

A black steering wheel with a three-spoke design, centered in the background.

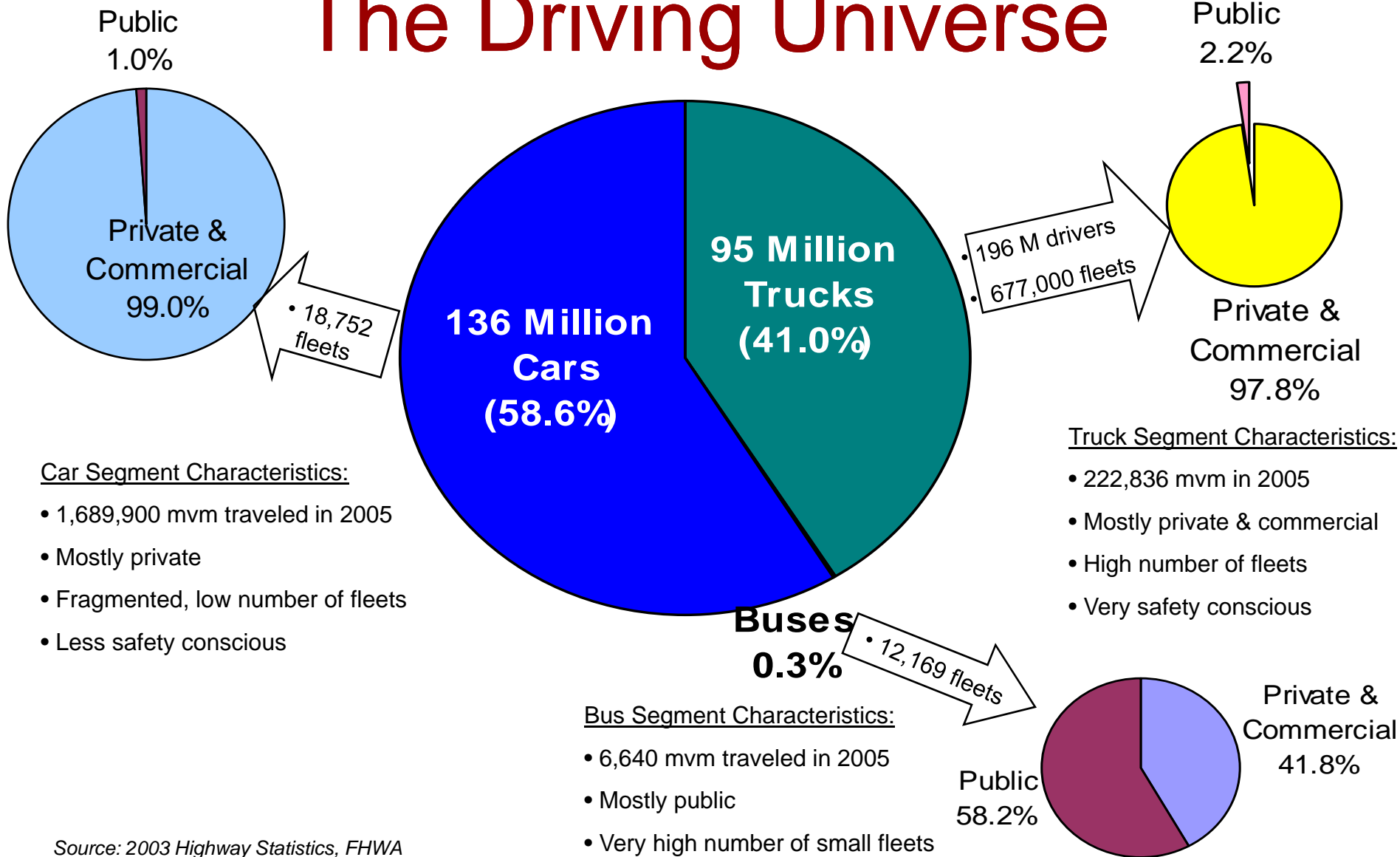
Driving Safety

Safety Telematics Market Review

Agenda

- The Driving Universe at a Glance: Cars, Trucks & Buses
- Potential Customers Matrix
- Commercial Truck Segment
 - Internal drivers
 - External drivers
- Crash Statistics & Economics
- Ideal Solution to Safety related issues
- Adoption factors & trucking specific solutions

