

SUPPORTING JUSTIFICATION – Part A
Electronic Distraction Device (EDD) Survey; OMB No. 2130-NEW
Form Number FRA F 6180.158

Summary of Submission

- This information collection request is a new submission. The proposed qualitative study is intended to survey a select group of railroad employees to gain insight into the extent and nature of distraction among these workers by various electronic devices.
- The total number of burden hours requested for this submission is **304 hours**.
- The total number of responses requested for this submission is **902**.
- ******The answer to question **number 12** itemizes the hourly burden associated with the survey form associated with this proposed collection of information (See pp. 9 - 11).

1. Circumstances that make collection of the information necessary.

The Federal Railroad Administration (FRA) has statutory responsibility to ensure the safety of railroad operations. See the Federal Rail Safety Act of 1970 (49 U.S.C. 20103). This responsibility requires that the FRA remain vigilant for emerging risks to the public due to railroad operations, and to take steps to mitigate those risks. One such emerging risk is “electronic device distraction”. In this context, an “electronic device” can be defined as “anything with a keyboard, screen, microphone, or speaker that requires visual and or auditory attention that can divert attention from operating machinery”. Examples include cell phones, tablet and other computers, game consoles, music, and DVD players.

Electronic device distraction is a threat to safety across all transportation modes, and railroad operations are no exception. In September, 2008, a westbound Southern California Regional Rail Authority Metrolink train collided head-on with eastbound Union Pacific Railroad freight train near Chatsworth, CA. The collision resulted in 25 fatalities and damages of \$112 million. It was determined that the Metrolink engineer failed to observe and respond to the red signal because he was engaged in the prohibited use of a wireless device, specifically text messaging.¹

A May 2002 collision between two BNSF freight trains near Clarendon, TX, was found to be partially attributed to the improper use of electronic devices. The coal train engineer was using a cell phone at the time of the accident, causing him to be unaware

¹ <http://www.nts.gov/doclib/reports/2010/RAR1001.pdf>

that he needed to prepare his train to stop. All four crew members on board were injured, one fatally.²

Across other transportation modes, research has been conducted to determine prevalence, causes, and effects of electronic device distraction. A study sponsored by the Federal Motor Carrier Safety Administration (FMCSA) found that text messaging creates a crash risk 23 times worse than driving while not distracted.³

In addition to these publically reported examples, private conversations with FRA personnel and others in the industry indicate that electronic device distraction is known to be, or suspected to be, an important contributing factor in many other accidents.

In order to take effective and efficient action to minimize the risk of electronic device distraction in the railroad industry, FRA requires trustworthy information on what electronic devices are being used, by whom, for what reason, and under what circumstances. At present this information is unknown. With this submission, FRA is requesting permission to acquire the needed knowledge.

2. How, by whom, and for what purpose the information is to be used.

This is a new collection of information, and is entirely voluntary. Primary users of the information will be personnel within FRA's Office of Safety Analysis whose charge it is to develop educational programs, public relations messaging, and collaborative programs with industry that will combine to minimize the risks associated with electronic device distraction.

A second set of users will be officials and staff within FRA's Office of Railroad Policy and Development who will have access to summarized data in an effort to inform a research agenda in support of minimizing the amount of electronic device use and the risks associated with such use.

A third set of users will be the railroad industry. Both management and labor in the industry are vitally concerned with electronic device distraction, and will have access to summarized data to assist in efforts to develop effective policies, programs, and mitigation strategies aimed at minimizing the problem.

Finally, the public has an interest in knowing the extent of electronic device usage in the railroad industry and the beliefs members of the railroad industry have regarding the ability to use electronic devices safely while on duty. Additionally, the public has an interest in knowing the efficacy of government and private efforts aimed at reducing improper electronic device usage and mitigating the risks associated with usage.

² <http://www.nts.gov/doclib/reports/2003/rar0301.pdf>

³ <http://www.distraction.gov/research/PDF-Files/Driver-Distraction-Commercial-Vehicle-Operations.pdf>

The purpose of this data collection effort is to learn about electronic device usage, attitudes about usage, and opinions about the efficacy of various countermeasures to usage. FRA is conducting this survey as a *qualitative* rather than *quantitative* data collection effort. In this context, qualitative data is used to gain in depth information regarding opinions about electronic device usage, underlying reasons for use, and motivations for use. This qualitative information can better inform the development of educational programs, targeted safety campaigns, and peer to peer interventions. FRA intends to collect this data annually so these interventions will reflect the current state of the rail industry as it relates to electronic device usage, attitudes, and opinions about countermeasures. FRA has carefully considered its options for this data collection effort and has chosen a survey instrument rather than focus groups, case studies, or other qualitative measures for a variety of reasons. First, FRA intends to collect the same data annually. A survey instrument will allow for consistent data across years. Secondly, the information FRA is interested in collecting can be collected most expeditiously through a survey instrument. Other qualitative measures would require more processing to get data into a useable form. Thirdly, case studies and focus groups can provide more detail about a limited number of individuals. FRA is interested in information as it relates to electronic device usage for the purpose of designing educational programs, targeted safety campaigns, and peer to peer interventions. More in depth information would not provide additional value to these types of interventions. Lastly, the costs of focus groups or case studies would be greater than that of the proposed survey and this investment of additional funds would result in data that would not be as useful to FRA for the purposes outlined above.

