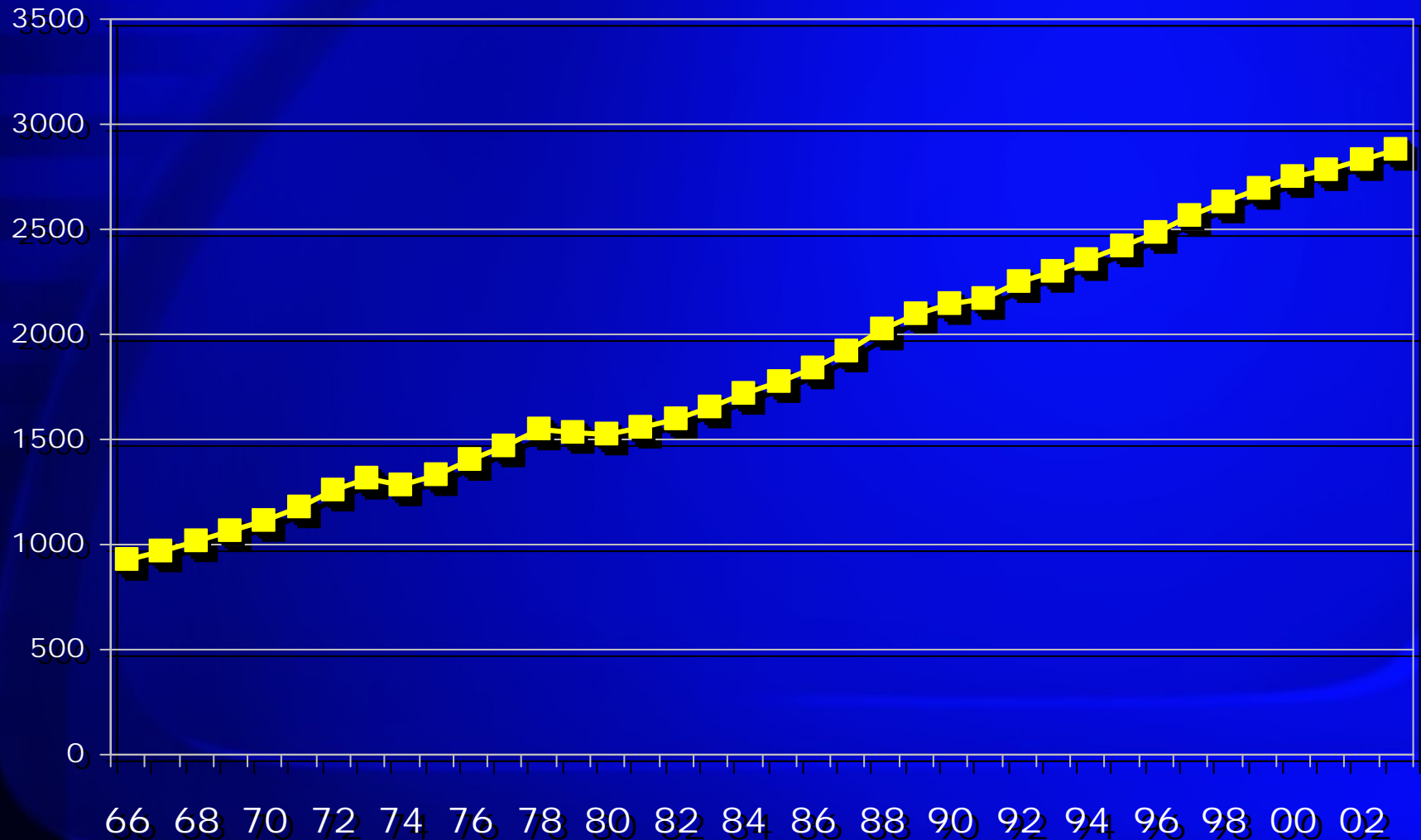
Stan Backaitis
SAE Fellow



Tom Hollowell
Forest R. McFarland Award

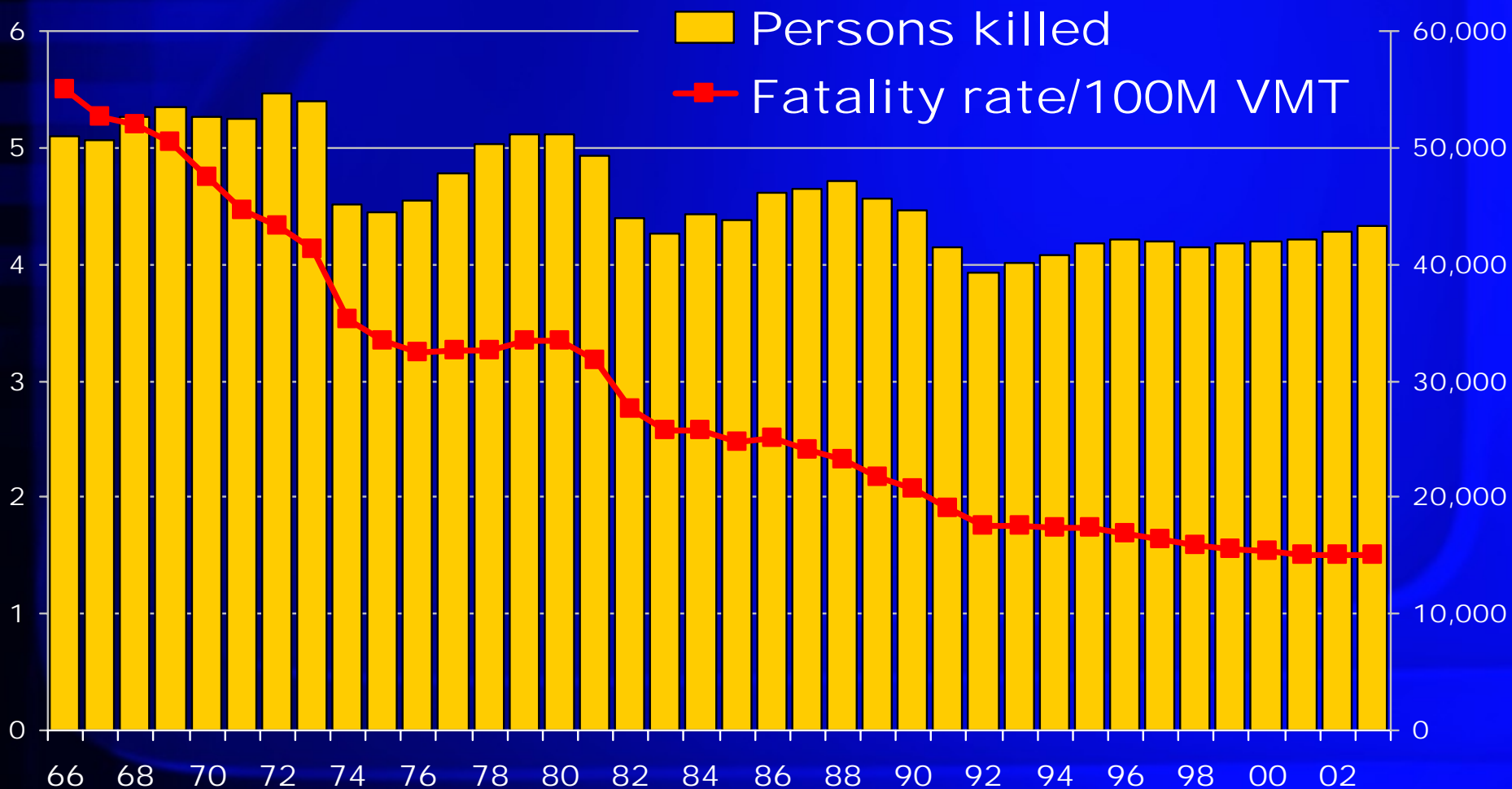


Vehicle Miles Traveled, 1966 - 2003 (in Billions)