The Driving Universe



Source: 2003 Highway Statistics, FHWA

A Total of Over 230 M Vehicles

Potential Customers Matrix

#2

#1

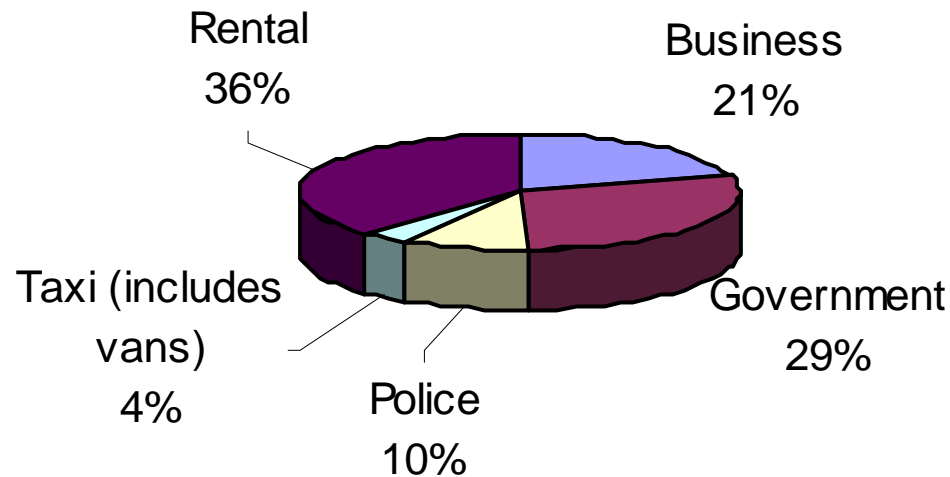
	Novice Drivers	Standard Drivers	Elderly Drivers	Truck Drivers (Private & Commercial)	Public Drivers (Car & Truck)
Volume	high	high	high	high	medium
Ease of Reach	hard	hard	hard	easy	hard
Buying Decision	individual	individual	individual	fleet	fleet
Needs	safety, crash prevention, training, peace of mind	safe commute, crash prevention	safety, crash prevention, training, peace of mind	cut costs, train new drivers	cut costs, training
Barriers	reluctant authority figure	various	reluctant authority figure	new technology, big brother concept, legal	multiple levels, lobbying
Technology Adoption Rate	high	medium	low	medium	medium
Price Sensitivity	low	various	high	medium	low

Commercial Truck Market is the Primary Target

Driving Universe - Fleets

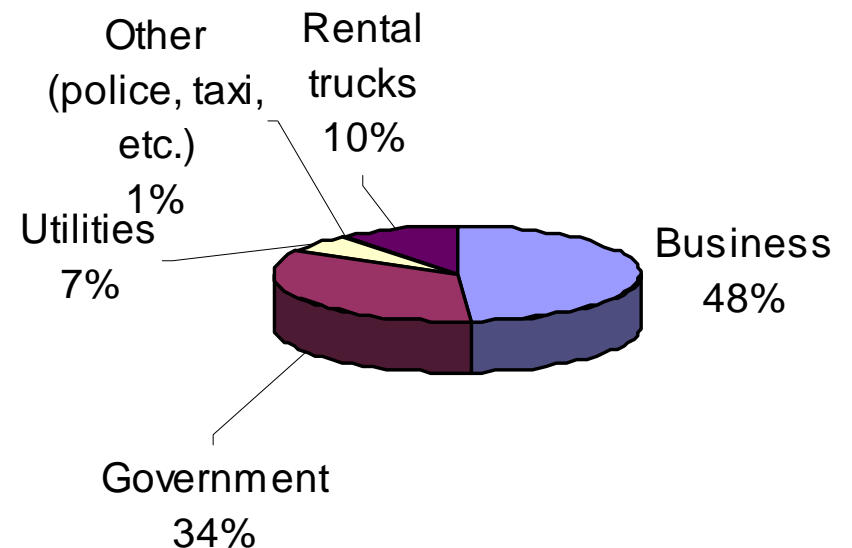
Cars in Fleets - 4.2 M

(25 or more)



Trucks in Fleets - 4.8 M

(25 or more)

