



INTEGRATED SAFETY:

WILL TECHNOLOGIES ACCELERATE SAFETY DELIVERY?

May 16, 2007



Joseph N. Kianthra, Ph.D.

Associate Administrator for Vehicle Safety Research | National Highway Traffic Safety Administration

Outline

1. Safety Problems

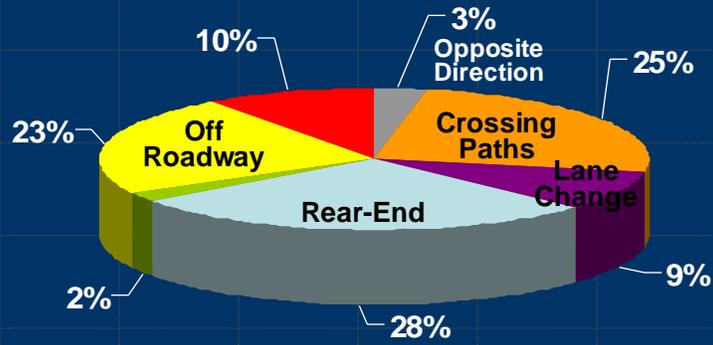
2. Integrated Safety Concept

3. Current and Future Technologies

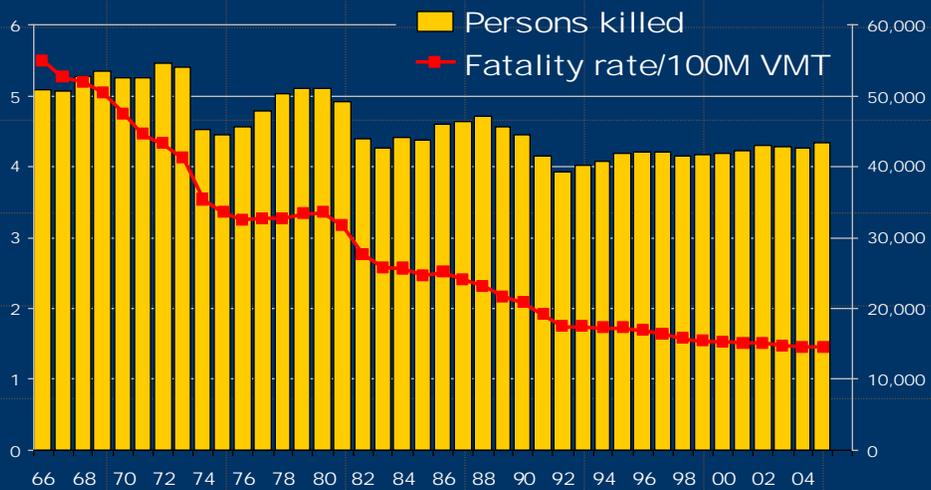
4. Conclusions

Crashes of all Severities

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

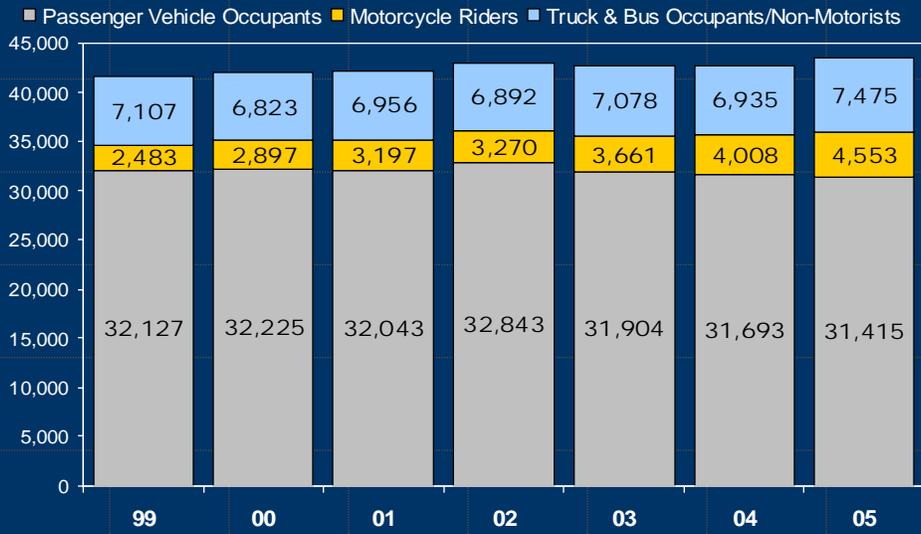


Persons Killed and Rate 100M VMT

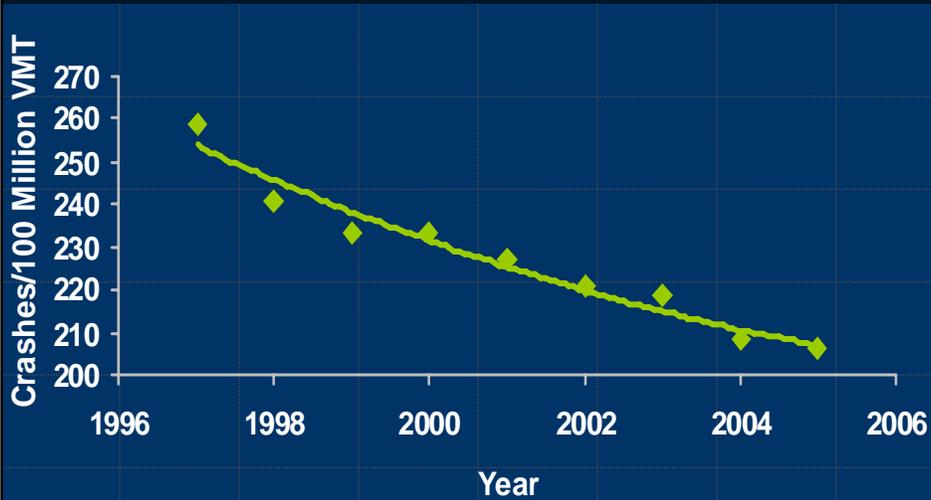


Source: 2005 FARS

