



National Transportation Safety Board

Pay Attention: Challenges and Opportunities to Enhance Transportation Safety

Honorable Mark R. Rosekind, Ph.D.
Board Member

Center for Automotive Research at Stanford
August 6, 2012

NTSB Mission

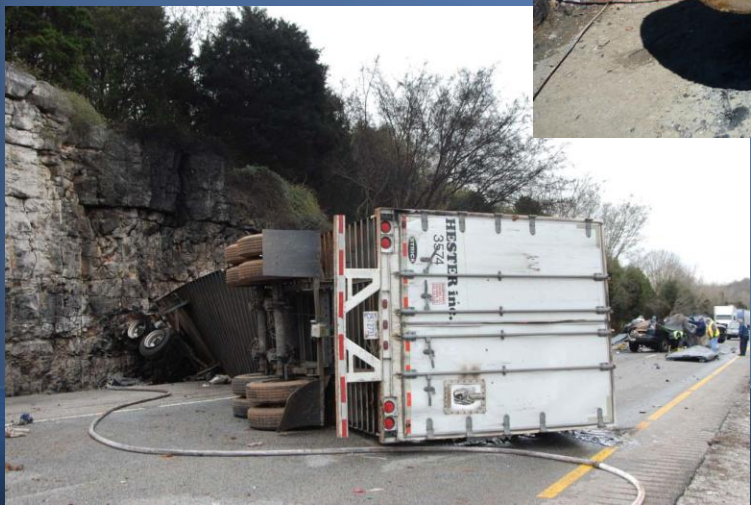


NTSB



- 1) determining the probable cause of transportation accidents**
- 2) making recommendations to prevent their recurrence**