Source: FHWA

Persons Killed and Rate Per 100M VMT



Top 10 Leading Causes of Death in the United States for 2001, by Age Group

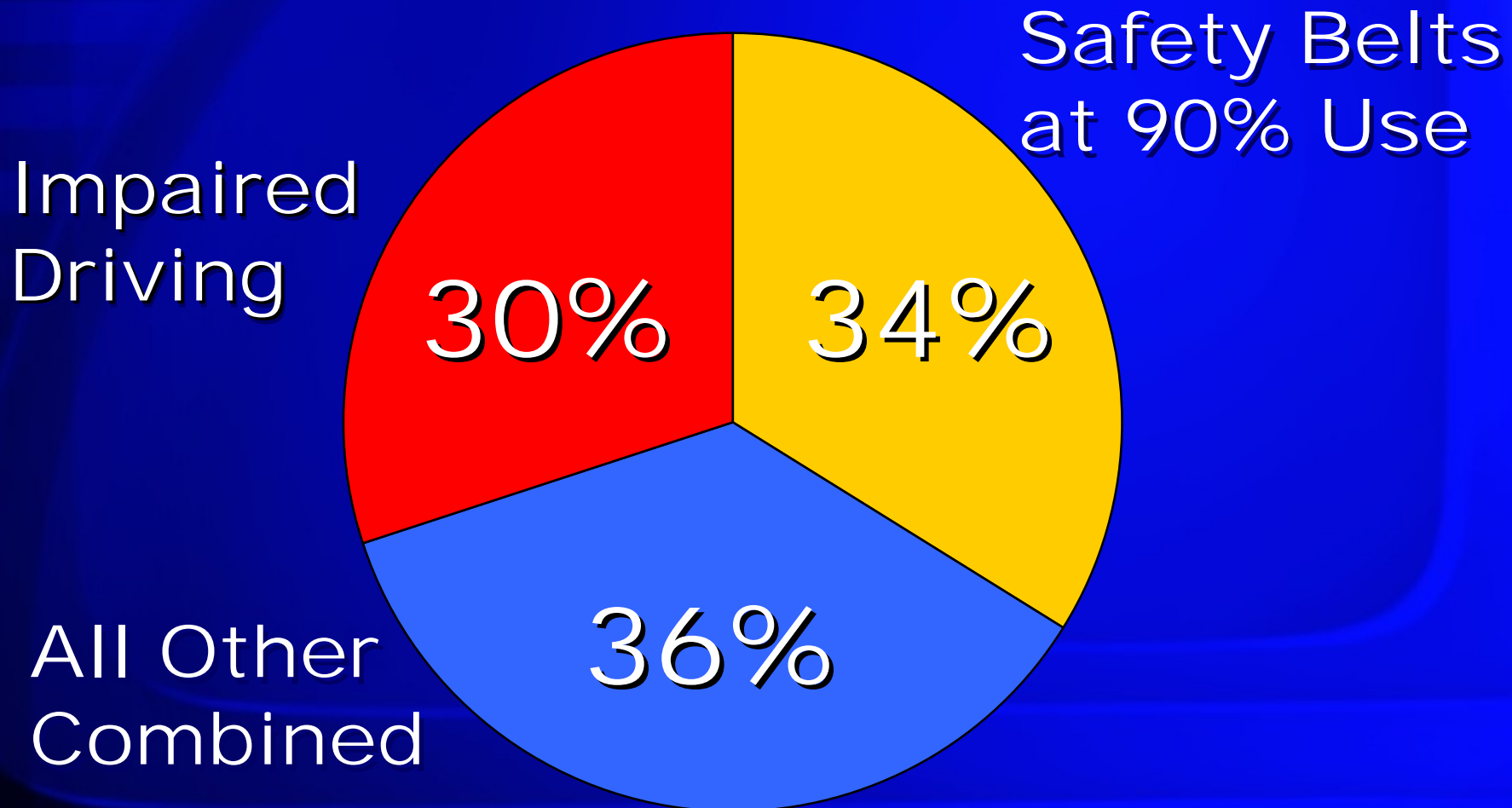
RANK	Cause and Number of Deaths											Years of Life Lost
	Infants Under 1	Toddlers 1-3	Young Children 4-7	Children 8-15	Youth 16-20	Young Adults 21-24	Other Adults			Elderly 65+	All Ages	
							25-34	35-44	45-64			
1	Perinatal Period 13,734	Congenital Anomalies 496	MV Traffic Crashes 533	MV Traffic Crashes 1,546	MV Traffic Crashes 5,979	MV Traffic Crashes 4,136	MV Traffic Crashes 6,759	Malignant Neoplasms 16,569	Malignant Neoplasms 139,785	Heart Disease 582,730	Heart Disease 700,142	Malignant Neoplasms 23% (8,614,131)
2	Congenital Anomalies 5,513	MV Traffic Crashes 421	Malignant Neoplasms 400	Malignant Neoplasms 829	Homicide 2,414	Homicide 2,738	Homicide 5,204	Heart Disease 13,326	Heart Disease 98,885	Malignant Neoplasms 390,214	Malignant Neoplasms 553,768	Heart Disease 22% (8,110,571)
3	Heart Disease 479	Accidental Drowning 393	Exposure to Smoke/Fire 178	Suicide 447	Suicide 1,879	Suicide 1,924	Suicide 5,070	MV Traffic Crashes 6,891	Stroke 15,518	Stroke 144,486	Stroke 163,538	MV Traffic Crashes 5% (1,700,952)
4	Homicide 332	Homicide 362	Congenital Anomalies 168	Homicide 391	Malignant Neoplasms 814	Accidental Poisoning 771	Malignant Neoplasms 3,994	Suicide 6,635	Diabetes 14,913	Chronic Lwr. Resp. Dis. 106,904	Chronic Lwr. Resp. Dis. 123,013	Stroke 5% (1,687,683)
5	Septicemia 312	Malignant Neoplasms 321	Accidental Drowning 164	Congenital Anomalies 324	Accidental Poisoning 566	Malignant Neoplasms 768	Heart Disease 3,160	HIV 5,867	Chronic Lwr. Resp. Dis. 14,490	Influenza/Pneumonia 55,518	Diabetes 71,372	Chronic Lwr. Resp. Dis. 4% (1,444,745)
6	Influenza/Pneumonia 299	Heart Disease 200	Homicide 133	Accidental Drowning 293	Heart Disease 398	Heart Disease 543	Accidental Poisoning 2,507	Accidental Poisoning 5,036	Chronic Liver Disease 13,009	Diabetes 53,707	Influenza/Pneumonia 62,034	Suicide 3% (1,079,822)
7	MV Traffic Crashes 139	Exposure to Smoke/Fire 170	Heart Disease 82	Heart Disease 273	Accidental Drowning 326	Accidental Drowning 211	HIV 2,101	Homicide 4,268	Suicide 9,259	Alzheimer's 53,245	Alzheimer's 53,852	Perinatal Period 3% (1,070,154)
8	Nephritis/Nephrosis 133	Septicemia 96	MV NonTraffic Crashes 51	Exposure to Smoke/Fire 140	Congenital Anomalies 244	Congenital Anomalies 206	Stroke 601	Chronic Liver Disease 3,336	MV Traffic Crashes 8,750	Nephritis/Nephrosis 33,121	MV Traffic Crashes 42,443	Diabetes 3% (1,014,201)
9	Stroke 108	Influenza/Pneumonia 92	Benign Neoplasms 46	MV NonTraffic Crashes 125	Accidental Falls 114	HIV 167	Diabetes 595	Stroke 2,491	HIV 5,437	Septicemia 25,418	Nephritis/Nephrosis 39,480	Homicide 3% (924,263)
10	Meningitis 78	Perinatal Period 63	Septicemia 33	Chr. Lwr. Resp. Dis. 102	Acc. Dischg. of Firearms 114	Accidental Falls 134	Congenital Anomalies 458	Diabetes 1,958	Nephritis/Nephrosis 5,106	Hypertension Renal Dis. 16,397	Septicemia 32,238	Chronic Liver Disease 2% (623,998)
ALL	27,568	4,288	2,703	6,672	15,851	14,940	41,683	91,674	412,204	1,798,420	2,416,425	All Causes 100% (36,866,317)

