Written Statement of
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before
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Chairman Lautenberg, Ranking Member Smith, and other Members of the Subcommittee, I am very pleased to be here today, on behalf of Secretary of Transportation Peters, to discuss the reauthorization of the Federal Railroad Administration's (FRA) rail safety program. At your May 22 hearing, also on this subject, FRA's witness Associate Administrator for Safety Jo Strang included in her testimony an overview of FRA's day-to-day work to reduce the number and the severity of railroad accidents, a status report on the agency's implementation of our National Rail Safety Action Plan, a summary of our passenger safety rulemakings and other key safety initiatives, and an analysis of rail safety statistics. Today, for the sake of brevity, I will provide an update of these safety statistics (at Appendix A) and, otherwise, focus on rail safety legislation alone.

In February of this year, the Administration submitted its rail safety reauthorization bill, the Federal Railroad Safety Accountability and Improvement Act, to the Congress. The bill has been introduced, by request, in both the House and the Senate. I want to thank you again, Chairman Lautenberg, for introducing the Administration bill, by request, for yourself and Senator Smith. The Administration bill has been designated as H.R. 1516 and S. 918, respectively. In addition to proposing to reauthorize FRA's vital safety mission, this bill calls for important—and in some cases historic—substantive changes in the rail safety laws that we expect will materially improve safety. I look forward to working with you to help secure their enactment.

The U.S. Department of Transportation (DOT) has also provided a views letter on H.R. 2095 as introduced by Chairman Oberstar and Chairwoman Brown. DOT also plans to provide its comments on major rail safety reauthorization legislation introduced in the Senate.

THE ADMINISTRATION'S RAIL SAFETY BILL (H.R. 1516, S. 918)

The Administration's rail safety reauthorization bill would reauthorize appropriations for FRA to carry out its rail safety mission for four years. FRA has made a full copy of the proposal available on our Web site at http:// www. fra.dot.gov/us/ content/48, including the supporting analysis for each section. Let me take this opportunity to discuss the major provisions of the Administration bill and how we believe they will further FRA's safety efforts.

A. Authorizes Safety Risk Reduction Program and Protects Confidentiality of Risk Analyses Produced

In order to enhance the accountability of railroads in assuming full responsibility for the safety of their employees and operations, the bill would authorize appropriations for the addition of a safety risk reduction program to supplement FRA's current safety activities. The bill requests Congressional endorsement of this pilot program, which FRA has already begun on a voluntary basis. Since rail-related accidents, injuries, and deaths are already at historically low levels, FRA seeks to augment the agency's traditional behavior-based and design-specification-based regulations with a robust risk reduction program to further drive down those key indicators and measures of risk at a reasonable cost and in a practical manner before accidents and injuries occur.

In the rail safety context, such a risk reduction program is intended to ensure that the systems by which railroads operate and maintain their properties are adequate to meet or exceed safety objectives. Our current risk reduction program is intended to encourage an open collaboration with industry's labor and management so that they will try, and eventually adopt, voluntary risk reduction approaches. FRA is placing much greater emphasis on developing models of how railroads can systematically evaluate safety risks and implement plans to eliminate or reduce the chance for workers to make mistakes that can lead to accidents or close calls. A safety risk reduction program could integrate previous voluntary efforts in the human factors area (such as behavior-based safety methods and close call reporting), while extending similar risk management techniques to track safety and other areas.