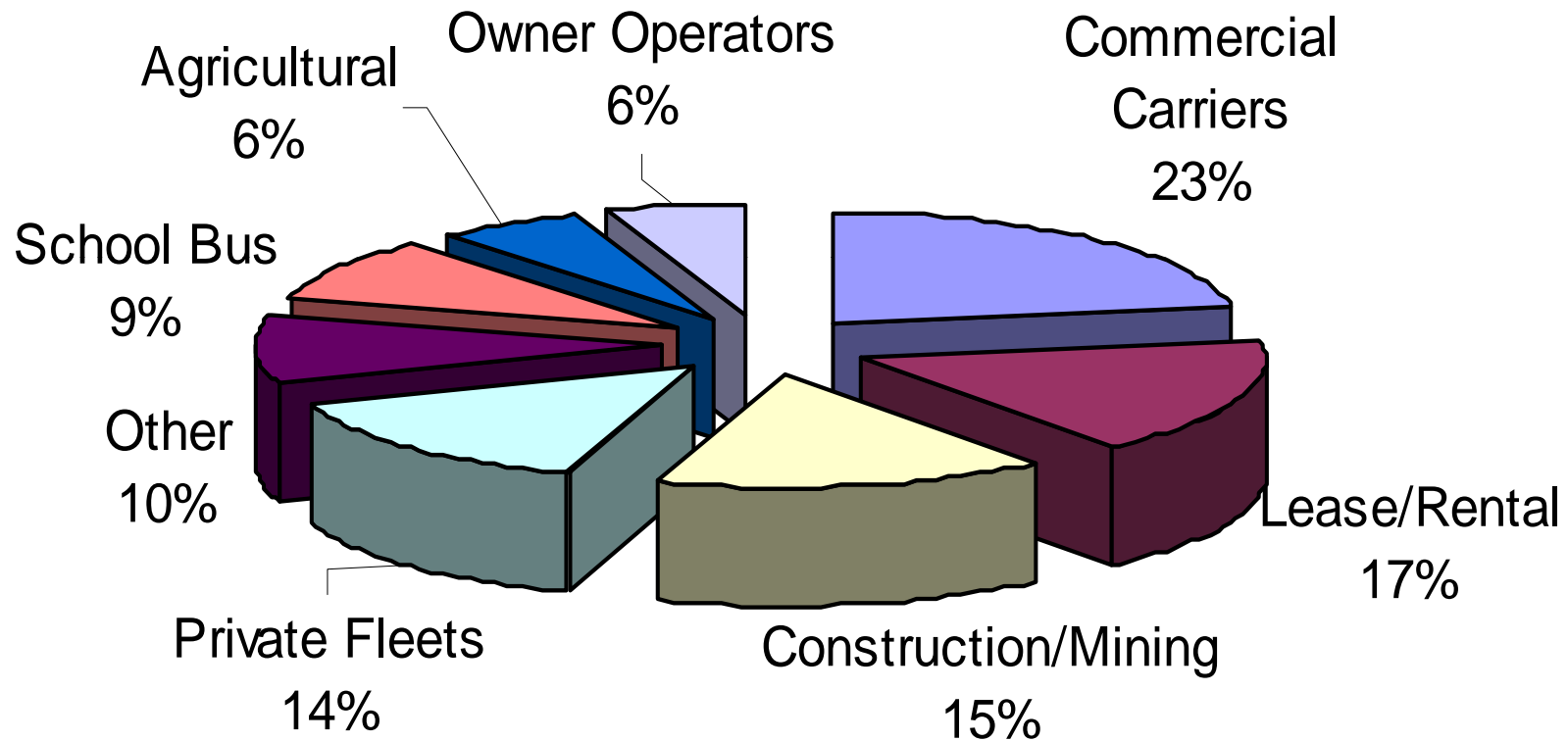


Source: 2004 Transportation Statistics Annual Report

9 Million Cars and Trucks in Fleets

Commercial Trucking

Large & Medium Trucks (4.2M)



Note: Large and Medium trucks include classes 6-8 only.

Commercial Carriers is the Largest Segment

Truck Segment - Internal Drivers

Trucking Operational Objectives

1. Safety
2. Operations - Customer Service
3. Performance Management
 - Driver
 - Equipment and maintenance
4. Financial - Return on Fleet Investment



Fleets Safety Concerns

Rating	Fleet Safety Manager
1	At-risk driving behavior (e.g. speeding)
2	High-risk drivers (all causes)
3	Driver health, wellness, lifestyle
4	Lack of defensive driving skills
5	Delays at loading and unloading
6	Driver fatigue and drowsiness
7	Aggressive driving ("road rage")

Safety Management

Driver Safety

- speed management
- braking (hard braking, etc.)
- coasting
- rollover avoidance

Vehicle Safety

- on-board diagnostics
- oil pressure
- excessive RPM
- brake failure

Carrier Safety

- accident investigation
- driver incentives
- driver discipline

Source: FMCSA Survey

Safety is the Top Priority

Truck Segment - External Drivers

- US DOT regulations: Hours-of-Service
 - Most significant revision to the HOS in 60 years
 - Mandatory compliance with the new Hours-of-Service Regulations began for carriers/drivers January 4, 2004
 - Most Significant Change Affecting Industry – 14-hour rule
- US DOT Intelligent Vehicle Initiative:
 - Goal: accelerate the deployment of near-term safety systems for cars, heavy trucks, buses, specialty vehicles
 - Pre-competitive research projects being negotiated with OEMs
 - Ambitious Safety Goals: 50% reduction in heavy-truck related fatalities within 10 years
- Automotive / truck OEMs and suppliers worldwide developing safety technologies
- Publicly-funded programs in Asia, Europe, North America

HOS Recap Of Changes

Old Rule

New Rule

10 hours driving

→

11 hours driving

15 hours on-duty
(off- duty breaks may
extend time on-duty)

→

14 consecutive hours
on-duty (breaks do not
extend on-duty time)