Economic Cost of Crashes

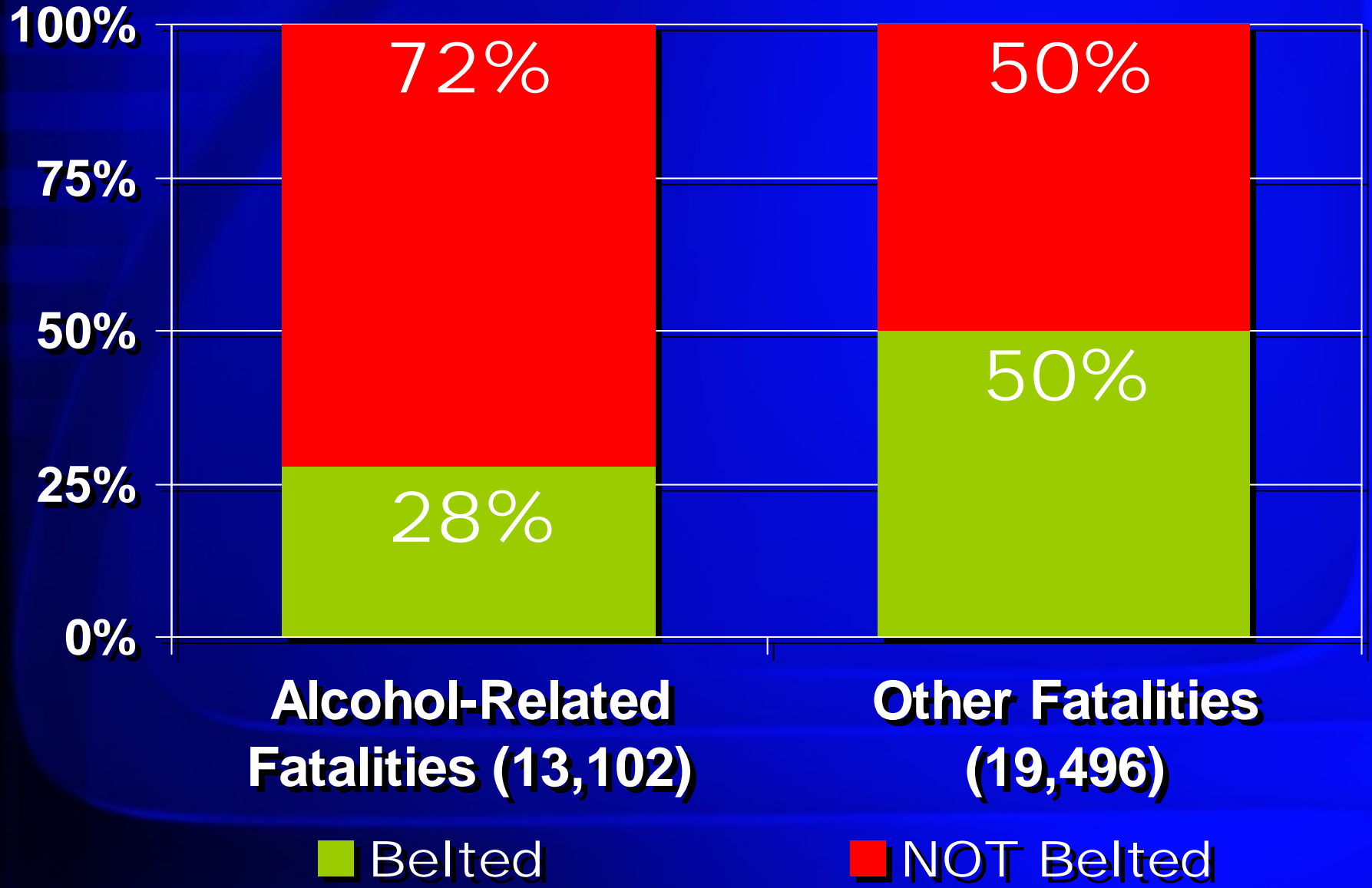
- **\$230 billion total**
 - **\$32 billion medical cost**
 - **\$51 billion for impaired driving**
 - **\$20 billion failure to use belts**



