TRI-STATE OVERSIGHT COMMITTEE

and

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

JOINT FATIGUE MANAGEMENT STUDY OF THE WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

FINAL REPORT

NOVEMBER 11, 2011

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Executive Summary

Credible research has concluded that sleep deprivation and/or fatigue have a harmful effect on the safety of transportation systems. As a result of Washington Metropolitan Area Transit Authority (WMATA) incidents related to fatigue and discussions with the authority's Board of Directors, the Tri-State Oversight Committee (TOC) and the WMATA Safety Department have undertaken a joint study of current WMATA policy and practice relative to managing employee fatigue in the Metrorail system. TOC and WMATA spent approximately four months conducting interviews of front-line personnel and managers, analyzing volumes of data on employee hours worked in several safety-critical departments, and evaluating WMATA's current fatigue management programs.

This cooperative study is an extensive fact-finding mission and not an attempt to conclude that specific WMATA practices are "wrong" or to single out certain job categories. The intent is to represent the honest attitudes, thoughts, and practices of employees, to describe the assessment of current fatigue-related programs, and to present the analysis of hours worked data. WMATA will take the next steps in deciding what actions must be taken to improve safety, and TOC will work with WMATA to shape and/or approve these plans, as appropriate.

Following is a general summary of the findings of fact contained in this report:

Overall Operating Environment

- There were 318 vacancies or open positions within departments evaluated as of this study.
- WMATA is experiencing a demanding operational tempo of infrastructure renewal and capital projects, including high priority projects stemming from NTSB recommendations.
- WMATA managers report a lack of qualified applicants for technical positions, such as ATC mechanics.
- WMATA has limited financial resources to expand its workforce.
- There are limited time windows available for track access

Hours of Service and Scheduling

- The current Collective Bargaining Agreement (CBA Section 215) creates a *de facto* 16-hour daily limit for Metrorail employees.
- Statistical analysis shows that instances of employees working more than 16 hours are rare, but do occur.
- There are no current limits on the number of consecutive days an employee may work.
- Overtime practices vary by department, and are informal.
- Some overtime assignments can add significant time to employee commutes.
- Interviews with employees, managers, and supervisors indicated widespread belief that these rules and practices did not adequately control fatigue.
- Shift assignments/hours are not reviewed for fatigue potential.
- The CBA provides incentive for employees to work overtime during the highest-earning years of employment, in order to maximize retirement benefits.
- Employees who sign the overtime board have little flexibility in the assignments they receive, and are required to work "any and all" shifts assigned.
- Employees will try to "pull the weight" for a fatigued co-worker, and many see a choice between personal responsibilities and financial incentives.
- Some supervisors try to accommodate fatigued employees (such as encouraging them to skip an overtime shift, or ignoring a brief nap) but fear accusations of favoritism or special treatment.

Secondary Employment

- Rule 1.63 states, "*Employees shall not engage in outside employment, instructional courses or other activities that are competitive with, interfere with or adversely affect the performance of duties, or deprive the employee of having at least eight (8) consecutive hours off in every 24 consecutive hour period."*
- Managers and supervisors regard this rule as vague and unenforceable in its present form, as employees are responsible for making a determination as to the potential conflicts described in the rule.

Medical Review & Fitness for Duty

- The WMATA Medical Department conducts Certifying Medical Exams (CMEs) for Train Operators, including screening for sleep disorders.
- The CME process is comparable to the Commercial Driver's License (CDL) process for Bus Operators.
- CMEs can result in referrals for medical sleep evaluations, but WMATA's existing medical contractors are often backlogged.
- CMEs are not required of other safety-sensitive employees aside from Train Operators.

Fatigue Recognition and Training

- The review team's assessment of the current fatigue awareness training (computer-based training) was positive.
- Employees who had taken the training gave mostly positive feedback.
- Many safety-critical groups were not aware of the training, nor that it was reportedly mandatory.
- Supervisors have the authority to send employees for medical exams based on "observed behavior and performance" but no formal WMATA training program on fatigue recognition existed at the time of the study.

This report discusses and displays more specific information and statistics for each of the departments based on interviews, data analysis, and other methods. As part of this study, WMATA is in the process of developing a separate plan to address the issues identified herein. TOC will review and approve as appropriate WMATA's proposed action plans through the Corrective Action Plan (CAP) process.

1) Introduction

Sleep deprivation, fatigue and general questions of employee fitness for duty have been a challenge for the rail transportation industry since its inception. In 1907, Congress passed the Hours of Service Act, forbidding railroad engineers from working more than 16 hours per day. In 1969, that limit was lowered to 14 hours per day, and in 1972, to 12 hours per day. Today, detailed federal regulations outline time-on-duty requirements and restrictions for safety-critical positions like signal maintainers and train crews. Similar federal regulations guide hours of service for safety-critical employees in commercial aviation, over-the-road trucking and the maritime industry.

However, no comparable government regulations exist in America's rail transit systems. The federal government has limited authority to oversee their safety and security, since the Federal Transit Administration (FTA) is not a regulatory agency, but rather a funding agency. Therefore, primary responsibility for such oversight is delegated to the states. While a handful of states such as California, have strong state regulatory authority, rail transit is by and large a self-regulated industry. Industry standards, such as those promulgated by the American Public Transportation Association (APTA), for the most part are consensus-based and voluntary.

Studies and research conducted or commissioned by the U.S. Departments of Defense and Transportation, the National Transportation Safety Board (NTSB), industry groups and academia have all reached the conclusion that sleep deprivation and/or fatigue have a significant deleterious effect on the safety of complex transportation systems. In addition to the decrease in safety, fatigued employees have been shown to operate equipment less effectively, increasing stress and damage to agency property.[1] Fatigue is the body's and mind's response to sleep loss, physical activity or mental activity. People who are fatigued report feeling tired, losing motivation and desiring rest. Fatigue is usually accompanied by changes in behavior, many of which degrade work performance. Decreases in vigilance or attention, impaired judgment and slow response times can all result from fatigue. Fatigue and decreased alertness have the potential to affect productivity, customer relations and employee morale, safety and general health.

A recent American Public Transportation Association (APTA) survey found that 20 percent (30 of 145) of responding transit agencies identified fatigue as a contributing factor to on-road accidents. Eight agencies (5 percent) identified fatigue as a factor in non-road accidents. The APTA survey also found that most transit agencies do not explicitly consider fatigue in their accident and injury investigation procedures. Thus, it is likely that fatigue related accidents and worker injuries are more common than these statistics indicate. As transit industry ridership continues to grow and service hours expand, operator fatigue has the potential for placing transit staff, customers and the general public at greater risk. Addressing the issue of operator fatigue in a preventive and proactive manner will help reduce potential consequences.

Researchers have found that a complex interaction of timing of sleep, work schedule, environment, nutrition and drug issues all affect human alertness. Any approach to mitigating operator fatigue must address this spectrum of relevant issues. With proper planning and forethought, human fatigue and the risks that it carries for the public transit industry can be minimized.

The Washington Metropolitan Area Transit Authority (WMATA) operates the nation's second-busiest rail transit system. In 2004, a non-revenue train at the Woodley Park station "rolled back" and collided with a parked passenger train, causing severe damage and a number of minor injuries to patrons. An NTSB investigation found that the operator of the striking train had likely fallen asleep at the controls due to a "micro sleep" event brought on by fatigue. NTSB subsequently recommended that transit agencies implement stronger hours-of-service rules to ensure safety-critical employees such as train operators had adequate opportunity for rest. In January 2009, APTA issued an industry standard on hours of service,

[1] TRANSIT COOPERATIVE RESEARCH PROGRAM-**TCRP REPORT 81**

specifying that train operators work no more than 14 consecutive on-duty hours with no fewer than 10 hours off between shifts. This standard goes into effect in January 2014 and does not apply to other safety-sensitive job classifications, including maintenance, inspection or control center personnel.

The Tri-state Oversight Committee (TOC) is a joint effort of the State of Maryland, Commonwealth of Virginia and District of Columbia governments, and provides safety and security oversight of WMATA's rail operations under 49 Code of Federal Regulations, Part 659. As part of an ongoing hazard management process, and in light both of incidents such as Woodley Park and discussions with the WMATA Board of Directors, TOC and the WMATA Safety Department have undertaken a joint study of current WMATA policy and practice relative to managing employee fatigue in the Metrorail system. This report constitutes the results of this fact finding effort.

2) Methodology

Beginning in June 2011, TOC and WMATA staff began their work by setting the parameters of this study. The intent was to create a comprehensive "snapshot in time" of the current state of fatigue management within the Metrorail system. Such a snapshot was intended to inform and advise senior policymakers, both at WMATA and at the TOC's component government agencies, in future decision-making related to hours-of-service and fatigue.

For the purposes of this study, the term "safety-critical" or "safety-sensitive" is defined by 49 Code of Federal Regulations, Part 655.4. This Federal Transit Administration (FTA) definition is used to determine which employees are, due to their significant role in the safe operation of a system, subject to random drug and alcohol testing. This includes, but is not limited to, employees who operate, maintain or dispatch revenue service vehicles or related support equipment.