8 cumulative hours
off-duty for sleep

→

10 cumulative hours
off-duty for sleep

60/70 in 7/8 days

→

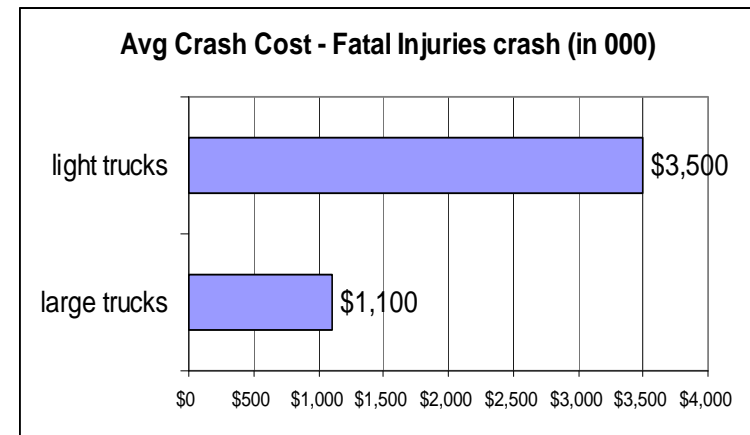
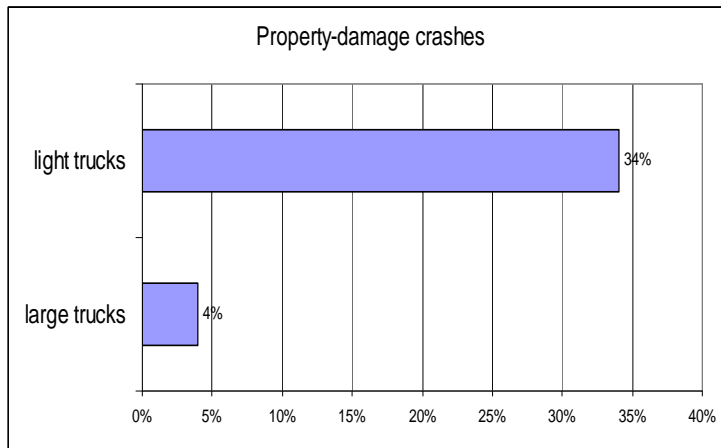
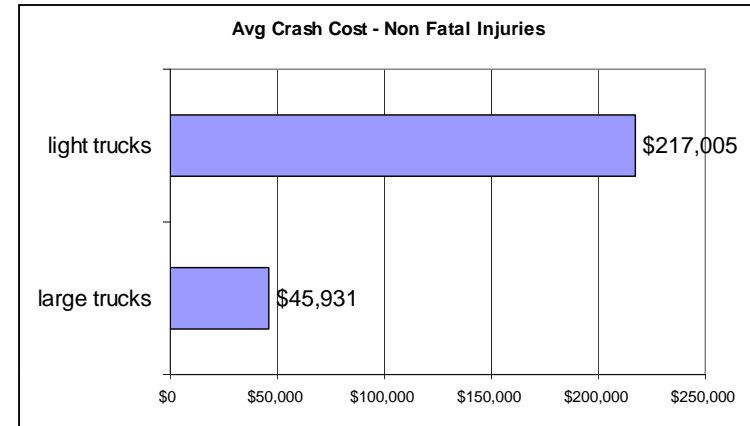
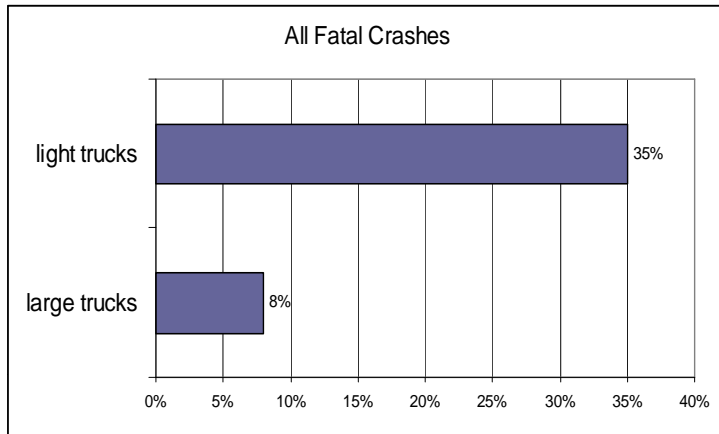
60/70 in 7/8 days

