

National Highway Traffic Safety Administration



# Transportation Safety: The Sleep Factor

Mark R. Rosekind, Ph.D.  
Administrator

# Federal Agencies: Transportation

NHTSA

FMCSA

FRA

NTSB

PHMSA

DOT

MARAD

FTA

FHWA

FAA

# U.S. Department of Transportation



*Safer drivers. Safer cars. Safer roads.*

# OUR NATION'S TRANSPORTATION INFRASTRUCTURE

- Rail
- Pipeline
- Urban Transit
- Roads/Highways
- Airports/Airways
- Ports/Waterways

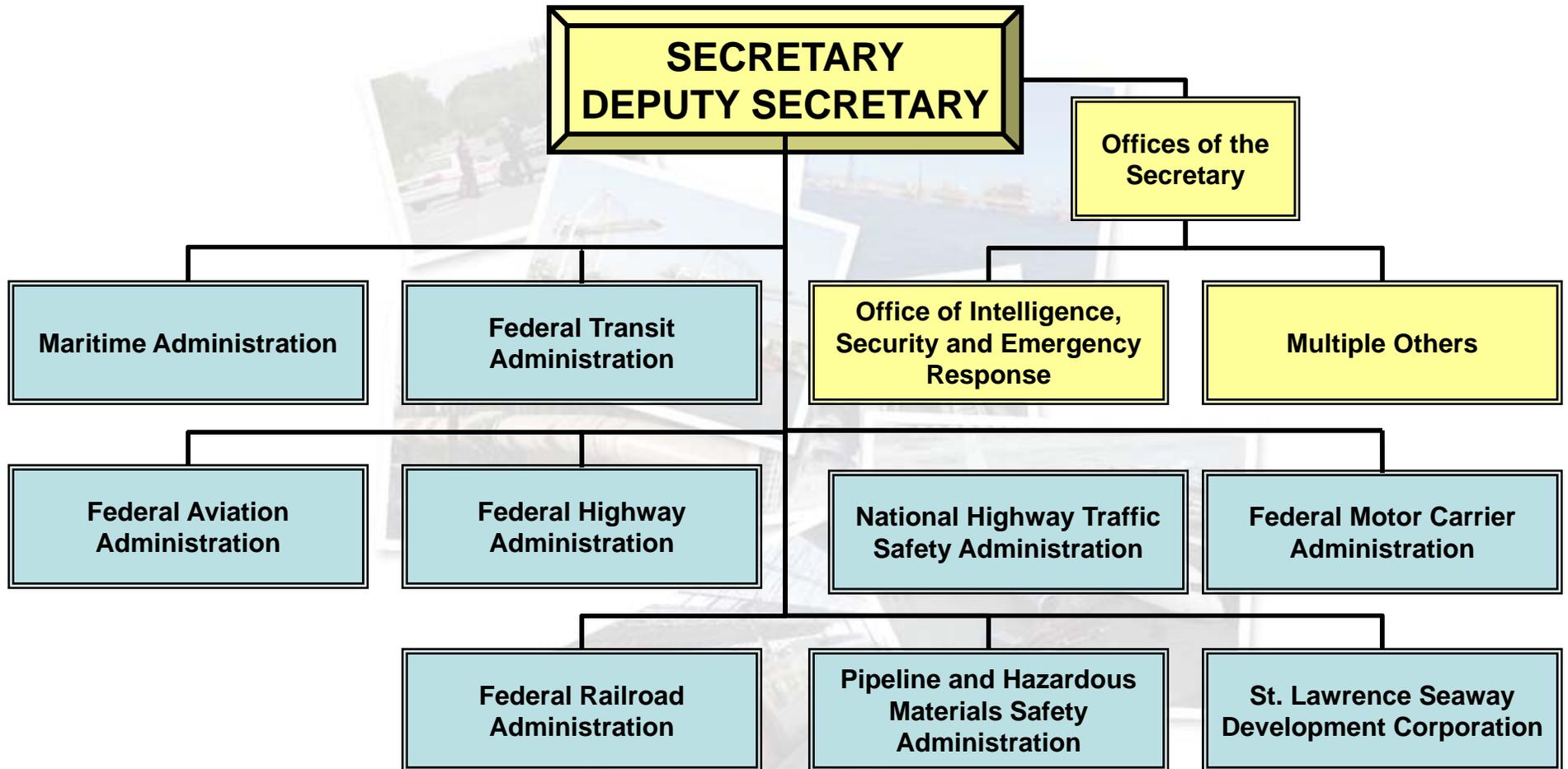


# Transportation Infrastructure Moves People and Goods, and Supports Nation's Economy

- **Carries 265 million vehicles**
- **Provides mobility to 15 million Americans without vehicles**
- **Moves 16 billion tons of goods**
- **Pipelines transport 5.4 billion barrels of petroleum**
- **Supports 10 million airline flights,**
  - **carrying 800 million passengers**
  - **44 billion tons of freight**
  - **among 600 airports**
- **Entire transportation system ~ 9 percent of U.S. GDP**



# DOT Organization Chart



# NHTSA Mission

Reduce deaths, injuries and economic losses  
resulting from motor vehicle crashes



*Safer drivers. Safer cars. Safer roads.*

# NHTSA Mission

- Set/enforce safety performance standards for motor vehicles & equipment
- Set/enforce fuel economy standards
- Conduct research on driver behavior and traffic safety