Motor Vehicle Fatalities



Trends in Crash Rates – All Crashes

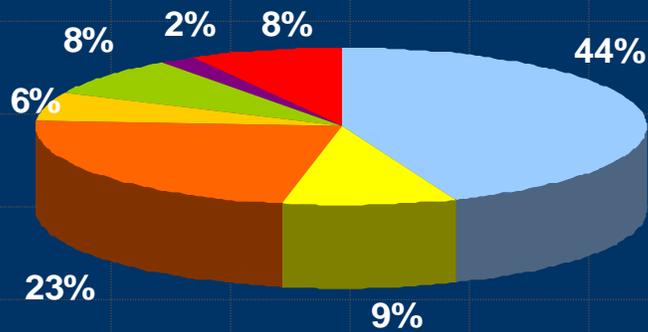


Trends in Fatality Rates in head on crashes



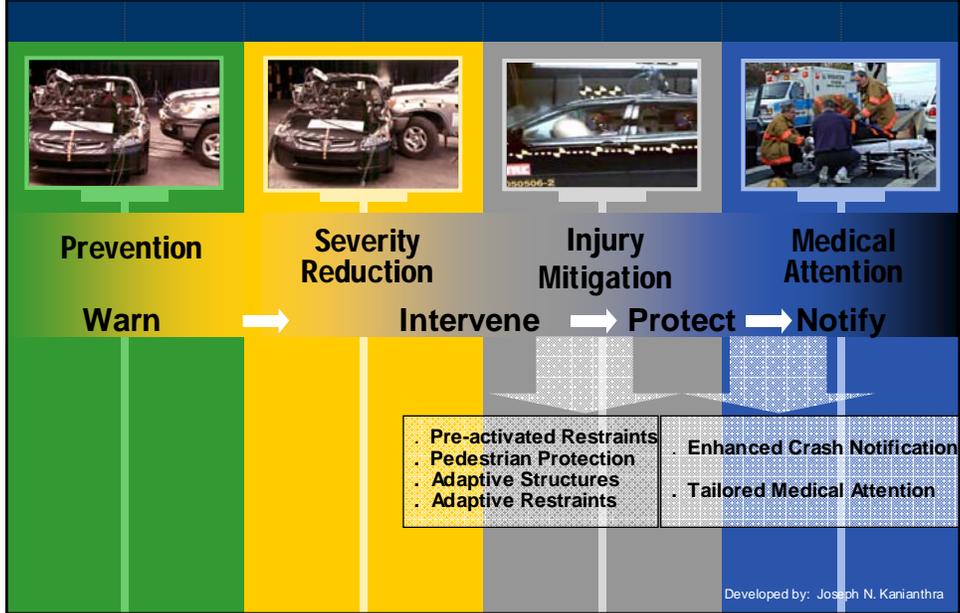
Crash Causal Factors

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

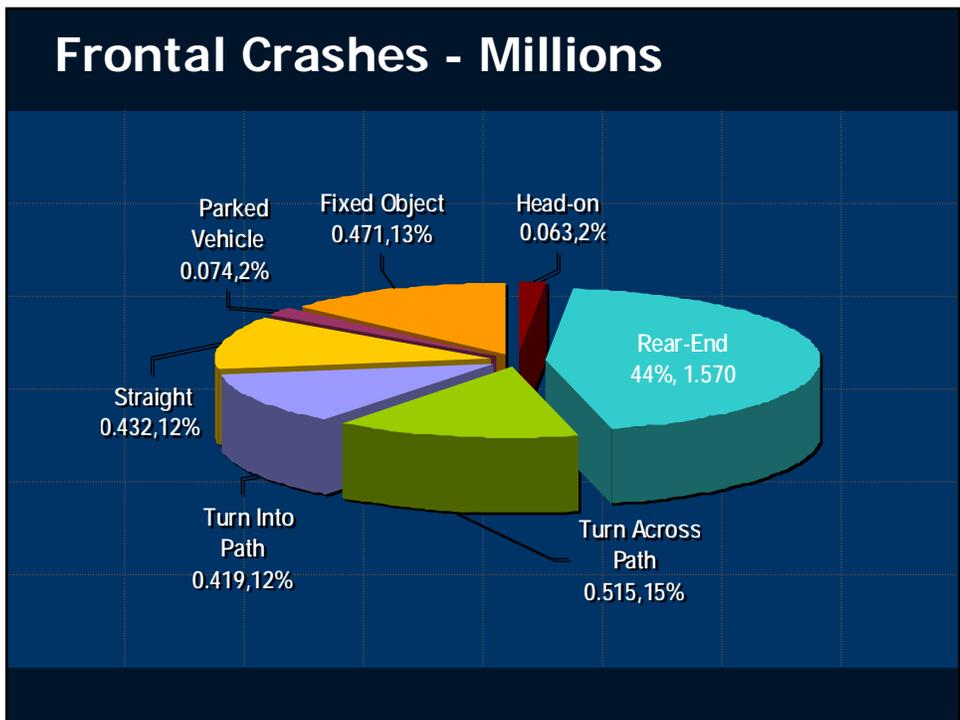