3. Extent of automated information collection.

The overwhelming majority of data collection will be via web based survey methods. This method of administration is possible because almost all the questions in the survey will be fixed choice. FRA is working with rail labor unions and rail management on this data collection effort. Since FRA, in conjunction with these groups, is seeking detailed information regarding electronic devices and railroaders have historically been a more guarded population, a subgroup of employees that have a history of active participation in these types of qualitative data collection efforts has been identified. This subgroup of rail employees comprises approximately 38% of the total railroader population. It is from this identified sub-population that the sample will be selected for this data collection effort. Valid email addresses are on file with the relevant labor unions for each of the individuals identified as part of population of interest.

As outlined in Part B question 3, labor union representatives will provide the necessary e-mail addresses (and introductions) to invite respondents to reply to the web-based survey form.

FRA intends to collect 100% of the survey data electronically. However, FRA understands that some individuals may be more comfortable completing a paper version of the survey. The email invitation to participate will also include information regarding how to request and complete a paper survey for those who are uncomfortable or unable to complete the survey online.

A printable electronic copy of the survey will be provided to all the participating unions. Participants who receive an email invitation to complete the survey but would prefer to do so via paper will receive instructions in that email invitation to request a paper copy from their union leader. Union leaders will collect the paper copies of the survey and return them to FRA for data entry/analysis. This will help to insure that survey participants' remain anonymous.

Craft/Position	Total Employees	Population of Interest	Percentage of Total
Conductors	53,800	26,900	50%
Engineers	37,500	15,346	41%
Signal Workers	10,245	5,325	52%
Maintenance of Way Workers	30,800	2,000	6.5%
Car Inspectors	7,000	3,400	49%
Machinists	10,227	1,200	12%
Dispatchers	2,500	1,250*	50%
Supervisors	5,790	4,632	80%
Total	157,862	60,053	38%

As previously mentioned, the extent of electronic device usage in the railroad industry is currently unknown. In an effort to get as much information about electronic device usage as possible, FRA is specifically targeting railroaders who show some evidence of regularly using electronic devices and already have some experience with electronic communication (i.e., those who are comfortable receiving information electronically via email). FRA, in conjunction with the railroads and related labor unions, has carefully considered the benefits and disadvantages associated with a 100% electronic data collection methodology. A web-based survey methodology will naturally exclude those individuals that may be less comfortable with technology. However, given that nearly half of Americans now own smartphones, this number is likely to be small and decrease further in subsequent survey years.⁴

A 2012 Pew Research⁵ study found that 87% of Americans own a cell phone and approximately 46% own a smartphone. However, these findings also establish that electronic device usage, and by extension the potential for electronic device distraction, is

⁴ <http://pewinternet.org/Reports/2012/Smartphone-Update-2012.aspx>

⁵ <http://pewinternet.org/Commentary/2012/February/Pew-Internet-Mobile.aspx>

higher among those aged 49 and younger. A 2011 NHTSA study⁶ on driver attitudes regarding cellphone use found that younger drivers were more likely to drift out of their lane when using a cell phone. Additionally, younger drivers were found to be more likely to take their eyes off the road for more than three seconds at a time to perform an activity on a cell phone. These numbers reflect the results from automobile operators. However, most railroaders also regularly operate motor vehicles whether as part of their work duties or for personal use. Given that, it is very likely that the data regarding the electronic device risks younger drivers take can be extrapolated to the railroader population. The results from the NHTSA study also indicated that over 50% of respondents felt that using a cell phone made no difference in their ability to drive. This information was not analyzed by age of respondent, but clearly indicates that the majority of drivers feel confident in their ability to use a cell phone while safely operating a motor vehicle. In conclusion, although railroad employees aged 49 and younger may initially be over-represented in the data, evidence suggests that they are also at greater risk of electronic device distraction. FRA anticipates that if there is an over-representation of younger railroad employees this gap will narrow through subsequent years of survey administration as more individuals switch to smartphones.

FRA has identified the major barriers respondents may encounter when completing a web-based survey. Of primary concern is email and computer access. There are several web-based email clients that offer free email accounts so the ability to obtain an email address is available to any railroader who chooses to establish one. Additionally, FRA has been in contact with both the railroads and related labor unions to confirm that computers with internet access are available in almost all railroad terminal break rooms. Thus, even respondents without computer or internet access at home would still be able to participate in the survey if they chose to do so. However, as indicated above, participants will be given information on how to obtain and complete a paper version of the survey if they do not wish to complete the survey form electronically.

An analysis of a public opinion survey presented both electronically and through more traditional paper-based methods found no significant differences in responses (Kaplowitz, Hadlock, & Levine, 2004)⁷. The analysis also did not reveal a significant difference in response rates between those individuals responding to the survey electronically versus those who responded through the paper-based mail in survey. The analysis did uncover a

⁶ Tison, J., Chaudhary, N., & Cosgrove, L. (2011, December). National phone survey on distracted driving attitudes and behaviors. (Report No. DOT HS 811 555). Washington, DC: National Highway Traffic Safety Administration. (available at: http://www.distraction.gov/download/research-pdf/8396_DistractedDrivingSurvey-120611-v3.pdf)

⁷ Kaplowits, M.D., Hadlock, T.D., & Levine, R (2004). A comparison of web and mail survey response rates. *Public Opinion Quarterly*, 68, 94-101. (available at: http://www.uwyo.edu/studentaff/files/docs/survey_calendar/kaplovitz_hadlock_levine_a_comparison_of_web_and_mail_survey_reponse_rates.pdf)

difference in mean age of respondents. Respondents who returned surveys electronically tended to be younger, on average, than those choosing to mail in survey responses.