The members of the study team came from WMATA's Office of Safety & Environmental Management (SAFE), the three TOC agencies (the Maryland Department of Transportation, Virginia Department of Rail & Public Transportation and District Department of Transportation) and from the TOC's technical consultant, Transportation Resource Associates, Inc. (TRA). The study team conducted three types of reviews: documentation analysis, structured interviews and general program evaluation.

a. Program Evaluation

The team looked at two specific fatigue management programs. The first was medical review and fitness for duty. The team looked at this area by meeting with representatives from WMATA's agency medical office and human resources division, as well as by reviewing documents provided by those groups. The second was employee fatigue awareness training. The study team assessed the content and presentation of WMATA's computer-based fatigue awareness training.

b. Structured Interviews

The TOC/WMATA fatigue management study team conducted interviews with many of the safety-critical Metrorail operations and maintenance departments. Specifically, the team met with:

- RTRA (rail transportation, train operators and controllers)
- CMNT (railcar maintenance)
- POWR (electrical power systems maintenance)
- ATC (automatic train control)
- ELES (elevator/escalator systems)
- TRST (track and structures maintenance.)

The study team structured the interview sessions similarly between departments. First, team members interviewed a given department's senior managers, typically at the level of general or assistant superintendents. Next, the team interviewed front-line supervisors or managers responsible for administering overtime programs or making work assignments. Finally, the team interviewed line employees. Interviewee identities have been kept confidential for the purposes of this review.

The study team developed and used a standardized interview questionnaire for each of these sessions (senior leadership, supervision and front-line workforce.) This set of questions, reviewed and approved both by WMATA and TOC personnel, helped to gather information in a consistent manner and ensured appropriate attention to key fatigue issues in every session. To see the questionnaires used in this study, please refer to Appendix A in this report.

c. Documentation Analysis

The study team analyzed a 28-day sample of hours worked for all employees from the Metrorail operations and maintenance departments listed above. The sample, from July 3-31st, represented four full work weeks at the agency. WMATA human resources staff removed all personally identifying information from the data, so only employee ID numbers were visible to the team. The extensive databases were narrowed to examine 10 categories of safety-sensitive employees in hourly positions. Care was taken to ensure that the full record of hours was included for each employee and not truncated by removing hours from employees who work two different job titles. The hours were also vetted to ensure time paid was not double-counted. The data for these job categories was then grouped together for positions with similar duties. The jobs are separated and referred to throughout this analysis as 10 job categories (refer to Section 4 of this report). Although these groups are not split evenly by total numbers of employees, they are representative of scheduling within different job functions.

This analysis portrays how much employees are working both in consolidated time periods (a day) as well as over an extended period of time (several weeks). The analysis includes a comparison of the amount of hours worked per week, a tabulation of the number of shifts worked in excess of standards, and the sum of total consecutive days worked.

TOC and WMATA staff worked together to develop this written report, and concur in its findings of fact. The main body of this report does not make specific or prescriptive recommendations, but simply sets forth information and observations uncovered as a result of this joint process. WMATA is in the process of developing an independent "road map," separate and apart from this joint study, designed to address the findings of fact contained herein.

3) Overall Findings of Fact

a. WMATA's rules governing maximum employee hours worked are established by the collective bargaining agreement. They are not codified by departmental policy, rule or procedure. Rather, each WMATA department has semi-autonomous authority to interpret the provisions of the collective bargaining agreement, which requires that employees be given no less than eight hours off between shifts; for practical purposes, this has generally been interpreted by WMATA departments as a daily 16-hour "cap" on total hours worked, both straight time and overtime. Some departments have established informal practices, such as limits on any more than 24 hours of overtime per employee, per work week. However, in the absence of formal rules or authority-wide tracking programs, these practices are difficult if not impossible to enforce, as demonstrated by employee hours-worked logs that showed shifts worked in excess of the "16-hour rule" in every department evaluated. No rules currently exist governing cumulative overtime, and employees are permitted to work consecutive 16-hour days without limitation. No department-wide systems or programs are in place to conduct analysis or data capture on employee hours worked or overtime usage.

b. WMATA's business practices and work rules create an incentive for employees to work significant amounts of overtime. Overtime in most Metrorail operating departments is obtained by signing up on a monthly overtime "board." Once the employee chooses to work overtime for the next month, he or she is obligated to work any and all shifts assigned by a supervisor. In some departments, declining a supervisor's directive to work an overtime shift can have an adverse affect on subsequent opportunities for overtime. While this is a workable system in some departments, others heavily rely on this resource, creating significant variation in shift times and reporting locations. Additionally, WMATA employee retirement compensation is determined by the retiree's highest-earning three work years, inclusive of overtime. These employees are older, and with their seniority they are afforded more opportunity for overtime.

c. WMATA has a computer-based fatigue awareness training program in place, and it is reportedly mandatory for all safety-sensitive employees within the rail operation. However, with the exception of train operators and rail transportation supervisors, most employees at the time of interviews were not aware that such a program existed, or that its completion was required of them. Employees who are required to make fitness-for-duty determinations (such as depot clerks and frontline supervisors) are trained in how to make reasonable suspicion determinations for drug and alcohol abuse. They are not given specific training in recognizing the signs and symptoms of fatigue, nor does a procedure exist for how to respond to such a situation.

d. Similar to the medical evaluations required of employees who hold Commercial Drivers' Licenses (CDLs,) WMATA has recently instituted a program of Certifying Medical Examinations (CMEs) for train operators. This medical examination, among other functions, serves to screen employees for sleep disorders that can contribute to fatigue, such as obstructive sleep apnea, and to monitor the condition of those who have already been diagnosed with such issues. Employee compliance with medical courses of treatment, such as usage of a continuous positive air pressure (CPAP) device, can be monitored. Those whose condition does not improve or who do not comply with their prescribed treatments can face medical disqualification. The CME program applies only to train operators, and is not required of safety-sensitive employees performing maintenance or dispatch functions. Supervisors are empowered to send an employee for medical evaluation based on observed behavior and performance, but not provided specific training in identifying fatigue-related conditions or problems. Both employees and supervisors

believe that additional training of, and engagement by, supervisors on safety issues would be beneficial.

e. WMATA employees are required to report secondary employment to their supervisors only if it conflicts directly with their primary job at the transit authority. WMATA defines a conflict as working for another company or organization which contracts to perform work for WMATA, or generally as a situation which could interfere with primary employment. No policy or agreement exists to govern secondary employment, and managers are not entitled to make inquiries on this topic. Interviewees stated that in some safety-sensitive areas, WMATA employees often work overtime in addition to second, unreported jobs. The updated Metrorail Safety Rules and Procedures Handbook, in Rule 1.63, notes, "Employees shall not engage in outside employment, instructional courses or other activities that are competitive with, interfere with or adversely affect the performance of duties, or deprive the employee of having at least eight (8) consecutive hours off in every 24 consecutive hour period." During interviews, supervisors pointed to the secondary employment policy as something that was good to have published but was essentially unenforceable and relied solely on the employee's judgment regarding whether or not their activities really conflicted.

f. A number of safety-critical departments have funded unfilled vacancies, as well as unfunded needs for additional personnel. This shortage of personnel forces an even heavier reliance on employee overtime, especially in light of resource-intensive capital infrastructure projects such as track and signal rehabilitation. While some employees felt that additional hours-of-service rules might have a safety benefit, WMATA personnel at all levels expressed concern that they might impact service and maintenance due to staff shortages.

4) Functional Area-Specific Findings of Fact

WMATA is a large-scale, complex rail transportation system with a number of different support organizations required for its safe and efficient operation. Any initiative to address employee fatigue must factor in the unique environments and needs of the individual departments to achieve maximum effectiveness. In the next section, this report presents findings of fact specific to individual departments. Included in this section are the numbers of funded positions which are, as of September 2011, vacant. It should be not be automatically inferred that the number of total budgeted positions (vacancies plus current employees) is either appropriate or inappropriate for the needs and mission of the department.

Departments reported a variety of and similar reasons for overtime worked. Loss of staff to retirements, injuries, vacation, and other vacancies are common and necessitate someone to fill in. Projects such as infrastructure renewal, which have a finite end, also require additional hours. Special events, such as those during Independence Day weekend during the time period for which data was analyzed for this study, usually result in overtime. Also, staff resources are routinely requested to participate and respond to various audits, studies and reviews by internal groups and external agencies, which further impacts staff availability for normal work assignments.

A. Automated Train Control (ATC)

WMATA's ATC group is responsible for monitoring, inspecting and maintaining the signal system that governs train movement, operations and communication. As of September 30, 2011, ATC had 212 employees with 30 vacancies.

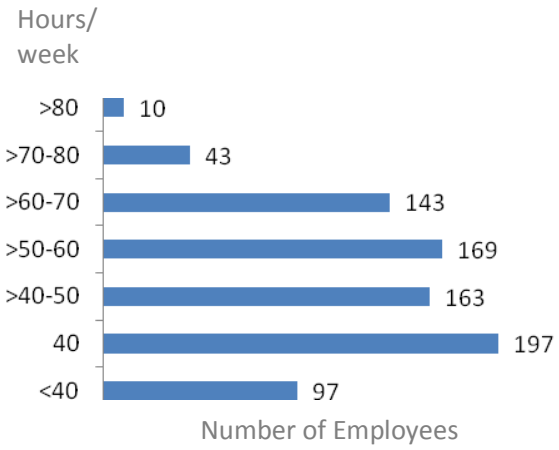
Overall, employees and managers within ATC expressed some of the highest degrees of concern about fatigue. They cited a regular maintenance function, as well as a capital infrastructure program, that was disproportionate to the available personnel resources. A supervisor stated, "This is something that keeps me awake at night." One employee, in addition to safety concerns, noted that he was "constantly fixing mistakes" made by his colleagues, and partially attributed poor work quality to fatigue.