Predicted Lives Saved by Countermeasure



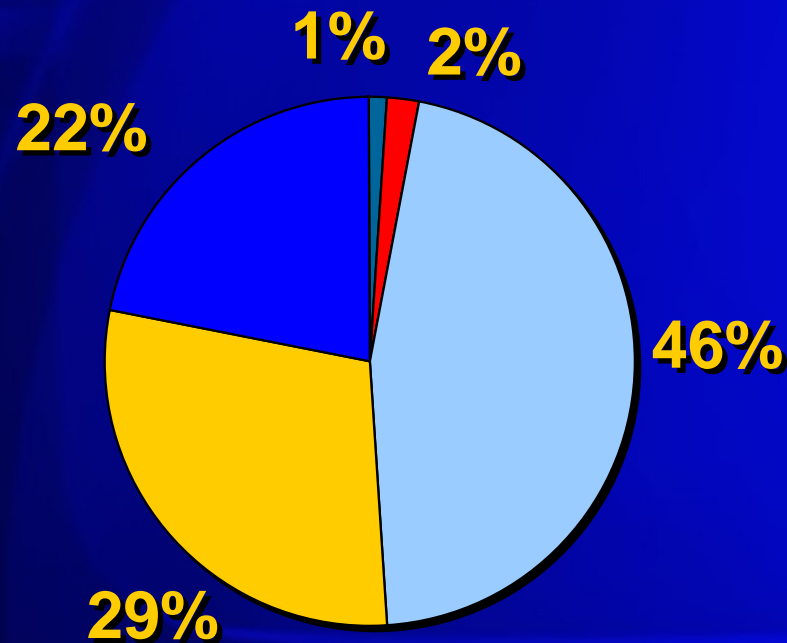
2002 Occupant Fatalities: 32,598



Vehicles and Fatalities by Collision Type 2002

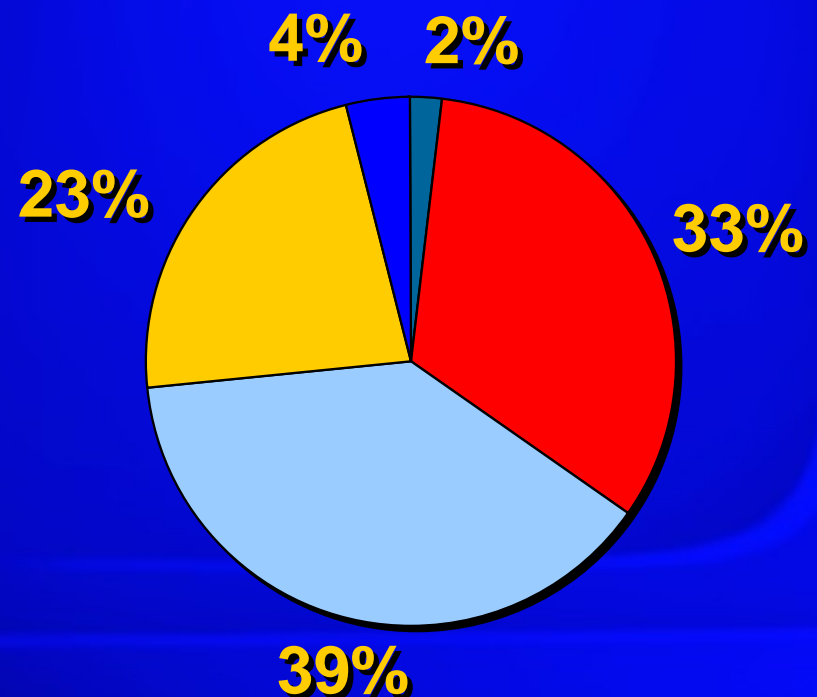
Passenger Vehicles in Crashes

Approx. 10.6 million vehicles involved



Passenger Vehicle Occupant Fatalities

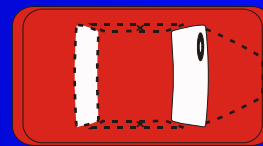
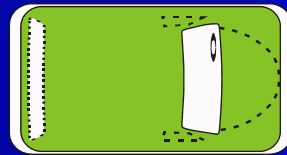
32,598 total occupants killed



■ Rollover ■ Front ■ Side ■ Rear ■ Other

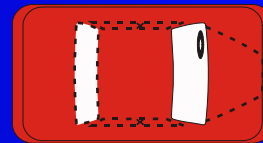
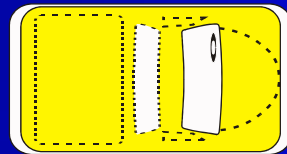
Driver Fatality Ratios in Frontal Crashes

Large Van



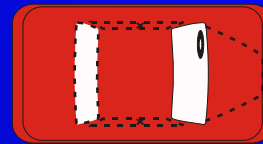
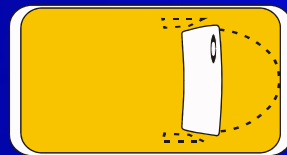
1:8.5

Large Pickup



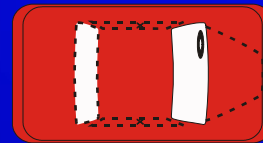
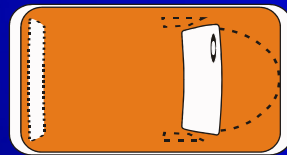
1:7.9

Sport Utility Vehicle (All)



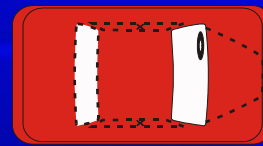
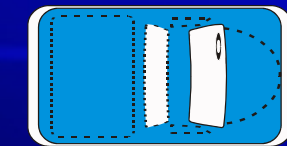
1:4.5

Minivan



1:3.6

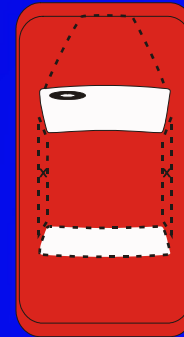
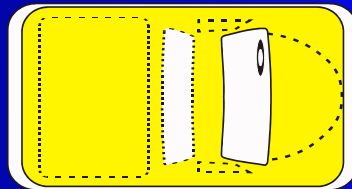
Compact Pickup



1:2.1

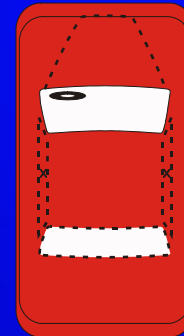
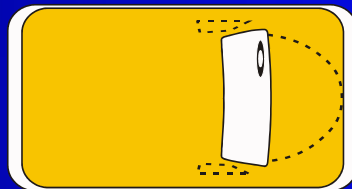
Driver Fatality Ratios in Side Crashes

Large Pickup



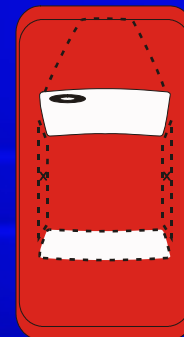
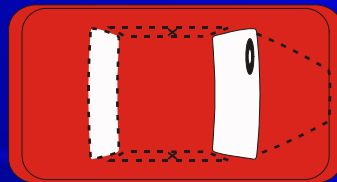
1:39.1

Sport Utility Vehicle (All)