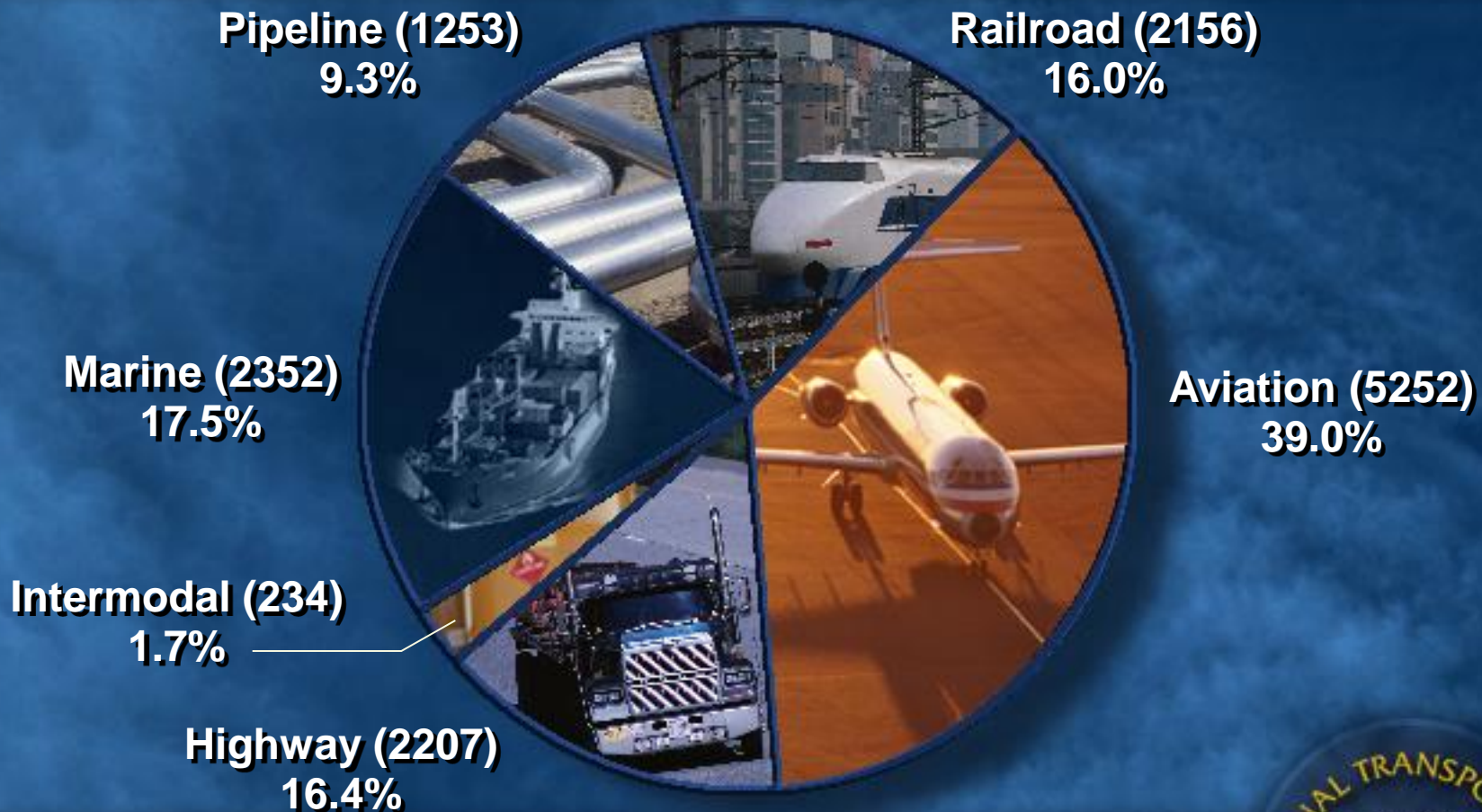
All Modes

Independent Federal Agency: Created in 1967

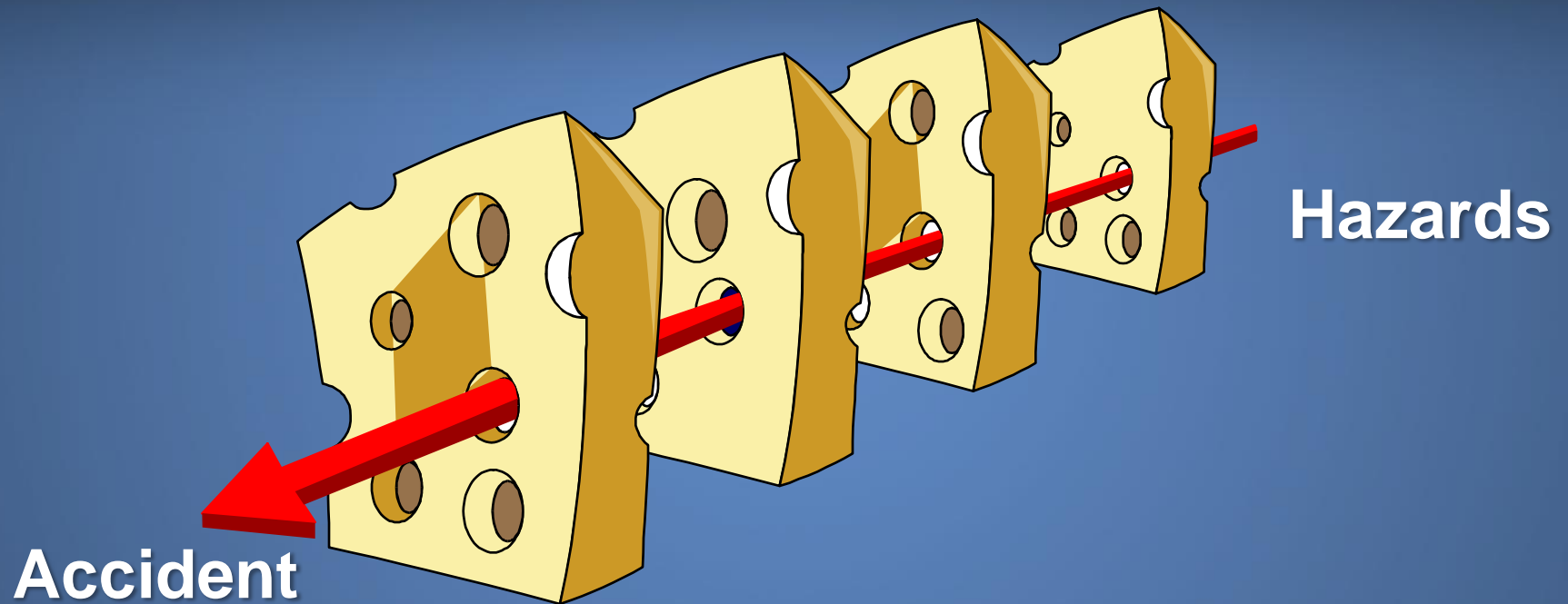
- > 132,000 accident investigations
- 13,500+ safety recommendations
- ~ 2,500 organizations/recipients
- 82% acceptance rate



13,454 Safety Recommendations issued since 1967



“Swiss Cheese” Model (Reason)