A study by Lozar Manfreda and Vehovar (2002)⁸ compared mail and web based survey administration. Results indicated no major differences in responses. However, data did show that the web-based survey had a higher item non-response rate. In consideration of this, FRA has designed the web survey to require answers to all questions before moving to the next section of the survey. This has been done in an effort to avoid missed responses due to carelessness, inattention, or unintentional error. Each question in the survey has a “prefer not to answer” option for those questions where the decision by the respondent not to respond was intentional.

4. Efforts to identify duplication.

To FRA’s knowledge, this is the first data collection effort of its kind. The survey team has been in constant communication with the leadership of FRA, and knows for certain that no similar efforts are being undertaken within the Administration.

Additionally, relevant labor and industry groups have indicated that, although they are very interested in the data obtained by the survey, they currently do not have any similar data and have no plans at present to undergo a data collection effort.

FRA is aware of the existing research on electronic device distraction in other transportation modes, but thorough literature reviews have revealed no data focusing on the railroad industry or particular segments within it. The existing data on electronic device usage in the railroads is limited to information related to specific railroad accidents involving electronic device usage.

5. Efforts to minimize the burden on small businesses.

Respondents will be individual railroad employees who voluntarily participate in the survey. Individuals invited to respond to the survey will be identified through the relevant railroad labor unions. Some individuals who respond to the survey may be employed by small businesses but this data collection will not directly impact small businesses. Therefore, the burden to small businesses should be negligible.

6. Impact of less frequent collection of information.

FRA has considered the use of less frequent data collection periods and determined less frequent data collection would not be appropriate. Specifically, since FRA intends to use

⁸ Lozar Manfreda, K. & Vehovar, V. (2002). Do mail and web surveys provide the same results? *Advances in Methodology and Statistics*, 18, 149 – 169. (available at: http://www.websm.org/uploadi/editor/Lozar_2002_Do_mail_and_web_surveys_provide_same_results.pdf)

this qualitative data to help inform the development of educational programs, targeted safety campaigns, and peer to peer interventions and these interventions typically are employed for periods of three to six months at a time, if proposed collection of information were not conducted or conducted less frequently, these interventions would be based on no information or outdated information. Furthermore, without such interventions, there would be a potential for increased numbers of rail accidents/incidents and corresponding injuries, fatalities, and property damage caused by railroad workers and train crew members who were distracted by electronic devices from performing their normal rail duties in a safe manner. Minimizing the risks associated with electronic device distraction requires a set of choices concerning education, social marketing, and collaborative programs with rail industry. Each of these approaches can contribute individually, and a coordinated set of all is needed to minimize a problem that has roots in technology, work process, rule-based behavior, psychology, peer group influence, and culture. Taking appropriate and effective remedial action requires more than guesswork as to which railroad employees are misusing electronic devices, exactly what devices are being used, the conditions under which such use/misuse is taking place, and how frequently use/misuse is occurring. For instance, is electronic device distraction mostly a problem with locomotive engineers who are away from home and need to communicate with their families? Or, is it most prevalent among shift workers who play electronic games because they are bored? Very different initiatives would be needed in each case.

The use of different types of electronic devices will impact the types of safety interventions developed. For example, if the majority of respondents report using cell phones as a means to keep in touch with family, targeted awareness campaigns could be developed to increase awareness of railroad programs that are in place to assist railroaders on duty who need to have contact with family members in emergency situations. Alternately, if it is found that the majority of usage is on company issued devices for company related activities, educational campaigns could be developed to instruct when and how to use these devices/applications safely. Finally, if it is found that a great deal of usage involves games or other applications because of boredom, this is best identified by rail peers and best addressed through a peer to peer program.

Currently there are no available data to address these kinds of questions. Trustworthy qualitative data collected over a period of years are needed to ascertain the extent of the problem and to design potentially effective programs, and to redesign efforts as needed. Considering the time needed to design and implement programs, and budgeting and planning cycles, once-yearly data collection is appropriate.

7. **Special circumstances.**

The survey contains no special circumstances. Survey participation is entirely voluntary. Respondents will not be required to respond more than annually, will not be required to provide a written response in fewer than 30 days, to submit any documentation in

association with the survey, to provide confidential/proprietary information, to provide a pledge of confidentiality, or to retain any records associated with the survey. Respondents will be invited to respond via an e-mail containing a hyperlink to an electronic form. FRA is asking for response by survey respondents within a few days of receipt of the information as e-mails tend to get lost and respondents may forget about the survey invitation. However, to alleviate forgetfulness, reminder notices will be sent two days, one week, two weeks, three weeks, one month, and 45 days after the initial invitation is sent. Respondents will be given the flexibility to respond at any time up to 60 days after the initial survey invitation is sent.

All statistical methods have been presented to OMB for review and approval.

8. Compliance with 5 CFR 1320.8.

As required by the Paperwork Reduction Act of 1995, FRA published a notice in the Federal Register on December 31, 2012, soliciting comment on the proposed data collection. See 77 FR 77181. To date, FRA has received no comments in response to this notice.