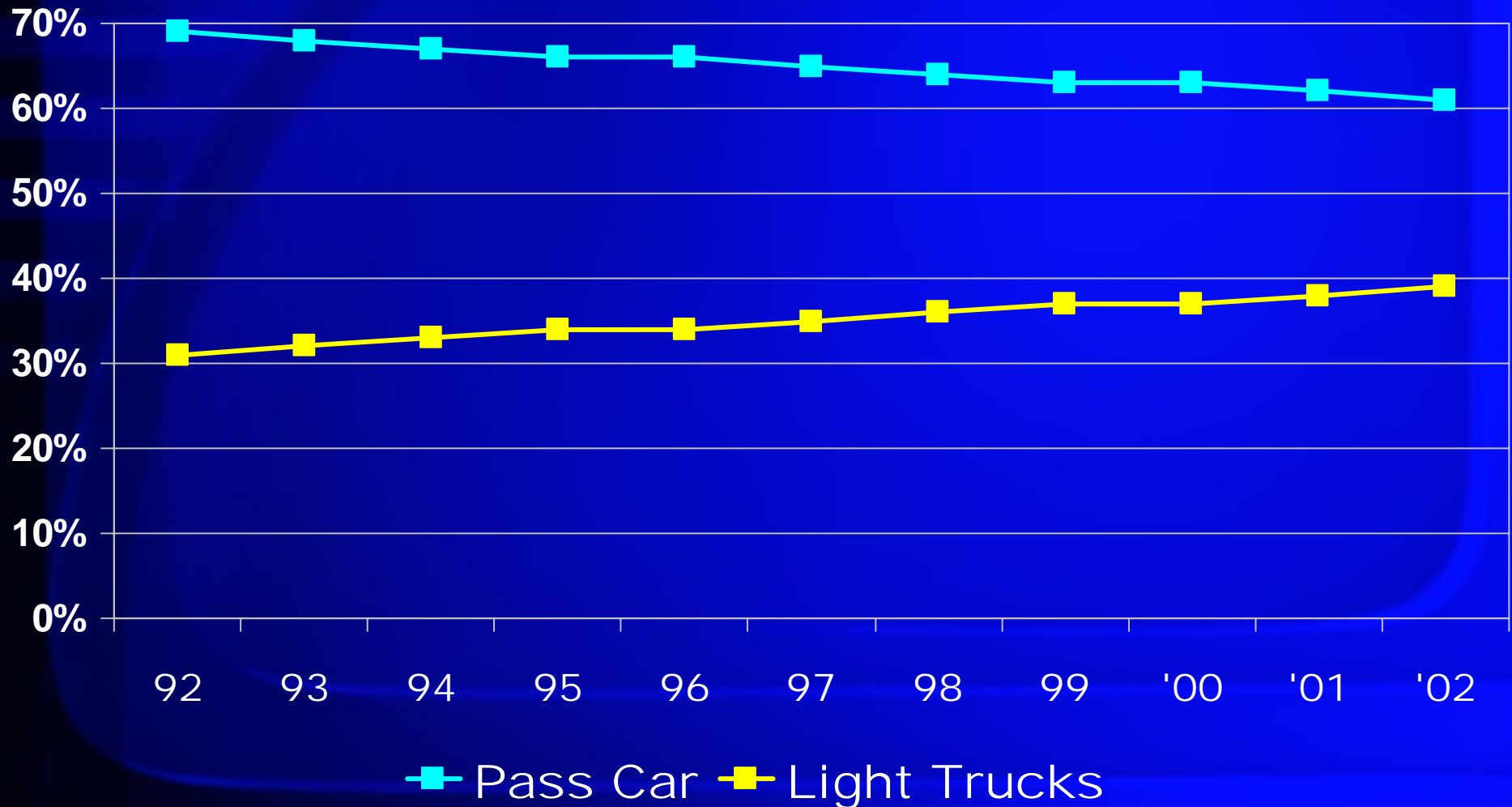
1:22.1

Passenger Car

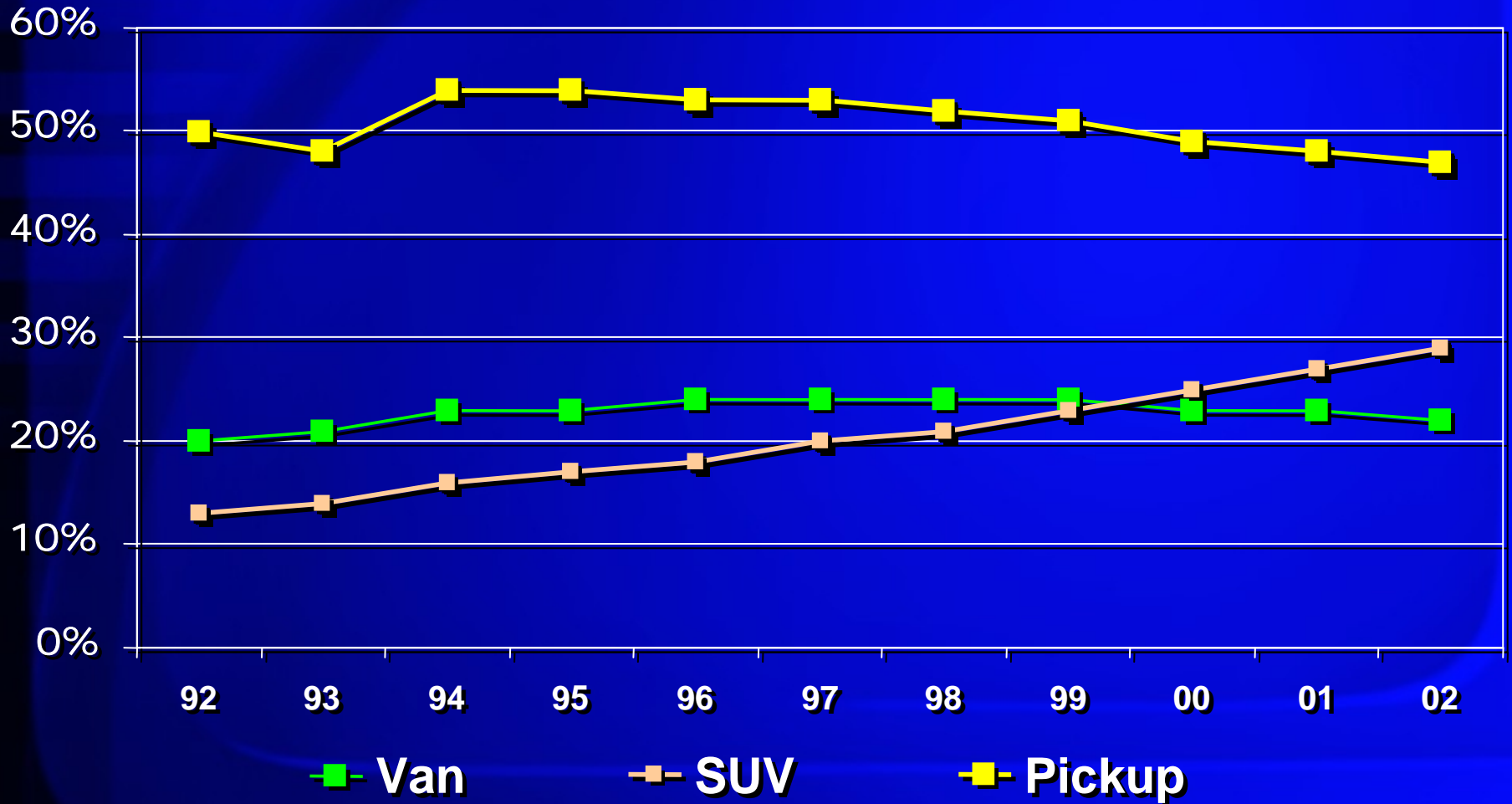


1:8.2

Change in Total Vehicle Fleet



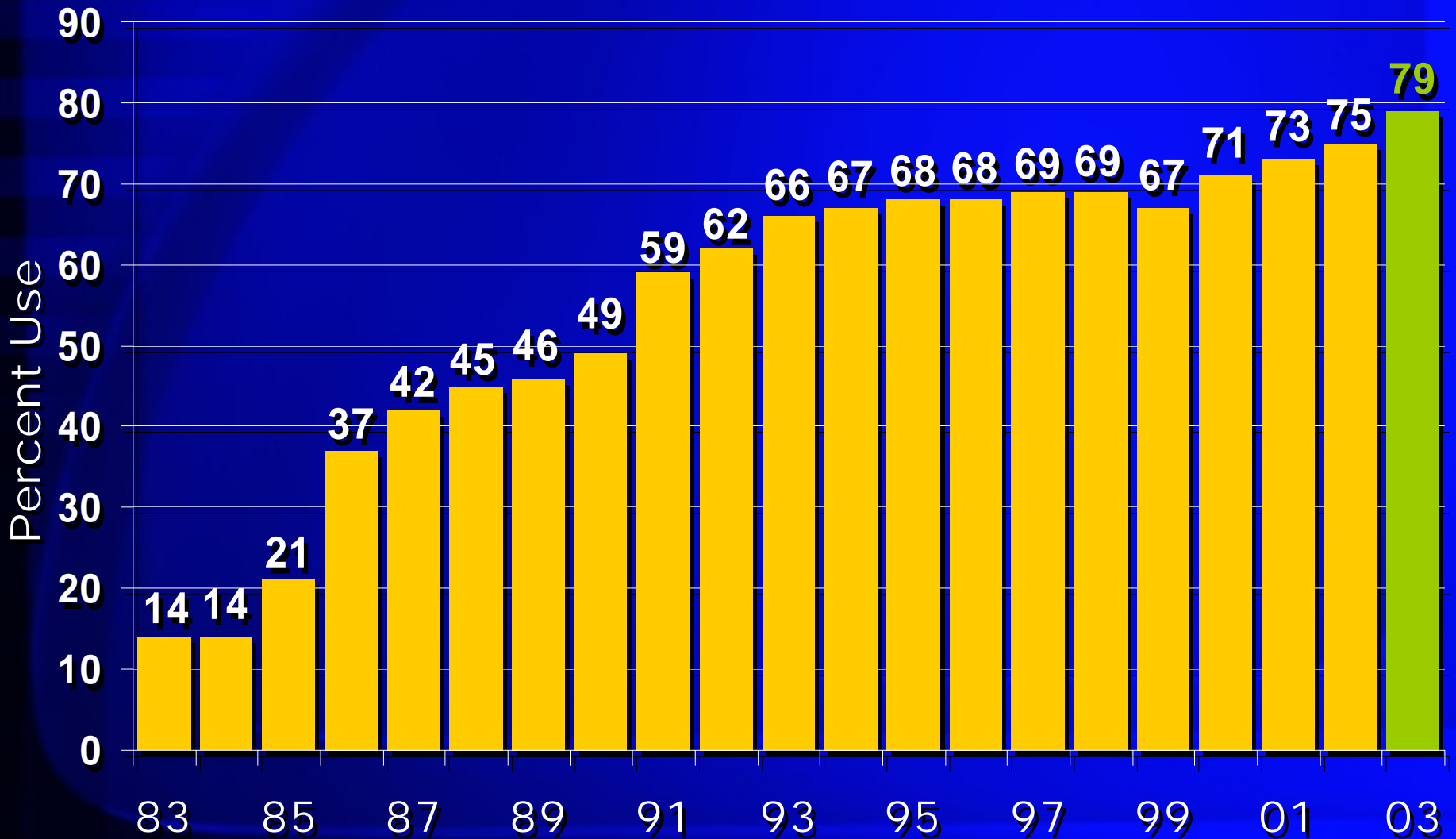
Change in LTV Fleet



Highway Safety Priorities

- **Increase safety belt use**
- **Reduce impaired driving**
- **Improve data**
- **Reduce rollovers**