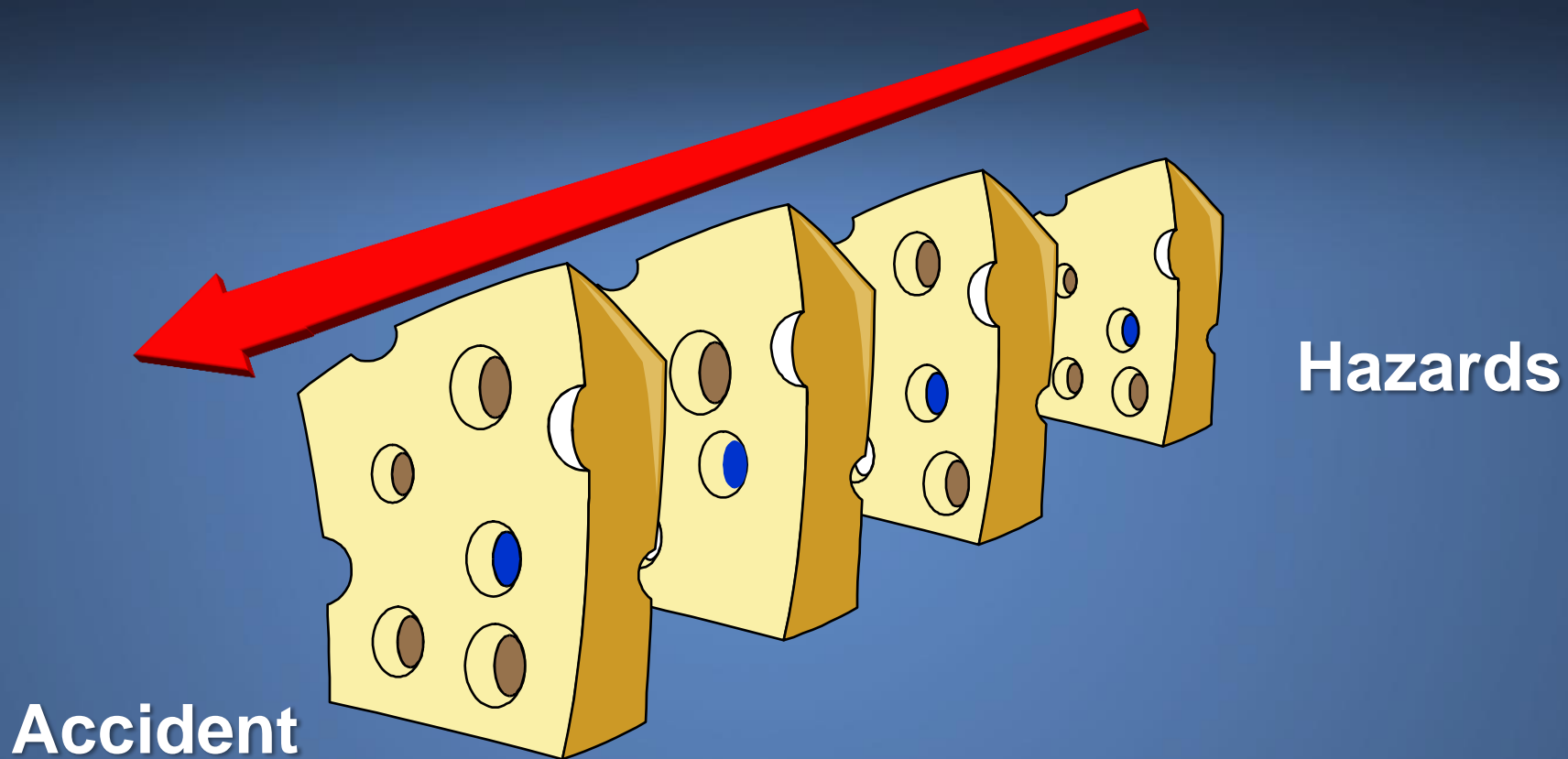


Successive layers of defenses, barriers, and safeguards



NTSB

The Challenge (Haueter)

