



**NTSB** National Transportation Safety Board

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# **Enhancing Transportation Safety: The Importance of Managing Fatigue**

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Board Member

Fatigue in Transit Operations  
Transportation Research Board  
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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 his or her duties, the Vice Chairman shall perform the duties of the Chairman.

# 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:**

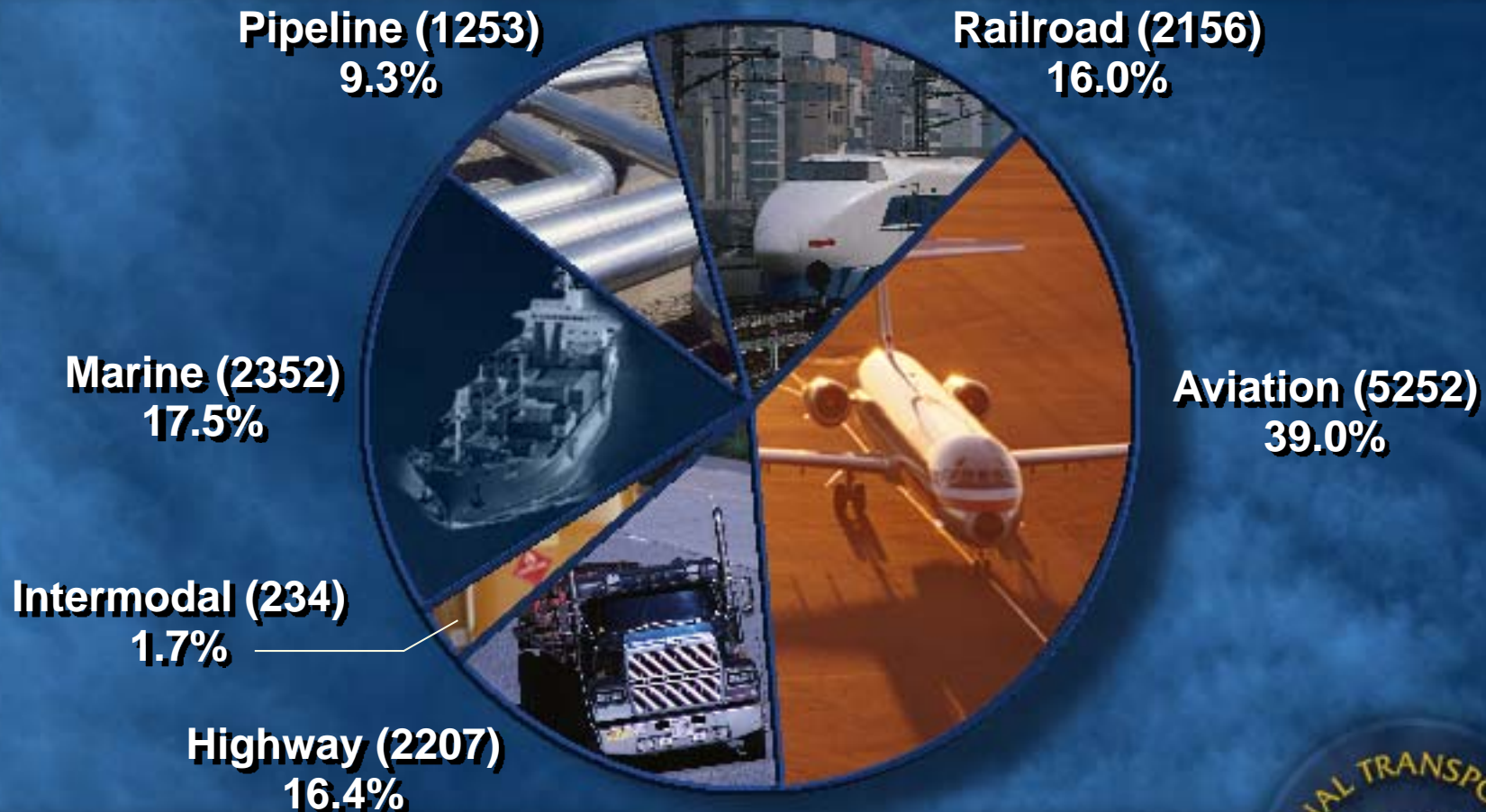
**Aviation, highway, rail, marine, pipeline,  
and hazardous material accidents**





