



NTSB National Transportation Safety Board

The Biggest Risk in Transportation Safety: Human Behavior

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Academic Grand Rounds
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1967

In 1967, the Congress created an independent NTSB within the newly formed Department of Transportation (DOT); expanded the NTSB's authority to include all modes of transportation.





In 1974, Congress made the NTSB completely independent of the DOT.

1974





UNITED STATES CODE, TITLE 49
CHAPTER 11—NATIONAL TRANSPORTATION SAFETY BOARD

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SUBCHAPTER 5—GENERAL

§1181. Definitions

Section 40102(a) of this title applies to this chapter.

SUBCHAPTER 6—ORGANIZATION AND ADMINISTRATIVE

§1183. General organization

(a) ORGANIZATION.—The National Transportation Safety Board is an independent constitutional body of the Government.

(b) APPOINTMENT OF MEMBERS.—The Board is composed of 5 members appointed by the President, by and with the advice and consent of the Senate. Not more than 3 members may be appointed from the same political party. Members shall be appointed on the basis of technical qualification, professional standing, and demonstrated knowledge of accident reconstruction, safety engineering, human factors, transportation safety, or transportation regulation.

(c) TERMS OF OFFICE AND REMOVAL.—The term of office of each member is 7 years. At the end of the term, the President may appoint a member to fill a vacancy occurring before the expiration of the term for which the predecessor of that member was appointed for the remainder of that term. When the term of office of a member ends, the successor may not be a successor in office.

(d) CHAIRMAN AND VICE CHAIRMAN.—The President shall designate, by and with the advice and consent of the Senate, a Chairman of the Board. The President also shall designate a Vice Chairman of the Board. The terms of both the Chairman and Vice Chairman are 2 years. When the Chairman is absent or unable to perform the duties of the office, the Vice Chairman shall perform the duties of the office.

Mission

The NTSB is charged with:

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



The NTSB is Responsible for Investigating:

**Aviation, highway, rail, marine, pipeline,
and hazardous material accidents**





- 130,000+ accident investigations
- 13,000+ safety recommendations
 - 82% acceptance rate

The Biggest Risk in Transportation Safety: Human Behavior

- Fatigue
- Medications
- Alcohol impaired driving
- Distractions

Go! Flight 1002



- early starts, multiple segment days, sleep apnea

NTSB



Honorable John K. Lauber:

No Accident \neq
Safe Operation

Guantanamo Bay Cuba

First NTSB aviation accident to cite fatigue as probable cause



- acute sleep loss, sleep debt, circadian disruption

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Continental Connection (Colgan Air) Buffalo NY (February 12, 2009)