To encourage railroads to produce thorough, as opposed to superficial, risk assessments, a companion provision in the bill would bar public disclosure by DOT of records required under the safety risk reduction program, except for Federal law enforcement purposes. Also in order to promote the preparation of substantive risk analyses by railroads, the provision would forbid discovery by private litigants in civil litigation for damages of any information compiled or collected under the program, and would forbid admission into evidence of the same information in civil litigation by private parties for damages. Here is an example of how this provision would work if

enacted. A commuter railroad undertakes, develops, and writes a collision hazard analysis required by an FRA order issued under the risk reduction program and implements the results of the analysis. In this process, the railroad identifies a bridge abutment near a crossover as a collision hazard. It is unlikely that the railroad would be able to remove this collision hazard (a derailment could send the cars into the fixed structure), but the railroad could mitigate the risk by reducing operating speeds and by further training its employees on safely transiting the location. DOT would not be allowed to release the railroad's written hazard analysis except to enforce Federal law, and the hazard analysis (as well as information compiled or collected under the program) would also be protected from discovery in a civil action by private parties for damages.

FRA is mindful that any restriction of public access to information may be controversial and requires careful scrutiny. However, to prevent misuse of the data developed under the risk reduction program, we are convinced that assuring confidentiality is essential to promote full, accurate, and timely disclosure by both the railroads and their employees, making certain that such programs are meaningful and more likely to bring about tangible improvements in safety.

B. Grants Rulemaking Authority over Hours of Service to the Secretary of Transportation

Human factors are a primary or contributing factor in more than a third of all train accidents, constituting the leading cause of train accidents. Fatigue is at least a contributing factor in one of every four serious human factor train accidents. We believe that crewmember fatigue has played an increasing role in railroad accidents over the past decade through poor judgment, miscommunication, inattentiveness, and failure to follow standard operating procedures. The challenge before us is to ensure that crewmembers consistently have adequate opportunity to rest, do not suffer from medical disorders that can disrupt sleep, and are fully engaged in, and committed to, maintaining alertness.

However, the statutory provisions that govern the hours of service of railroad train crews, dispatchers, and signal maintainers are antiquated—essentially a century old—and woefully inadequate to address present realities. For example, under those laws, train crews may work on a schedule of eight hours on duty, eight hours off duty, perpetually. Engineers and conductors often work 60 to 70 hours a week, and may be called to work during the day or night, which may disrupt sleep patterns and reduce their ability to function. Please see Appendix B, "Scientific Learning Demonstrating the Inadequacy of the Hours of Service Laws."

Moreover, the hours of service laws contain no substantive rulemaking authority. The lack of regulatory authority over duty hours—authority that other DOT agencies have with respect to their modes of transportation—has precluded FRA from making use of scientific learning on this issue of sleep-wake cycles and fatigue-induced performance

failures. Behavioral science has progressed to the point that computer models can accurately predict the likely effect of specific sleep and rest patterns on employee performance. The models provide useful guidance to aid employee scheduling practices, and as discussed in FRA's May testimony, the agency published a validation report of one such model in 2006. Yet, only the Union Pacific Railroad Company and the Canadian Pacific Railway are making use of a sleep model to evaluate their own crew scheduling practices. Most railroads have yet to integrate use of such models into their operations and have refrained from making public commitments to use this capability in the future. Further, over the past 15 years, the history of attempts by rail labor and management to cooperatively improve fatigue management has not experienced steady progress.

We recognize that specific amendments to the hours of service laws might mitigate some sources of fatigue. Yet, we believe that sincere and well-intentioned attempts at providing short-term relief will almost certainly result in unintended consequences that may limit FRA's and the industry's ability to consider or provide better solutions downstream. Even if exceptions are provided for in statute, treating limbo time as on-duty time, for instance, may force carriers to reduce the length of many assignments to avoid the possibility of "violations" under circumstances where safety could not be seriously compromised, and may significantly increase the cost of any further reforms. Hours of service issues are inherently complex, and they need to be properly considered within the overall context of fatigue prevention and management. FRA is committed to achieving significant progress in this area, but we require the regulatory authority to do so.