- **Improve vehicle compatibility**

Safety Belt Use Rates

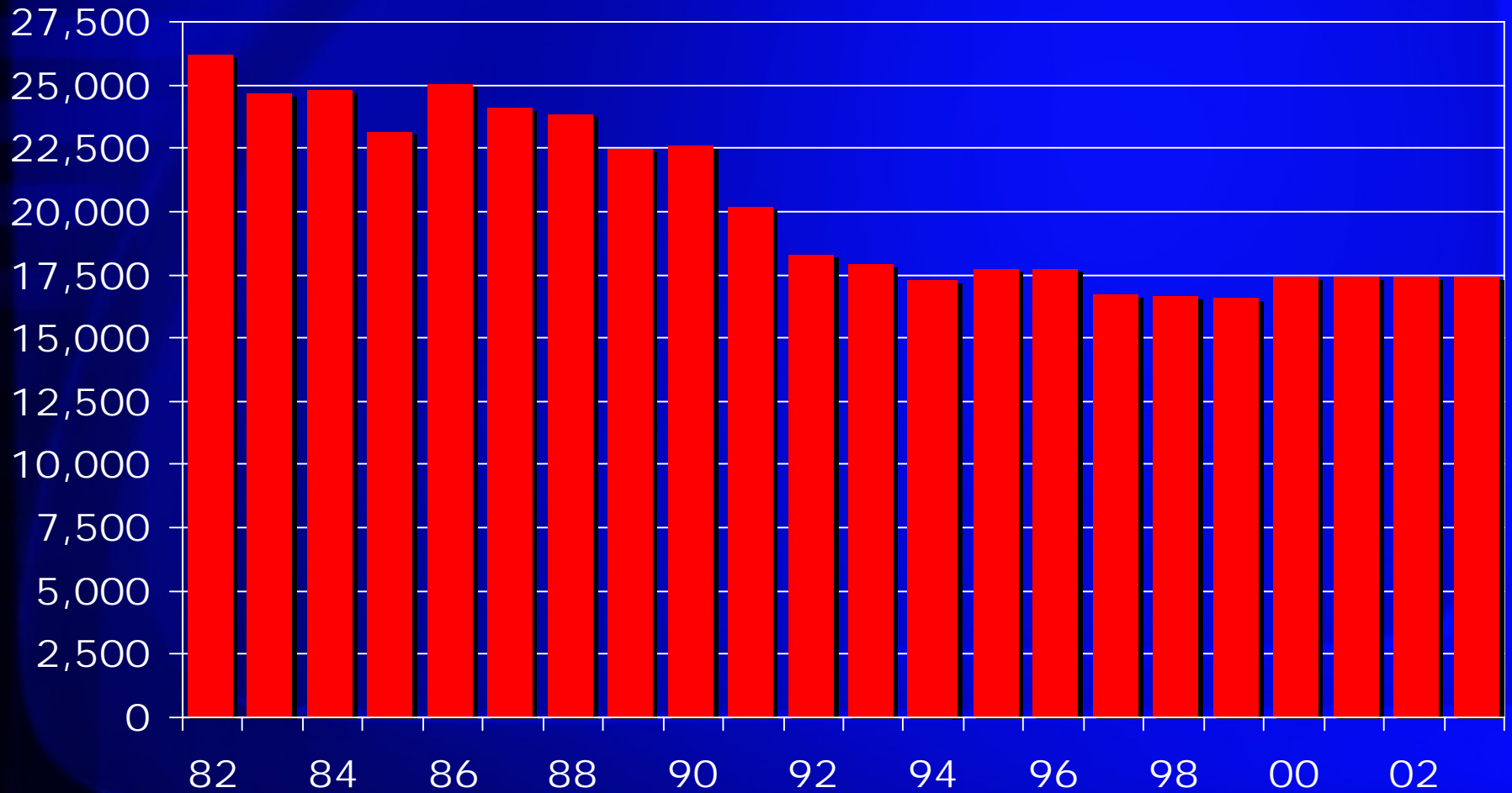


Lives Saved by Rulemakings

- **Child Restraints** **36 – 50 lives**
 - **Advanced Air Bags** **117 – 215 lives**
 - **TPMS** **124 lives**
 - **Tire Upgrade** **1 – 4 lives**
 - **Fuel Tank Integrity** **8 – 21 lives**
-
- **Total** **286 – 414 lives/year**