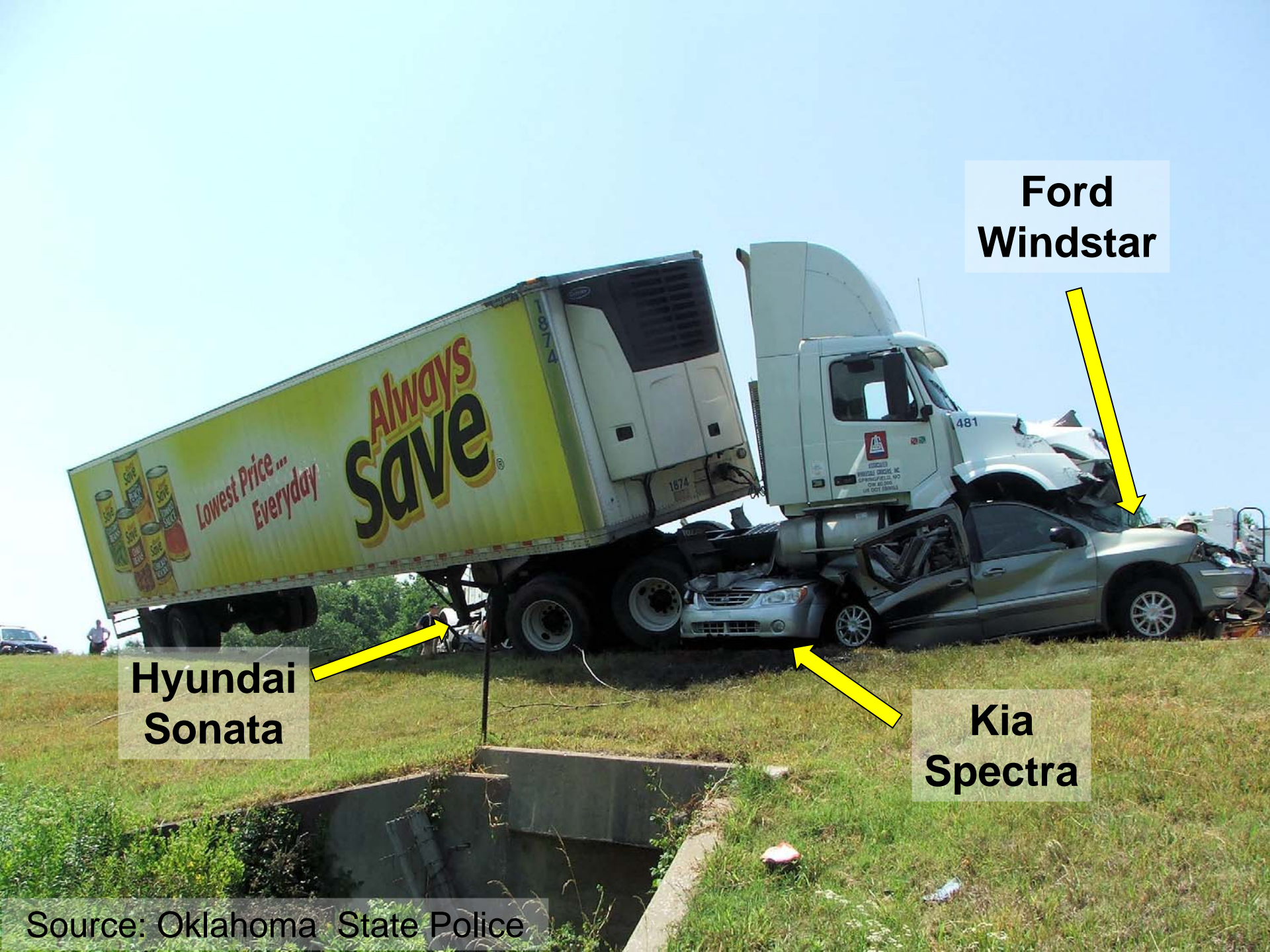
- 50 fatalities; commuting, acute sleep loss

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Fatal Airline Accidents (fatigue cited)

- 8/97 Guam: 228 fatalities
- 6/99 Little Rock AK: 11 fatalities
- 10/04 Kirksville MO: 11 fatalities
- 8/06 Lexington KY: 49 fatalities
- 2/09 Buffalo NY: 49 fatalities