*Safer drivers. Safer cars. Safer roads.*

# Challenges of a 24/7 Society



*Safer drivers. Safer cars. Safer roads.*

# Sleep Loss and Circadian Disruption

- Degrade/impair
  - Safety
  - Health
  - Performance
  - Mood

# Impaired Driving: 3D's → 4D's

- Drunk
- Drugged
- Distracted
- Drowsy

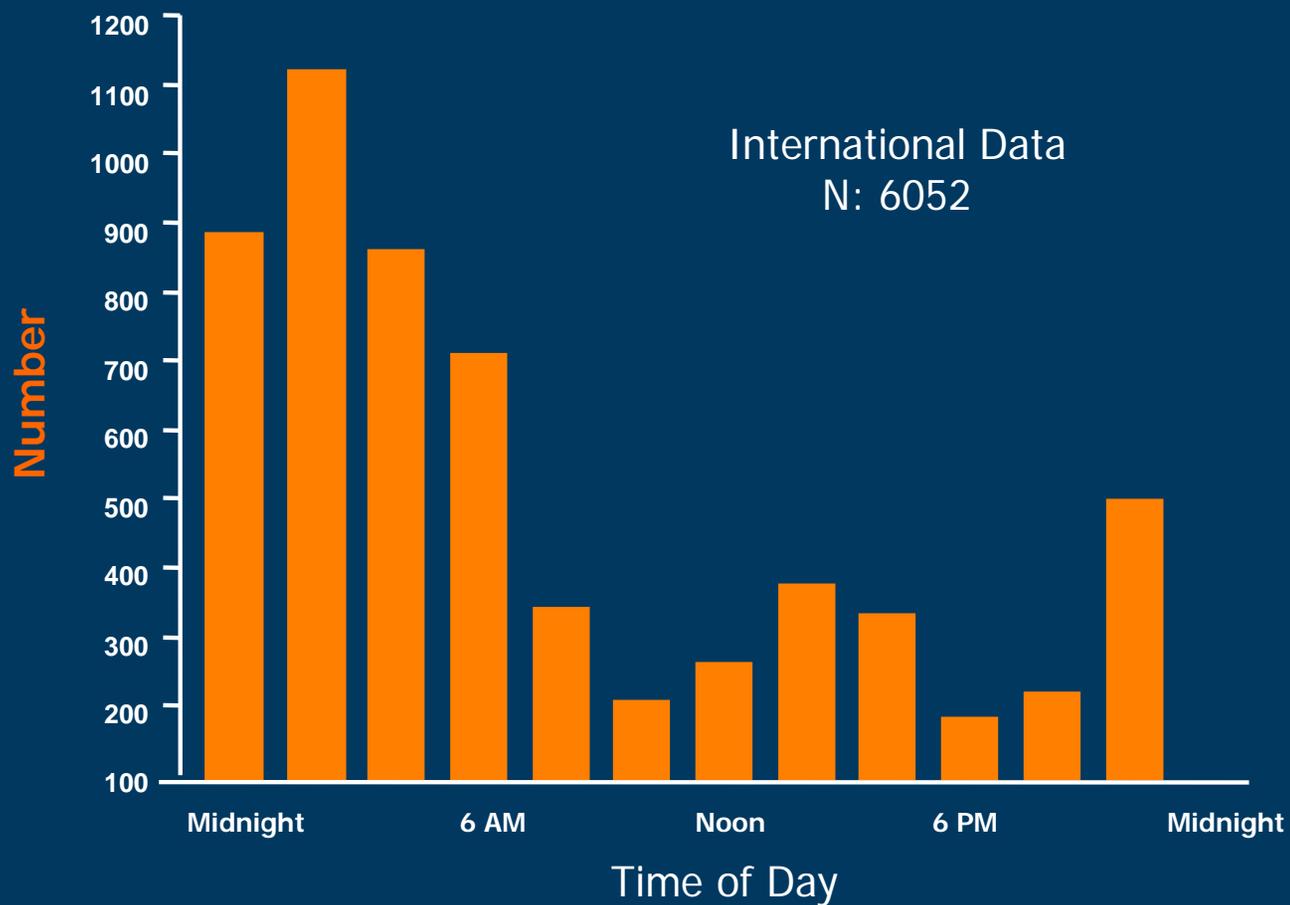
# Drowsy Driving

NSF Poll:           60% reported driving while drowsy  
                          37% nodded off

AAA:                400,000 -1 million crashes annually

Estimates:         5,000 – 7,000 lives lost/year

# Circadian Influence: Car Crashes



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M.M. Mitler, et al., Sleep, 1988