ATC employees made reference to the personal strain of signing up for overtime, given how often it would be assigned. ATC management has instituted a system by which employees are limited to four "declines," or missed overtime shifts, per month. After four declines, an employee is removed from overtime consideration. Few employees reported secondary employment to the study team, and attributed it to the ready availability of overtime. Some interview subjects noted that managing fatigue was primarily a personal responsibility, for one's own safety. "You have to choose between your life and your money," one said.

Though many ATC staff were aware of, and had taken, the computer-based training (CBT) on fatigue, some did not feel it was realistic. A supervisor stated, "Taking a CBT is not addressing fatigue." A frontline employee noted, "I get eight hours off, and the CBT says I need to sleep for eight hours?" Another referred to it as "almost a throwaway," although others noted that it served as an important "reminder." In addition, managers found it difficult to find time for employees to take the training.

ATC staff is deployed across the system, and as such, often go through their workday without encountering a supervisor. This "face time" is considered valuable for making fitness-for-duty evaluations, and for determining fatigue. While all employees must have a shift safety briefing from their supervisors, within ATC, geographic separation often requires the briefing to occur via telephone.

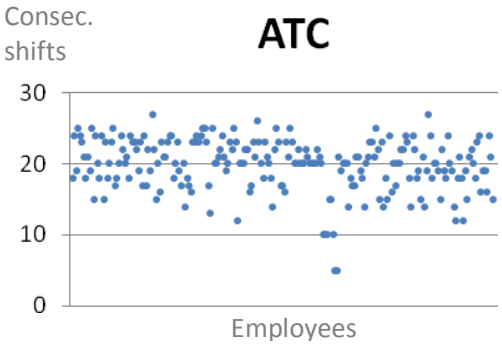
There is a stated practice of limiting overtime within ATC to 24 hours per work week. However, employees observed that this practice was not universally followed, a statement supported by the study team's review of hours-worked data. "I have to limit myself [on overtime]," said one ATC employee. "Nobody limits me." A manager noted that if ATC employees were in fact strictly limited to 24 hours of overtime per week, most major infrastructure projects would stop. The following graph shows that the limit of 24 hours of overtime per week is indeed not followed. At least 53 times in July, a safety-critical ATC employee worked more than 70 hours in a week.



Hours	Number of Shifts	Proportion of Shifts
>14	755	17.6%
>=16	592	13.8%
>16	26	0.6%
>20	3	0.1%

Unlike other departments, which assign their overtime based on reporting location (for example, a train operator assigned to the Brentwood division would most likely work overtime shifts from that site) ATC is a system wide function and assigns its overtime accordingly. An ATC technician could easily arrive at the Alexandria yard at 6:30am and be assigned a 2:30pm overtime shift in Greenbelt. ATC personnel pointed to disproportionate time spent commuting as a contributing factor to fatigue. Many employees lived far from their reporting locations, and one employee stated that he had fallen asleep during his commute home on more than one occasion.

The ATC employee group was also among the most likely to work a number of consecutive days that surpasses a typical 40-hour, 5-day work week.



Number of shifts (of 4,080)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	246	78	29	19
14+ hrs	135	30	11	4
16+ hrs	104	26	11	4

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	6.0%	2.0%	2.0%	2.0%
14+ hrs	2.0%	0.8%	0.3%	0.1%
16+ hrs	2.5%	0.7%	0.3%	0.1%

B. Power Department (POWR)

WMATA's POWR group inspects and maintains both high- and low-voltage electrical systems throughout the agency, including passenger and maintenance facilities, office sites and the rail system. As of September 30, 2011, POWR had 259 employees with 11 vacancies. POWR has an unwritten policy limiting overtime to 24 hours in one week, "violations" of which supervisors describe as "rare" and the efficacy of which employees described as good.

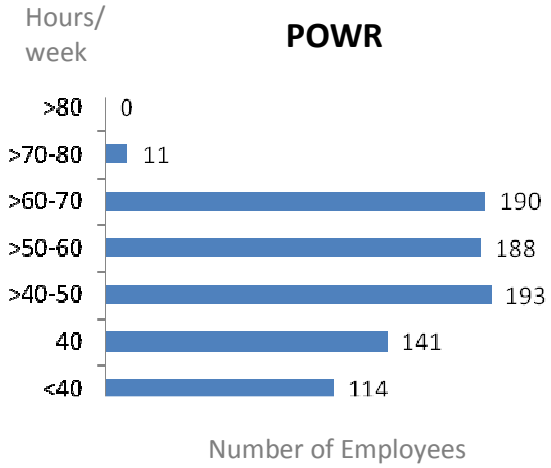
"It used to be a lot worse" before the implementation of the 24-hour limit, one stated, although one employee stated he would prefer fewer restrictions on overtime for financial reasons. Another felt additional rules would be helpful, noting his personal experience. "I worked more than 24 hours of overtime in a week once, and I knew I didn't want to do that anymore." One employee noted that it was their responsibility to look out for their co-workers' potential fatigue, and vice versa. "If your partner is fatigued, you got to pull that weight." The following graph shows that work weeks in excess of 64 hours do occur, but they are rare in comparison to the number of employees. The second chart shows the proportion of shifts per month that involve overtime.

POWR employees noted that additional restrictions on overtime, such as the proposed APTA standard, would severely impact the ability of crews to conduct work on the track. Since WMATA's rail operation shuts down for a limited time during the overnight hours, POWR staff felt that any additional impingement on the available manpower during that time would make their work even more difficult.

Supervisors expressed concerns about the safety implications of fatigue. One recalled a year in which 40 accidents involving POWR vehicles occurred, 26 of which were later determined to be preventable. "What I remember about that year was that overtime was through the roof," the supervisor noted, adding that he felt there was a correlation. Supervisors feel that secondary employment is likely common among employees, given their specific electrical skills, but it is rarely reported to management.

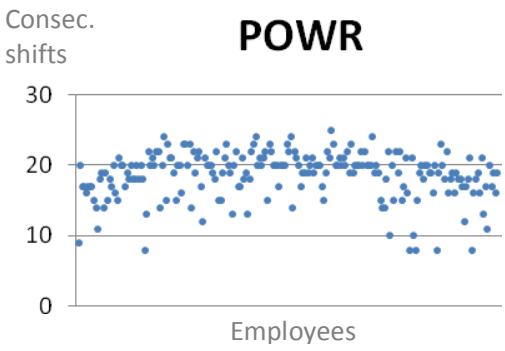
One supervisor stated that "overtime is good for short-term projects, but to use it as a normal way of doing business...sooner or later we'll connect the dots and have an incident." But another pointed to the larger picture of rehabilitating the transit system and the shortage of qualified personnel. "This issue is resource-driven. The railroad is deteriorating. It's like fighting a war." A manager agreed, saying that it took two years before a new employee "knows what *not* to do," and added in relation to additional hours of service rules, "Personally, I'm for [them], it's about the safety of the employee. But operationally, it's gonna cause havoc." Continuing medical examinations are not required for POWR personnel, and few were aware of the fatigue computer-based training.

Coinciding with employee statements characterizing it as "rare" to violate the 24-hours of overtime limit per week, the POWR group had some, but few instances that surpassed the limit in July. The number of hours worked per week topped out at 72 hours for each week in July, as opposed to 64 if the 24-hour rule were followed. However, the POWR group by far had the greatest number of instances of 14- to 16-hour shifts worked; about 26 percent of all shifts were 16 hours, according to the data WMATA supplied. This implies that POWR is distributing overtime frequently but perhaps to more employees, rather than assigning a small group of employees to work excessively long weeks.



Hours	Number of Shifts	Proportion of Shifts
>14	1109	27.6%
>=16	1076	26.8%
>16	34	0.8%
>20	5	0.1%

Consecutive days of work and overtime shifts are more rare in POWR than most other departments analyzed.



Number of shifts (of 3,800)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	362	95	11	3
14+ hrs	295	66	1	0
16+ hrs	275	61	0	0

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	9.5%	2.7%	0.3%	0.1%
14+ hrs	7.8%	1.8%	0.0%	0.0%
16+ hrs	7.2%	1.7%	0.0%	0.0%

C. Rail Transportation (RTRA)

WMATA's RTRA group includes a number of administrative functions, but is primarily constituted of train operators, station managers and frontline supervisors. As of August 25, 2011, there were approximately 500 train operators within RTRA and 70 vacancies.

RTRA supervisors compared fatigue management strategies at WMATA with those of FRA-regulated commuter rail operations such as MARC and Virginia Railway Express, noting that the heavy railroads contracted with hotels to allow crews on "swing shifts" (morning and evening rush hour shifts with a few hours off in between) to meet federal requirements for crew rest. According to them, secondary employment among train operators was "uncommon, but not unheard of."