**Ford
Windstar**



**Hyundai
Sonata**



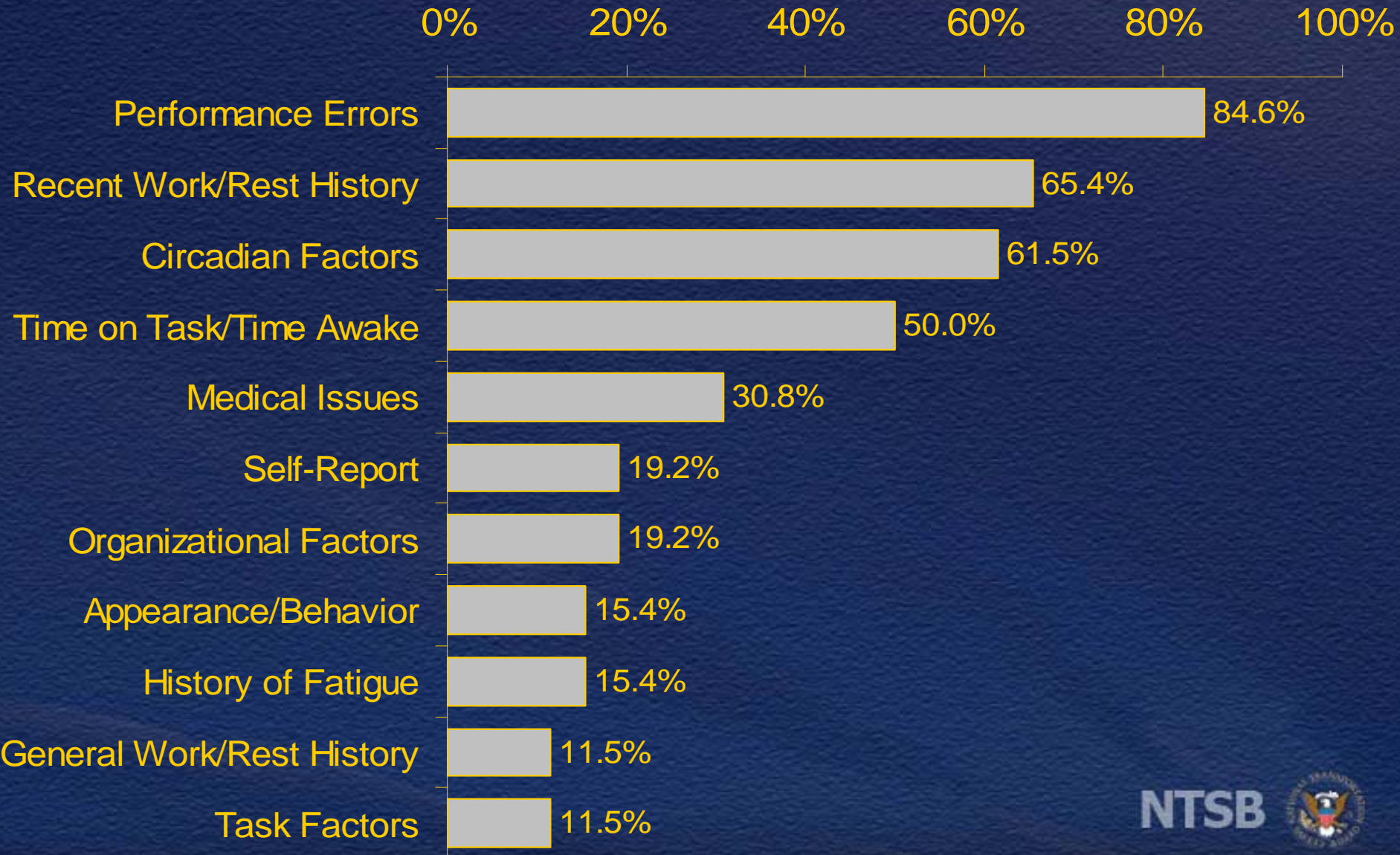
**Kia
Spectra**



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. . . . ”