Background

This survey has been designed with rich input from stakeholder groups representing labor organizations and railroads whose members/employees constitute the survey respondents. A working group of the Rail Safety Advisory Committee (RSAC)⁹ was created to discuss ways to reduce electronic device distraction in the railroad industry. The RSAC working group recommended several interventions to reduce the risks associated with electronic device distraction. These recommendations included a public service announcement from FRA's Administrator Joseph Szabo about the dangers of distractions from electronic devices while on duty, the development and implementation by individual railroads of peer to peer programs regarding the risks associated with electronic device distraction, the development of model electronic device distraction presentations and posters for use by individual railroads, and a survey to assess the scope of the electronic device distraction problem and attitudes about electronic device usage. To date the public service announcement is complete and available at (available at:

⁹ The importance of RSAC involvement can be understood from their history and mission. To quote from the RSAC section of the FRA website : *RSAC History*: "In 1996, FRA established the Railroad Safety Advisory Committee (RSAC) to develop new regulatory standards, through a collaborative process, with all segments of the rail community working together to fashion mutually satisfactory solutions on safety regulatory issues." regulations are necessary, the Committee shall take into account section 1(a) of Executive Order 12866 (Regulatory Planning and Review). *RSAC Purpose*: "The Committee shall seek agreement on the facts and data underlying any real or perceived safety problems; identify cost effective solutions based on the agreed-upon facts; and identify regulatory options where necessary to implement those solutions. In determining whether regulations are necessary, the Committee shall take into account section 1(a) of Executive Order 12866 (Regulatory Planning and Review)."

<http://www.youtube.com/watch?v=tW3p53Tbklc>), railroads are in the process of developing peer to peer programs, and FRA has completed and delivered to the railroads model posters and presentations that discuss the risks associated with electronic device distraction. FRA agreed with the RSAC recommendation to create and deploy a survey to assess the scope of use of electronic devices in the railroad industry and the attitudes of railroaders regarding this use. It was determined that a robust data collection effort across varying railroad classes, carriers, and crafts would require that the survey be administered by FRA. In an effort to create a survey designed to accurately reflect the major issues associated with electronic devices and attitudes on these devices, FRA reached out to a diverse group of stakeholders to assist in all aspects of this effort. FRA has worked with representatives of the United Transportation Union (UTU), the Brotherhood of Locomotive Engineers and Trainmen (BLET), the Brotherhood of Railway Signalmen (BRS), the Brotherhood of Maintenance of Way Employee Division (BMWED), International Association of Machinists (IAM), the American Train Dispatchers Association (ATDA), the Transportation Communication Union (TCIA), and the Association of American Railroads (AAR) in developing the questions that will be asked in the survey. Additionally, FRA worked with individuals in government, academia, and private industry with experience in survey development to insure that any survey developed is a valid and reliable instrument.

These stakeholders provided input on potential questions, frequency of survey administration, the instructions provided to respondents, and the decision to conduct the survey as a web-based as opposed to a paper-based collection. It is based on these recommendations that the survey instrument and instructions were developed, and the data collection and analysis plan, the frequency of data collection, and the means to make data available to stakeholders were determined.

Many railroads currently have their own policies in place to deter electronic device usage while on duty. These policies vary greatly and some cover only safety critical employees while performing safety critical activities, while others are much broader and cover all employees while on duty – regardless of the tasks being performed. Still other railroads have no formal policies in place. In many cases, these policies have been developed by the railroads without input from their employees/relevant labor organizations. These questions will enable employees to share their opinions on what interventions they consider to be more or less effective. This information will then be shared with the railroads and relevant labor unions, and they can use this information when developing future policies regarding electronic device usage.

In an effort not to unduly place a burden on the public in the draft survey piloting process, 20 FRA regional inspectors were selected based on their extensive railroad experience and recent interactions with the railroads as former employees. These pilot respondents received an email invitation similar to what will be used for the actual data collection and were invited to respond to the survey. After survey completion, each

respondent participated in a detailed interview to discuss the survey and its validity for the railroad industry. The survey was refined based on feedback from these interviews.

The stakeholder groups who have helped in the development of the survey will have access to the survey data to suggest mitigation strategies once the data has been collected and analyzed. Additionally, these stakeholders who represent the survey respondents will be consulted on a yearly basis to ensure the survey instrument is still relevant and that subsequent survey data collection efforts are appropriate.

Additional information on the development of the questionnaire including the piloting and refining of questions is found in Part B question 4.

9. Payments or gifts to respondents.

There are no monetary payments provided or gifts made to respondents associated with this proposed collection of information.

10. Assurance of confidentiality.

FRA fully complies with all laws pertaining to confidentiality, including the Privacy Act of 1974. Thus, information obtained or acquired by FRA in this proposed study will be used exclusively for statistical purposes or, in this case, to compile data to describe the use/misuse of electronic devices among railroad employees throughout the United States. Furthermore, the design of the survey precludes any possibility of any individual being identified since no personally identifying information is being requested. This ensures confidentiality for respondents. Additionally, no individual survey responses will be released and data will only be reported as group means or aggregate summaries. Participants will be advised before commencing the survey that the survey is completely anonymous and it is impossible for responses to be traced back to an individual. However, as FRA does not currently have a formal rule or official policy which provides an assurance of confidentiality, participants will be advised that FRA cannot assure confidentiality.

11. Justification for any questions of a sensitive nature.

This survey will not ask respondents questions regarding sexual behavior and attitudes, religious beliefs, or other matters that would be considered private or of a sensitive nature. Participation in this proposed study by railroad employees is completely voluntary. Thus, only those consenting to participate in the survey will do so. The survey will ask respondents questions relating to their use of and opinions regarding electronic devices. Although these questions will only focus on the use of and attitudes regarding electronic devices, each question has a “prefer not to answer” option, so respondents may choose not to answer any questions for which they would feel

uncomfortable providing information.