Primary belt laws 1400 lives

Alcohol-Related Fatalities 1982 - 2003



Source: FARS

Haddon Matrix

Human

Vehicle

Environment

Pre-Event



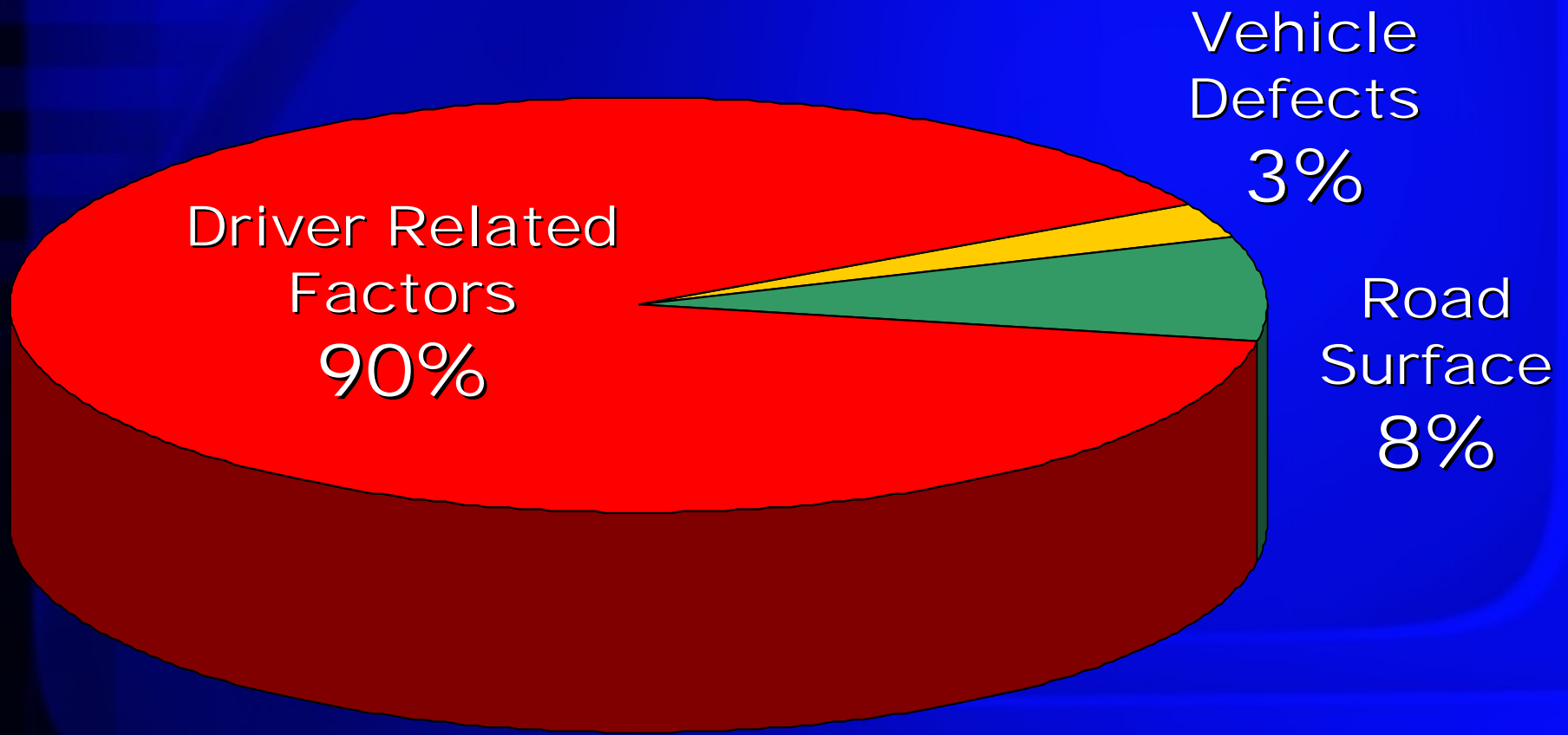
Event



Post-Event



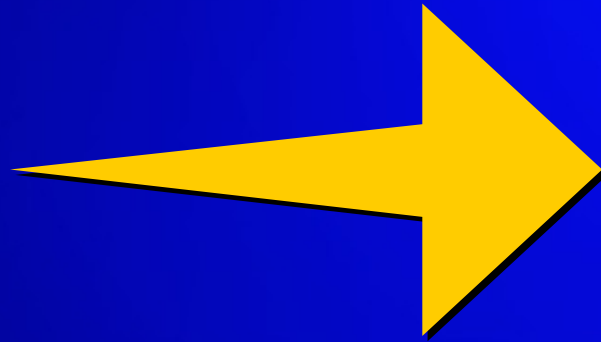
Crash Causation Factors



Evolution of Vehicle Safety

The Past

Crash
Worthiness



The Future

Crash
Avoidance

Delivery of Auto Safety

Traditional Approach

- Define problem
- Develop safety countermeasures
- Evaluate benefits
- Regulation

New Approach

- Identify technologies
- Collaborative research
- Evaluate benefits
- Consumer information

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Reduce Rollovers



Timeline for Reducing Rollover Fatalities



Fishhook Maneuver

Zone where tip-up most likely to occur

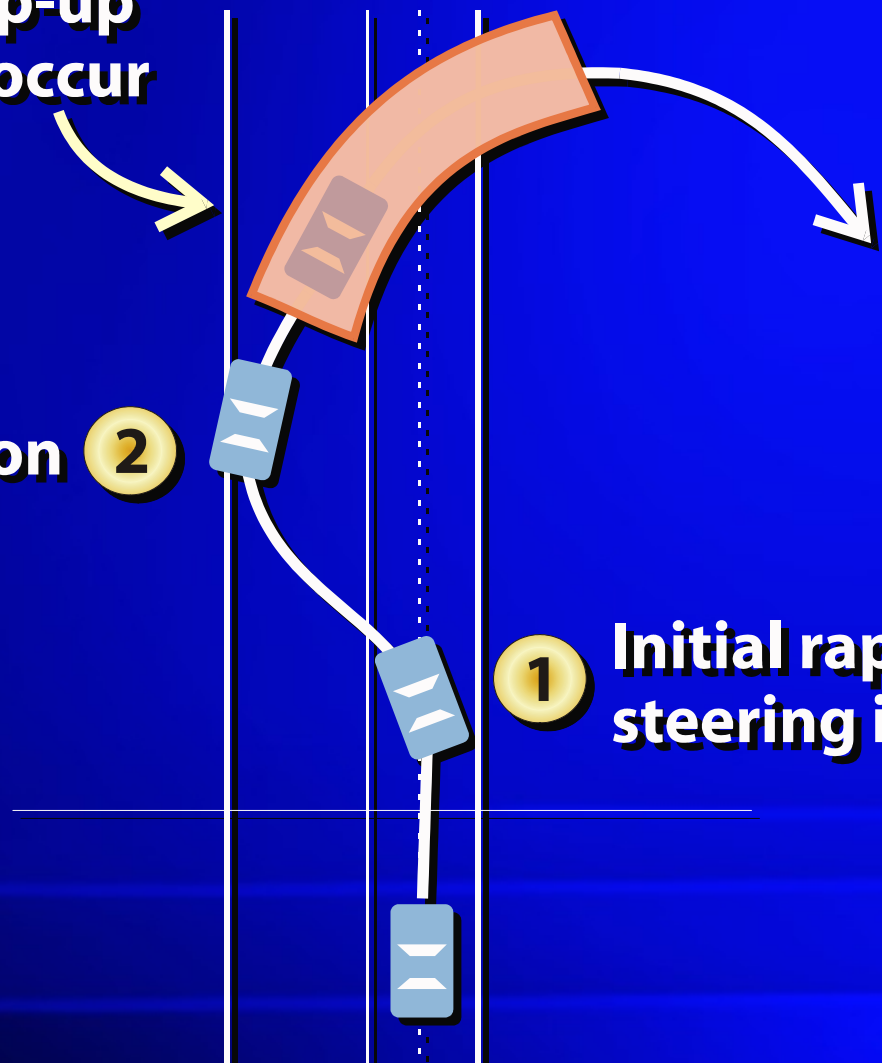
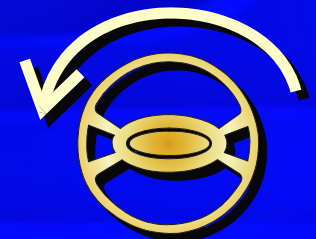
Test Complete