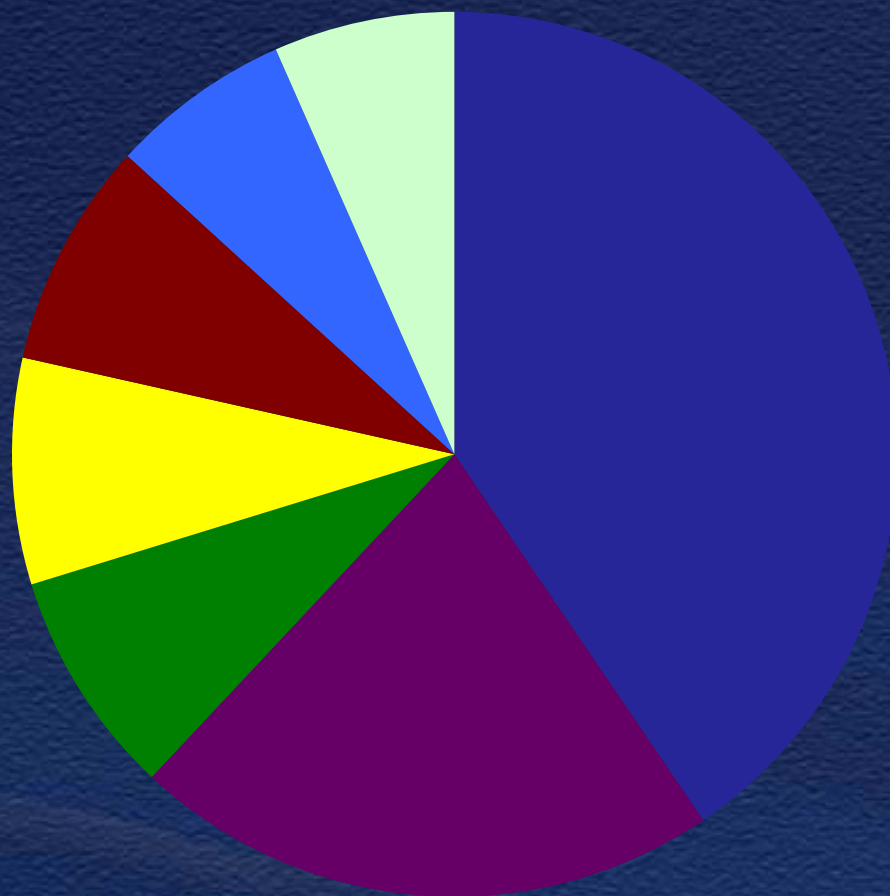
Fatigue Indicators



NTSB Fatigue Recommendations

- MOST WANTED since 1990
- 150+ fatigue recommendations

Complex Issue: Requires Multiple Solutions

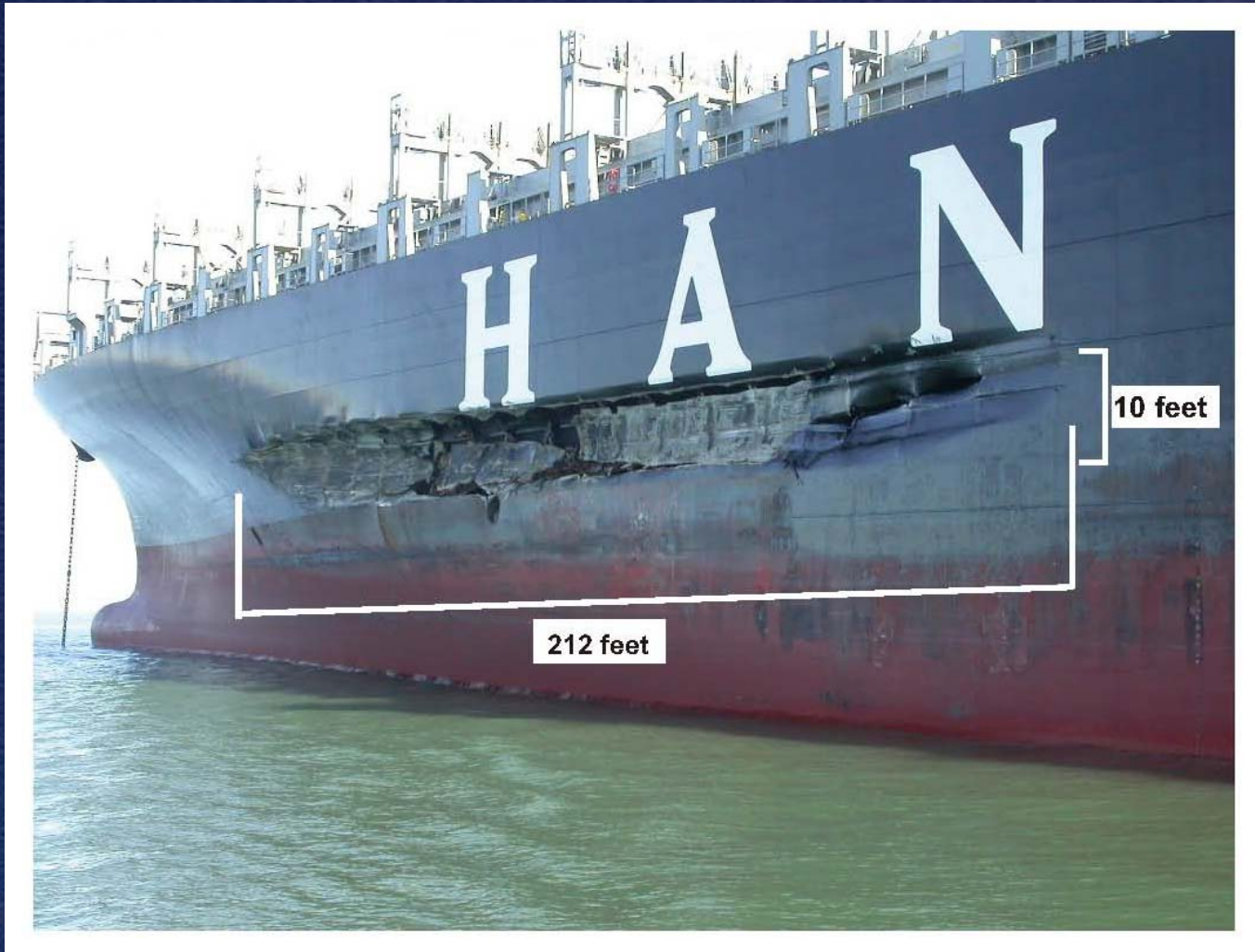


- Scheduling Policies and Practices
- Education
- Organizational Strategies
- Raising Awareness
- Healthy Sleep
- Vehicle and Environmental Strategies