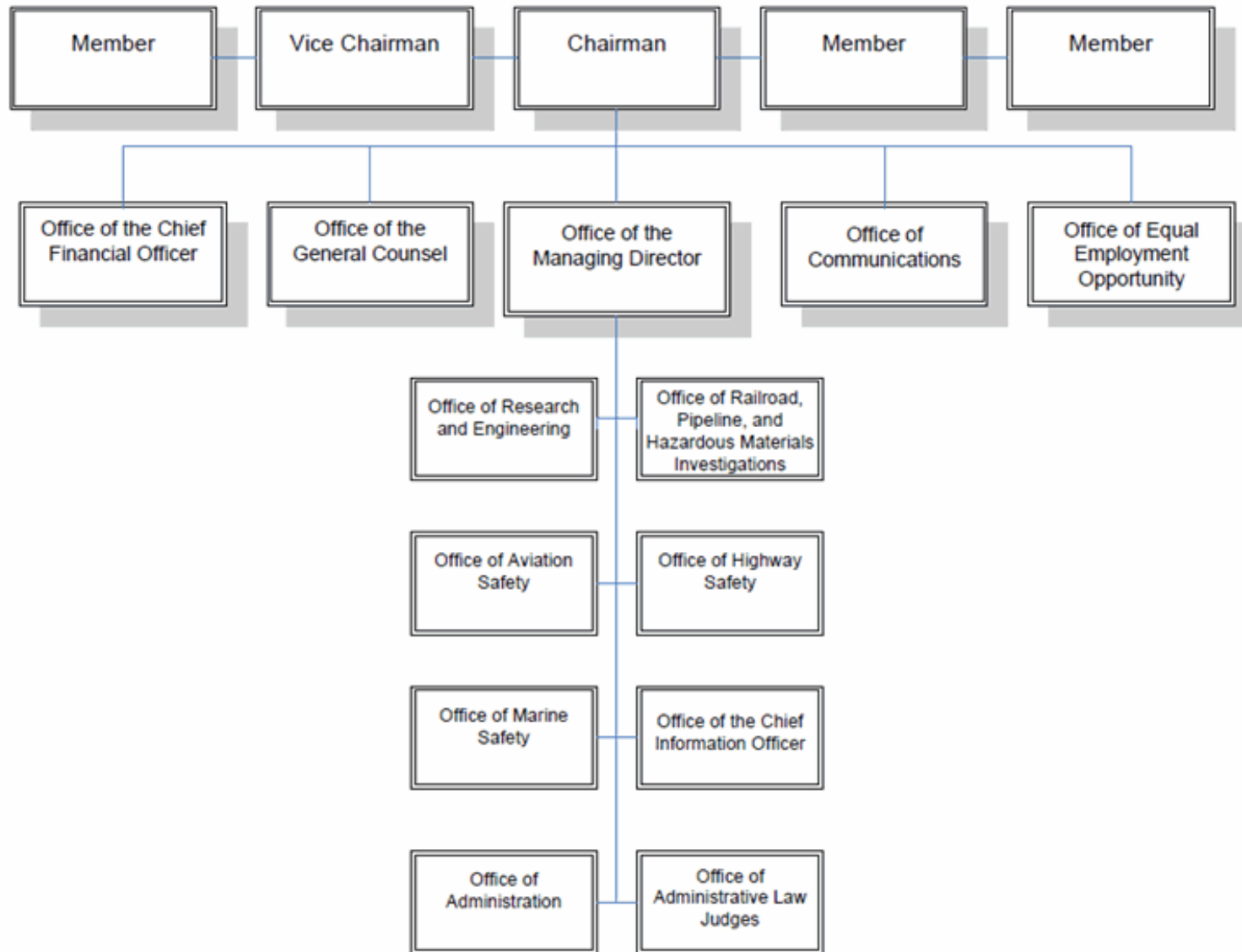


Successive layers of defenses, barriers, and safeguards



NTSB

NATIONAL TRANSPORTATION SAFETY BOARD



NTSB: The Board

- Five Members:
 - President nominates
 - Senate confirms



Mark Rosekind
Member



Chris Hart
Vice Chairman



Debbie Hersman
Chairman



Robert Sumwalt
Member



Earl Weener
Member



NTSB Characterized as:

‘moral compass and industry conscience’

NTSB Chairman Deborah A.P. Hersman



NTSB

NTSB Investigation Process



NTSB

NTSB Go Team: 24/7/365

- Individual investigator
- Regional/Limited team
- Major launch/Board Member



Key On-scene Events



Organizational Meeting

- Designate parties and party coordinators
- Establish and organize groups

Progress Meetings

- Summarize findings
- Info for briefings

Family Briefings

Press Briefings



NTSB

NTSB Party System

- NTSB selects parties
(No insurers, claimants, lawyers)
- Bound by rules of engagement
(Responsive to NTSB direction)
- Verify factual reports written by group chairmen

*“...persons, government agencies, companies, and associations whose employees, functions, activities, or products were involved in the accident and who can provide **suitable qualified technical personnel** to actively assist...”*

Party Member Examples

- FAA (always)
- Equipment manufacturer
- Engine manufacturer
- Airline Pilots Association
- Air Traffic Controllers Union



NTSB Investigative Process



On-scene Investigation

- Organizational Meeting
- Groups and Parties
- Progress meetings
- Media Briefings
- Press Releases



Preliminary Report

Factual information



Public Hearing

- Fact finding
- Depositions
- Witnesses
- Docket



Board Meeting

- Docket
- Findings
- Conclusions
- Probable Cause
- Safety Recommendations



Final Report

Government in the Sunshine Act



NTSB

Reno, NV Air Race (9/16/11)



11 fatalities
74 injuries



NTSB



June 24, 2012
Goodwell,
Oklahoma



NTSB

Distraction: 10 Years of NTSB Investigations



NTSB

**Ford Explorer Sport Collision
With Ford Windstar Minivan
and Jeep Grand Cherokee
on Interstate 95/495
Near Largo, Maryland
February 1, 2002**



Highway Accident Report

NTSB/HAR-03/02

PB2003-916202

Notation 7561



**National
Transportation
Safety Board**
Washington, D.C.



NTSB

Largo, MD (February 1, 2002)

- ~ 8:00 p.m., on outer lanes of Interstate 95/495 near Largo, MD
- a 1998 two-door SUV, traveling northbound at an estimated speed of 70 to 75 mph
- veered off the left side of the roadway, crossed over the median, climbed up a guardrail, flipped over, and landed on top of a southbound 2001 four-door minivan
- subsequently, a 1998 four-door Jeep ran into the minivan