Overcorrection 2

2

1

Initial rapid steering input



2000 Toyota 4Runner 4x4

Maneuver: Fishhook

Entrance Speed: 40 mph

ESC: No

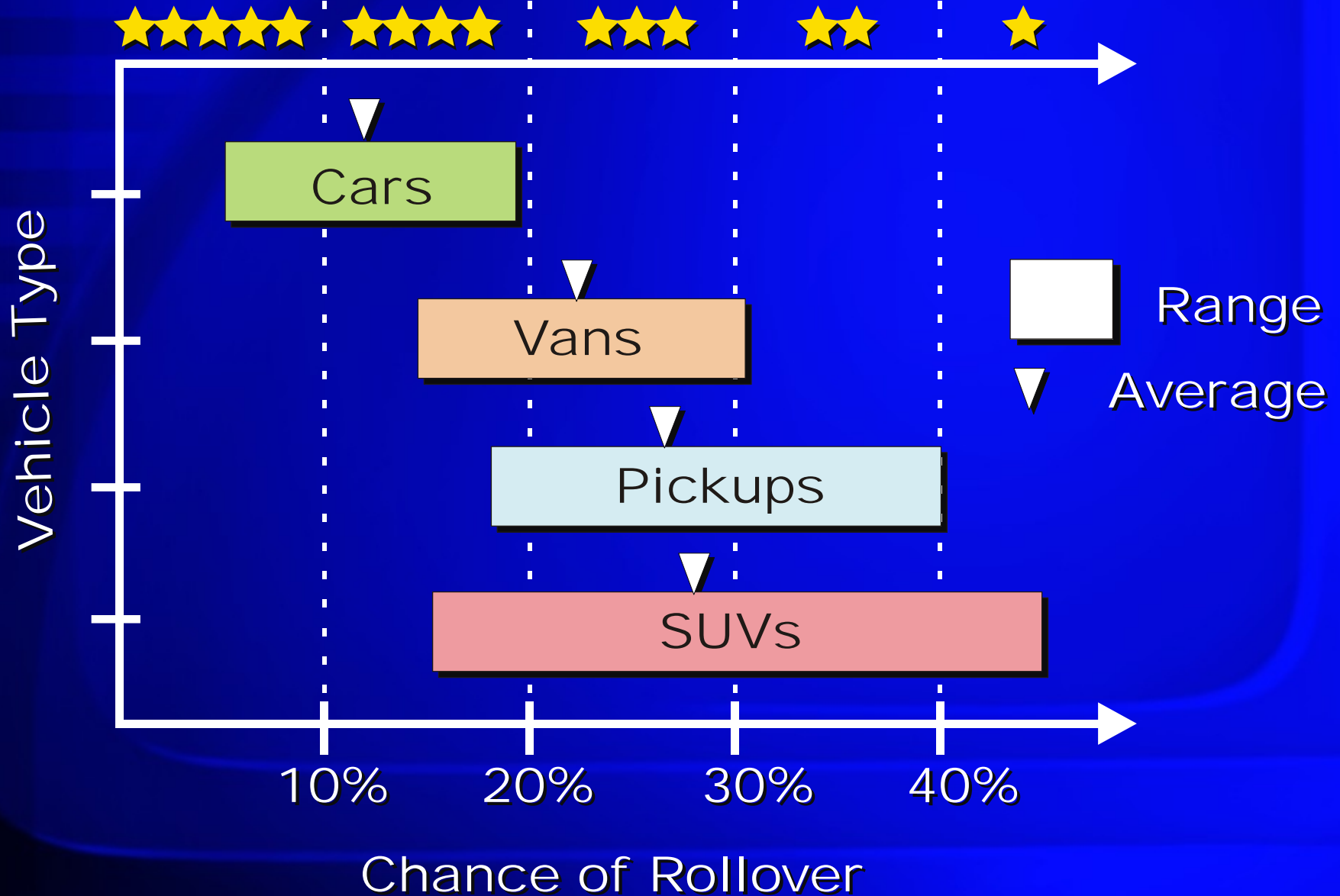
2003 Toyota 4Runner 4x4

Maneuver: Fishhook

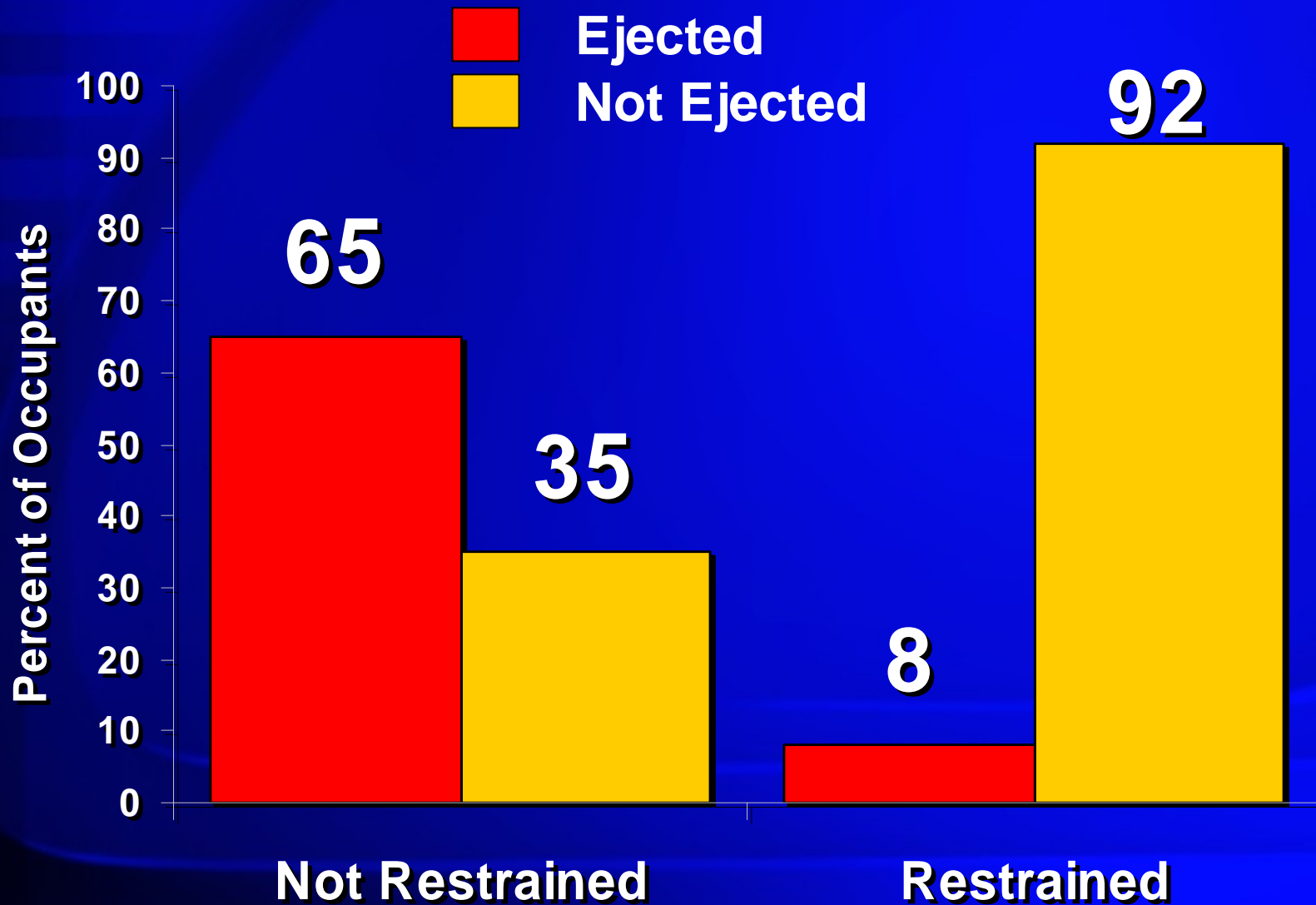
Entrance Speed: 45 mph

ESC: Yes

Vehicle Class Comparison



Restrained Occupants Rarely Ejected In Fatal Rollovers



Improve Vehicle Compatibility









108TH CONGRESS
2D SESSION

H. R. 4167

To authorize appropriations for the motor vehicle safety and information and cost savings programs of the National Highway Traffic Safety Administration for fiscal years 2005 through 2007, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 2, 2004

Mr. STEARNS (by request) introduced the following bill; which was referred to the Committee on Energy and Commerce

A BILL

To authorize appropriations for the motor vehicle safety and information and cost savings programs of the National Highway Traffic Safety Administration for fiscal years 2005 through 2007, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **TITLE I—MOTOR VEHICLE**
4 **SAFETY**

5 **SEC. 101. AUTHORIZATION OF APPROPRIATIONS.**

6 Section 30104 of title 49, United States Code, is
7 amended to read as follows:

What You Can Do

- **Collaborative Research**
 - **Technology specifications**
 - **Test procedure development**
 - **Safety benefits**



People Saving People

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