- Research and Evaluation

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Cosco Busan (SF Bay, Nov. 2007)



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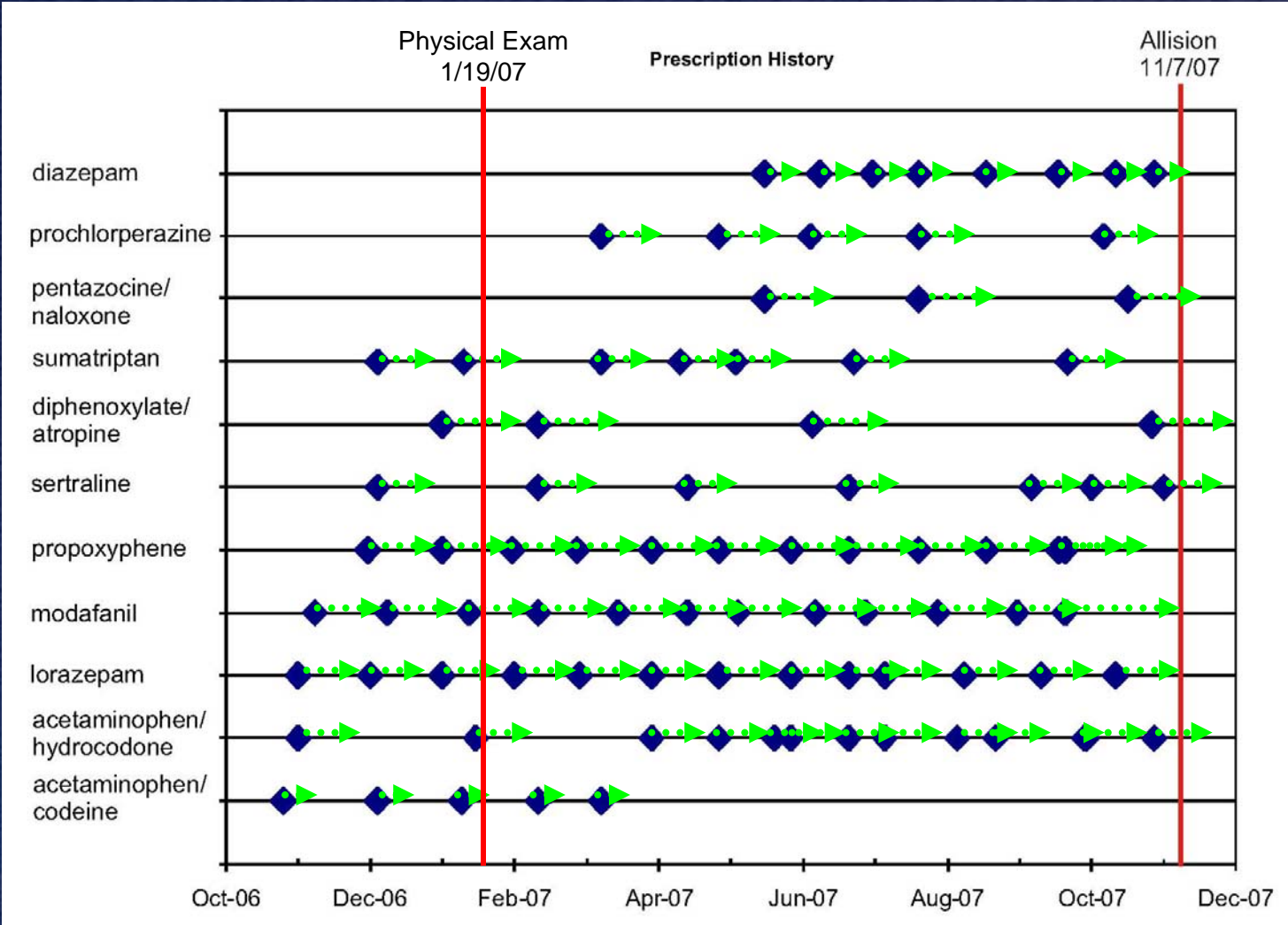
- Pilot - over 25 years experience
- Misinterpreted electronic chart and radar displays
- Navigated vessel directly toward the Delta tower of the bridge