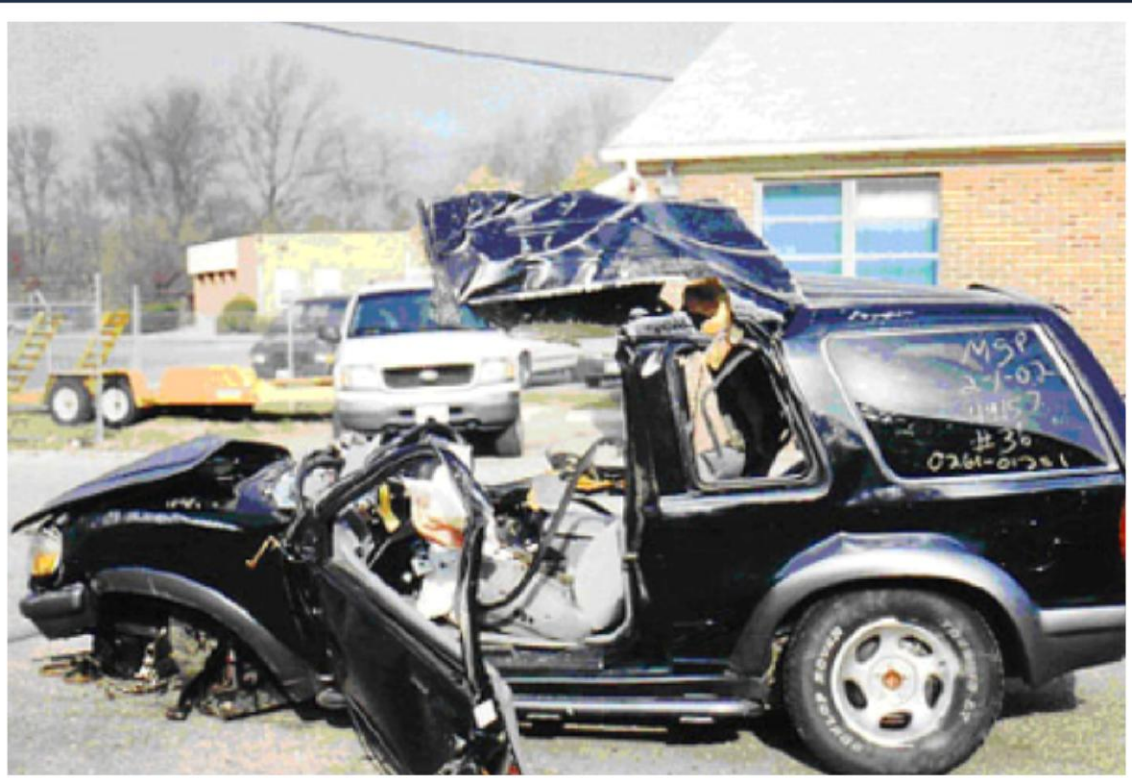


Largo, MD (February 1, 2002)

- SUV driver's handheld cell phone found
- wireless records showed:
 - starting at 4 pm, accident driver placed/received 15 calls
 - 12 to/from friend's wireless number
 - call #15 at 8 pm (accident occurred ~ 8 pm)



5 fatalities
1 injury



SUV



minivan



NTSB

Probable Cause

“ . . . was the Explorer driver’s failure to maintain directional control of her high-profile, short-wheelbase vehicle in the windy conditions due to a combination of inexperience, unfamiliarity with the vehicle, speed, and distraction caused by use of a handheld wireless telephone.”



Recommendations

To the National Highway Traffic Safety Administration:

Develop, in conjunction with The Advertising Council, Inc., a media campaign stressing the dangers associated with distracted driving. (H-03-03)

Develop, in conjunction with the American Driver and Traffic Safety Education Association, a module for driver education curriculums that emphasizes the risks of engaging in distracting behavior. (H-03-04)

Determine the magnitude and impact of driver-controlled, in-vehicle distractions, including the use of interactive wireless communication devices, on highway safety and report your findings to the U. S. Congress and the States. (H-03-05)

To the 48 States that do not have legislation prohibiting holders of learner's permits and intermediate licenses from using interactive wireless communication devices:

Enact legislation to prohibit holders of learner's permits and intermediate licenses from using interactive wireless communication devices while driving. (H-03-08)

To the 34 States that do not have driver distraction codes on their traffic accident investigation forms:

Add driver distraction codes, including codes for interactive wireless communication device use, to your traffic accident investigation forms. (H-03-09)

To the American Driver and Traffic Safety Education Association:

Develop, in conjunction with the National Highway Traffic Safety Administration, a module for driver education curriculums that emphasizes the risks of engaging in distracting behavior. (H-03-10)



**Collision of Two Burlington Northern
Santa Fe Freight Trains Near
Clarendon, Texas
May 28, 2002**



Railroad Accident Report

NTSB/RAR-03/01

PB2003-916301

Notation 7558



**National
Transportation
Safety Board**

Washington, D.C.



NTSB

Clarendon, TX (May 28, 2002)

- at 8:57 a.m., CDT, an eastbound Burlington Northern Santa Fe (BNSF) coal train collided head on with a westbound BNSF intermodal train
- both trains had a crew of two, all crewmembers jumped before impact
- the collision resulted in a subsequent fire that damaged or destroyed several of the locomotives and other railroad equipment



Clarendon, TX (May 28, 2002)

- at 8:05 a.m., a 23-minute call originated from engineer's cell
- ~ 16 minutes of non-use
- at 8:44 a.m., another call originated from engineer's cell
- coal train should have waited in siding at 8:47 a.m.
- this call lasted about 10 minutes (same number as previous call)



Clarendon, TX (May 28, 2002)

Both the *General Code of Operating Rules* and BNSF operating instructions restrict the use of cell phones by operating employees. The BNSF instructions prohibit locomotive engineers from using cell phones/laptop computers while operating a locomotive. Federal regulations contained in 49 CFR Part 220 do not prohibit an engineer from using a cell phone while at the controls of a moving locomotive. As noted, however,



Clarendon, TX (May 28, 2002)



Figure 3. Wreckage of coal train.

1 fatality
3 injuries



Figure 4. Wreckage of intermodal train.



NTSB

Probable Cause

- (1) The coal train engineer's use of a cell phone during the time he should have been attending to the requirements of the track warrant his train was operating under . . .