We strongly recommend that the existing hours of service laws be replaced with flexible regulations based on a modern, scientific understanding of fatigue. Today, I am again asking for your support for legislation that will permit us to put into action what has been learned. In order to apply this scientific knowledge to the problem of fatigue, the Administration bill first proposes to sunset the hours of service laws, but retain their protections as interim regulations embodying their substantive provisions. Next, the proposal calls for FRA, as the Secretary's delegate, to make use of the extensive research findings in reviewing the issue of fatigue through FRA's Railroad Safety Advisory Committee, and to develop as necessary new, science-based requirements that can help us reduce the number and severity of human factor-caused train accidents and casualties. We believe revised "benchmark" limits are needed on work hours, and requirements for rest periods, to provide simple guidance for fixed schedules, where that will suffice.

The bill would also authorize FRA under certain circumstances to permit railroads to comply with an approved fatigue management plan as an alternative to complying with the "benchmark" limits" set forth in any prospective regulations. With the tools now available, we will be able to evaluate proposed fatigue management approaches to ensure that they include an objective evaluation of a wide variety of more flexible work

schedules by validated techniques. In fact, under such conditions, we believe that most safety-critical railroad employees would be protected by performance-based fatigue management programs that will enhance safety while holding down costs.

For the sake of public and employee safety, it is time to make a long-overdue change by granting the Secretary rulemaking authority over hours of service so that FRA as the Secretary's delegate is authorized to directly address the major cause of far too many train accidents.

C. Promotes Crossing Safety

Accidents at highway-rail crossings and dedicated pedestrian crossings over railroad tracks account for more than a third of all fatalities arising from railroad operations. In 2006 alone, according to FRA's preliminary figures, 368 people were killed at crossings. The bill seeks to prevent accidents, injuries, and deaths at crossings and to make crossings safer through two main provisions.

1. Requires Reports by Railroads and States to DOT on the Characteristics of Crossings

Currently, reporting to the DOT National Crossing Inventory is strictly voluntary. FRA is the custodian of the inventory, and the quality of the data is only as good as what States and railroads have historically reported. Some information is missing from the Inventory altogether. Too much information that is in the Inventory has become outdated, rendering its use at least problematic. The bill would remedy these information deficits by requiring that railroads and States provide the Secretary with current information regarding the country's approximately 277,000 at-grade and grade-separated highway-rail crossings and dedicated pedestrian crossings over railroad tracks. Mandatory reporting would make this unique national database more current and complete, which would help (i) States better rank their crossings by risk and channel resources to the most dangerous crossings first, and (ii) DOT and transportation researchers identify the most promising ways to reduce crossing casualties. The bill would, therefore, require initial reports on all previously unreported crossings and then periodic updates on all crossings.

2. Fosters Introduction of New Technology to Improve Safety at Public Highway-Rail Grade Crossings

Only about 40 percent of the Nation's 144,000 public highway-rail grade crossings are equipped with an active device to give warning to motorists and pedestrians at the crossing. Many crossings have only crossbucks. Active warning devices are expensive to install and maintain, and, perversely, safety engineering improvements at one crossing are often cited in tort actions to prove or insinuate the relative inadequacy of warning signs or devices at another crossing. Under the Administration bill, if the

Secretary has approved a new technology to provide advance warning to highway users at a grade crossing, the Secretary's determination preempts any State law concerning the adequacy of the technology in providing the warning. FRA believes that this proposal would help encourage the creation and deployment of new, cost-effective technology at the Nation's approximately 80,000 public grade crossings that still lack active warning devices. Let me provide an example of innovative crossing safety technology. Under an FRA waiver the Twin Cities and Western Railroad Company and a supplier successfully demonstrated a warning system designed for lower-volume roadways and rail lines using dedicated locomotives. The system uses the Global Positioning System and a data radio link between the locomotive and each crossing. This product is now being commercialized by a major signal supplier.