Integrated Safety Concept

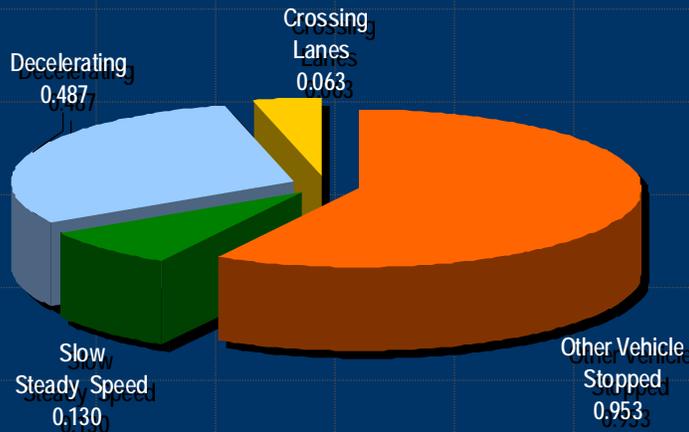
Crash Time Line



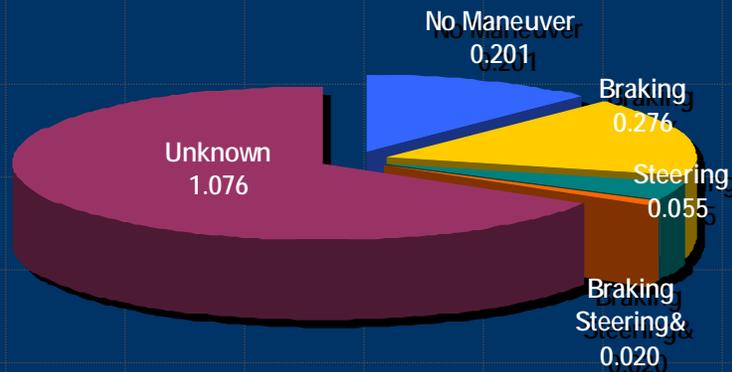
Frontal Crashes - Millions



Critical Events – Crashes in Millions



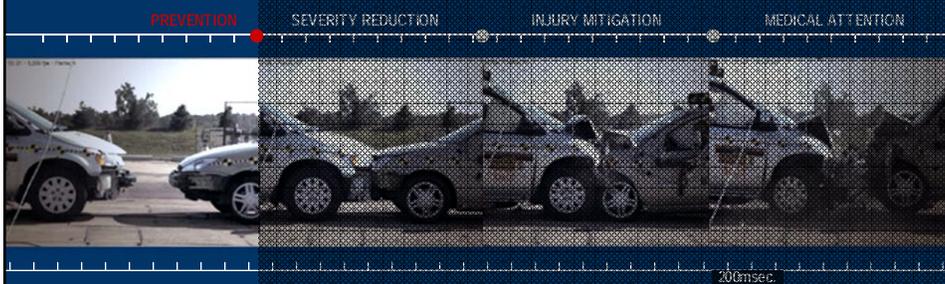
Driver Actions – Crashes in Millions



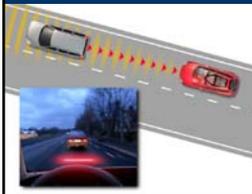