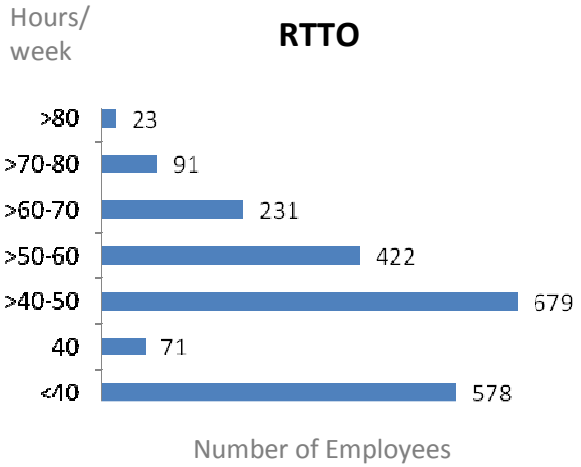
Supervisors and employees were generally positive about the effect of the computer-based training, although some felt that it would be more useful in a classroom environment. Most operators of whom they were aware had taken the training, and one supervisor stated that despite the shortfalls of the training module, "everybody learned something."

When asked to describe the potential result of implementing the APTA standard's limits on overtime, one supervisor stated "The railroad wouldn't run. [Supervisors] would be operating trains." Other filling in for vacancies or employees who are off, Train Operators receive overtime for training requirements, special events, and moving railcars in yards. Contractual requirements dictate that overtime is assigned based on job seniority.

One supervisor stated that while they were required to evaluate an employee's work schedule, "if they're not violating the 16-hour rule, we can't say anything." If an employee is scheduled for work in contradiction of the 8-hours off requirement, the Trapeze scheduling system will flag or alert the Depot Clerk so that hours will not be assigned. RTRA reports that management routinely reviews weekly Trapeze reports on 8-hour violations along with sixth and seventh day assignments for adherence and compliance with policy guidelines. Depot clerks are counseled and re-instructed for noncompliance findings.

Train operators generally tended to express satisfaction with current overtime rules, with one describing the APTA standard's 14-hour limit as "harsh" and "taking money out of people's pockets." Operators consistently characterized fatigue management as a personal obligation, including one who noted that the CME was helpful in reinforcing the consequences of ignoring that responsibility.

The data analysis showed that Train Operators were the least likely, of all job categories analyzed, to work a 16-hour day. An operator's daily pay time is typically 9 hours. Still, one in 22 shifts lasted more than 14 hours. There were some isolated instances of Train Operators working more than 80 hours a week; this includes one Train Operator who worked 95 hours during the last full week of July.



Hours	Number of shifts	Proportion of Shifts
>14	440	4.4%
>=16	48	0.5%
>16	25	0.2%
>20	0	0.0%

While WMATA policies forbid employees from sleeping, or giving the appearance of sleep while on duty or on agency property, some supervisors took a more lenient approach. "I'm not going to bother an operator about resting between shifts," despite the policy, said one. One supervisor was emphatic that designated "quiet rooms," in addition to the operator lounges, would be beneficial in combating fatigue by allowing operators to rest during their downtime between shifts. All of the RTRA divisions have an operator's lounge; during the operators' "swing time" they can rest in lounges until their platform times resume. All interviewed RTRA staff were familiar with and had taken the computer-based training.

Number of shifts (of 9,532)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	52.1%	36.2%	23.7%	13.4%
14+ hrs	1.0%	0.3%	0.1%	0.0%
16+ hrs	0.0%	0.0%	0.0%	0.0%

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	4970	3243	1993	1052
14+ hrs	93	26	6	0
16+ hrs	1	0	0	0

D. Rail Operations Control Center (ROCC)

WMATA's ROCC is responsible for dispatching and controlling the safe movement and operation of revenue and non-revenue vehicles on the rail system. While it is a subcomponent of RTRA, the duties of ROCC personnel are very different from front-line train operators and supervisors. Therefore the study team considered ROCC staff in a separate category. As of August 25th, 2011, there were 31 ROCC controllers within RTRA and 2 vacancies.

Controllers within ROCC are limited by their collective bargaining agreement to 12-hour shifts with a minimum of eight hours off. Supervisors remain in close contact with controllers and conduct "direct observation" of their performance, which in the opinion of ROCC management helps improve safety. "We're doing relatively okay in the control center" as it relates to fatigue, one manager stated. Additional restrictions beyond the 12-hour rule would necessitate hiring more controllers. Some employees noted the need for additional controllers. Controllers are only allowed to work 12 hours within a 24 hour period.

ROCC controllers work in teams of two, one with primary responsibility for communicating via the radio to trains on their line, and the other primarily responsible for managing computer functions. When necessary, one employee can temporarily manage both functions to allow their co-worker to take a break. ROCC staff stated that in the event they become visibly fatigued or drowsy, a supervisor may allow them to take a short break in a "quiet room" adjacent to the control center.

Controllers stated that regardless of overtime rules, fatigue was a consistent concern for them. One noted that managing it was a personal responsibility, and stated they began to avoid overnight shifts out of fear their reduced performance might contribute to an incident. Another stated that controllers could, and should, get up and move around if they felt their alertness was reduced. There is not any restriction on the length nor the number of breaks a controllers can take during the course of their work day.

WMATA recently moved the ROCC from the Jackson Graham Building to the Carmen Turner Facility in Landover, Maryland.

According to RTRA and ROCC management, all personnel within RTRA had taken the fatigue CBT with a handful of exceptions.

As of this report, data for ROCC employee hours worked was not included as part of the data analysis, however, joint review team may revisit ROCC employee hours worked as part of a future analysis.

E. Railcar Maintenance (CMNT)

WMATA's CMNT group conducts general service and inspection as well as heavy maintenance and overhaul of the rail agency's rolling stock. As of October 21, 2011 there were 997 CMNT employees with 36 vacancies.

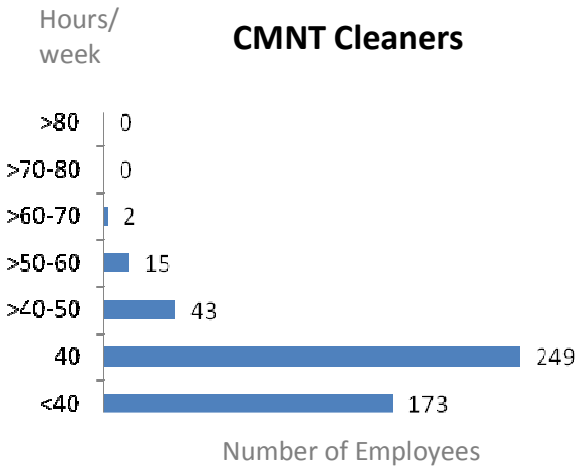
According to supervisors, CMNT's system of geographically-distributed service, maintenance and inspection shops allows them to get "eyes on" their employees more effectively than other departments, such as ATC, that are more dispersed. Additionally, the limitations of CMNT shops (only so many bays, only so much available equipment) creates an inherent "ceiling" on the amount of extra work that can be done via overtime.

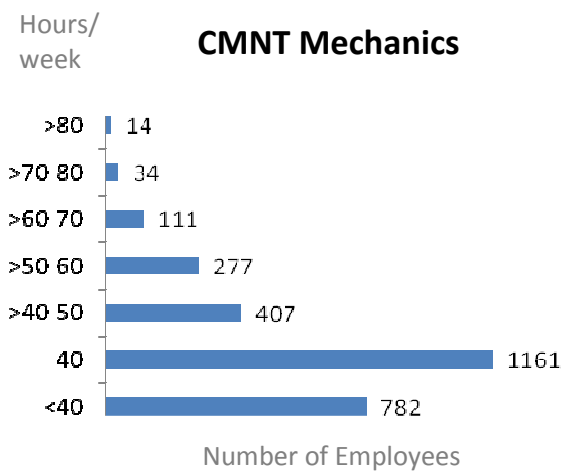
Supervisors state that they encourage their employees to take "skips" (declining an assigned overtime shift) if they seem to be tired, which carries no penalty within CMNT. A supervisor can, however, justify sending an employee for a medical evaluation based on observed behavior and performance, but this is reportedly rare. Such situations must be documented and investigated in accordance with written WMATA protocol and ATU Local 689 labor agreements. Managers felt that going to a higher standard for hours of service, such as the APTA Standard, was needed, and "would be disruptive, but not necessarily bad."

Supervisors within CMNT felt that secondary employment (especially for certain technician fields) was widespread and unreported, and expressed a desire for additional mechanisms to track, if not regulate, such activities. They generally spoke in support of additional hours-of-service rules. One said, "We really need something to govern this stuff," while another made mention of recent incidents and added, "unless [a policy] is mandated, this stuff is going to continue." Others cautioned about the effect on productivity; one said, "If you're going to be cautious on the side of safety, you're going to have work back up."

Generally, frontline employees felt that fatigue was not a significant issue within CMNT, but stated that additional restrictions on overtime would have minimal impact on them. Most stated that they tended to work only one or two overtime shifts per week. An employee felt that while no additional rules were necessary in his estimation, "12 on, 12 off would be the safest possible thing." One employee emphasized, "If I were General Manager, I'd train all frontline supervisors to recognize [fatigue.]" CMNT staff at all levels was not aware of the fatigue awareness CBT.

Employee statements that fatigue is not a concern are generally in concert with the data analysis for CMNT. The average hours for CMNT Car Cleaners are very similar to 40-hour, 5-day work weeks. CMNT Mechanics work a bit longer weeks, but the outliers for Mechanics are exceptional. It appears that while most employees are working within authority-wide recommended hours of service, a few employees retain a significant amount of overtime. In at least two instances, an employee worked 112 hours in one week, the equivalent of 16-hour shifts for seven days in a row.