D. Expands the Secretary's Authority to Disqualify Individuals Unfit for Safety-Sensitive Service

Another provision of the bill would expand the Secretary's existing disqualification authority to cover individuals who, after opportunity for a hearing, are deemed to be unfit for safety-sensitive service in the railroad industry because of a violation of the Hazardous Materials Regulations related to transporting hazardous material by rail. Currently, FRA, as the Secretary's delegate, may disqualify an individual only for a violation of the rail safety laws or regulations, not the Hazardous Materials Regulations, even though violation of the Hazardous Materials Regulations may involve a greater potential accident risk or consequence (in the event of an accident). This proposal would logically extend our disqualification authority over railroad employees and complement current initiatives to strengthen FRA's safety compliance program.

E. Protects Rail Safety Regulations from Legal Attack on the Ground that They Affect Security and Repeals the Statutory Requirement for the Secretary of Homeland Security to Consult with the Secretary of Transportation when Issuing Security Rules that Affect Rail Safety

The bill would also bar legal challenges to DOT safety regulations on the basis that they affect rail security. In many cases, rail safety and security are intertwined, if not linked inextricably, and part of the justification for certain DOT regulations is that they enhance rail security. The bill would clarify the scope of the Secretary's safety jurisdiction and help deter or quickly rebuff any legal challenge that asserts that DOT has exceeded its statutory authority in issuing such regulations.

Of course, the U.S. Department of Homeland Security (DHS) would continue to exercise primary responsibility for the promulgation of rail security regulations. In this regard, the bill would repeal the statutory provision that, when issuing security rules that affect rail safety, DHS must consult with DOT. We believe the provision is unnecessary

and confusing in light of other statutes, executive orders, and existing inter-Departmental cooperation formalized under the DOT-DHS Memorandum of Understanding and its related annexes on rail security.

F. Clarifies the Secretary's Authority to Issue Temporary Waivers of Rail Safety Regulations Related to Emergencies

The bill would clarify that FRA, as the Secretary's delegate, may grant a temporary waiver without prior notice and an opportunity for public comment and hearing, if the waiver is directly related to an emergency event or needed to aid in recovery efforts and the waiver is also in the public interest and consistent with railroad safety. Although FRA's normal practice is to set aside time for public comment and hearing on waiver petitions, this process appreciably slows down issuance of waivers necessary for emergency response and recovery efforts. Yet granting a waiver without such procedures risks legal challenge. The provision would free FRA from this dilemma and allow the agency to support emergency response and recovery efforts by dispensing with prior notice and an opportunity for comment and hearing, and by otherwise expediting the process for granting waivers. Further, the relief granted would be temporary (a maximum of nine months), and the normal waiver procedures would have to be followed to extend the temporary relief granted should doing so be necessary.

G. Authorizes the Monitoring of Railroad Radio Communications

Currently, FRA is permitted to monitor railroad radio communications only in the presence of an authorized sender or receiver, such as a railroad employee. Yet, when railroad employees know that FRA is present, they tend to be on their best safety behavior. Therefore, FRA cannot be sure whether the level of compliance observed is normal, and we are less able to identify what are, under ordinary circumstances, the most frequent and serious instances of noncompliance. Access to candid communications off site would yield a truer picture of compliance levels.

The bill would address this concern by letting FRA safety inspectors monitor and record railroads' radio communications over their dedicated frequencies outside of the presence of railroad personnel for the purpose of accident prevention (including accident investigation) and, with certain exceptions, to use the information received.

As FRA's objective of accident prevention is ordinarily fulfilled daily by conducting safety inspections of railroad operations and enforcing the rail safety laws, monitoring of radio communications would not only help achieve that objective, but would greatly improve the efficiency of those inspections, the accuracy of the results, and the effective deployment of FRA's limited inspection resources based on those more accurate results.

H. Clarifies and Relaxes the Existing Statutory Provision on Moving Certain Defective Equipment for Repair

Finally, I would like to mention that the bill would amend a complicated statutory provision that states the conditions for hauling a railroad car or locomotive with a safety appliance or power brake defect for repair without civil penalty liability, including the requirement that equipment be back-hauled to the nearest available repair point. Back hauls required by statute can be both unsafe (because of the hazards related to switching a car out of one train and into another train), and inefficient (because the car is stopped from moving toward its destination and forced to go to a different place that is physically closer than the next forward point for repair). The proposal would allow the equipment to be moved to the next forward point of repair under clear regulatory safeguards for moving defective equipment that are more consistent with the movement-for-repair provisions applicable to vehicles with other types of defects, such as Freight Car Safety Standards defects.