Recommendations

To the Federal Railroad Administration:

Promulgate new or amended regulations that will control the use of cellular telephones and similar wireless communication devices by railroad operating employees while on duty so that such use does not affect operational safety. (R-03-1)



Motorcoach Collision With the Alexandria Avenue
Bridge Overpass
George Washington Memorial Parkway
Alexandria, Virginia
November 14, 2004



**National
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ACCIDENT REPORT

NTSB/HAR-06/04
PB2007-916201



NTSB

Alexandria, VA (November 14, 2004)

- ~ 9:30 a.m., EST, a 58-passenger motorcoach departed the Baltimore/Washington International Thurgood Marshall Airport
- for an approximately 60-mile trip to Mount Vernon, Virginia
- occupants: bus driver, adult chaperone, 27 high school students
- vehicle was second of a two-bus team traveling to Mount Vernon
- accident bus driver had driven this route 9 days earlier



Alexandria, VA (November 14, 2004)

- ~ 10:40 a.m., the bus was traveling southbound in the right lane of the George Washington Memorial Parkway in Alexandria, Virginia, at an electronic control module – recorded speed of approximately 46 mph
- as bus approached the Alexandria Avenue bridge, driver passed warning signs bridge had a 10-foot, 2-inch clearance in the right lane
- nonetheless, driver remained in the right lane, drove the 12-foot-high bus under the bridge, colliding with underside and side of overpass
- at time of the accident, the 13-foot, 4-inch-high left lane was available to the bus, the lead bus was in left lane ahead of the accident bus
- accident bus came to final stop in right lane ~ 470 feet beyond bridge



Alexandria, VA (November 14, 2004)

- bus driver had company issued cell phone and personal cell phone
- bus driver reported talking on hands-free personal cell phone when the accident occurred
- cell phone service provider records showed a 12-minute call
- witness: driver on headset for majority of trip; believe he was talking on phone when hit the bridge
- driver also had hand-held cell phone that was used at one point



Alexandria, VA (November 14, 2004)



11 injuries



NTSB

Probable Cause

“ . . . bus driver’s failure to notice and respond to posted low-clearance warning signs and to the bridge itself due to cognitive distraction resulting from conversing on a hands-free cellular telephone while driving.”



Recommendations

To the Federal Motor Carrier Safety Administration:

Publish regulations prohibiting cellular telephone use by commercial driver's license holders with a passenger-carrying or school bus endorsement, while driving under the authority of that endorsement, except in emergencies.

(H-06-27)

To the 50 States and the District of Columbia:

Enact legislation to prohibit cellular telephone use by commercial driver's license holders with a passenger-carrying or school bus endorsement, while driving under the authority of that endorsement, except in emergencies.

(H-06-28)

6 other recommendations addressed
cell phone use and distraction



NTSB

Collision of Metrolink Train 111 With
Union Pacific Train LOF65-12
Chatsworth, California
September 12, 2008



Accident Report

NTSB/RAR-10/01
National Transportation Safety Board
PB2010-916301



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Chatsworth, CA (September 12, 2008)

- ~ 4:22 p.m., PDT, westbound Metrolink train, one locomotive and three passenger cars, collided head-on with eastbound freight train
- Metrolink train derailed its locomotive and lead passenger car
- the freight train derailed its 2 locomotives and 10 of its 17 cars
- the force of the collision caused the Metrolink train to telescope into the lead passenger coach by about 52 feet



Chatsworth, CA (September 12, 2008)

- Metrolink engineer's wireless records on day of accident:
 - sent/received 95 text messages
- during time responsible for train operation:
 - sent 21 text messages, received 21 text messages, 4 outgoing calls
- 28 day review: use on day of accident consistent with previous use



Chatsworth, CA (September 12, 2008)

The *General Code of Operating Rules*⁴³ addresses the use of wireless or other electronic devices by train crewmembers as follows:

Rule 1.10 Games, Reading, or Electronic Devices

Unless permitted by the railroad, employees on duty must not:

- Play games.
- Read magazines, newspapers, or other literature not related to their duties.
- Use electronic devices not related to their duties.

Metrolink Timetable No. 5 *Additions and revisions to General Code of Operating Rules* dated July 8, 2008, adds to Rule 1.10:

[Unless permitted by the railroad, employees on duty must not:]

- Use cellular telephones when operating the controls of moving equipment except in emergencies.



Chatsworth, CA (September 12, 2008)



Survival Factors Factual Report - Photo 9 - Aerial view of accident area (Metrolink)

25 fatalities, 135 injuries



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Chatsworth, CA (September 12, 2008)



25 fatalities, 135 injuries



NTSB

Chatsworth, CA (September 12, 2008)