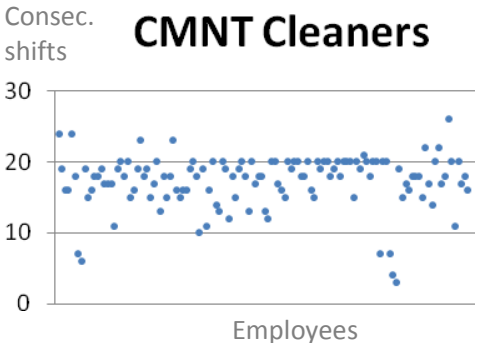


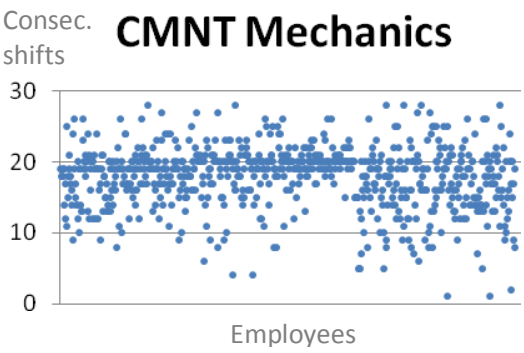


Hours	Number of shifts	Proportion of Shifts
>14	54	2.5%
>=16	39	1.8%
>16	0	0.0%
>20	0	0.0%

Hours	Number of Shifts	Proportion of Shifts
>14	661	4.9%
>=16	445	3.3%
>16	12	0.1%
>20	0	0.0%

It is notable that a significant number of CMNT Mechanics worked almost every day from July 3-30. However, of all departments analyzed, the CMNT groups exhibited the lowest share of consecutive shifts in excess of 8 hours.





CMNT Cleaners: Number of shifts (of 2,049)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	4	0	0	0
14+ hrs	4	0	0	0
16+ hrs	2	0	0	0

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	0.2%	0.0%	0.0%	0.0%
14+ hrs	0.2%	0.0%	0.0%	0.0%
16+ hrs	0.1%	0.0%	0.0%	0.0%

CMNT Mechanics: Number of shifts (of 12,624)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	371	141	59	37
14+ hrs	105	43	28	21
16+ hrs	69	28	20	16

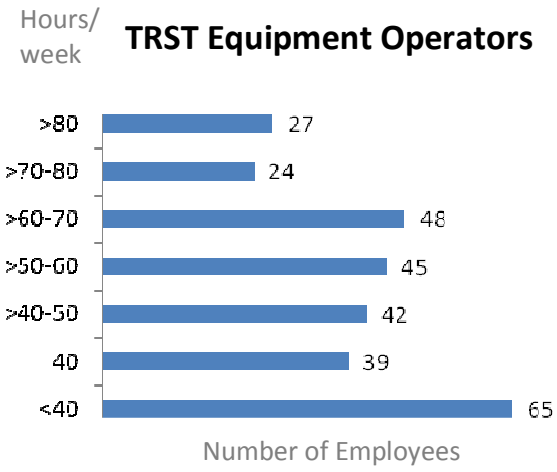
Proportion of shifts

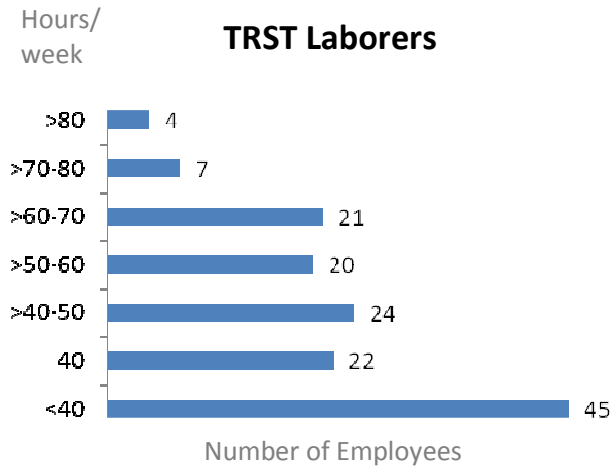
	2+ days	3+ days	4+ days	5+ days
>8 hrs	2.9%	1.2%	0.5%	0.4%
14+ hrs	0.8%	0.4%	0.3%	0.2%
16+ hrs	0.5%	0.2%	0.2%	0.2%

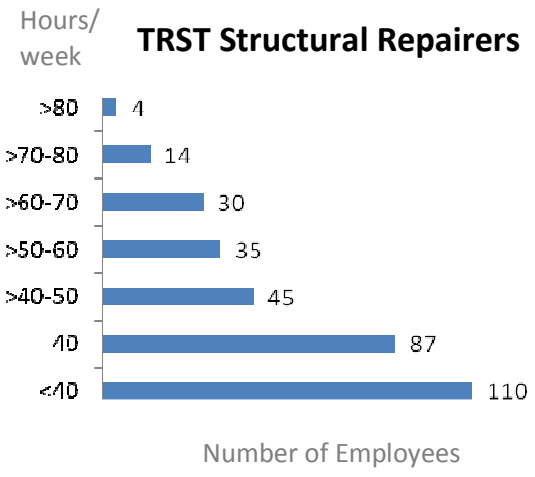
F. Track & Structures (TRST)

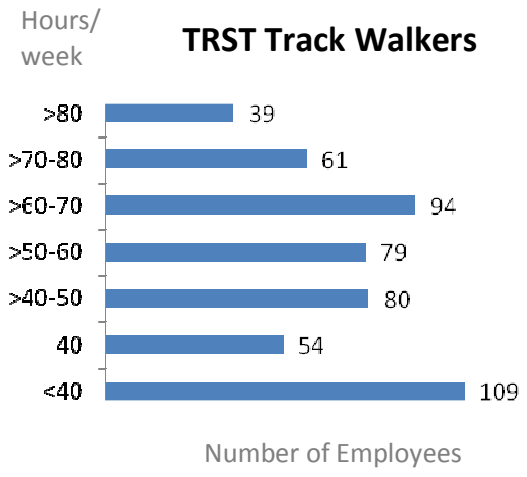
WMATA's TRST group inspects and maintains the agency's tracks, bridges, aerial structures and other rail infrastructure. As of September 30, 2011 there were 454 TRST employees with 46 vacancies.

TRST employees work significant amounts of overtime in support of major weekend "shutdowns," the heavy infrastructure projects which address multiple maintenance issues in specific areas of the rail system. Most managers and employees were supportive of the practice of 12-hour shifts for these shutdowns. Most managers felt that sleep-related fatigue was not a significant safety issue, since the significant majority of overtime was done in 12-hour shifts and 16-hour shifts were "atypical" and "unplanned." However, rules and regulations specifically governing these practices were not written; one supervisor mentioned that he thought there was a 14-hour cap on overtime; while another felt it was 16. "People say eight hours off is a rule," noted one manager, "but no one's sure." The following graphs and tables illustrate how many hours total per week and per day different TRST groups worked in July.









TRST Equipment Operators

Hours	Number of Shifts	Proportion of Shifts
>14	245	16.6%
>=16	233	15.8%
>16	29	2.0%
>20	3	0.2%

TRST Laborers

Hours	Number of shifts	Proportion of Shifts
>14	65	9.3%
>=16	63	9.0%
>16	10	1.4%
>20	1	0.1%

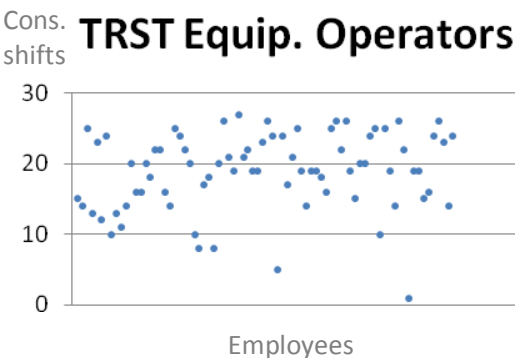
TRST Structural Repairers

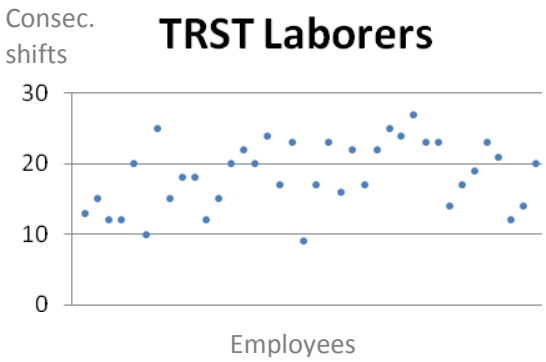
Hours	Number of Shifts	Proportion of Shifts
>14	118	8.0%
>=16	99	6.7%
>16	1	0.1%
>20	0	0.0%

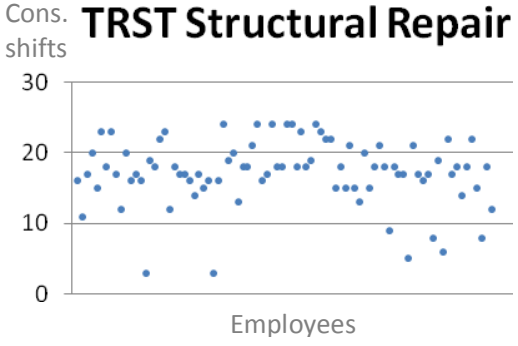
TRST Track Walkers/Repair

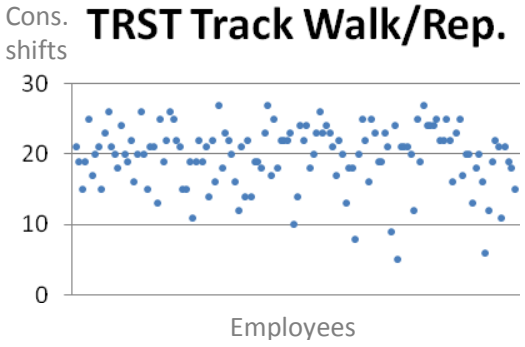
Hours	Number of shifts	Proportion of Shifts
>14	388	14.5%
>=16	337	12.6%
>16	43	1.6%
>20	13	0.5%

TRST Track Walkers and Equipment Operators, among all job categories analyzed, along with POWR had the highest proportion of back-to-back 14- and 16-hour shifts. Both of those TRST groups also had the highest percentage of 5 or more consecutive days of 14- and 16-hour shifts, albeit a small fraction. Both groups had the highest average number of hours worked in a week, reaching 58.6 during week three of the analysis. TRST Laborers and Structural Repairers tended to work noticeably less overtime.