Typical Head-on Crash



Importance of Crash Timelines

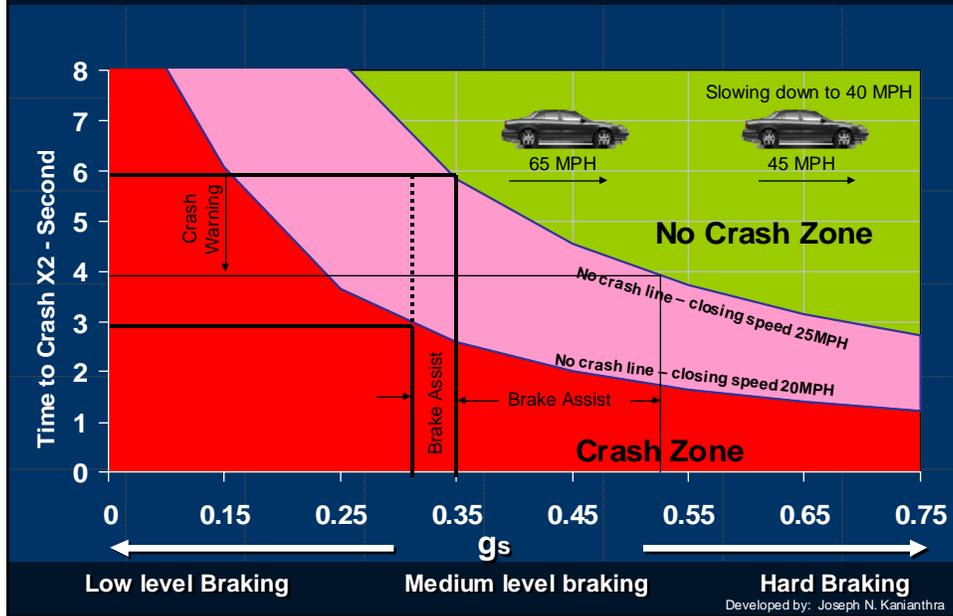


HUMAN / PRE- EVENT

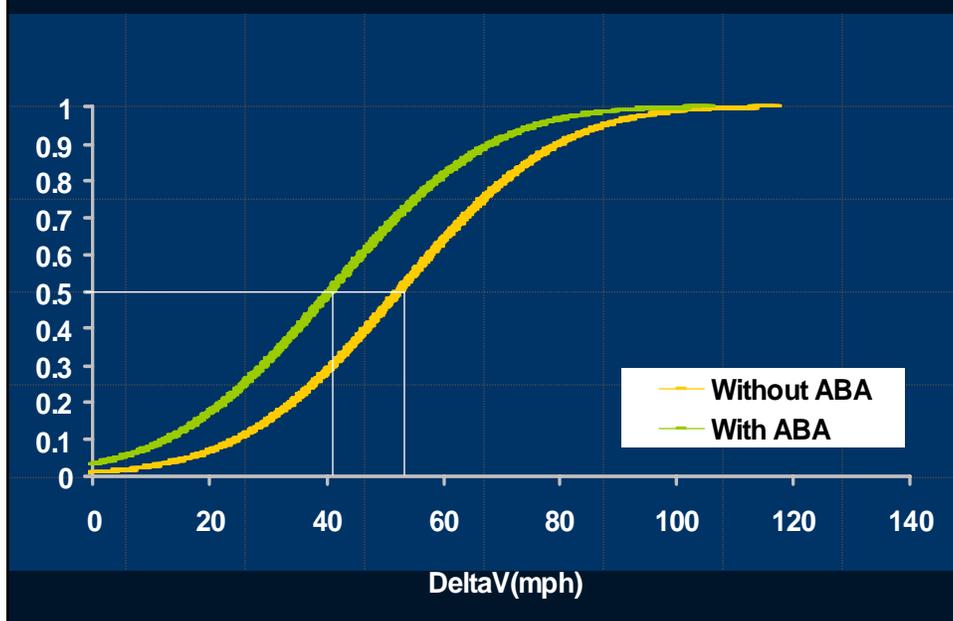


Volv of onward collision warning

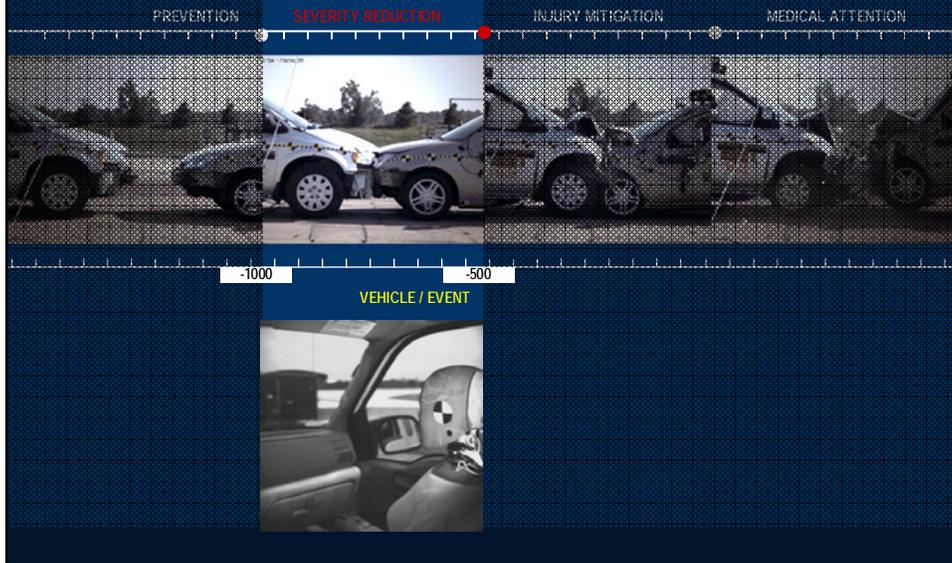
Effect of Rear-End Collision Avoidance Technologies



