Massachusetts Bay Transportation Authority

• Fifth largest mass transit system in the United States measured by ridership.

• The Authority serves a daily ridership of approximately 1.24 million passengers.

• Our service area is comprised of 175 cities and towns.
MBTA System

- 178 Bus Routes
- 4 Rapid Transit Lines of Heavy and Light Rail
- 5 Bus Rapid Lines
- 4 Trackless Trolley Lines
- 14 Commuter Rail Lines
- 3 Ferry Routes
- Flexible Para transit Service

- Over 2,700 Vehicles
- 286 Stations
- 885 miles of railroad track
- Approximately 500 Bridges
- 20 Miles of Tunnel
- 19 Maintenance Shops
- Over 6000 employees
- 4,500 are considered Safety-Sensitive
• On May 28, 2008, at about 5:51 pm, Westbound Train #3681 was stopped at a red signal west of Waban on the MBTA’s Green Line D Branch.

• At this time, Westbound Train #3667, traveling about 38 mph, struck the rear end of Train #3681. Train #3667 had failed to stop at a signal that warned of the presence of #3681, and had failed to proceed at restricted speed, prepared to stop short of the train. The Operator of Train #3667, Terrese Edmonds, was killed and several passengers were injured.
The following were neither causal nor contributory to the accident: weather conditions, equipment performance, track condition, crewmember use of alcohol or illegal drugs, crewmember use of cell phones, crew training and qualifications, of the performance of the crew of the stuck train.

2. The emergency response to this accident was timely and appropriate.

3. The operator of the striking train was at a high risk for having undiagnosed sleep apnea, and she may have been chronically fatigued as a result of the condition.
4. The operator of the striking train failed to respond appropriately to the controlling signal indication or to take advantage of several opportunities to slow or stop the train and to prevent the accident likely because she experienced a micro-sleep episode after departing Waban Station.

5. The MBTA continues to have an inadequate fatigue awareness program to educate train operators about the risks of fatigue and an inadequate program to identify and address potential sleep disorders for its train operators.
NTSB Recommendations

R-09-10: *
Review your medical history and physical examination forms and modify them as necessary to ensure that they elicit specific information about any previous diagnosis of obstructive sleep apnea or other sleep disorders and about the presence or specific risk factors for such disorders.

R-09-11: *
Establish a program to identify operators who are at high risk for obstructive sleep apnea or other disorders and require that such operators be appropriately evaluated and treated.

* - NTSB has also made this recommendation to the industry. MBTA is also involved in this effort.
R-09-10

Medical history and exams for sleep apnea

- Reviewed and updated our medical history and physical examination forms as appropriate.

- A sleep disorder sleeping questionnaire is used by Medical Operations to identify employees for possible sleep disorders. This screening includes a Sleep Apnea Questionnaire and the Epworth Sleepiness Scale.

- Screenings take place at pre-employment physicals, annual and bi-annual physical exams, and return to work physicals. All post accident, reasonable suspicion, Drug & Alcohol testing and, when a supervisor requests a fitness for duty exam include this screening.

- Employees who are suspected of having a sleep disorder are required to be evaluated and produce medical documentation of treatment compliance.
Identify Operators at risk for sleeping disorders

- The clinic has added a sleep disorder sleeping questionnaire as a component to all physical examinations. This screening includes a Sleep Apnea Questionnaire and the Epworth Sleepiness Scale. This screening can be used to open a dialogue with employees about their sleep habits and/or to determine a potential sleep disorder.

- Supervisory staff attend Fitness for Duty training classes. Classes are designed to teach supervisory staff to recognize signs, symptoms and issues involving the physical and mental health of employees. How and why to request a fitness for duty examination.
MBTA MEDICAL PROGRAM

• All applicants have a pre-employment physical.
• All applicants are required to answer a questionnaire on Sleep Disorders.
• Safety-Sensitive employees under the age of 45 are seen for a physical examination every two years. After age 45 the exam is yearly.
• Part of that examination is to complete a questionnaire on Sleep Disorders.
Sleep Disorder Screening Questionnaire

• Combination of the Epworth scale and questions that are designed to begin a conversation between the Doctor and the employee/applicant.
Work Alert Program

Posters

Decals

Tip Cards
Posters

GET ENOUGH SLEEP FOR SAFETY’S SAKE.

Well-rested drivers are safe drivers. WORK ALERT.

BE YOUR BEST. GET ENOUGH REST.

Being safe isn’t an accident. In order to be aware and alert on the job, you need enough sleep. WORK ALERT.

“Work Alert” Internal posters

Over 500 posters displayed in garages, lobbies, rest areas, and meeting areas reminding operators that part of coming to work fit for duty means being fully rested, alert and aware.
Operator Cab Decal

BE YOUR BEST.
GET ENOUGH REST.

It’s your responsibility to WORK ALERT.

Operator cab decal
Over 2,000 5” x 3” cab decals will be installed to remind operators of the importance of staying alert on the job.
WORK ALERT. 10 TIPS TO COMBAT FATIGUE

1. Avoid caffeine several hours before bedtime.
2. Avoid alcohol several hours before bedtime.
3. Know the side effects of your medication.
4. Lower your thermostat before going to bed.
5. Block or mask outside sounds.

6. Close the bedroom door and hang a “Do Not Disturb” sign on it.
7. Unplug the telephone in your bedroom.
8. Make your bedroom dark and sleep at the same time every day.
9. Develop a relaxing sleep ritual.
10. Talk to your primary care provider about your overall health.