TRST Equip. Ops.: Number of shifts (of 1,395)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	341	188	99	53
14+ hrs	118	59	26	11
16+ hrs	85	34	12	0

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	24.4%	14.3%	8.0%	4.6%
14+ hrs	8.5%	4.5%	2.1%	0.9%
16+ hrs	6.1%	2.6%	1.0%	0.0%

TRST Laborers: Number of shifts (of 661)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	105	48	21	12
14+ hrs	18	4	0	0
16+ hrs	11	3	0	0

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	15.9%	7.7%	3.6%	2.2%
14+ hrs	2.7%	0.6%	0.0%	0.0%
16+ hrs	1.7%	0.0%	0.0%	0.0%

TRST Str. Repair: Number of shifts (of 1,391)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	298	174	99	45
14+ hrs	53	4	0	0
16+ hrs	37	3	0	0

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	21.4%	13.3%	8.1%	4.0%
14+ hrs	3.8%	0.3%	0.0%	0.0%
16+ hrs	2.7%	0.2%	0.0%	0.0%

TRST Track: Number of shifts (of 2,544)

	2+ days	3+ days	4+ days	5+ days
>8 hrs	610	328	171	84
14+ hrs	160	76	32	13
16+ hrs	131	63	26	10

Proportion of shifts

	2+ days	3+ days	4+ days	5+ days
>8 hrs	24.0%	13.6%	8.0%	3.9%
14+ hrs	6.3%	3.2%	1.5%	0.6%
16+ hrs	5.1%	2.6%	1.1%	0.5%

Supervisors and managers feel that major projects ("the big shutdowns") would not be seriously affected by overtime limitations, as restricting overtime below 12 hours was considered unlikely. However, a manager noted the cumulative fatigue effects of constant overtime and added, "My guys have worked the last 22 weekends in a row." TRST personnel also noted that any additional overtime rules could have a negative effect on their ability to access the track during off-peak or out-of-service hours. Since the WMATA system has a limited overnight shutdown window, TRST staff felt that any reduction in available staff could further hinder system maintenance or inspection functions.

TRST supervisors also noted that they can send employees for medical evaluation based on "observed behavior and performance" but do not receive specific training on that. One related his experience with an employee who would fall asleep almost immediately upon sitting down, and was found after a medical exam to have obstructive sleep apnea. One manager identified the limitations of the agency's ability to affect the problem, saying "We see it with the minor incidents, the slip and falls, but when they punch out at 6:00, I can't force them to rest."

G. Elevator/Escalator Maintenance (ELES)

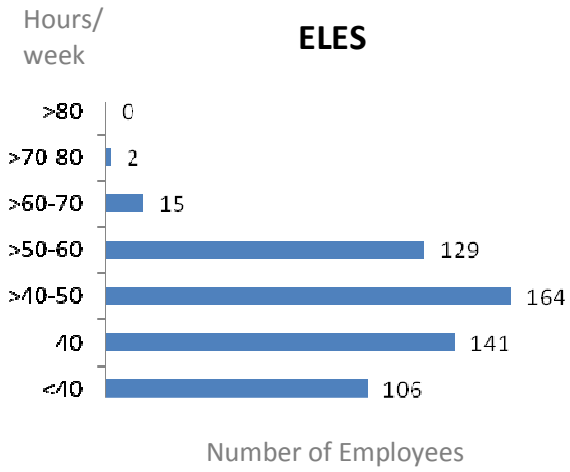
WMATA's ELES group inspects and maintains the agency's elevators, escalators and related equipment. As of September 30, 2011, there were 209 total employees with 17 vacancies. Neither 49 CFR Part 655 nor WMATA have classified any ELES employees as safety-sensitive, but negotiations are underway to begin conducting associated substance abuse testing.

According to the ELES managers interviewed, employees generally do not work more than 12 hours straight. Pieces of overtime work are typically 4 to 5 hours in duration, while regular shifts vary somewhat – pieces of work may be 4-5 hours, or 8 hours long during weekend shutdowns. By their estimation, most of the mechanics work about 48 to 50 hours a week. ELES is somewhat unusual in that, although they use an "overtime list" similar to that used by other departments, virtually none of the employees choose to sign the overtime list. "They would rather their overtime be voluntary," said one manager, and as long as virtually none of them were on the overtime list, each employee would be offered overtime in order of seniority.

The managers interviewed seemed to be vaguely aware of WMATA fatigue management efforts, but were not aware of the current CBT; neither were supervisors or front-line employees aware of the CBT. Though the managers stated that they had not observed employees exhibiting signs of fatigue, and that they're "not sure whether it's a problem," as one said, fatigue is not something that they have looked at specifically among their employees.

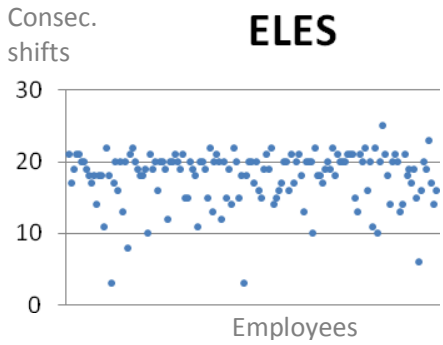
The Supervisors interviewed concurred with the managers as to why hardly any front-line employees sign the overtime list – it's because if they do sign up, "they can't decline." They felt strongly that any overtime assigned should be voluntary rather than mandatory, and one even suggested that employees could work four 10-hour days to increase the number of days off. However, they admitted that ELES mechanics don't work that much overtime, and that "not much overtime is needed in order to make six figures."

According to the Supervisors, a significant number of ELES employees have side jobs. Additionally, though the Supervisors couldn't easily recall observing fatigue in their employees, they were concerned about "forcing employees to injure themselves," as one put it, by assigning too few mechanics to a shift where heavy objects needed to be lifted and moved, such as floor plates. The mechanics interviewed felt most strongly about this aspect of the job – that is, too few mechanics assigned to a particular location. Mechanics have heavy tool boxes, carry around barricades, jump in and out of pits, and perform other tasks that can become exhausting, and could be less so if there were another employee to help out. ELES front-line employees are generally only scheduled to work no more than 12-hour shifts, unless there are unforeseen system emergencies. Front-line employees pointed out that some of them do in fact work 16 hours straight, and that such long hours, combined with the physical demands of the work, can leave employees exhausted.



Hours	Number of shifts	Proportion of Shifts
>14	46	1.7%
>=16	30	1.1%
>16	8	0.3%
>20	1	0.0%

Although consecutive days of overtime is a way of life in ELES, the department appears to cap overtime at a much lower number of hours per day if overtime is being worked on consecutive days, as shown in the following tables.



Number of shifts (of 9,532)

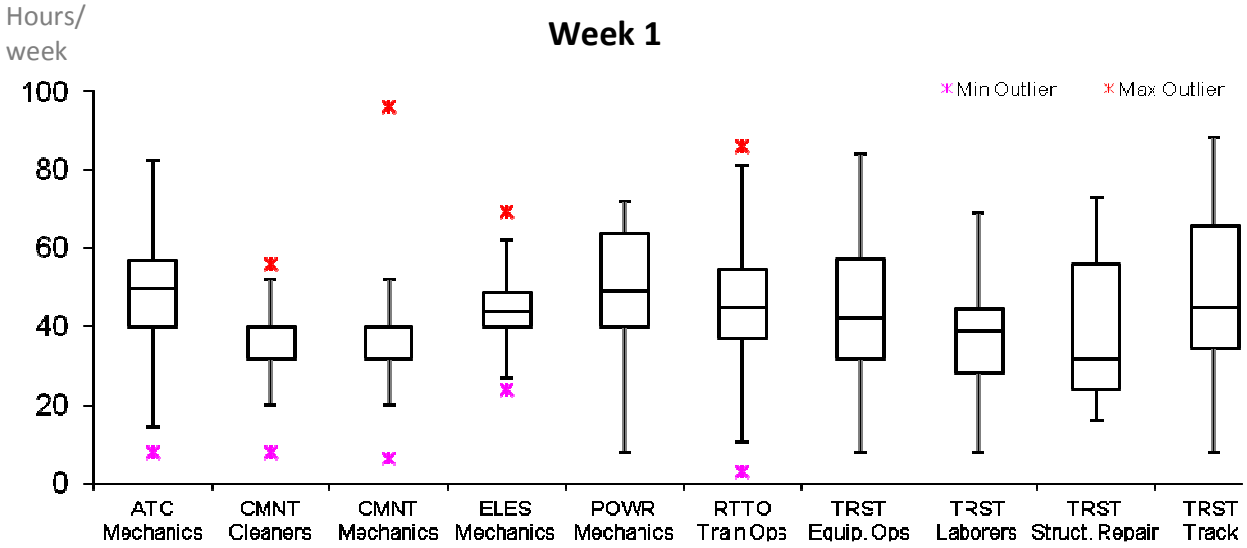
	2+ days	3+ days	4+ days	5+ days
>8 hrs	396	208	96	28
14+ hrs	8	0	0	0
16+ hrs	4	0	0	0