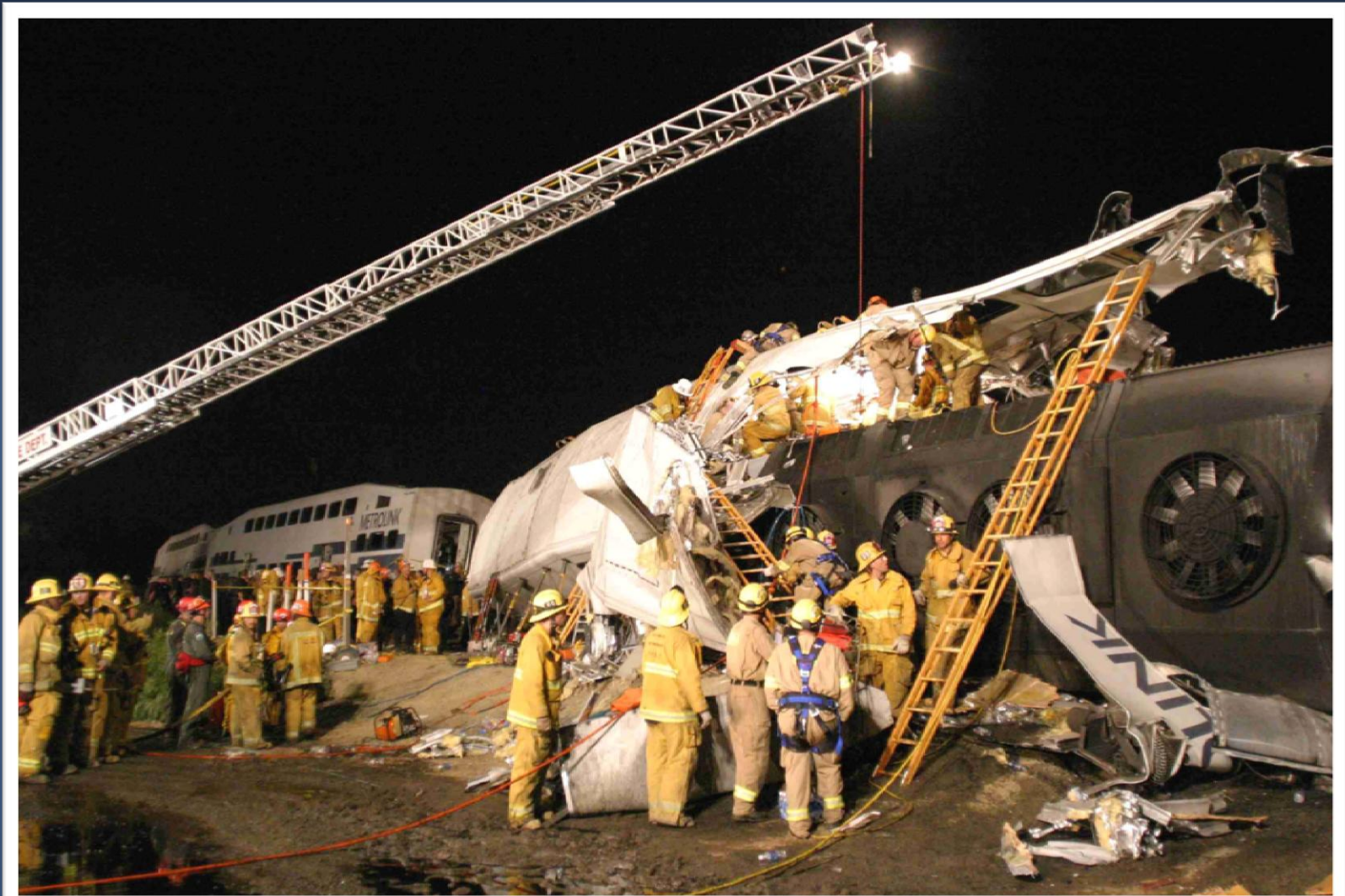


25 fatalities, 135 injuries



NTSB

Chatsworth, CA (September 12, 2008)



25 fatalities, 135 injuries



NTSB

Probable Cause

“ . . . failure of the Metrolink engineer to observe and appropriately respond to the red signal . . . because he was engaged in prohibited use of a wireless device, specifically text messaging, that distracted him from his duties.”



Minneapolis, MN (October 21, 2009)



- A320 overflew destination
- 1 hour 17 minutes; over 100 miles



Minneapolis, MN (October 21, 2009)

The National Transportation Safety Board has determined that Northwest Airlines flight 188 overflew its destination airport of Minneapolis by more than 100 miles and failed to maintain radio communications because the pilots became distracted by a conversation unrelated to the operation of the aircraft.



Truck-Tractor Semitrailer Median Crossover
Collision With 15-Passenger Van
Munfordville, Kentucky
March 26, 2010



Accident Report

NTSB/HAR-11/02
PB2011-916202



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Munfordville, KY (March 26, 2010)

- truck-tractor semitrailer combination unit
- departed the left lane of southbound Interstate 65
- crossed a 60-foot-wide median
- struck and overrode a cable barrier system
- entered the northbound travel lanes
- struck a 15-passenger van
 - 11 passengers (eight adults, two children, infant)



Munfordville, KY (March 26, 2010)

- driver used his mobile phone for calls and text messages a total of 69 times while driving in the 24-hour period prior to the accident
- driver made four calls in the minutes leading up to the crash
- last call at 5:14 a.m. CDT, coinciding with the time that the truck departed the highway





- crossed 60 ft median
- overrode cable barrier

Fatalities

- truck driver
- van driver
- 9 van passengers



Probable Cause

“ . . . the truck driver’s failure to maintain control of the truck-tractor combination vehicle because he was distracted by use of his cellular telephone.”



Recommendations

- **To the Federal Motor Carrier Safety Administration:**
Prohibit the use of both handheld and hands-free cellular telephones by all commercial driver's license holders while driving in commercial operations, except in emergencies. (H-11-26) *[This recommendation supersedes Safety Recommendation H-06-27.]*
- **To the 50 states and the District of Columbia:**
Prohibit the use of both handheld and hands-free cellular telephones by all commercial driver's license holders while driving in commercial operations, except in emergencies. (H-11-29) *[This recommendation supersedes Safety Recommendation H-06-28.]*



Collision of Tugboat/Barge *Caribbean Sea/The Resource*
with Amphibious Passenger Vehicle *DUKW 34*
Philadelphia, Pennsylvania
July 7, 2010



Accident Report

NTSB/MAR-11/02
PB2011-916402



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Philadelphia, PA (July 10, 2010)