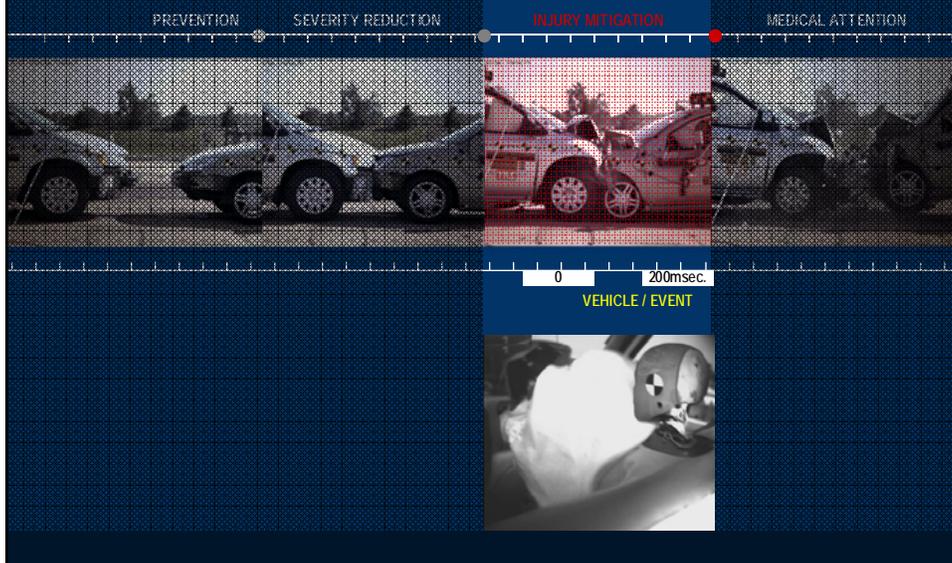
Hypothetical Example of Cumulative Delta V for Head-on Collisions ABA: 0.8g @ TTC = 0.5 sec