Pilot Medical History

- History included:
 - chronic esophagitis
 - sleep apnea
 - “occasional” abdominal pain
 - glaucoma
 - “occasional” medication “for sleep”
- No other medications noted
- No additional review; “competent”

Prescription History

IMPAIRING
ADDICTING



Probable Cause/Contributors

- The failure to safely navigate the vessel in restricted visibility as a result of the pilot's degraded cognitive performance . . .

Des Plaines, Illinois (October, 2002)



Des Plaines, Illinois (October, 2002)



Probable Cause

. . . the train MPRSS-21 engineer's falling asleep at the controls of his locomotive and the unexplained inattentiveness and inaction of the conductor in the moments before the collision.

Contributing to the engineer's falling asleep was likely his use of prescription medications that may cause drowsiness, as well as his lack of sleep in the 22 hours preceding the accident.

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Carrollton, KY (May, 1988)



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

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Alcohol Impaired Driving

- 10,839 fatalities in 2009
- > 4X total of all other modes
- Daily fatalities > 27 in deadliest crash

Hard Core Drinking and Driving

- Hard core:
 - 0.15 or $>$ BAC or
 - repeat offender in past 10 yrs
- Hard core: 70% of fatalities
 - 7,607 fatalities (2009)
 - 22% of all highway fatalities

Hard Core Drinking and Driving

- NHTSA:
 - estimates 88 impaired trips before being arrested once
 - hard core repeat offender: 176 trips before being caught!

Hard Core Drinking and Driving

- NTSB 2000 Recommendation:
 - establish comprehensive program designed to reduce the incidence of alcohol-related crashes, injuries, and fatalities caused by hard core drinking drivers
- States Most Wanted List since 2003

Hard Core Drinking and Driving

- Crime and punishment
- Technology innovations
- Behavioral/systems interventions:
 - DWI courts

Incline Village, NV – Feb 2007



urine ethanol: 0.279 percent; chest blood ethanol 0.155 percent

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Chatsworth, CA (Sept., 2008)