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

# 13,454 Safety Recommendations issued since 1967

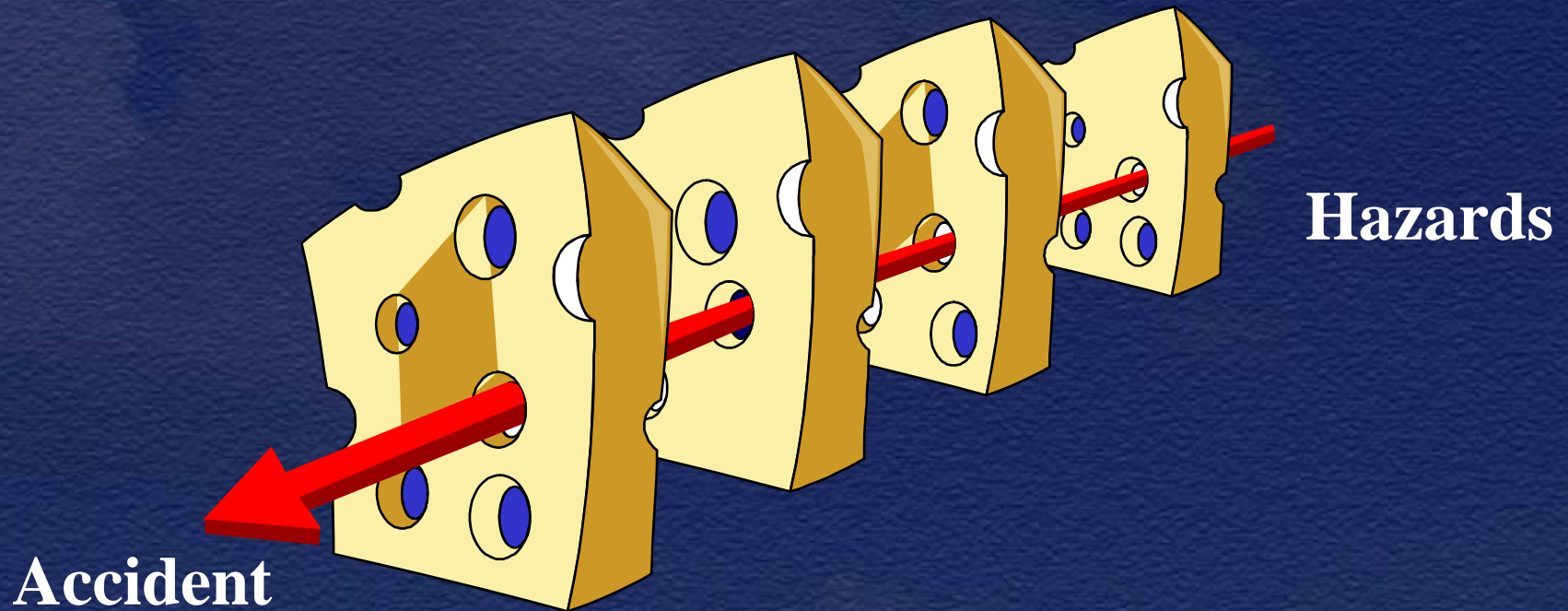




Major product: safety recommendations

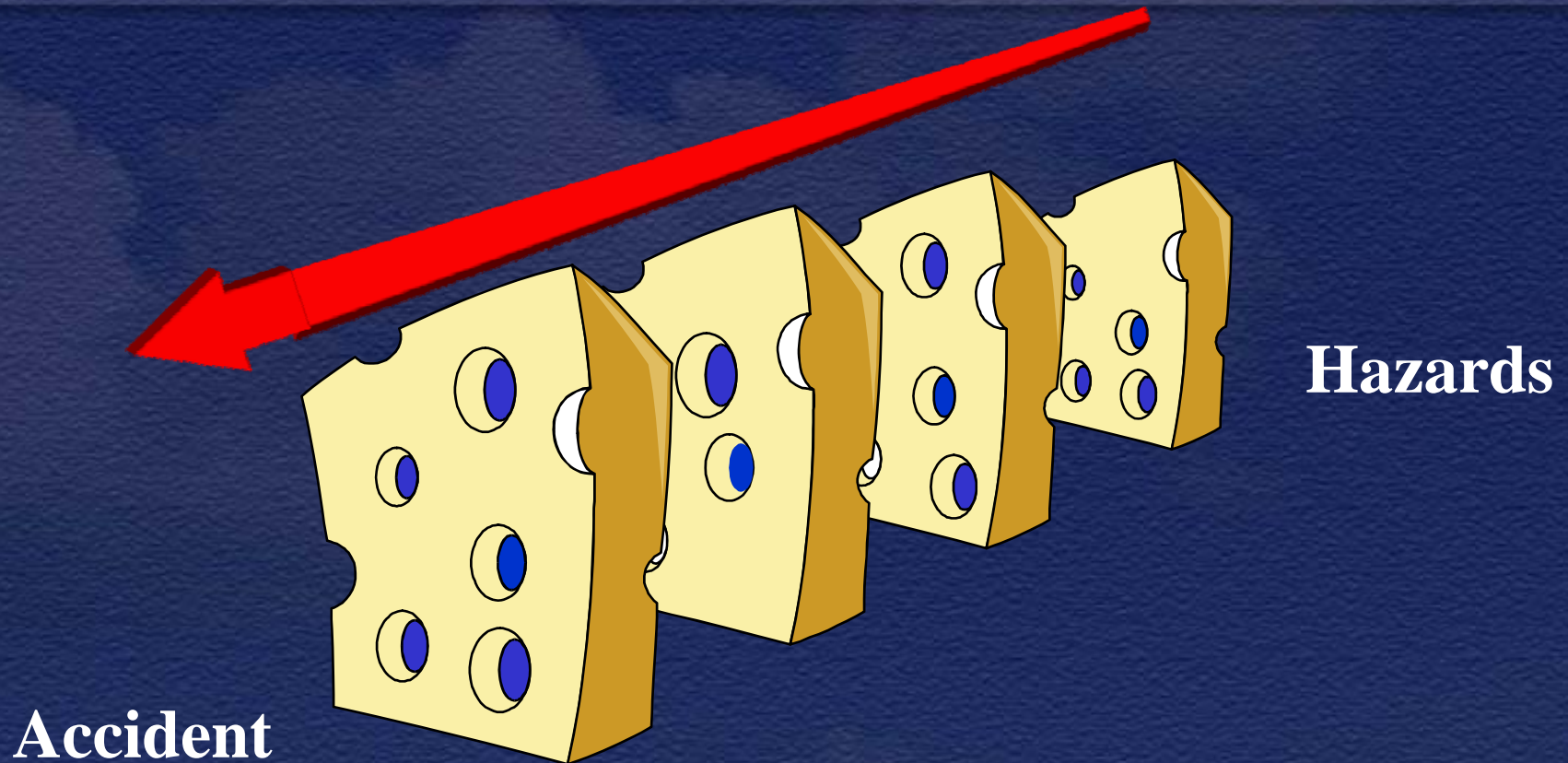
Moral compass and industry conscience

# “Swiss Cheese” Model (Reason)



Successive layers of defenses, barriers, and safeguards

# The Challenge (Haueter)



Successive layers of defenses, barriers, and safeguards



# Challenges of a 24/7 Society



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# Why Manage Fatigue in Transit?

Fatigue is a safety risk

# NTSB Most Wanted List

Critical changes needed to reduce transportation accidents and save lives.



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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