→

34-hour restart

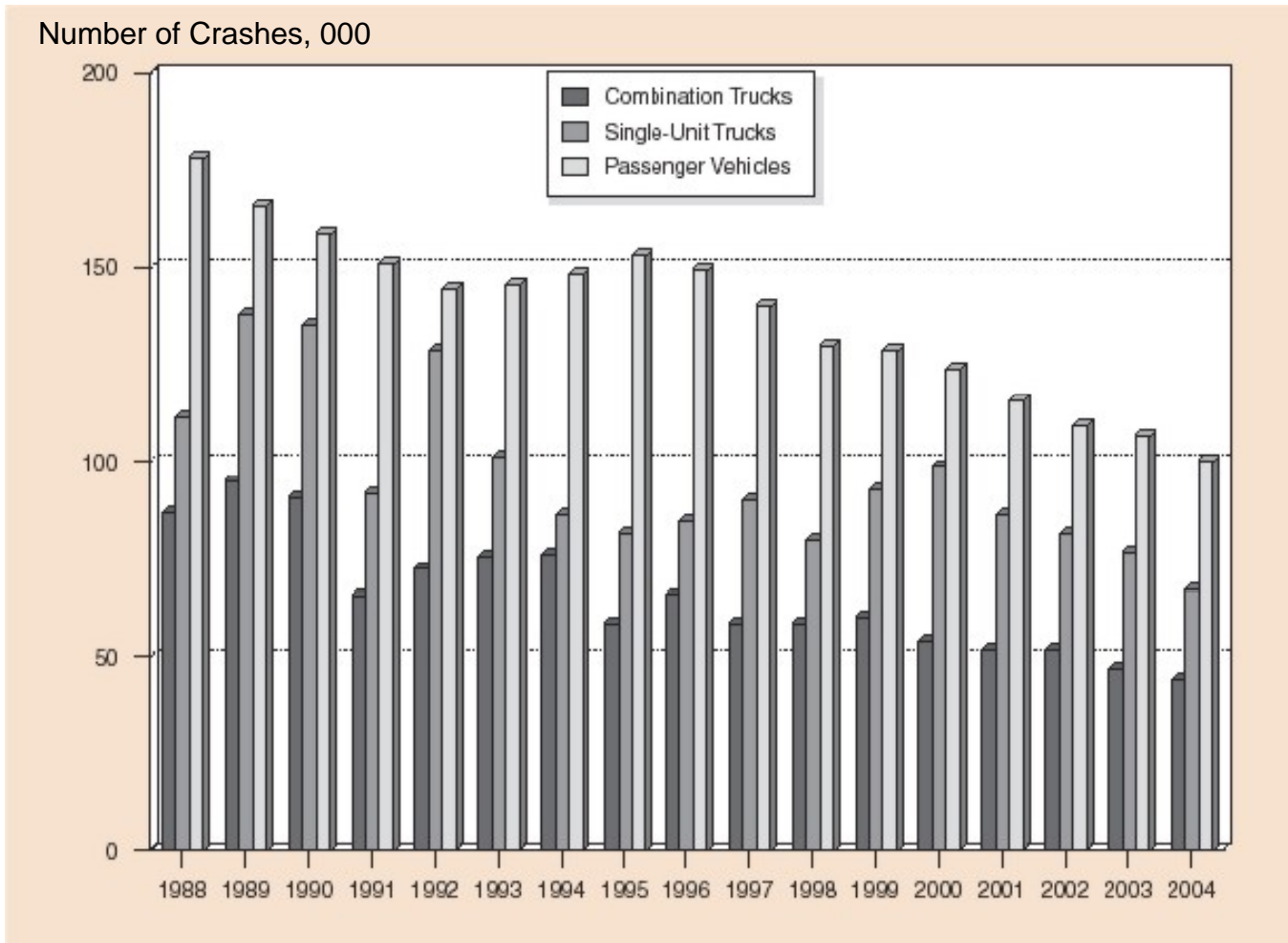
90-day stay until 12/27/07

US Crash Stats – Trucks



Large Truck Crashes Are Less Frequent But More Costly

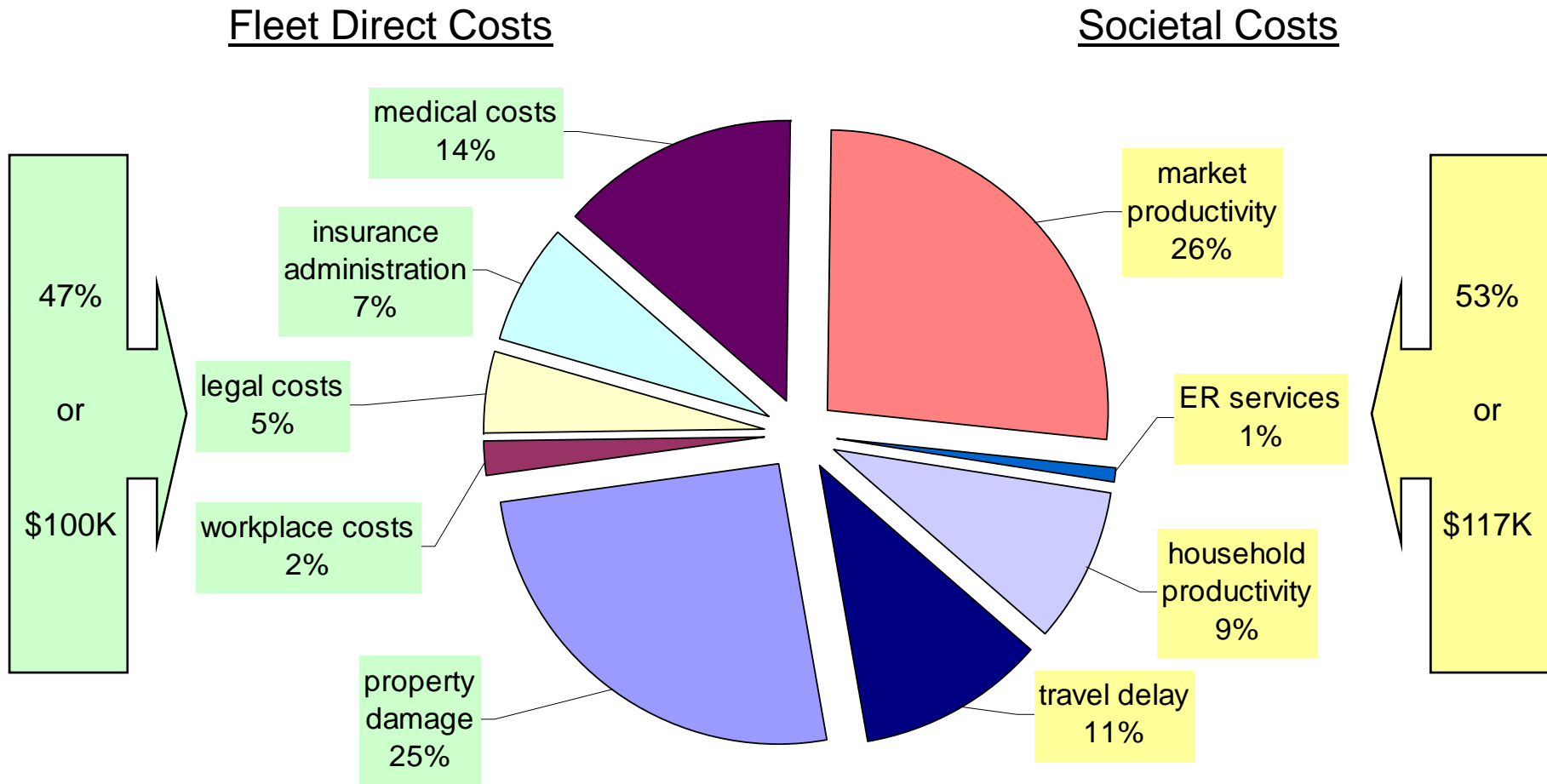
US Crash Stats – Trucks



Large Truck Crashes Are Less Frequent But More Costly