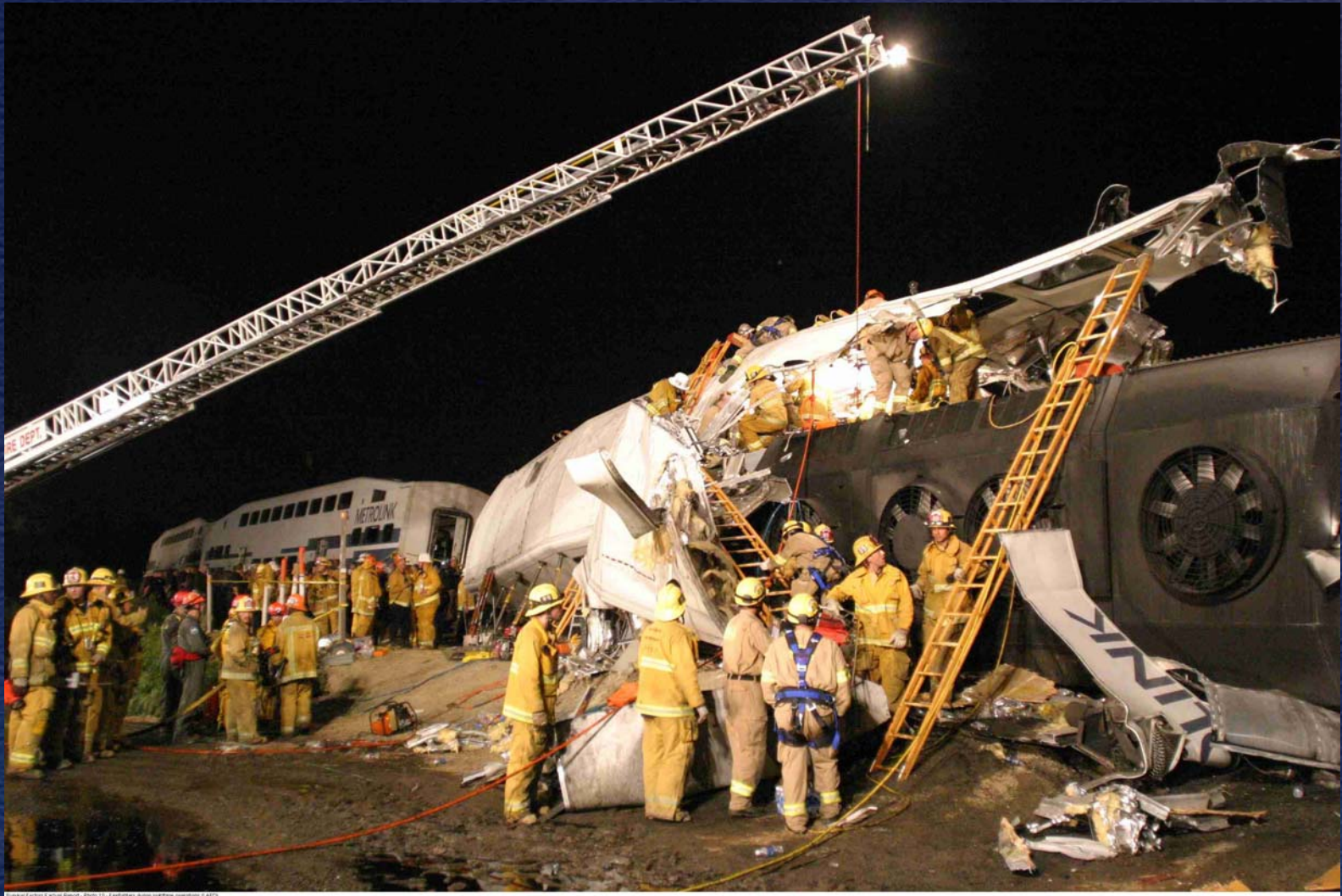
Survival Factors Factual Report - Photo 9 - Aerial view of accident area (Metrolink)

25 fatalities, 135 injuries; \$12M damage

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Chatsworth, CA (Sept., 2008)



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Chatsworth, CA (Sept., 2008)

Probable cause:

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

Manage Human Behavior = Enhance Safety

- Promote change:
safety culture
- Get educated
- Acknowledge risk
- Act!



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