# Drowsy Driving . . .



Surrogate  
&  
Symbol



Safety, health, performance, and mood risks  
created by our sleep-deprived society

# Example Challenges

- Scope/cost of the problem
  - Workplace/school issues
  - Developmental/age changes
  - Health issues
  - Design/technology (+/-)
  - Countermeasures/future directions
- 

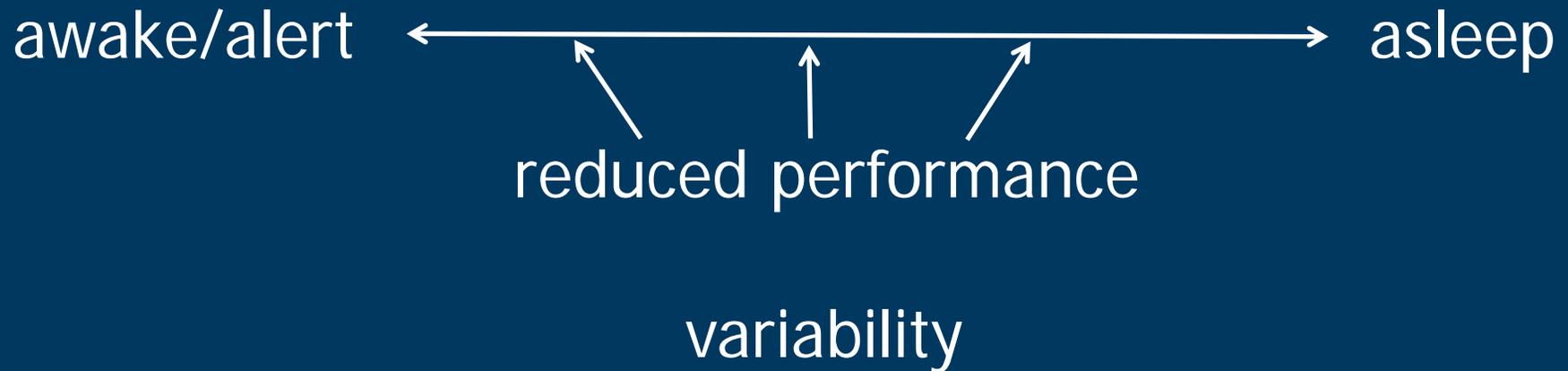
No Magic Bullet

# NHTSA Drowsy Driving Initiative

- Collect better data and improve estimate of problem
- Develop/test public awareness and education campaign
- Identify/develop effective legal and enforcement strategies
- Develop strategies for vulnerable populations