Share of Economic Cost of Crashes

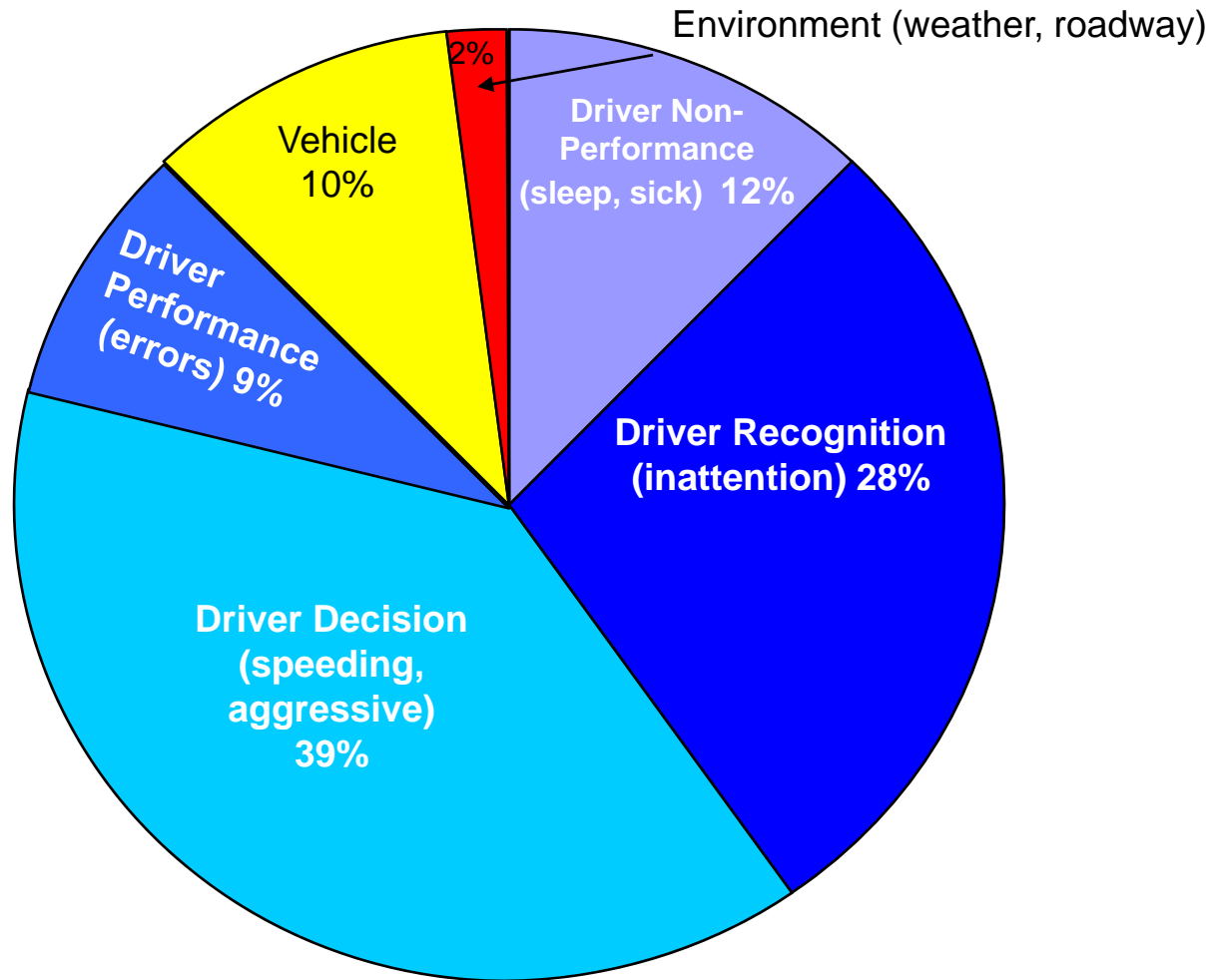
Average Cost per Truck Crash is \$217K



Source: 2000 Bureau of Transportation Statistics Report

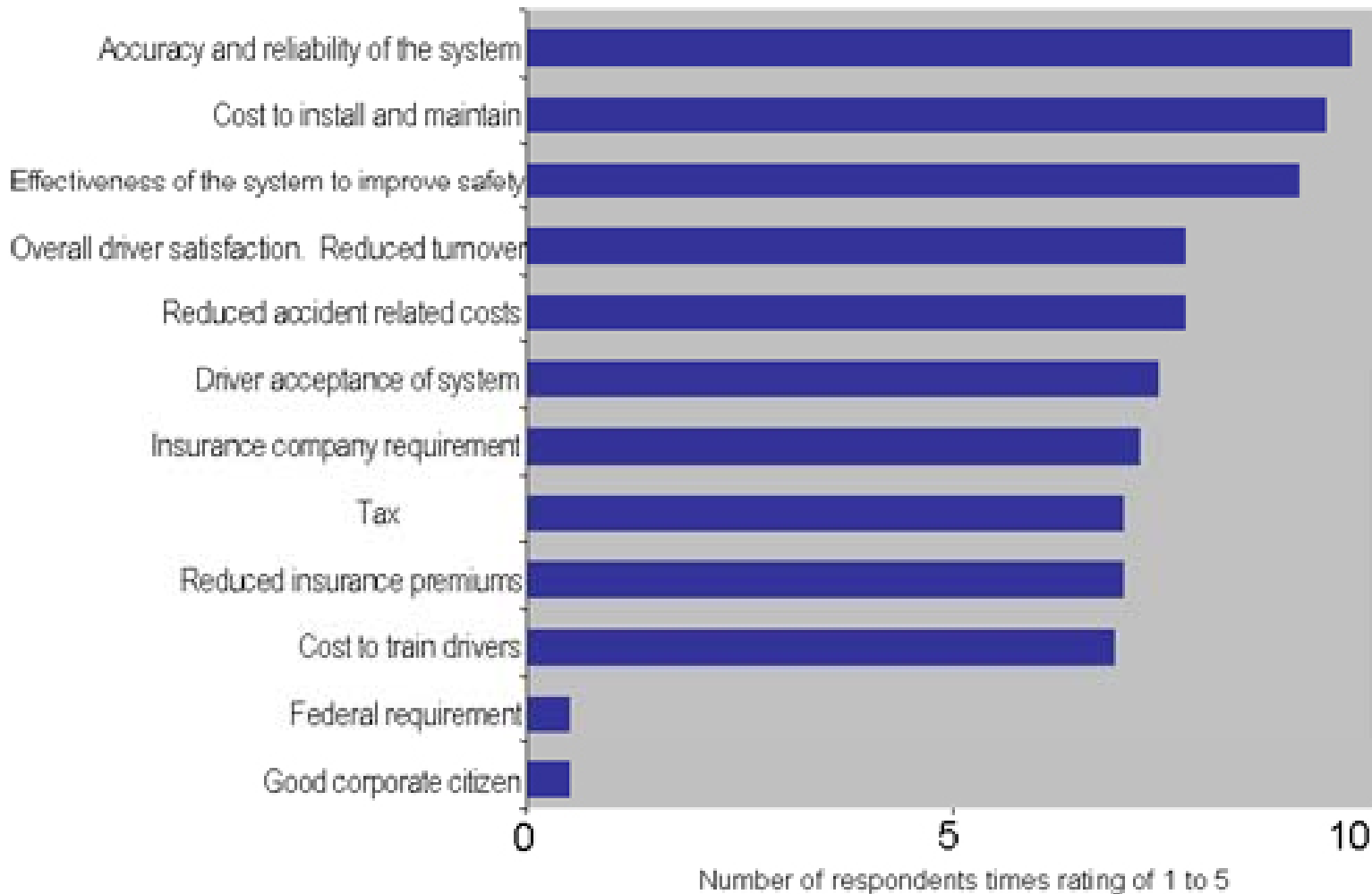
Over Half of the Cost is Absorbed at the Fleet Level

