

1 **Tenth International Conference on Managing Fatigue: Updated Abstract**

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3 *Railroaders' Guide to Healthy Sleep* Website: Lessons Learned from Facilitating Awareness and Use

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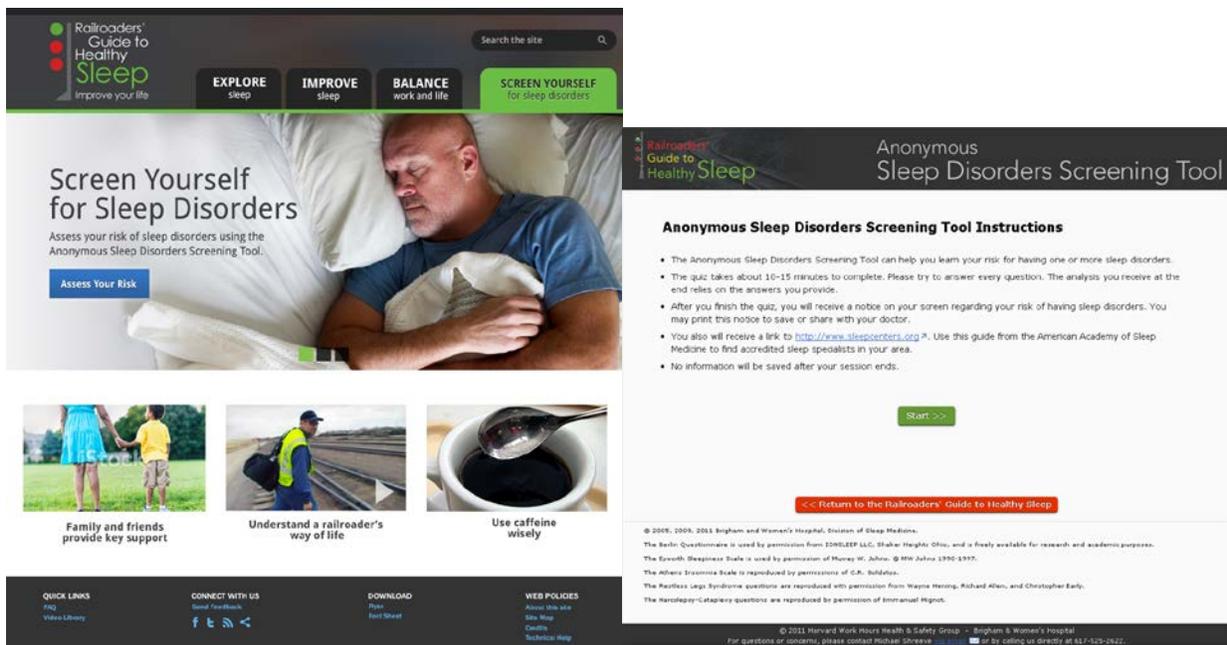
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11 **Problem**

12 The National Transportation Safety Board (NTSB) officially recognized fatigue as a serious problem in
13 transportation starting in 1990 with the creation of its "Most Wanted List" of advocacy priorities. NTSB
14 cites the current cost of sleep-loss in the billions of dollars, over and above the underreported numbers
15 of transportation injuries and fatalities tied to fatigue. Informational resources, such as websites, are
16 one way to increase awareness about this issue and educate about healthy sleep strategies. However,
17 "effectiveness" of website resources are difficult to assess in terms of prevalence of use. This study
18 reports on the methods implemented to facilitate awareness and use of this resource.

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20 **Method**

21 Originally launched in 2012, the *Railroaders' Guide to Healthy Sleep* website (www.RailroaderSleep.org)
22 is a publically available, non-regulatory, educational resource. Designed for a target audience of
23 railroaders and their support networks, the website provides scientifically valid information about the
24 importance of sleep, tools to monitor and self-assess risk for sleep disorders, and practical strategies for
25 improving sleep health. Experts in sleep science and health from Harvard Medical School Division of
26 Sleep Medicine originally created the site in conjunction with Volpe, The National Transportation
27 Systems Center with sponsorship from the US Federal Railroad Administration. Working closely with
28 railroad industry stakeholders since project inception and utilizing best practices from educational
29 technology and web design, the project team fully redesigned the website in 2015.