Drowsy Driving Forum: November 4 -5, 2015

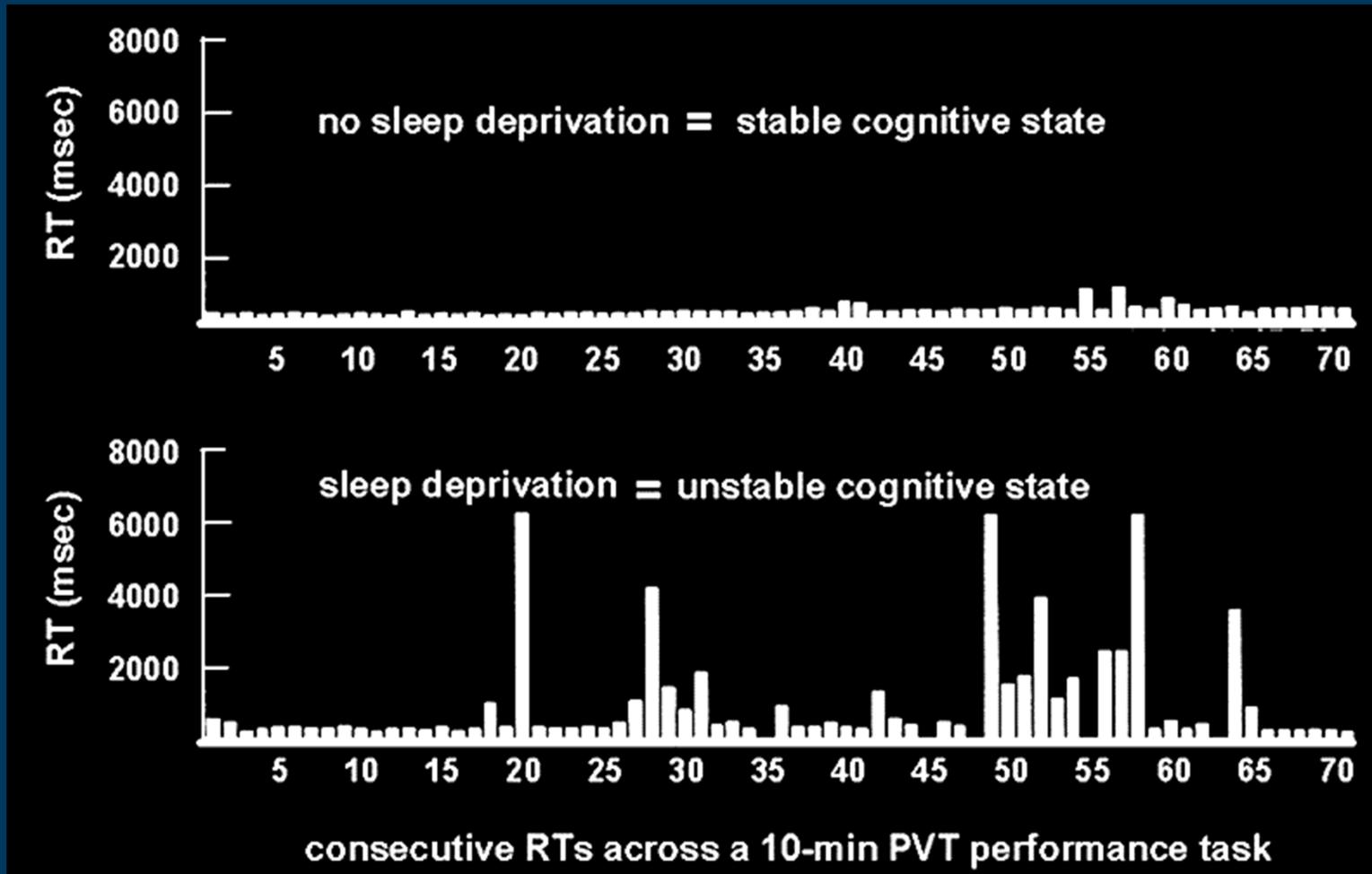
# Fatigue Risks



# Fatigue Risks

- degraded 20 – 50%+ :
  - reaction time
  - memory
  - communication
  - situational awareness
  - judgment
  - attention
  - mood
- increased:
  - irritability
  - apathy
  - attentional lapses
  - microsleeps