Critical Reasons in Truck Crashes



Most of Truck Crashes are Caused by the Driver

On-Board Technologies Concerns



Source: FMCSA: Factors in Decisions to Make, Purchase and Use On-board Safety Technologies

Safety is the Top Priority

Ideal Solution

- Understand the driver behavior and modify it with the best in-cab technologies
 - Reward good drivers' behavior
 - Retrain poor drivers
- Consolidate as many in-cab safety technologies available on the market into an active real-time system
- Provide the right info at the right time to the fleets:
 - convenient reports as opposed to raw data dump
 - coaching scripts matching every situation to follow in discussion with the driver
 - real-time links to the epic recording

Safety Applications

• Lane Departure Warning	\$1,500
– Auto Vue (Iteris)	
– SafeTrac	
– Delphi LDW	
• Drowsy Driver Monitoring	\$1,500
– Eye patrol, Driver Fatigue Monitor	
• Side and rear view cameras	\$1,500
– DualBeam	
– VORAD	
– Eagle Eye	
• Forward Collision avoidance	\$3,000
– Eaton VORAD	
– MobileEye	
– Delphi	
• Rear and side sensors (\$400 each)	\$1,600
• Driver Behavior Monitoring	\$750
	<hr/>
TOTAL:	\$9,850

Close to \$10K per Truck

Expected Benefits

- Financial
 - Minimize property and casualty losses
 - Reduce at-fault collisions by over 50%
 - Lower worker's compensation expenses
 - Reduce insurance premiums
- Operational
 - Identify top 10% most at-risk drivers
 - Predict and prevent risky driving behavior
 - Train and retain drivers for long-term performance excellence
- Maintenance
 - Extends Vehicle Life
 - Reduces Maintenance Costs

Investment in Safety Technologies Pays Off

What's Out There: Safety Applications

- Forward Collision Warning System (FCWS)
 - Installed sensors provide audible/visual warning
 - Suppliers: VORAD by Eaton's RoadRanger, Collision Warning System by Freightliner
 - Average cost per unit is \$3,000.
- Lane Departure Warning System (LDWS)
 - Detects lane boundaries based on lane markers, provides audible warning, adjustable warning threshold.
 - Suppliers: Auto Vue by Iteris, Delphi LDWS, Movileye LDWS, AssistWare
 - Cost: \$1,000-\$2,000 per installed
- Drowsy Driver Warning System (DDWS)
 - Detects head position and eye closure
 - Ten seconds of video are captured and logged immediately preceding an accident.
 - Driver performance data is time stamped and recorded
 - Field adjustable settings enables fleet management to select system sensitivity, customize user interface and limit operator access.
 - Data and settings are password-protected and tamper-proof.
 - Suppliers: Attention Technologies, SafeTRAC DDWS

Safety Technologies Slow in Entering Truck Market

What's Out There Cont'd

- Driver Monitoring Systems
 - DriveCam (62,000 units, 1200 fleets)
 - driver behavior management systems
 - video recorders (2 cameras)
 - software and implementation services
 - Advanced EDR
 - 2 camera, no GPS, no vehicle data bus
 - video viewer and database storage tool
 - lower end pricing
 - SmartDrive Systems
 - Product similar to DriveCam