Further, the bill would also define some key statutory terms and then provide FRA, as the Secretary's delegate, with rulemaking authority to define others. Currently, FRA may provide only guidance on the meaning of these terms, and this has contributed to an atmosphere of uncertainty about the requirements of the statute in day-to-day application. For example, FRA has received many complaints over the years that cars have been hauled past a repair point that FRA does not consider to be a repair point. This proposal would, therefore, help dispel such uncertainty and promote understanding and compliance with the provisions governing the safe movement of equipment with a safety appliance or power brake defect.

I would like to emphasize that, while all of the provisions I have discussed are among the major provisions of the bill, there are other significant provisions I have not mentioned today that will also enhance rail safety. These include providing FRA rail security officers with greater access to Federal, State, and local law enforcement databases, officer-protection warning systems, and communications for the purpose of performing the Administrator's civil and administrative duties to promote safety, including security, and for other purposes authorized by law. All of these provisions are set forth in the bill the Secretary presented in February, and I would be glad to discuss each of them in detail with you.

LEGISLATION PROPOSING AMENDMENTS TO THE RAIL SAFETY AND SECURITY PREEMPTION PROVISION AT 49 U.S.C. 20106

The Administration's bill does not include a provision that would revise the preemption provision at 49 U.S.C. § 20106 (Section 20106). Section 3 of H.R. 1401, as passed by the House provides that causes of action for damages under State law are not preempted under Section 20106 unless compliance with the State standard makes

compliance with the Federal standard impossible. It further provides that the Secretaries of Transportation and Homeland Security may preempt positive State law and regulations only by covering the subject matter. Common law tort claims related to the same subject matter would not be preempted. The effect of this proposal would be that an ever-changing myriad of State and local standards would be established through tort litigation, based on the findings of individual judges and juries, who will undoubtedly have limited exposure to and understanding of the Federal standards at issue, and even less understanding of the consequences of their decisions beyond the implications for the immediate plaintiffs. The result of this amendment would be to eviscerate national uniformity, as the existence of Federal requirements and the railroad's compliance with them would have no bearing on the potential for liability in the event of an accident or terrorist incident. The effective standard would be the latest tort judgment in each State, without any assurance whatsoever that compliance with that standard would save a railroad from future liability. Faced with limitless tort liability and the need to meet these changing standards all around the country, nationally uniform standards would lose their meaning and effectiveness, and safety and security would be compromised. For this reason, the Administration's views letter on H.R. 1401 threatens a Presidential veto if section 3 remains in the bill.

Another proposed amendment to Section 20106, the provision at Section 616 of H.R. 2095 as passed by the House Transportation and Infrastructure Committee, provides a State cause of action for damages for personal injury, death, or property damage resulting from a violation of Federal railroad safety and security standards. However, the amendment goes too far by providing that a State cause of action is also created for a railroad's failure to "adequately comply" with any Federal regulation or order and "adequately comply" with its plan or standard created pursuant to a Federal regulation or order; this provision will generate needless litigation and undercut the national uniformity that section 20106 aims to achieve. If the Committee needs further information to address this important issue, FRA staff would be glad to provide assistance.

CONCLUSION

The Administration's rail safety reauthorization bill would enable FRA to continue its existing rail safety initiatives and to enhance rail safety systematically in many ways. I look forward to working with the Subcommittee to bring about the enactment of the Administration's bill, and to help make our Nation's railroad system even safer. Thank you.