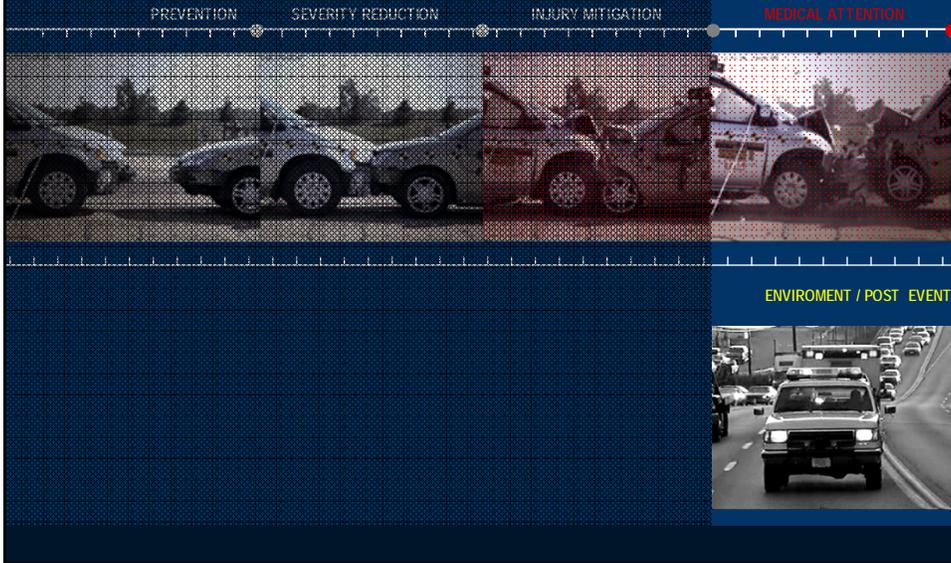
Importance of Crash Timelines



Importance of Crash Timelines

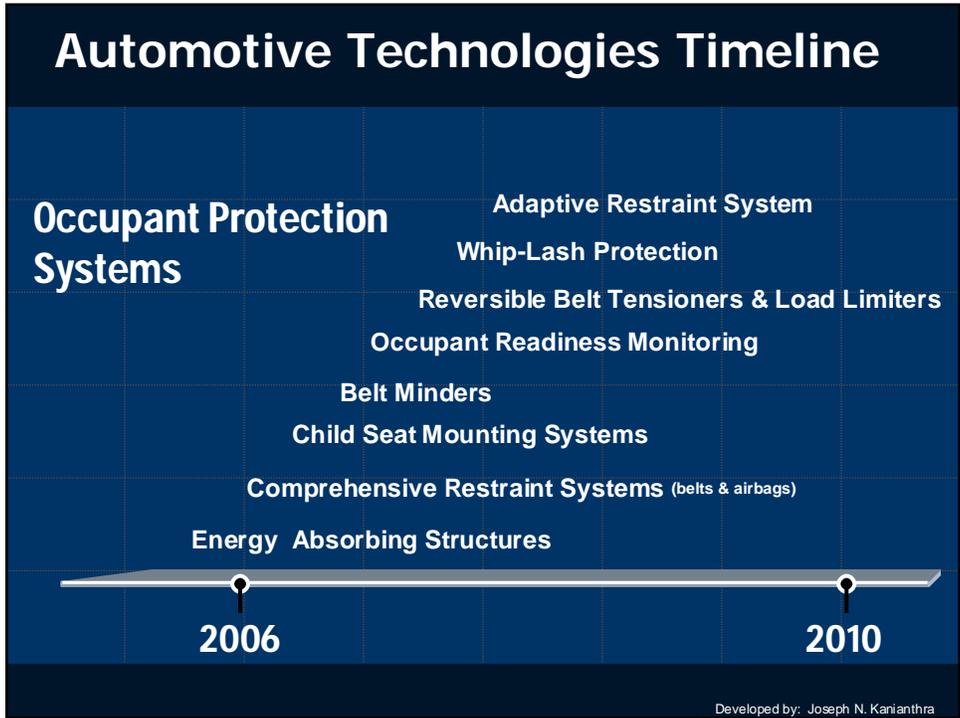
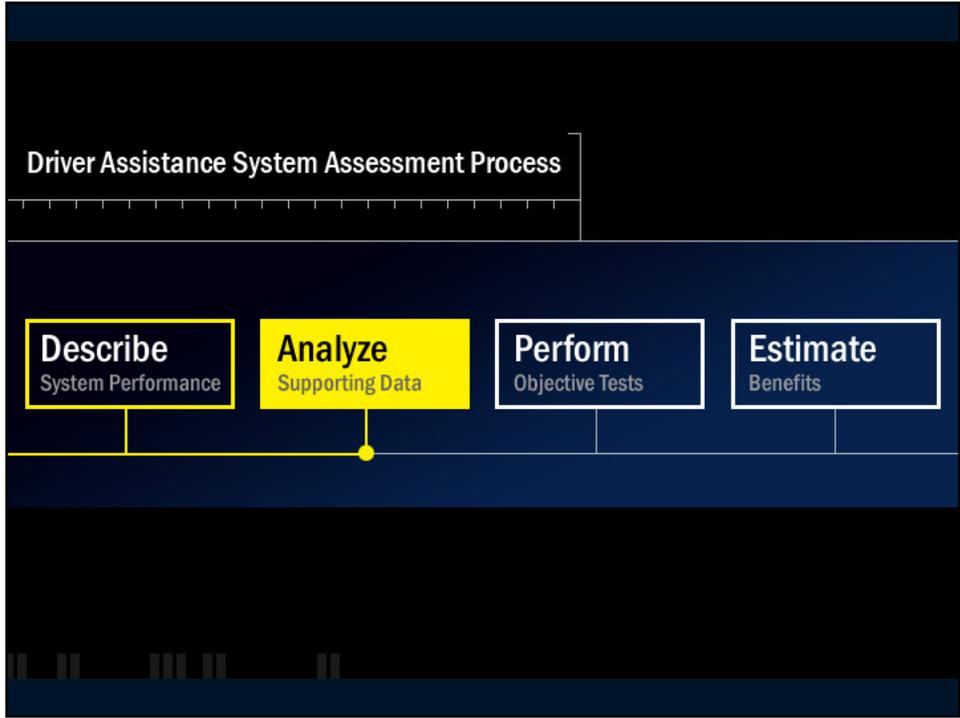