- empty 250-foot-long sludge barge, being towed alongside 78.9-foot-long tugboat
- collided with the anchored 33-foot-long amphibious passenger vehicle (APV) in the Delaware River
- APV carried 35 passengers and 2 crewmember
- on board the tugboat were five crewmembers
- as a result of the collision, APV sank in about 55 feet of water



Philadelphia, PA (July 10, 2010)

- tugboat mate cell phone use:
 - 65 minutes/135 minutes of duty
- 18 incoming/outgoing calls totaling 53 minutes:
 - while mate solely responsible for navigating tug and barge
- on call when APV distress calls initiated
- internet search on company laptop
- APV deckhand:
 - sent 2 text messages, received 2 text messages
 - last message 1 min before jumping in water



Philadelphia, PA (July 10, 2010)



2 fatalities, 26 injuries



NTSB

Probable Cause

(2) distraction and inattentiveness as a result of his repeated personal use of his cell phone and company laptop computer while he was solely responsible for navigating the vessel



Recommendations

- **To the U.S. Coast Guard**

Regulate and enforce the restriction on nonoperational use of cell phones and other wireless electronic devices by on-duty crewmembers in safety-critical positions so that such use does not adversely affect vessel operational safety. (M-11-3)

Until you can develop regulations governing nonoperational use of cell phones and other wireless electronic devices by on-duty crewmembers in safety-critical positions, continue your outreach program of information and education to the maritime industry on this issue. (M-11-4)



Multivehicle Collision
Interstate 44 Eastbound
Gray Summit, Missouri
August 5, 2010



Accident Report

NTSB/HAR-11/03
PB2011-916203



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Gray Summit, MO (August 5, 2010)

- traffic slowed in the approach to an active work zone, as motor vehicles merged from the closed left lane to the right lane
- 2007 Volvo truck-tractor with no trailer, traveling in the right lane, had slowed or stopped behind traffic
- ~10:11 a.m. CDT, a 2007 GMC Sierra pickup truck merged from the left to the right lane, struck the rear of the Volvo tractor
- this collision was the first in a series of three



Gray Summit, MO (August 5, 2010)

- convoy of two school buses, lead bus was a 71-passenger school bus, occupied by 23 passengers
- following closely behind the lead bus was a 72-passenger school bus, occupied by 31 passengers
- seconds after the lead bus passed a motorcoach that had pulled over and stopped on the shoulder, it struck the rear of the GMC pickup
- this collision – the second in the series – pushed the pickup forward, overturning it onto the back of the Volvo tractor
- the front of the lead bus was ramped upward, as it came to rest on top of the GMC pickup and the Volvo tractor
- moments later, the following school bus struck the right rear of the lead bus



Gray Summit, MO (August 5, 2010)

- pickup driver cell phone use:
 - 11 minutes prior to accident, 11 text messages (6 sent/5 received)
- witness: driver appeared to lean to right
- witness: did not see brake lights illuminate
- pickup's sensing and diagnostic module (SDM):
 - brakes not applied in seconds before impact





2 fatalities
37 injuries



NTSB

Probable Cause

“ . . . the initial Gray Summit collision was distraction, likely due to a text messaging conversation being conducted by the GMC pickup driver, which resulted in his failure to notice and react to a Volvo tractor that had slowed or stopped in response to a queue that had developed in a work zone.”



Recommendations

- **To the 50 states and the District of Columbia:**
 - (1) Ban the nonemergency use of portable electronic devices (other than those designed to support the driving task) for all drivers;
 - (2) use the National Highway Traffic Safety Administration model of high visibility enforcement to support these bans;
 - and (3) implement targeted communication campaigns to inform motorists of the new law and enforcement, and to warn them of the dangers associated with the nonemergency use of portable electronic devices while driving. (H-11-39)



Attentive Driving – Countermeasures for Distraction Forum





- Forum (March 27, 2012):
 - Forum Information
 - Agenda
 - Presentations
 - Expert Panel Biographies
 - Staff Biographies
 - Transcript
 - Press Release





Home > Transportation Safety > Most Wanted List

SHARE    ...

MOST WANTED LIST

A program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives. The following are ten of the current issues.



Addressing Human Fatigue



General Aviation Safety



Safety Management Systems



Runway Safety



Bus Occupant Safety



Pilot & Air Traffic Controller Professionalism



Recorders



Teen Driver Safety



Addressing Alcohol-Impaired Driving



Motorcycle Safety



Carrollton, KY (May 14, 1988)



67 passengers, 27 fatalities, 34 serious injuries; driver: .28 BAC



NTSB

Since 1988 . . .

- 300,000 lives lost
- millions injured
- 200 law enforcement lives lost



Since 1988 . . .

- 10,228 lives lost in 2010:
 - > 4X total of all other modes
- Daily fatalities > 27 in deadliest crash



Miami, OK (June 26, 2009)

10 fatalities
3 serious injuries
2 minor injuries
5 no injuries

Ford
Windstar



Hyundai
Sonata

Kia
Spectra

Probable Cause (fatigue)

“ . . . driver’s fatigue, caused by the combined effects of acute sleep loss, circadian disruption associated with his shift work schedule, and mild sleep apnea, which resulted in the driver’s failure to react to slowing and stopped traffic ahead by applying the brakes or performing any evasive maneuver to avoid colliding with the traffic queue. . . . ”



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