Appendix A

The Railroad Industry's Safety Record

The railroad industry's overall safety record is very positive, and most safety trends are moving in the right direction. While not even a single death or injury is acceptable, progress is continually being made in the effort to improve railroad safety. This improvement is demonstrated by an analysis of FRA's database of railroad reports of accidents and incidents that have occurred over the nearly three decades from 1978 through 2006. See 49 CFR part 225. (The period 1978 through 2006 is chosen for analysis because the worst year for rail safety in recent decades was 1978, and 2006 is the last complete year for which preliminary data are available.) Between 1978 and 2006, the total number of rail-related accidents and incidents has fallen from 90,653 to 13,139, an all-time low since FRA's existing database was first established in 1975, representing a decline of 86 percent. Between 1978 and 2006, total rail-related fatalities have declined from 1,646 to 912, a reduction of 45 percent. From 1978 to 2006, total employee cases (fatal and nonfatal) have dropped from 65,193 to 5,165, the record low; this represents a decline of 92 percent. In the same period, total employee deaths have fallen from 122 in 1978 to 16 in 2006, a decrease of 87 percent.

Contributing to this generally improving safety record has been a 74-percent decline in train accidents since 1978 (a total of 2,891 train accidents in 2006, compared to 10,991 in 1978), even though rail traffic has increased. (Total train-miles were up by 7.8 percent from 1978 to 2006.) In addition, the year 2006 saw only 28 train accidents, out of the 2,891 reported, in which a hazardous material was released, with a total of only 69 hazardous material cars releasing some amount of product, despite about 1.7 million movements of hazardous materials by rail.

In other words, over the last almost three decades, the number and rate of train accidents, total deaths arising from rail operations, employee fatalities and injuries, and hazardous materials releases all have fallen dramatically. In most categories, these improvements have been most rapid in the 1980s, and tapered off in the late 1990s. Causes of the improvements have included a much more profitable economic climate for freight railroads following deregulation in 1980 under the Staggers Act (which led to substantially greater investment in plant and equipment), enhanced safety awareness and safety program implementation on the part of railroads and their employees, and FRA's safety monitoring and standard setting. (Most of FRA's safety rules were issued during this period.) In addition, rail remains an extremely safe mode of transportation for passengers. Since 1978, more than 11.2 billion passengers have traveled by rail, based on reports filed with FRA each month. The number of rail passengers has steadily increased over the years, and since 2000 has averaged more than 500 million per year. Although 12 rail passengers died in train collisions and derailments in 2005, none did in 2006. On a passenger-mile basis, with an average about 15.5 billion passenger-miles per year since

the year 2000, rail travel is about as safe as scheduled airlines and intercity bus transportation and is far safer than private motor vehicle travel. Rail passenger accidents–while always to be avoided–have a very high passenger survival rate.

As indicated previously, not all of the major safety indicators are positive. Grade crossing and rail trespasser incidents continue to cause a large proportion of the deaths associated with railroading. Grade crossing and rail trespassing deaths accounted for 97 percent of the 912 total rail-related deaths in 2006. In recent years, rail trespasser deaths have replaced grade crossing fatalities as the largest category of rail-related deaths. In 2006, 521 persons died while on railroad property without authorization, and 368 persons lost their lives in grade crossing accidents. Further, significant train accidents continue to occur, and the train accident rate per million train-miles has not declined at an acceptable pace in recent years. It actually rose slightly in 2003 and 2004 (to 4.05 and 4.39, respectively) compared to that in 2002 (3.76), although it dropped in 2005 (to 4.11) and in 2006 (to 3.57), close to the all-time low of 3.54 achieved in 1997.

The causes of train accidents are generally grouped into five categories: human factors; track and structures; equipment; signal and train control; and miscellaneous. The great majority of train accidents are caused by human factors and track. In recent years, most of the serious events involving train collisions or derailments resulting in release of hazardous material, or harm to rail passengers, have resulted from human factor or track causes. Accordingly, the National Rail Safety Action Plan makes human factors and track the major target areas for improving the train accident rate.