12. Estimate of burden hours for information collected.

Craft/Position	Total Population	Population of interest	Sample Size	Number of invitations assuming 65% response rate to get sample	Total Annual Burden Hours	Total Compensation/Hour	Total Yearly Cost
Conductors	53,800	26,900	75	115	38	\$47	\$ 1786
Engineers	37,500	15,346	75	115	38	\$47	\$ 1786
Signal Workers	10,245	5,325	75	115	38	\$46	\$ 1748
Maint of Way Workers	30,800	2,000	75	115	38	\$45	\$ 1710
Car Inspectors	7,000	3,400	75	115	38	\$47	\$ 1786
Machinists	10,227	1,200	75	115	38	\$48	\$ 1824
Dispatchers	2,500	1,250	75	115	38	\$58	\$ 2204
Supervisors	5,790	4,632	75	115	38	\$59	\$ 2242
	157,862	60,053	600	920	304	Yearly Total	\$ 15086
	(1) Source: http://www.bls.gov/oes/current/naics4_482100.htm and UTU, BLET, BRS, BMWED, TCU, IAM, ATD						
	(2) Sample size based on 95% Confidence Level & 5 Interval						
	(3) Workers obtained from rail labor unions (see fourth bullet point under answer to question 1 Part B for an expanded discussion regarding this number)						
	(4) Annual Burden based on 20 minutes per survey						

*Note: If the burden were calculated in terms of dollars rather than hours, the equivalent annual cost for the estimated 304 hours would be \$15,086. Data will be collected only once per year pertaining to the use of electronic devices by railroad employees. Respondent data will be collected once per year for five years, and based on piloting information it should take approximately 20 minutes for a respondent to complete a survey.

13. Estimate of total annual costs to respondents.

There will be no additional cost burden to respondents beyond any customary and usual expenses associated with private practices. There will be no need for respondents to keep any records associated with this data collection effort.

14. Estimate of Cost to Federal Government.

Resources	Hours	\$ Fully Loaded per Hour	Total
FRA Supervisor	20	\$120	\$2,400
FRA Specialist	150	\$100	\$15,000
FRA Specialist	150	\$100	\$15,000
Contractor			\$60,000
Total Annual Cost			\$92,400

* Contractor to develop survey questions and on line resource for hosting the survey. Included in contractor costs are the costs for on-line web hosting of the survey.

As this is an electronic data collection effort, beyond the labor costs summarized in the table above, there are no additional equipment, printing, or support staff costs. The labor costs summarized in the table include overhead expenses. The labor hours are based on actual hours spent for similar data collection efforts.

15. Explanation of program changes and adjustments.

This proposed study is a new collection of information. By definition, it is a **program change**. The total estimated burden for this proposed collection of information is 304 hours.

There is no additional cost to respondents besides the costs itemized in the answer to question number 12 above.

16. Publication of results of data collection.

Plans for publication of the data have yet to be determined, and will be subject to a future decision by the FRA. At a minimum, FRA plans to publish a technical brief summarizing annual survey results and a white paper summarizing survey results from the entire five year period. Technical briefs will be published approximately six months after completion of data analysis. A white paper will be published approximately 18 months after the completion of data analysis on the fifth survey administration.

Data collection will begin approximately two months after the date of OMB approval, and continue annually thereafter. Data collection will be completed within 120 days of commencement. Current plans call for analysis to be completed within two months of the end of data collection.

17. Approval for not displaying the expiration date for OMB approval.

Once OMB approval is received, the FRA will publish the approval number for these information collection requirements in the Federal Register.

18. Exception to certification statement.

No exceptions are taken at this time.

SUPPORTING JUSTIFICATION – Part B
Electronic Distraction Device (EDD) Survey; OMB No. 2130-NEW
Form Number FRA F 6180.158

1. Description of sampling method to be used.

The extent of electronic device usage in the railroad industry is currently unknown. However, data on the extent of electronic device usage in the railroad industry is urgently needed so that the FRA's regulatory efforts can be data-driven decisions. Given that this is the first data collection effort of its kind within the railroad industry, there are many unknowns.

The purpose of this data collection effort is to learn about electronic device usage, attitudes about usage, and opinions about the efficacy of various countermeasures to usage. FRA is interested in collecting this qualitative data to help better inform the development of educational programs, targeted safety campaigns, and peer to peer interventions. FRA intends to collect this data annually so these interventions will reflect the current state of the rail industry as it relates to electronic device usage, attitudes, and opinions about countermeasures. As this is qualitative data, FRA does not intend to use this data to draw statistical inference. FRA has carefully considered its options for this data collection effort and has chosen a survey instrument rather than focus groups, case studies, or other qualitative measures for a variety of reasons. First, FRA intends to collect the same data annually. A survey instrument will allow for consistent data across years. Secondly, the information FRA is interested in collecting can be collected most expeditiously through a survey instrument. Other qualitative measures would require more processing to get data into a useable form. Thirdly, case studies and focus groups can provide more detail about a limited number of individuals. FRA is interested in information as it relates to electronic device usage for the purpose of designing educational programs, targeted safety campaigns, and peer to peer interventions. More in depth information would not provide additional value to these types of interventions. Lastly, the costs of focus groups or case studies would be greater than that of the proposed survey and this investment of additional funds would result in data that would not be as useful to FRA for the purposes outlined above.

