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RAILROADERS' GUIDE TO HEALTHY SLEEP: **A RESEARCH-BASED EDUCATIONAL WEBSITE**

SUMMARY

Originally launched in 2012, the *Railroaders' Guide to Healthy Sleep* (RGHS) website (<http://www.RailroaderSleep.org>) is a non-regulatory, educational resource. Designed for railroaders and their support networks, the website provides scientifically valid information about the importance of sleep, tools to monitor and self-assess risks for sleep disorders, and practical strategies for improving sleep health.

Experts from the Harvard Medical School Division of Sleep Medicine originally created the website in collaboration with fatigue and rail domain specialists from the U.S. DOT Volpe Center with sponsorship from the Federal Railroad Administration's (FRA) Office of Research, Development and Technology (RD&T). Since the project's inception, the RGHS team has worked closely with railroad industry stakeholders, and in 2015, utilizing best practices from educational technology and web design, it fully redesigned the website (see Figure 1).

The primary focus of this report is to describe the lessons learned from the strategic methods implemented to date to promote awareness and facilitate use of this type of educational resource across the railroad industry at-large, for those at the highest risk and their support networks. As part of ongoing improvement efforts, the team employs a multi-pronged approach, including real-time demonstrations, in-person promotions, digital communications to self-selected subscribers, and collecting real-world cases of website use.

To monitor and assess the efficacy and influence of these approaches, the project team identifies indicators of website awareness and usage. These include user testing, convening a Stakeholder Review Panel (SRP), interviewing railroaders and spouses, observing promotion events, assessing website analytics, and reviewing cases of use.

Overall, results since 2012 indicate an increase in website awareness and usage over time. Users and industry stakeholders continue to identify topics that can be utilized for future development. Through the development, launch, and redesign phases of the RGHS website, the project team recognized the integral value of engaging stakeholder groups. The website may serve as process model for the development and application of similar educational resources across the transportation industry.

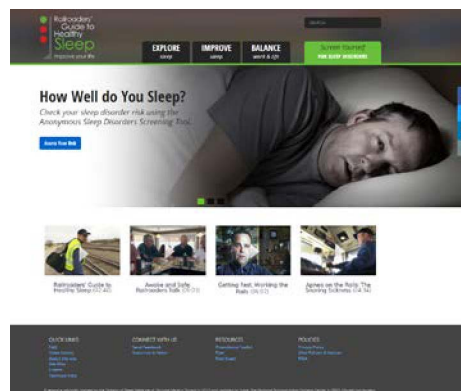


Figure 1. *Railroaders' Guide to Healthy Sleep* Website Homepage



BACKGROUND

The National Transportation Safety Board (NTSB) officially recognized fatigue as a serious issue in transportation starting in 1990 with the creation of its “Most Wanted List” of advocacy priorities [1]. Over past decades, the NTSB has issued more than 200 safety recommendations related to fatigue and cites the current cost of sleep-loss in the billions of dollars, despite the underreported numbers of transportation injuries and fatalities tied to fatigue [2].

Although the exact number of rail incidents that have fatigue as a causal or contributing factor is difficult to estimate, industry stakeholders understand that operator fatigue can be a critical safety issue. An August 2006 analysis by the Collision Analysis Working Group, a cross-industry representative group, determined that in 19 of 65 human factors-caused mainline track train collisions, 29.3% involved impaired alertness [3].

Informational resources, such as websites, are one way to increase awareness about this serious public safety issue and education about healthy sleep strategies. The RGHS website features an *Anonymous Sleep Disorders Screening Tool* (see Figure 2) that takes 10–15 minutes to complete and assesses risk for five of the most common sleep disorders. Upon completion, level of risk is reported in a printable format, and users with results indicating a high risk are encouraged to share the findings with a healthcare provider.