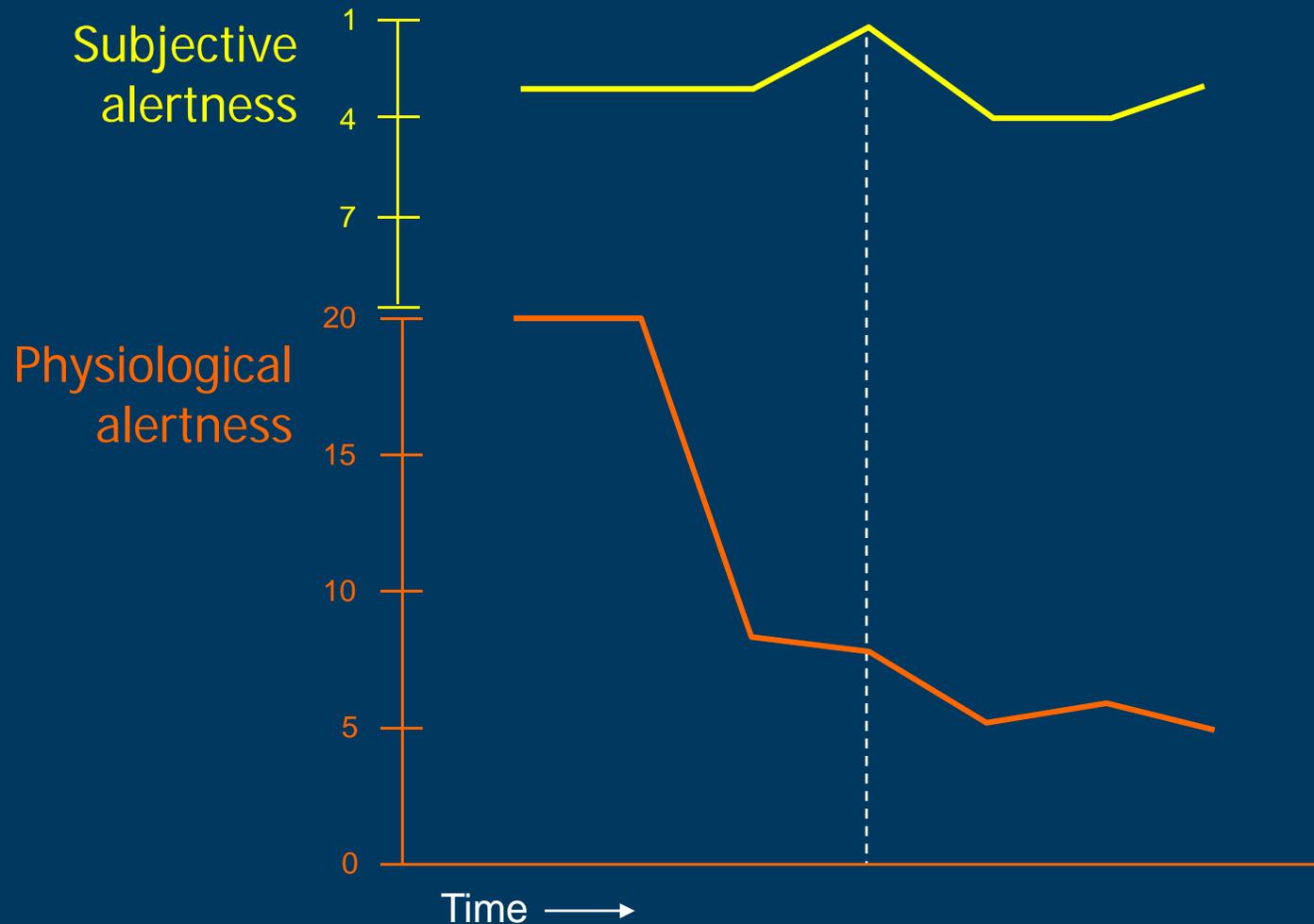
# Fatigue and Reaction Times



Doran SM, Van Dongen HP, Dinges DF. Sustained attention performance during sleep deprivation: evidence of state instability. *Archives of Italian Biology: Neuroscience* 2001;139:253-267.

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# Alertness Reports Often Inaccurate



# Success requires . . .

a culture change that supports  
different attitudes and behaviors

# To Better Manage Sleep/Circadian Factors

- Acknowledge risks
- Educate everyone
- Strong policies
- Take action/use strategies!
- Promote culture change

# The Role of Sleep/Circadian Science

- Opportunities
  - operationally relevant research
  - translate/communicate findings
  - your personal role/responsibility

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Mark R. Rosekind, Ph.D.  
NHTSA.Administrator@dot.gov  
[www.NHTSA.gov](http://www.NHTSA.gov)