The use of different types of electronic devices will impact the types of safety interventions developed. For example, if the majority of respondents report using cell phones as a means to keep in touch with family, targeted awareness campaigns could be developed to increase awareness of railroad programs that are in place to assist railroaders on duty who need to have contact with family members in emergency situations. Alternately, if it is found that the majority of usage is on company issued devices for company related activities, educational campaigns could be developed to instruct when and how to use these devices/applications safely. Finally, if it is found that a great deal of usage involves games or other applications because of boredom, this is best identified by rail peers and best addressed through a peer to peer program.

The population of interest is safety related railroad employees. The specific railroad crafts that are involved in safety-related activities were identified by means of interviews with FRA personnel and members of stakeholder groups who have an interest in the results. Once the railroad crafts of interest were identified, data from the Bureau of Labor Statistics (http://www.bls.gov/oes/current/naics4_482100.htm), the American Association of Railroads (AAR), and the relevant labor organizations were used to determine the number of employees working in each railroad craft.

FRA is working with rail labor unions and rail management on this data collection effort. Since FRA, in conjunction with these groups, is seeking detailed information regarding electronic devices and railroaders have historically been a more guarded population, a subgroup of employees that have a history of active participation in these types of qualitative data collection efforts has been identified. This subgroup of rail employees comprises approximately 38% of the total railroader population. It is from this identified sub-population that the sample will be selected for this data collection effort.

This subgroup has also demonstrated evidence of regularly using electronic devices and already has some experience with electronic communication (i.e., those who are comfortable receiving information electronically via email). FRA, therefore, believes this subgroup is the best population from which to draw a sample for this qualitative data collection effort. FRA has worked closely with railroad management and the rail labor unions on this data collection effort. FRA has found that the unions have had much success with surveys administered to this group of individuals, reporting that this group of individuals tends to be very responsive and cooperative. FRA is interested in obtaining the highest quality data possible, and as such, is specifically targeting this group of individuals for this qualitative data collection effort. FRA, in conjunction with the railroads and related labor unions, has carefully considered the benefits and disadvantages associated with a 100% electronic data collection methodology. A web-based survey methodology will naturally exclude those individuals that may be less comfortable with technology. However, given that nearly half of Americans now own smartphones, this number is likely to be small and decrease further in subsequent survey years.¹⁰ However, this is a minor point for the identified population of interest as they all have valid email addresses on file with their respective labor unions and have demonstrated proficiency with web-based applications.

For this data collection effort, FRA made several assumptions guiding sample size calculations:

- Survey Population consists of railroad employees (and their supervisors) whose duties regularly require them to work around railroad track and rolling equipment: engineers, conductors, trainmen, car inspectors, maintenance of way employees, signal maintainers, dispatchers, and machinists. The population of railroad workers is

¹⁰ <http://pewinternet.org/Reports/2012/Smartphone-Update-2012.aspx>

a known and finite population of approximately 160,000 individuals. The identified population for this qualitative survey data collection effort is approximately 60,000 individuals.

- Data from the sample will be used for qualitative purposes only. No quantitative analyses will be conducted on sample data.

on duty.

The survey includes questions regarding age, years in craft, type of railroad operation (passenger/freight), and primary work region. These survey questions will help FRA in determining how close the sample represents the underlying railroad population. However, even in the case that the sample and population have are nearly identical, FRA must reiterate that its intent is not to make statistical inference but rather to collect qualitative data.

To avoid the potential of under or over representing a particular railroad craft of interest and since different railroad crafts are governed by different rules and regulations regarding electronic device usage while on duty, samples will be collected from each railroad craft. The reasons for this are twofold: First, one global sample of identified safety related railroad employees of interest would have the potential for under or over representing a particular craft since there is a great deal of variability in the numbers of employees in the different crafts of interest. Employees of a particular railroad craft can represent anywhere from less than 2% to 34% of the entire population. It is possible that if one global sample is used those railroad crafts with fewer employees may be underrepresented in the final sample. Secondly, different railroad crafts are governed by different rules, regulations, and performance standards. For some crafts, such as conductors and engineers, Federal regulations restrict electronic device usage while on duty. Individuals in these crafts who used electronic devices inappropriately would violate Federal regulations and could face disciplinary action or even termination of employment. Other crafts, such as machinists, may have different usage patterns because the nature of their work limits the opportunities to use electronic devices. Using a stratified random sample of the population was considered. However, since some crafts represent such a small percentage of the total railroad population, even stratification would result in very little data (in some instances less than 2 participants) from these crafts. Therefore, each craft was treated as its own unique population with a separate sample. These are discrete samples as, even though crafts are all part of a generic “railroad population,” comparing these crafts either through statistical inference or otherwise would be inappropriate for the reasons outlined above.

It was assumed that approximately 65% of potential respondents would participate in the survey. This number was based on information obtained from the labor unions as well as FRA’s previous survey experience. The labor unions contend that they typically received response rates of around 80% for this population of interest. However, when sampling from the entire population of railroaders (not just this subset of interest) FRA has found much lower response rates. Previous FRA human factors surveys have found response rates of between 21% - 50% for the different railroad crafts. The table below summarizes the response rates for select railroad crafts

for a recent FRA survey. Links to the final reports for each of these surveys are included in the footnotes.