Shift worker wallet card

Operators will be armed with wallet-sized information to combat sleepiness.
Quantity: 5,000
**Fatigue Detection Tips for Supervisors**

A supervisor with daily contact can determine if employees are fully alert and ready to work. Warning signs that they may not include:
- A usually upbeat and cheerful employee appears moody, quick to anger or withdrawn;
- A normally diligent employee displays a lack of interest in work;
- An employee complaining about being fatigued;

- Any employee nodding off or napping at inappropriate times and places.
- If any of the above symptoms of fatigue are apparent, you should:
  - Check for fitness for duty.
  - If appropriate, remove from safety-sensitive duty.
  - Refer employee to OSH/Medical Clinic.
Using your knowledge of the employee’s typical behavior as a guide, decide if he or she is fit to work.
Fatigue Awareness Program

Overview
30 Minute Program Overview
Causes and Effects
Fatigue Countermeasures
Individual Responsibilities
Notification Procedures
What’s your sleep I.Q.?
OVERVIEW

• Causes of Fatigue
• Effects of Fatigue
• Fatigue Countermeasures
• Individual Responsibilities
• Notification Procedures
CAUSES OF FATIGUE

• Sleep Loss

• Disruption of Circadian Rhythms
HOURS OF SLEEP

- On average, everyone needs about 8 hours of sleep each night
- Less than 7 or more than 9 hours is associated with poorer health
- Short-term (few days) – you can get by with 6 hours
SLEEP LOSS...

• Adds up over time & creates a sleep debt
• Leads to increased sleepiness
• Repeated loss of sleep can lead to a reduced ability to handle routine challenges
CIRCADIAN RHYTHM

• The human body is governed by an internal clock called Circadian Rhythm
• In each 24-hour cycle, it makes you want to sleep when it’s dark & be awake when it’s light
• It has two low activity or sleep cycles:
  • 12 to 6 a.m.
  • 3 to 5 p.m.
Factors linked to disrupted sleep cycles include:
- Age – sleep becomes less deep & more disrupted as we get older
- Alcohol & caffeine
- Medications
- Environment (physical & emotional)
- Sleep disorders
- Changing work shifts & time cues
NIGHT SHIFT

The human body never adjusts to the night shift
FATIGUE

Decision-makers are more prone to the effects of fatigue than those doing hard physical work.
FATIGUE ACCUMULATES

Accumulated (chronic) fatigue leads to reduced alertness, increased accidents & decreased productivity
EMERGENCY RESPONSE

• In an emergency, the effects of fatigue become critical & may result in:
  – Spatial disorientation
  – Loss of vigilance
  – Workload monitoring
EFFECTS OF FATIGUE

• Impaired concentration
• Poor judgment & decision-making
• Forgetfulness
• Difficulty communicating
• Increased moodiness & aggressive behavior
EFFECTS OF FATIGUE

• Slowed reaction & response times
• Complacency
• Errors (missed radio calls, sloppiness, mis-understanding of orders)
• About to nod off
• Micro-sleep
FITNESS

• *Does fitness influence fatigue?*

Yes – fit workers accomplish more work with less fatigue.

Note: Regular, moderate physical activity enhances the ability to fall asleep.
ENERGY

• *Do nutrition & hydration influence fatigue?*

  Yes - fatigue is reduced & more work is done when energy needs are met.
SHIFT LENGTH

• *Does shift length influence fatigue?*

  Yes – fatigue accumulates & immune function declines during long shifts.
Do rest & sleep influence fatigue?

Yes – adequate rest/sleep helps avoid chronic fatigue.
FATIGUE COUNTERMEASURES

• Improve your fitness & maintain regular physical activity
• Ensure appropriate rest before assignment or work shift
• Be sensible about nutrition – eat moderate portions, don’t skip meals & stay hydrated
INDIVIDUAL RESPONSIBILITIES

• The Drug & Alcohol Policy requires you to *report all prescription & over-the-counter medication* prior to usage.

• The Clinic will inform you of any restrictions regarding safety-sensitive duties when taking the medication.

• The Clinic cannot advise you on how to take your medication (that is the job of your prescribing doctor & pharmacist).
INDIVIDUAL RESPONSIBILITIES

• All diagnosed sleep disorders must be reported to the Clinic
• These include, but are not limited to:
  • Insomnia
  • Sleep Apnea
  • Restless Leg-Syndrome
  • Sleepwalking
  • Bruxism
  • Narcolepsy

If you suspect that you may have a sleep disorder, see your doctor
NOTIFICATION PROCEDURES

• The MBTA Clinic provides 24-hour service starting at 6 a.m. on Monday through 10 p.m. on Friday & can be reached at (617) 222-5858

• All other times are covered by an on-call system
REMEMBER:

• Sleep disorders are treatable – many people who’ve been diagnosed with these conditions still report to work & are able to function normally

• If you have any concerns, see your doctor
CONCLUSIONS

• Fatigue affects everyone
• Fatigue affects individuals differently
• Vigilance declines – we don’t hear, see, think or focus as well, & reactions are slowed
• Know your limits
SUMMARY

• Causes of Fatigue
• Effects of Fatigue
• Fatigue Countermeasures
• Individual Responsibilities
• Notification Procedures
• Questions????
WORK ALERT

BE YOUR BEST
GET ENOUGH REST

It’s your responsibility