



# FMCSA Safety and Security Accomplishments



Office of Research and Analysis

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U.S. Department of Transportation

**Federal Motor Carrier Safety Administration**



# Fatigue Management Transportation Operations International Conference

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U.S. Department of Transportation  
**Federal Motor Carrier Safety Administration**

# FATIGUE MANAGEMENT in

## Transportation Operations

## International Conference



U.S. Department of Transportation  
Federal Motor Carrier Safety Administration



Transport  
Canada

Transports  
Canada



# Conference Co-Chairs

- ◆ Robert Carroll, FMCSA
- ◆ Sesto Vespa, Transport Canada
- ◆ Valérie Gil, Transport Canada



# Implementation Team

## ◆ Support Team:

- Victoria Chapman, Hi-Tech Systems
- Sunny Owens, Wright Solutions, Inc.
- Dina Iwanycky, Transport Canada
- Anne Delson, Kanaal Design Communication Inc

## ◆ Contractor – Cambridge Systematics, Inc.

- Shelley Feese
- Paul Smith
- Roan Bennett
- Iris Fujito



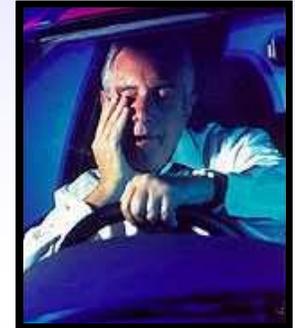
# Conference Profile

- ◆ Keynote speakers
  - Annette Sandberg, Administrator, *Federal Motor Carrier Safety Administration*
  - Derek Sweet, Director General for Road Safety, *Transport Canada*
  - Dr. David Dinges, *University of Pennsylvania School of Medicine*
  - Dr. Gregory Belenky, *Washington State University*
- ◆ 90 papers included for oral and poster presentations, and panel sessions
- ◆ All modes of transportation
- ◆ 200 participants; 13 countries
  - Industry, government, academia



# Conference Goals

- ◆ Identify
  - New knowledge (research)
  - New approaches, techniques and technologies
- ◆ Move knowledge and developments toward industry applications



# Why Fatigue?





# Importance of Sleep

- ◆ Safety
- ◆ Productivity
- ◆ Health and well-being



*Fatigue can lead to personal loss . . .*





*... Fatigue can be catastrophic.*





# Session Topics

1. Indicators and accidents
2. Monitoring devices
3. Mathematical modeling
4. Fatigue and performance
5. Scheduling
6. Risk management
7. Sleep disorder screening and treatment
8. Countermeasures
9. Fatigue management programs



# Expert Panel Discussion Topics

- ◆ **Prescribed and Over-the-Counter Medication Risks:** Appropriate usage in transportation
- ◆ **Fatigue Self-assessment:** How well does it relate to performance, and how can it be realistically used in fatigue management?
- ◆ **Sleep Disorders:** What are cost-effective means for implementing sleep disorder screening and treatment on an industry-wide basis?
- ◆ **Fatigue Risk Management Programs:** How can they improve operational safety and performance?



# Approaches to Managing Fatigue Risk

- ◆ Hours of Service Regulations
  - Regulator-based
  - One size fits all
  - Verified by regulator
  - Modifiable by fatigue risk management within HOS



# Approaches to Managing Fatigue Risk

- ◆ Fatigue Risk Management – Internal
  - Company-based
  - Embedded in safety management systems
  - Flexible; setting dependent
  - Verified by regulator



# Approaches to Managing Fatigue Risk

- ◆ Fatigue Risk Management – External
  - Insurance-based
  - Rates vary with insurance company assessment of risk
  - No verification



# Some Outstanding Issues

## ◆ Time-on-task effects

- Does ratio of working (flying, driving, etc.) to on-duty time affect fatigue?
- Does change = rest?
- Are the effects of fatigue reversed with simple rest?



# Some Outstanding Issues

- ◆ Sleep restriction over time
  - How much sleep is required for recovery?
  - Are naps additive to recuperative sleep?



# Some Outstanding Issues

- ◆ Recovery time (hours needed to restart)
  - Recovery appears rapid in some studies; delayed in others
  - When is recovery complete enough to allow safe driving?
  - Individual differences



# Some Outstanding Issues

- ◆ Operational definitions
  - Fatigue
  - State instability
  - Sleep debt
- ◆ Individual differences
  - Screening
  - Intervention
- ◆ Medical evaluation
  - Sleep apnea
  - Other sleep disorders
  - Other medical conditions



# Next Steps – FMCSA Programs

- ◆ North American Fatigue Management Program with Canadian partners
  - Program evaluation
  - Implementation guide
  - Roll out



# Next Steps – FMCSA Programs

- ◆ Recovery initiatives with Canadian partners
  - Empirical studies beginning 2006
  - Strategic napping study



# Next Steps – FMCSA Programs

- ◆ Monitoring device research
  - Available to most drivers
  - 24-hour operation
  - Performance and physiological monitoring

# Ensuring CMV Driver Alertness





# Additional Information

- ◆ Conference website:

<http://www.engr.washington.edu/epp/fmto/>

- ◆ Conference Proceedings

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