Proportion of shifts

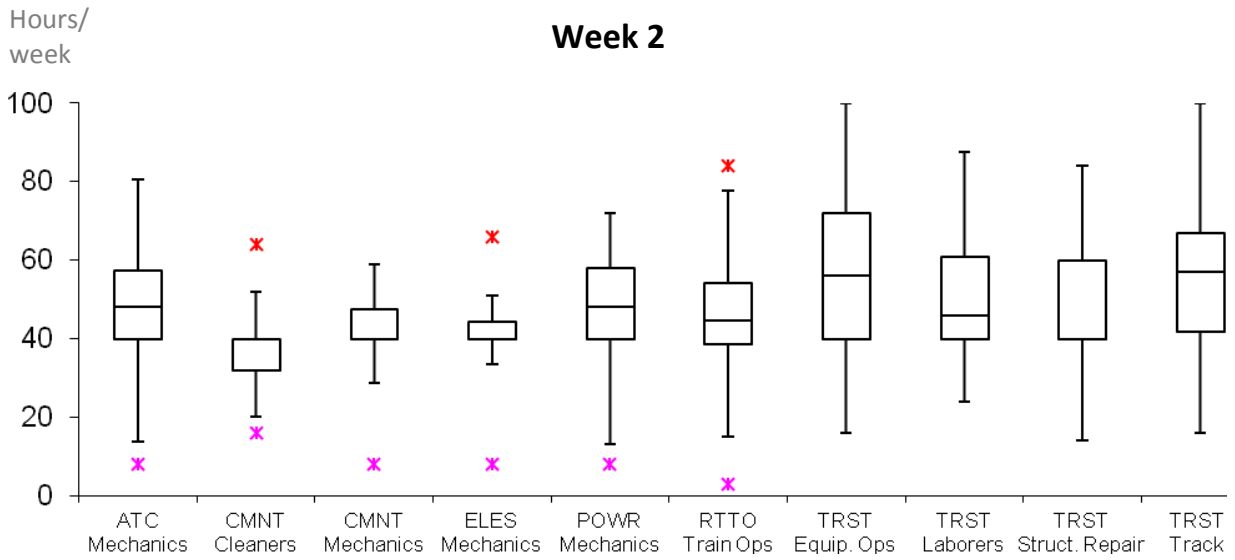
	2+ days	3+ days	4+ days	5+ days
>8 hrs	15.6%	8.7%	4.3%	1.3%
14+ hrs	0.3%	0.0%	0.0%	0.0%
16+ hrs	0.2%	0.0%	0.0%	0.0%

H. Comparison of Hours Worked per Week

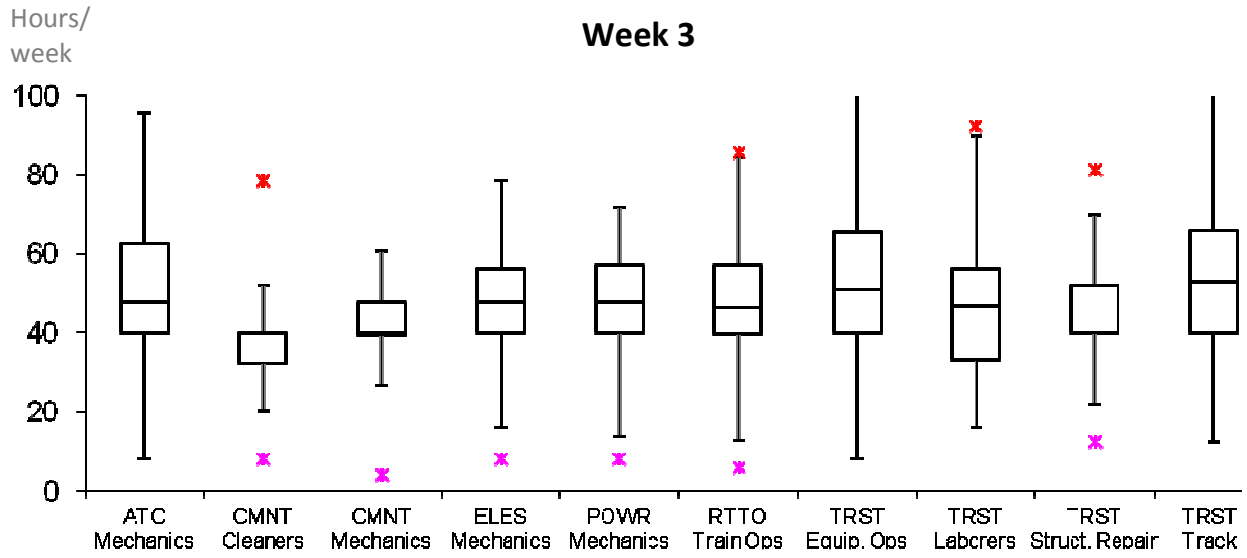
The proportion of hours worked per department varies widely. It appears that extremely high occurrences of overtime are routine and the "typical" work week is rare in some departments, such as TRST categories, where employees often endure long work weeks. Other departments such as CMNT and ELES employ more traditional scheduling. The box plots on the following pages depict a comparison of all 10 job categories for each of the four weeks. The distribution shows where the most common number of total hours occur, the median, and the minimum and maximum hours worked per week (outliers) within each group. Note that in a few rare instances, work hours exceed 100 per week.



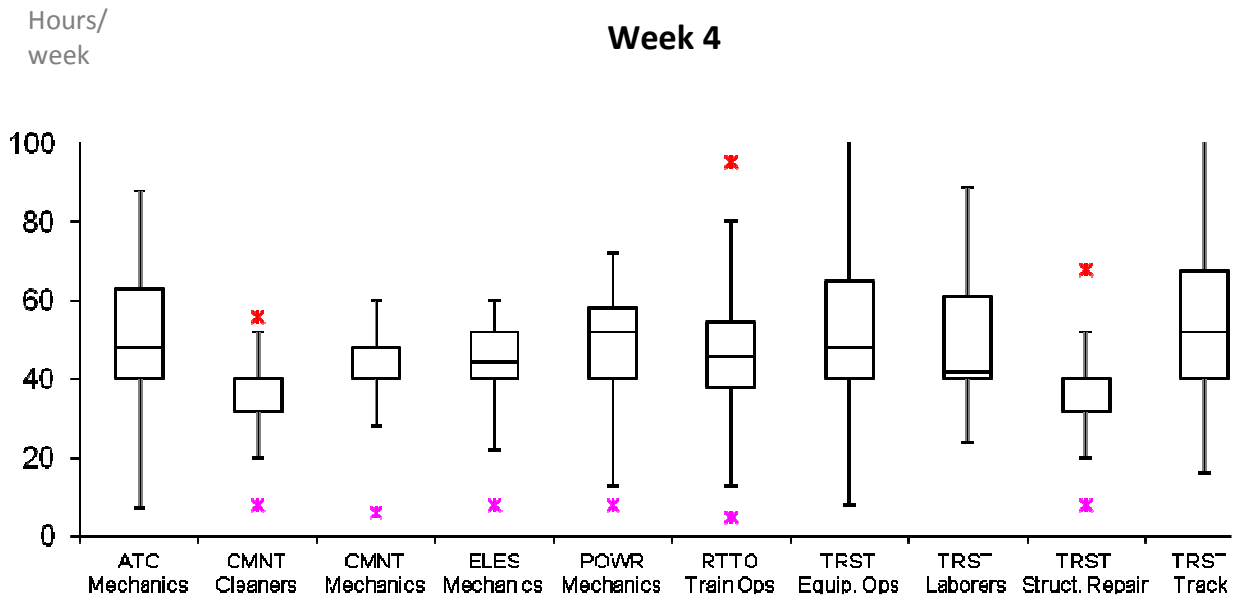
	ATC	CMNT Cleaners	CMNT Mechanic	ELES Mechanic	POWR Mechanic	RTTO Train Ops	TRST Equip. Ops	TRST Laborers	TRST Struct. Repair	TRST Track
Min	8.0	8.0	6.3	24.0	8.0	2.8	8.0	8.0	16.0	8.0
Q_1	40.0	32.0	32.0	40.0	40.0	37.1	32.0	28.0	24.0	34.5
Median	49.8	40.0	40.0	44.0	49.0	44.9	42.5	39.0	32.0	45.0
Q_3	57.1	40.0	40.0	48.9	63.8	54.7	57.3	44.8	56.0	66.0
Max	82.5	56.0	96.0	69.5	72.0	85.8	84.0	69.0	73.0	88.0
Mean	49.6	37.6	37.9	44.5	50.4	44.8	44.8	38.3	39.3	48.8