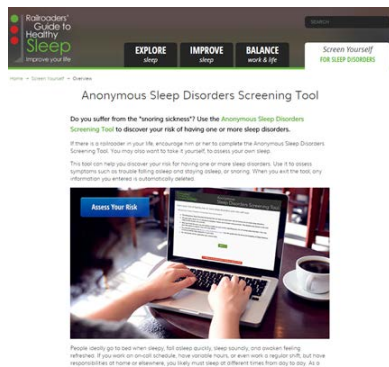


Figure 2. The RGHS *Anonymous Sleep Disorders Screening Tool* Start Page

OBJECTIVES

Operator fatigue is a critical issue in the railroad industry due to the serious safety implications for employees and the public at large. Moreover, this issue is not unique to railroading; many cross-modal agencies in the US and internationally now recognize and encourage transportation organizations to adopt a Safety Management System framework with an integrated Fatigue Risk Management System (FRMS) designed to identify hazards, assess risks, and implement mitigation strategies specific to fatigue.

One important FRMS strategy is to provide education and training programs to employees regarding the importance and science of sleep, and countermeasures to reduce the potential for employees to become fatigued. The RGHS website can be used in this capacity by industry stakeholders, such as labor unions, industry associations, and carriers, in addition to individual use outside of work. It is one effort in a larger safety culture-focused research and development portfolio within the FRA’s Office of Research, Development and Technology mission to ensure the safe, efficient and reliable movement of people and goods by rail [4].

The objective of this report is to describe the lessons learned from the strategic methods implemented to facilitate use of this type of non-regulatory resource by railroaders and their support networks, across the railroad industry.

METHODS

Quantitative and qualitative methods yielded findings and preliminary project outcomes that indicate increasing awareness and website use. The data sources are as follows:

- Needs Assessment Survey: Target-audience responses, which were gathered by the labor unions, indicated needs for a sleep health and fatigue focused educational website, and helped to frame the website content and design.



- Interviews & User Testing: Primary target audience users and emerging potential users, such as railroader families, captured and reflected the real-world context and lifestyle of a railroader with an unpredictable work schedule through interview themes that informed content development and vignettes to further tailor the website design.
- Google Analytics: Website visits are used to understand directional access (i.e., to/from the site), referential links, search engine optimization, and website pages and sections visited most frequently to inform navigation design improvements and user pathways.
- Digital Communications Platform Subscriptions: Interested users “opt-in” to newsletter and topical interest email lists that help to gauge increasing awareness within, and related to, the railroad industry.
- Stakeholder Review Panel: Representative panel of key stakeholder groups advise and critique, as “critical friends,” the development, ongoing improvement, and implementation strategies of the project. Also, the SRP assists in understanding the emerging needs of the users and validating the importance of existing website content.
- Case Examples: Descriptions of real-world instances of website use, such as training modules and union meetings with group screenings, illustrate the various ways the target audience is becoming aware of and using the website, and inform further outreach and development.

RESULTS

Ongoing analyses of data sources are producing outcome indicators and opportunities for improvement, helping the project team to understand website awareness and usage of the website during the various stages of development and implementation.

The needs assessment conducted by the labor unions helped frame website content and features to the interests of the target audience for the original website.

Through user testing and individual interviews with target audience representatives, the project team learned that users found the original site challenging overall: text-heavy, compounded by long, scrolling pages, and a “too dark” color palette. Moreover, many users described the website navigation as confusing, when trying to find specific information related to the lifestyle challenges of a railroader with an unpredictable schedule.

Visits to the website generally have increased over time, and continue to be tracked, as outreach and communications efforts are ramped up to increase website awareness and usage in the industry. Outreach also continues to boost the number of subscriptions to the digital communications platform.

Analysis of other data sources, such as use cases of users and the Stakeholder Review Panel, are ongoing and final results or indicators of outcomes are emerging.

CONCLUSIONS

The website has been well-received by industry stakeholders and continues to be used by an increasing number of carriers and labor union representatives to reach railroaders. Target audience members generally find that the redesigned website addresses their challenging lifestyle realities better than the original website. This may be, in part, as a result of the additions of railroader-family testimonials and other content in the “Balance Work & Life” section that specifically focuses on families and railroader support networks.



FUTURE ACTION

In conjunction with ongoing improvement of the website, the project team is developing additional FRA *Research Results* reports to describe further project details and outcomes, particularly the integral role of stakeholder participation and industry usage.

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