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The project team has employed a multi-pronged implementation approach to promote awareness and facilitate use of the website. The approaches included real-time demonstrations, in-person promotion, digital communications to with targeted (self-selected) subscribers, and collecting cases of website use.

To monitor and evaluate the efficacy and influence of these approaches, an exploratory study was conducted to identify indicators of increasing awareness and use of the website. Methods included user-testing, convening stakeholder review panels, interviewing railroaders and spouses, observing promotion events, assessing website analytics, and reviewing cases of use.

Results

Data analyses yielded outcome indicators and opportunities for improvement, helping the project team to understand awareness and use of the website during the various stages of development and implementation.

Quantitative and qualitative findings and preliminary outcomes indicated an increase in awareness and website use, as follows by method:

- Survey—sample of target users in cooperation with the labor unions assessed the needs of the potential users and framed the content design.
- Interviews & User Testing—primary target audience users and also emerging potential users, such as railroader families: to capture and reflect the real-world context and lifestyle of a railroader with an unpredictable work schedule through interview themes, to inform content development and vignettes to improve the website look and feel.
- Google Analytics—website visitors: to understand directional access (i.e., to/from the site), referential links, search engine optimization, pages and sections visited most frequently to inform navigation design improvements and user pathways.
- Communication Subscriptions—interested “opt-in” users: through newsletter and topical interest email lists to gauge increasing awareness within and related to the railroad industry.
- Stakeholder Feedback—representative panel of key stakeholder groups: to advise and critique, as “critical friends,” the development, ongoing improvement, and implementation strategies of the project. Also, to assess the needs of the users and validate the content importance.
- Case Examples—detailed descriptions of specific instances of website use, such as training modules and union meetings with group screenings: to illustrate the various ways the target audience is becoming aware and using the website to inform further outreach and development.

Discussion

Overall, results indicate that there has been an increase in awareness and use of the website over time. The survey guided content and features of interest to our target audience for the original website. User testing found the original site too text heavy with long scrolling pages and very dark color pallet, and confusing to navigate to find solutions to the challenges of the lifestyle of a railroader with an

79 unpredictable schedule and its and effects on families (a major theme of the interviews). Visits to the
80 website increased over time, and continue to be tracked for the refreshed website as outreach and
81 communications efforts are ramped up. The refreshed website has been well received by stakeholders
82 and the target audience, and generally found to better address the realities of this lifestyle than the
83 original website. Outreach through a digital communications platform continues to grow the website
84 newsletter subscriber list. Users and industry stakeholders continue to identify topics that can be
85 utilized for future development.

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87 Over the course of the development, launch, and redesign of the RGHS website, the project team
88 recognized the value of engaging stakeholder groups. Fairly early in the project, a Stakeholder Review
89 Panel (SRP) was created to facilitate interactive decision-making so the project team could make
90 informed decisions about various key aspects of the website. The SRP is comprised of railroad labor,
91 management, industry associations, and federal representation. In conjunction with the SRP, the
92 website redesign was guided by project team members with applied human factors and rail domain
93 expertise, and by findings from user testing conducted with railroaders and their support networks.
94 In this presentation, we will discuss the decision-making processes that were utilized, and will highlight
95 outcomes from in the development of the website. The website may serve as process model for the
96 development and application of similar educational resources across the transportation industry.

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98 **Summary**

99 Operator fatigue is a critical issue in the railroad industry due to the serious safety implications for
100 railroad employees, and the public-at-large. Moreover, this problem is not unique to railroading; many
101 cross-modal agencies in the US and internationally now recognize and encourage transportation
102 organizations to adopt a Safety Management Systems framework with an integrated Fatigue Risk
103 Management System (FRMS) designed to identify hazards, assess risk, and implement mitigation
104 strategies specific to fatigue. One important FRMS risk-mitigation strategy is the provision of education
105 and training programs to employees regarding the importance and science of sleep, and
106 countermeasures to reduce the potential for employees to become fatigued. The primary focus of this
107 paper is to describe the lessons learned from a study of the strategic methods implemented to facilitate
108 use of this type of educational resource to those at the highest risk and their support networks across
109 the railroad industry at-large.