	ATC	CMNT Cleaners	CMNT Mechanic	ELES Mechanic	POWR Mechanic	RTTO Train Ops	TRST Equip. Ops	TRST Laborers	TRST Struct. Repair	TRST Track
Min	8.0	16.0	8.0	8.0	8.0	2.9	16.0	24.0	14.0	16.0
Q_1	40.0	32.0	40.0	40.0	40.0	38.6	40.0	40.0	40.0	41.8
Median	48.0	40.0	40.0	40.0	48.0	44.8	56.0	46.0	40.0	57.0
Q_3	57.5	40.0	47.5	44.4	58.0	54.2	72.0	61.0	60.0	66.9
Max	80.5	64.0	112.0	66.0	72.0	84.1	100.0	87.5	84.0	100.0
Mean	48.9	36.5	41.3	41.4	48.6	45.4	58.6	49.0	46.8	55.8



	ATC	CMNT Cleaners	CMNT Mechanic	ELES Mechanic	POWR Mechanic	RTTO Train Ops	TRST Equip. Ops	TRST Laborers	TRST Struct. Repair	TRST Track
Min	8.0	8.0	4.0	8.0	8.0	6.0	8.0	16.0	12.5	12.5
Q_1	40.0	32.0	39.5	40.0	40.0	39.6	40.0	33.5	40.0	40.0
Median	48.0	40.0	40.0	48.0	48.0	46.8	51.0	47.0	40.0	53.0
Q_3	62.6	40.0	48.0	56.0	57.5	57.5	65.8	56.0	52.0	66.0
Max	96.0	78.5	102.0	78.5	72.0	85.9	100.5	92.5	81.5	110.0
Mean	50.3	37.7	41.4	45.2	48.9	47.1	51.4	48.2	44.2	54.0



	ATC	CMNT Cleaners	CMNT Mechanic	ELES Mechanic	POWR Mechanic	RTTO Train Ops	TRST Equip. Ops	TRST Laborers	TRST Struct. Repair	TRST Track
Min	7.5	8.0	6.0	8.0	8.0	5.0	8.0	24.0	8.0	16.0
Q_1	40.0	32.0	40.0	40.0	40.0	38.0	40.0	40.0	32.0	40.0
Median	48.0	40.0	40.0	44.5	52.0	45.9	48.2	42.0	40.0	52.0
Q_3	63.0	40.0	48.0	52.0	58.1	54.8	65.0	61.0	40.0	67.7
Max	88.0	56.0	112.0	60.0	72.0	95.2	106.0	89.0	68.0	114.0
Mean	50.4	35.9	42.7	44.1	49.8	46.0	52.6	49.0	37.5	54.4

I. Medical Certification / Review

WMATA's agency medical office manages the certifying medical examinations (CMEs) for train operators, as well as the agency's drug and alcohol testing programs. The CMEs have been in place since a 2009 Green Line collision on the Massachusetts Bay Transportation Authority's rail system near Boston identified the need for better medical screening of rail operators.

WMATA employees are supposed to report prescription medications or diagnosed sleep disorders, but no consequences currently exist for those who fail to do so. The human resources department is reportedly developing a policy to address this. CMEs have reportedly identified a number operators suffering from sleep disorders, not limited to sleep apnea but also including problems such as insomnia and narcolepsy. The disqualification of employees based on medical problems has reportedly been contentious.

Medical staff noted that many fatigue issues often stemmed from overtime reliance based on personal financial problems, and had sponsored a financial planning seminar in 2009 through the Employee Assistance Program. Participation was reportedly limited, but the program is being revised and integrated into an employee wellness program.

5) General Conclusions

Per the parameters of this study, this concludes the factual portion of the Joint TOC/WMATA Fatigue Management Study. WMATA is in the process of putting together a plan to respond to the findings of fact contained herein. As appropriate, TOC will review and approve as appropriate WMATA's proposed action plans through the Corrective Action Plan (CAP) process.

6) Acknowledgements

The TOC, WMATA and TRA staff who contributed to this report through data analysis, interviews and report preparation would like to thank the WMATA senior management, supervisors, front-line employees and administrative personnel who participated in its development. This report represents the result of dozens of hours of interviews, hundreds of pages of records and many discussions, revisions and rewrites. The study team appreciates the candor, hard work and commitment to a safer system exhibited by the Metrorail employees and managers who were involved in this project.

Appendix A: TOC/WMATA Joint Fatigue Management Study Guided Questionnaires for Managers, Supervisors/Dispatchers, and Front Line Employees

TOC/WMATA Joint Fatigue Management Study	WMATA MANAGERS
Guided Questionnaire for WMATA Managers	**WMATA Department:**
Date:	**Personnel Interviewed:**
TOC/WMATA Reviewer(s):	
Question	**Reviewer Notes/Comments**
1) What is your current job title and how long have you held that position? What positions have you held with WMATA previously?	
2) Briefly describe your job responsibilities.	
3) Does your department have a policy or procedure regarding the maximum number of consecutive hours an employee may work? Is the policy written or unwritten?	
4) Does your department have a policy or procedure regarding the minimum number of off-duty hours for front-line employees between shifts? Is the policy written or unwritten?	
5) Do you require staff in your department responsible for assigning work to track employee hours on duty and time off between shifts? If so, how is this done?	
6) Do you require employees in your department to receive training in fatigue management? If so, which ones?	
7) Are you aware of front line employees in your department who have exhibited signs of fatigue or sleepiness on the job? If so, what do you believe is the cause?	
8) Do you believe that too many hours on duty, not enough rest between shifts, or both, may contribute to employee fatigue in your department?	
9) Do you believe that incidents of fatigue and/or sleepiness on the job among employees in your department is a safety hazard? If yes, why? If not, why not?	
10) Do you believe that WMATA management has adequately addressed employee fatigue? If yes, why? If not, why not?	
1) In your opinion, do you think that changing rules on employee overtime could help mitigate employee fatigue? Do you think that such rules would make assigning work harder?	

TOC/WMATA Joint Fatigue Management Study	DISPATCHERS/ASSIGNERS OF WORK
Guided Questionnaire for Dispatchers/Other Employees Responsible for Assigning Work	**WMATA Department:**
Date:	**Personnel Interviewed (Anonymous - Job Titles Only):**
TOC/WMATA Reviewer(s):	
Question	**Reviewer Notes/Comments**
1) What is your current job title and how long have you held that position? What positions have you held with WMATA previously?	
2) Briefly describe your job responsibilities.	
3) How do you assign work to front line employees in your department?	
4) Does your department have a policy or procedure regarding the maximum number of consecutive hours an employee may work? Is the policy written or unwritten?	
5) Does your department have a policy or procedure regarding the minimum number of off-duty hours for front-line employees between shifts? Is the policy written or unwritten?	
6) Are you required to track employee hours on duty and time off between shifts as part of your regular job duties? If yes, how is this done?	
7) As part of your responsibilities for assigning work, have you received training in fatigue management, or to notice signs of fatigue? If so, when?	
8) Have you observed front line employees in your department exhibit signs of fatigue due to too many hours on duty, not enough rest between shifts, or both?	
9) Do you believe that incidents of fatigue and/or sleepiness on the job among employees in your department is a safety hazard? If yes, why? If not, why not?	
10) Do you believe that WMATA management has adequately addressed employee fatigue? If yes, why? If not, why not?	
11) Have you ever felt pressure from your boss(es) to fill runs or assign work, even if it meant giving the work to an employee who may not be sufficiently rested? Your responses will remain anonymous.	
12) In your opinion, do you think that changing rules on employee overtime could help mitigate employee fatigue? Do you think that such rules would make assigning work harder?	

TOC/WMATA Joint Fatigue Management Study	FRONT LINE EMPLOYEES
Guided Questionnaire for Front Line Employees	**WMATA Department:**
Date:	**Personnel Interviewed (Anonymous - Job Titles Only):**
TOC/WMATA Reviewer(s):	
Question	**Reviewer Notes/Comments**
1) What is your current job title and how long have you held that position? What positions have you held with WMATA previously?	
2) Briefly describe your job responsibilities.	
3) How many hours do you work during an average week? During what shift?	
4) How long do you spend commuting to and from work during an average week?	
5) How many consecutive hours of sleep do you believe you usually receive between shifts?	
6) Do you have another job, in addition to working for WMATA? Your answers will remain anonymous.	
7) Do you have any family or other obligations (such as child care) that prohibits structured or consistent rest during your relief hours? Your answers will remain anonymous.	
8) What WMATA or departmental rules govern your schedule?	
9) Have you seen co-workers exhibiting signs of fatigue or sleepiness on the job?	
10) Did any of these incidents of fatigue or sleepiness create, in your opinion, a safety hazard or a potential for reduced job effectiveness? If so, what factors do you believe contributed to those incident(s)?	
11) Would you favor additional WMATA rules on overtime if they helped to ensure you an adequate opportunity for rest?	
12) Are you aware of co-workers or other employees who have side jobs during their time off? If so, has this ever affected their job performance?	
13) Are you aware of any WMATA resources available to help with fatigue or fatigue-related problems like sleep apnea?	
14) Do you have any suggestions for ways for WMATA to help minimize employee fatigue issues?	
15) The APTA Standard for Hours of Service (which applies only to Train Operators) calls for no more than 14 consecutive hours on duty, and no less than 10 hours off duty between shifts. Do you agree that having 10 hours off between shifts will help minimize employee fatigue? If yes, why? If not, why not?	