Safety Technologies Slow in Entering Truck Market

Fleet Success Stories

- **DriveCam (62,000 units, 1200 fleets)**
 - Crash reduction: 13 vehicle crashes in 2006 vs. 43 in 2005 (DS Waters)
 - Accident reduction: 2 accidents in 2006 vs. 14 accidents in 2005; both accidents were judged to be non-preventable (DS Waters)
 - At-fault collisions reduction: from 27 to 12 per month within one year, i.e. 56% reduction in at-fault collisions (Ampco)
 - Insurance cost savings: liability losses (auto claims only, not including property damage or administrative costs) dropped to \$13,200 in 2006 vs. \$82,100 in 2005 (Belmont)
 - Insurance savings: auto liability losses totaled \$0 in 2006 versus \$16,705 in 2005 (Oceanside)
- **Advanced EDR claims to:**
 - Significantly improve driving behavior in teens, commercial drivers, and others
 - Lower insurance premium, discounts are available
 - Reduce wrongly accused "at-fault" accidents
 - Reduce claim deductibles due to a lack of evidence to support the driver's claim
 - Substantially reduce litigation costs
- **SmartDrive Systems**
 - Dramatic drop in accident rate and significant savings in auto claims and insurance (Salvation Army)
 - 50% average reduction in crashes vs. baseline (ROI calculator)

Safety Technologies Gaining Credibility

Fleet Success Stories Cont'd

- **Iteris Lane Departure Warning System**
 - 90% decrease in sideswipe, inadvertent lane, change and run-off-road accidents with the equipped trucks. (Cargo Transportation)
 - 94% of truck drivers using LDW had positive feelings about the system
 - more than 70% of the drivers say it makes them a safer driver

- **EATON VORAD Collision Warning System**
 - over 70,000 heavy trucks equipped with Eaton-VORAD radar-based system
 - covers forward zone and perimeter blind spots
 - selling 10,000 per year
 - crash reductions said to be 50% or greater for some fleets
 - reduce rear-end accidents by 51%,
 - Lane-change accidents reduced by 47%.
 - fleets have seen accident reduction averaging 73% (Maverick Transportation)
 - “In a **fleet** of 500 trucks, **VORAD** is likely to save one life every five years.”

Safety Technologies Makes Its Way Into Truck Market

Product Features Availability

	DriveCam I	DriveCam II	DriveCam III	SmartDrive Systems	Advanced EDR	VTTI
Video						
Camera Views	2	2	2	2	2	4
Color / BW	Color	Color	Color	Color	Color	Color
Resolution / Camera	320 x 240	640 x 480	640 x 480	640 x 480	2 MP	640 x 480
Video Update Rate	2 Hz	4 Hz	Unknown	10 Hz	4 Hz	30 Hz
IR Illumination	No	Optional	Yes	Yes	Yes	Yes
Communications						
Method(s)	Wired	Wired/802.11	802.11	802.11	802.11	802.11/Cellular
Automated Transfer	No	No	Yes	Yes	No	Yes
Automated SW Update	No	No	Unknown	Yes	No	Yes
Display	None	None	None	None	None	Planned
Sensors						
GPS	No	No	Yes	Yes	No	Yes
Vehicle Data Bus	No	No	Yes	Yes	No	Yes
Manual Trigger Button	Yes	Yes	Yes	Yes	Yes	Yes
Data Management						
Transfer Validation	No	Yes	Yes	Yes	Unknown	Yes
Encryption	No	No	Yes	Unknown	Unknown	Yes
On Board Data Storage	100 Mb Flash	200 Mb Flash	Unknown	2 GB Flash	1 Gb Flash	1 Gb Flash, 500 Gb HDD (optional)
Data Review and Usage						
Data Reduction Service	No	Yes	Yes	Yes	No	Yes
Data Access SW	No	Yes	Yes	Yes	Yes	Yes
GPS Apps						
Vehicle Tracking (GPS)	No	No	Unknown	Yes	No	Yes
GeoFencing	No	No	Unknown	Yes	No	Planned
Stolen Vehicle Locator	No	No	Unknown	No	No	Planned
Real Time Tracking	No	No	Unknown	No	No	Planned
Machine Vision Apps						
Lane Departure Warn	No	No	No	No	No	Planned
Drowsy Driver Warn	No	No	No	No	No	Planned
Forward Collision Warn	No	No	No	No	No	Planned

Trucking Industry Aspects

- Extremely diverse
 - local delivery, long haul, etc.
- Industry is slow to embrace change
 - Management is centralized; workforce decentralized
- Return on Investment: essential for both OEM and truck operator
 - Freight haulage: margins are low, competition is high
 - Fleets: maintenance and service factors are key
- Typical price points for IV systems are “in the ballpark” for fleet operators
 - around \$2000
 - payback periods within 1-2 years
- Aftermarket vs. factory systems
 - aftermarket installations are a viable option; maybe more appropriate due to diversity of industry
 - affects OEM role and level of investment
 - higher performance generally achieved with OEM integration
- Driver acceptance is essential
 - must be sensitive to privacy and “Big Brother” aspects

Driver Aspects Are Central

- Manufacturer design:
 - driver-friendly systems
 - information presented to warn the driver, while not distracting or compromising his concentration on the road
 - eliminate false alarms (VORAD lesson)
- Driver training essential
 - to explain the functionality of all related safety systems (including limitations)
 - to explain the purpose of the systems (enhance safety, assist driver, support training)
- IV-equipped truck must not be driven harder or faster
- Driver cannot be less responsive to the road conditions due to the presence of safety technology

Safety Solutions Adoption Factors

- High cost of crashes and rising insurance premiums
- Fleets operating ratios improving driven by tonnage growth and fuel surcharge revenue
- 2006 was a record year for the trucking industry:
 - Record high truck build and truck sales (pre-buy for 2007)
 - Strong freight demand combined with tight capacity and fleet utilization generated higher revenues and profits
 - Trucks handled a record volume of export merchandise and exports
 - Diesel price increase were offset by surcharges; truckers expressing interest in alternative fuel and hybrid trucks

Industry Economics Driving Adoption of Safety Solutions