Importance of Crash Timelines



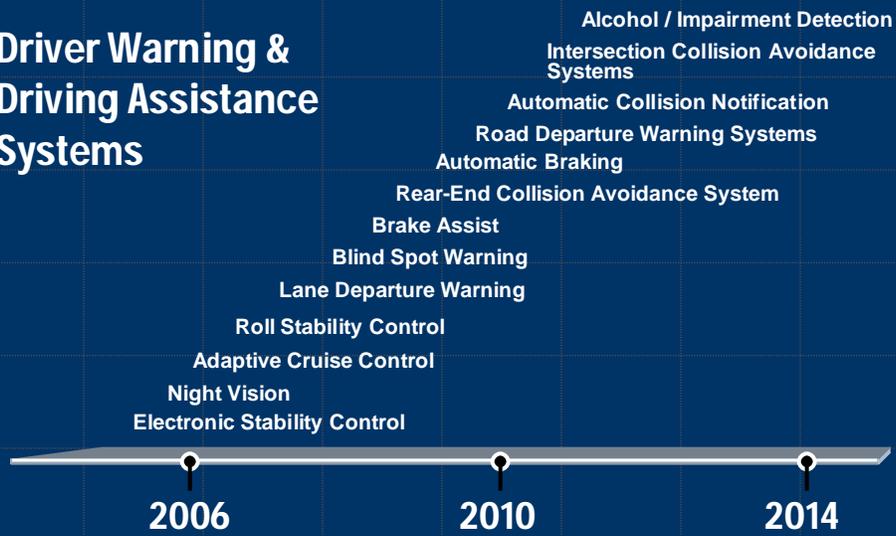
The Challenge

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

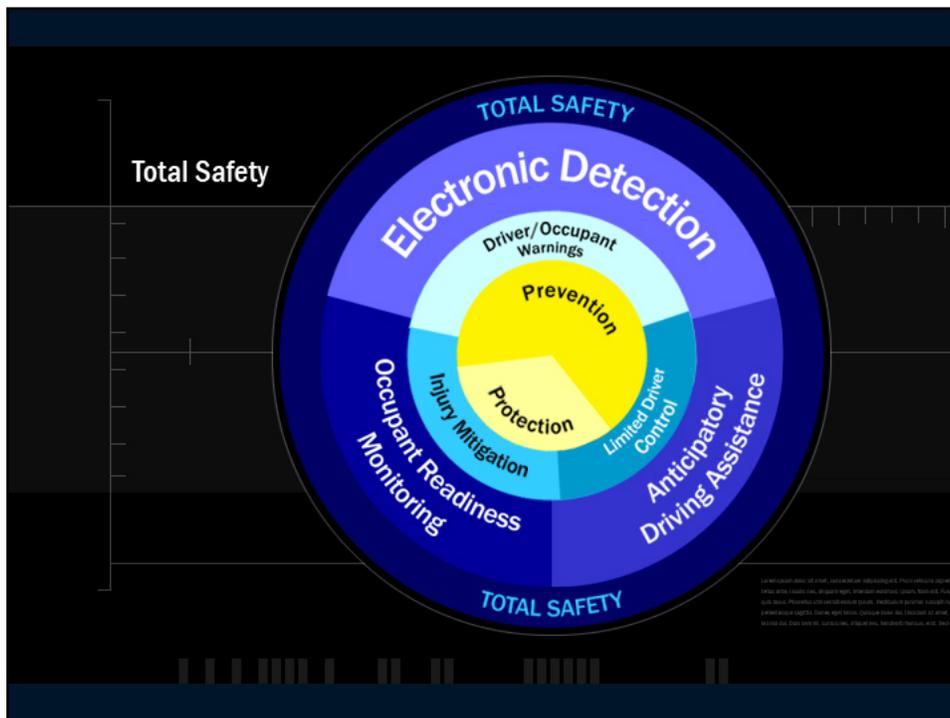


Automotive Technologies Timeline

Driver Warning & Driving Assistance Systems



Developed by: Joseph N. Karianthra



Conclusions

- **Integrated Safety has enormous safety potential**
- **Advanced technologies offer new opportunities**
- **Need to optimize the benefits at each step**
- **Make sure there are no unintended consequences**
- **Consumers will give limited chance to do it right**