Occupation	Response Rate (%)
Train & Engine ¹¹	33
Passenger Train & Engine ¹²	21
Signalman ¹³	49.9
Maintenance of Way ¹⁴	31
Dispatcher ¹⁵	46

Given this, FRA is assuming a more conservative response rate. Therefore, the calculated sample was adjusted to reflect the additional invitations need to be sent to obtain the calculated sample size given a 65% response rate. FRA has never collected survey data regarding electronic device usage. Additionally, this is FRA’s first completely electronic survey data collection. As such, it was difficult to calculate a response rate with certainty. FRA assumed a 65% response rate based on a review of the relevant literature, discussions with other agencies that had experience with electronic survey data collection, and discussions with railroad union representatives. As stated previously, union representatives have had the most experience with electronic survey data collection from railroad employee populations. Their experience has been that response rates are quite high for these types of survey data efforts. If after the first year of this survey data collection effort it is determined that actual response rates are much higher or lower than anticipated, FRA will adjust its assumed response rates and sample sizes accordingly.

FRA has worked closely with both railroad management and railroad labor unions in the development of this survey. This multi-stakeholder effort has been recognized by both management and labor as an area where data is urgently needed in the rail industry. For each craft, out of the identified population of interest, 115 individuals will be chosen at random to receive the survey invitation. Assuming a 65% response rate (discussed in more detail above), this will be enough invitations to obtain a sample of 75 responses needed for each craft. This multi-stakeholder effort has been recognized by both management and labor as an area where data is urgently needed in the rail industry. All stakeholders have thus-far been supportive of FRA’s qualitative data collection effort. The success of this survey data collection effort is contingent upon the continued support of both railroad management and railroad labor unions. There is currently a great deal of stakeholder interest in obtaining this data. As such, FRA currently has a great deal of support and is hoping to capitalize on that momentum while moving forward with this survey data collection effort. Should FRA delay this qualitative data collection effort, it is possible that stakeholder interest and support would be lost or diminished making

¹¹ <http://www.fra.dot.gov/eLib/details/L01507>

¹² <http://www.fra.dot.gov/eLib/details/L01305>

¹³ <http://www.fra.dot.gov/eLib/details/L02537>

¹⁴ <http://www.fra.dot.gov/eLib/details/L01638>

¹⁵ <http://www.fra.dot.gov/eLib/details/L01616>

data collection difficult if not impossible.

Although data will be used qualitatively, FRA is asking for a slightly larger sample size than would ordinarily be necessary for qualitative data (75 responses) in an effort to insure that in all crafts employees working in passenger and freight operations, all railroad classes (I, II, and III), and nationwide will have the opportunity to respond.

In securing the support of both management and labor, FRA has agreed to conduct the survey under some constraints. FRA believes that the value of this survey data collection effort and the subsequent data it provides far outweigh any inconveniences imposed by these constraints. Furthermore, without the support and participation of management and labor, this or any data collection effort looking at electronic device usage in the railroad industry would not be possible. Without collaboration from all parties, this critically needed data would remain unavailable. One of the major constraints FRA is working with relates to sample size. The cooperation of both railroad management and labor unions is contingent upon the FRA conducting this qualitative survey data collection effort and any future survey data collection efforts using smaller sample sizes. Additionally, FRA has agreed to never directly compare crafts. FRA believes the sample size is more than adequate to provide the qualitative data it seeks.

Craft/Position	Total Population	Population of interest	Sample Size	Number of invitations assuming 65% response rate to get sample
Conductors	53,800	26,900	75	115
Engineers	37,500	15,346	75	115
Signal Workers	10,245	5,325	75	115
Maint of Way Workers	30,800	2,000	75	115
Car Inspectors	7,000	3,400	75	115
Machinists	10,227	1,200	75	115

Dispatchers	2,500	1,250	75	115
Supervisors	5,790	4,632	75	115
	157,862	60,053	600	920
	(1) Source: http://www.bls.gov/oes/current/naics4_482100.htm and UTU, BLET, BRS, BMWED, TCU, IAM, ATD			
	(2) Sample size based on 95% Confidence Level & 5 Interval			
	(3) Workers obtained from rail labor unions (see fourth bullet point under answer to question 1 Part B for an expanded discussion regarding this number)			
	(4) Annual Burden based on 20 minutes per survey			

2. Description of procedures for information collection, including statistical methodology for stratification and sample selection.

Survey data will be collected once per year for a period of five years. FRA has considered the use of less frequent data collection periods and determined less frequent data collection would not be appropriate. Specifically, since FRA intends to use this qualitative data to help inform the development of educational programs, targeted safety campaigns, and peer to peer interventions and these interventions typically are employed for periods of three to six months at a time, if proposed collection of information were not conducted or conducted less frequently, these interventions would be based on no information or outdated information. Furthermore, without such interventions, there would be a potential for increased numbers of rail accidents/incidents and corresponding injuries, fatalities, and property damage caused by railroad workers and train crew members who were distracted by electronic devices from performing their normal rail duties in a safe manner. Minimizing the risks associated with electronic device distraction requires a set of choices concerning the specifics of regulation, education, social marketing, and collaborative programs with rail industry. Each of these approaches can contribute individually, and a coordinated set of all is needed to minimize a problem that has roots in technology, work process, rule-based behavior, psychology, peer group influence, and culture. Taking appropriate and effective remedial action requires more than guesswork as to which railroad employees are misusing electronic devices, exactly what devices are being used, the conditions under which such use/misuse is taking place, and how frequently use/misuse is occurring. For instance, is electronic device distraction mostly a problem with locomotive engineers who are away from home and need to communicate with their families? Or, is it most prevalent among shift workers who play electronic games because they are bored? Very different initiatives would be needed in each case. Presently, there are no available data to address these kinds of questions. Trustworthy qualitative data collected over a period of years are needed to ascertain the extent of the problem and to design potentially effective programs, and to redesign efforts as needed. Considering the

time needed to design and implement programs, and budgeting and planning cycles, once-yearly data collection is appropriate.