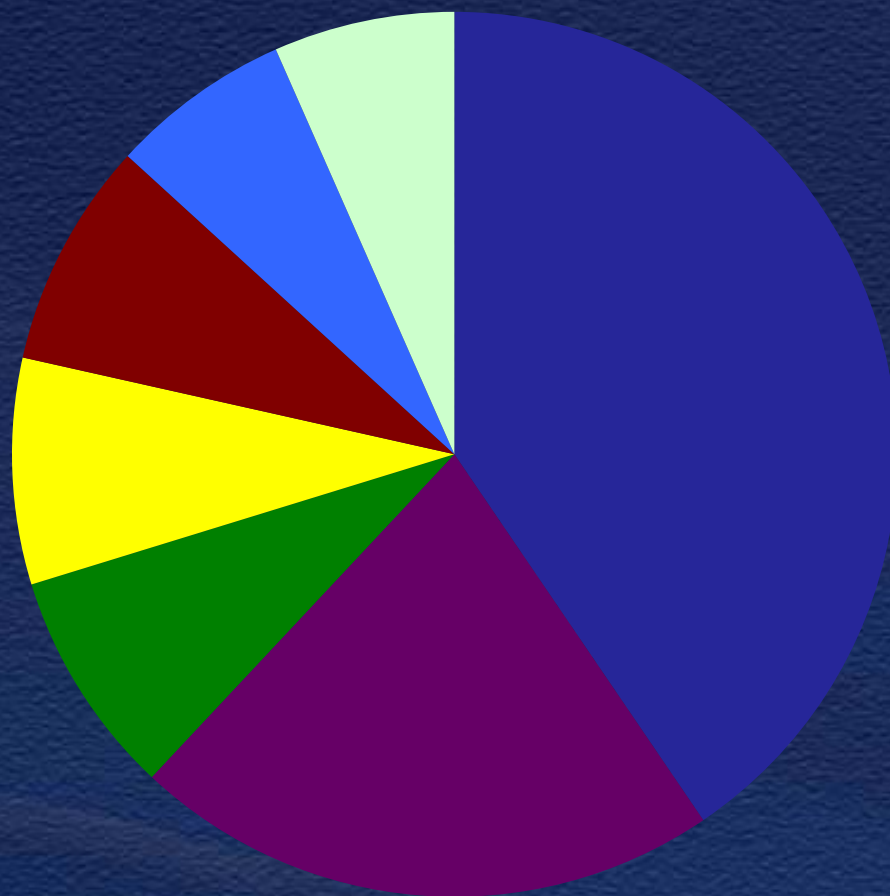
Motorcycle Safety



# NTSB Recommendations

- MOST WANTED since 1990
- ~200 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

# Education/Strategies

- Develop a fatigue education and countermeasures training program
- Educate operators and schedulers
- Include information on use of strategies: naps, caffeine, etc.
- Review and update materials

# Education

- Education vs. awareness
- Foundation for any fatigue efforts
- Address broad/applied content:
  - how fatigue affects performance
  - how to minimize fatigue risks
  - countermeasures to combat fatigue
  - policies to support tired drivers



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Video Animation  
Motorcoach Overturn  
Victoria, Texas

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# Scheduling Policies and Practices

Victoria, Texas, January 2, 2008



Victoria, Texas Fire Department

- Day sleep, night drive, ~ 4 am WOCL

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# Scheduling Policies and Practices

- Establish scientifically based hours of service regulations
- Address:
  - rotating schedules
  - extended duty days
  - schedule inversion (day sleep/night work)
  - schedule irregularity and unpredictability
  - opportunity for 8 hrs uninterrupted sleep

**Mexican Hat, Utah  
January 6, 2008  
8:02 PM**

# Healthy Sleep

Mexican Hat, UT, January 6, 2008



- 360 rollover, 50/53 ejected, 9 fatalities, OSA (-CPAP)

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# Healthy Sleep

- Disseminate guidance for identifying and treating obstructive sleep apnea
- Ensure drivers with apnea are effectively treated before granting unrestricted medical certification
- Have a written contingency plan to accommodate drivers impaired by fatigue or illness

# Organizational Strategies

- Improve drivers' rest facilities
- Review logbook violations  
(driver safety assessments)
- Non-punitive fatigue call-in policy
- Provide a backup driver when needed

# Vehicle and Environmental Factors

- Rumble strips
- In-vehicle technologies to reduce fatigue related accidents
  - EOBRs
  - Lane detection systems
  - Collision avoidance systems

# Fatigue Management Systems

- Develop guidance based on empirical and scientific evidence for operators to establish fatigue management systems
- Develop and use a methodology that will continually assess the effectiveness of fatigue management systems



# Fatigue Risk Management Systems

Implementation Guide  
for Operators

1<sup>st</sup> Edition  
July 2011



Doc 9966 - UNEDITED VERSION



# FRMS

Fatigue Risk Management Systems  
Manual for Regulators

2011 Edition

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# Fatigue Management Programs

- Comprehensive approach
- Multiple components
- Science based
- Continuously evaluated and updated
- Complements HOS regulations

# Honorable John K. Lauber:

No Accident  $\neq$   
Safe Operation

# Managing Fatigue . . .

- Develop
  - knowledge, tools, programs
- Implement
  - education, FRMS, policies
- Improve
  - evaluate, enhance, integrate

# Manage Fatigue . . .

enhance safety!



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