Appendix B

Scientific Learning Demonstrating the Inadequacy of the Hours of Service Laws

The following four examples illustrate some of the ways in which the existing hours of service statutory regime fails to reflect the latest scholarship on the subject of fatigue.

First, current scientific information indicates that to feel well rested most people need approximately eight hours of sleep per night. The current hours of service laws require a minimum off-duty period of only 10 hours if an employee in train and engine service has worked 12 consecutive hours in the previous 24-hour period. If an employee works 11 hours and 59 minutes or less, the laws require a minimum rest period of only eight hours. Very few employees work 12 consecutive hours; therefore, most may legally be called back to duty with only eight hours off duty. During that off-duty time, the employee must travel to and from work and attend to personal needs such as bathing and eating. Crew-calling practices allow the employee to be called as little as two hours prior to the beginning of the next duty period. Given these circumstances, it is certain that the current law permits employees to work with less than eight hours of sleep per night.

An FRA study of locomotive engineers' sleep and work patterns found that the average locomotive engineer obtained 7.13 hours of sleep per night.[1] Another FRA study of train handling performance conducted on a highly realistic locomotive simulator by locomotive engineers working under schedules that conformed with the hours of service laws[2] found that engineers who worked ten hours and had 12 hours off duty, slept an average of only 6.1 hours. A similar group of engineers who also worked ten hours, but had only 9.3 hours off duty, slept an average of only 4.6 hours. Again, most people need about eight hours of sleep per night; therefore, for most people, the amount of sleep these engineers received was insufficient even though their schedules fully conformed with the hours of service laws.

Second, scientific information also shows that the quantity and quality of sleep vary with the time of day. Most people sleep best at night; however, the current hours of service laws do not take the time of day when sleep can occur into account. Under those

[1] Pollard, J. K. 1996. Locomotive engineer's activity diary. Report Number DOT/FRA/RRP-96/02.

[2] Thomas, G. R., Raslear, T. G., and Kuehn, G. I. 1997. The effects of work schedule on train handling performance and sleep of locomotive engineers: A simulator study. Report Number DOT/FRA/ORD-97-09.

laws, engineers who quit work at dawn and have to sleep during the daytime, when it is harder to sleep, get the same minimum eight or ten hours off as engineers who quit work in the evening and have the relative luxury of sleeping at night. The study by Pollard referenced earlier found that engineers, in fact, obtain the least sleep if their on-duty period ends between 5:00 a.m. and noon.

Third, most mammals, including human beings, have an approximately 24-hour sleep-wake cycle known as a "circadian rhythm." Rapid changes in the circadian pattern of sleep and wakefulness disrupt many physiological functions such as hormone releases, digestion, and temperature regulation. Human function can be affected, performance may be impaired, and a general feeling of debility may occur until realignment is achieved. The maximum work periods and minimum off-duty periods specified in the current hours of service laws force sleep-wake cycles into a less-than-24-hour pattern that is highly unnatural and very difficult to adapt to. Jet lag when flying east is the most commonly experienced syndrome similar to the experience of consistently working on a less-than-24-hour cycle.

Fourth, recent studies "suggest that sleep loss (less than 7 hours per night) may have wide-ranging effects on the cardiovascular, endocrine, immune, and nervous systems, including the following:

- Obesity in adults . . .
- Diabetes and impaired glucose tolerance
- Cardiovascular disease and hypertension
- Anxiety symptoms
- Depressed mood
- Alcohol use[.]" [3]

In other words, sleep loss, which the current hours of service regime permits railroad operating employees to suffer, contributes not only to the safety risk of fatigue, but also to a gamut of health risks, including the risk of serious health problems such as diabetes, cardiovascular disease, and hypertension.

[3] Institute of Medicine of the National Academies. Sleep Disorders and Sleep Deprivation: an Unmet Public Health Problem (2006), p. 59.