FRA is working with rail labor unions and rail management on this data collection effort. Since FRA, in conjunction with these groups, is seeking detailed information regarding electronic devices and railroaders have historically been a more guarded population, a subgroup of employees that have a history of active participation in these types of qualitative data collection efforts has been identified. This subgroup of rail employees comprises approximately 38% of the total railroader population. It is from this identified sub-population that the sample will be selected for this data collection effort.

This subgroup has also demonstrated evidence of regularly using electronic devices and already has some experience with electronic communication (i.e., those who are comfortable receiving information electronically via email). FRA, therefore, believes this subgroup is the best population from which to draw a sample for this qualitative data collection effort. FRA has worked closely with railroad management and the rail labor unions on this data collection effort. FRA has found that the unions have had much success with surveys administered to this group of individuals, reporting that this group of individuals tends to be very responsive and cooperative. FRA is interested in obtaining the highest quality data possible, and as such, is specifically targeting this group of individuals for this qualitative data collection effort. FRA will draw a random sample from this identified specialized population. FRA will only be using this data for qualitative purposes. FRA, in conjunction with the railroads and related labor unions, has carefully considered the benefits and disadvantages associated with a 100% electronic data collection methodology. A web-based survey methodology will naturally exclude those individuals that may be less comfortable with technology. However, given that nearly half of Americans now own smartphones, this number is likely to be small and decrease further in subsequent survey years.¹⁶ However, this is a minor point for the identified population of interest as they all have valid email addresses on file with their respective labor unions and have demonstrated proficiency with web-based applications. The only inclusion criteria for the specialized population of interest are that the individual has a valid email address on file with the relevant labor union and has agreed to receive information electronically. However, this specialized population does not represent a random sample of the larger population of railroad employees. As such, this specialized population will not provide full coverage of the entire population. This further underscores FRA's reasoning to use this data qualitatively as it is unknown how this specialized population compares to the larger railroad population. As technology continues to become more ubiquitous, and since the only inclusionary criterion for the specialized population is that a person must have a valid email address on file with the relevant labor union and consent to electronic communication, FRA anticipates that as we approach subsequent survey years the sampling frame will expand and the specialized population will include more members of the larger railroad population. Although we anticipate that this specialized population will continue to grow in subsequent survey years, how that population relates to the larger railroad population will still remain unknown and data will continue to be

¹⁶ <http://pewinternet.org/Reports/2012/Smartphone-Update-2012.aspx>

used qualitatively.

3. Description of methods to maximize response rate and to deal with non-response issues.

This qualitative survey data collection effort will be carried out in collaboration with the leadership of relevant craft unions and the management of the railroads involved. In addition, members of the FRA's Rail Safety Advisory Committee on electronic device distraction are heavily involved in this project.¹⁷ Their support of the effort and acknowledgement of the importance of the information will be of considerable assistance in eliciting railroad employee cooperation. They will be involved in initial requests for cooperation and in follow-up communications and reminders.

A standard introductory email will be created by FRA. This email will alert the population that they may receive an invitation to participate in the survey. FRA will also create and distribute to the labor unions the invitation email and the reminder emails – to insure that all potential participants receive the same information. Additionally, unions may publicize the survey via union newsletters and at union meetings.

The survey invitations have been designed to enhance response rates by following suggestions given by Borg and Gall (1983). Specifically, introductory emails sent to respondents will come from labor union leaders using official email addresses. The introductory emails will explicitly state the purpose of the study and the estimated time to complete the survey. The letters will also stress that no special preparation is needed to participate. The survey has also been extensively pilot tested to insure that the questions use simple and straightforward language. Pretesting of 20 FRA employees and 9 railroad employees indicates that the average survey completion time is approximately 20 minutes to complete.

Union leaders will encourage participation by indicating that the survey data will be used to design educational programs, targeted safety campaigns, and peer to peer interventions. By completing the survey, railroad employees will be able to influence how these interventions are designed and implemented. The opportunity to influence these interventions should provide

¹⁷ The importance of RSAC involvement can be understood from their history and mission. To quote from the RSAC section of the [FRA website](#) : *RSAC History*: “In 1996, FRA established the Railroad Safety Advisory Committee (RSAC) to develop new regulatory standards, through a collaborative process, with all segments of the rail community working together to fashion mutually satisfactory solutions on safety regulatory issues.” regulations are necessary, the Committee shall take into account section 1(a) of Executive Order 12866 (Regulatory Planning and Review). *RSAC Purpose*: “The Committee shall seek agreement on the facts and data underlying any real or perceived safety problems; identify cost effective solutions based on the agreed-upon facts; and identify regulatory options where necessary to implement those solutions. In determining whether regulations are necessary, the Committee shall take into account section 1(a) of Executive Order 12866 (Regulatory Planning and Review).”

more than adequate motivation for participation. Additionally, having the request come from labor union leaders rather than from FRA or railroad management will increase the likelihood of participation.

Prior to the issuing of survey invitations, a pre-notification of the survey will be released. This pre-notification will be available on railroad intranets, union newsletters, and FRA's website. This pre-notification will explain the purpose of the survey including: when data will be collected, how data will be collected, the types of information to be collected, and why this information is being requested. FRA's Administrator Szabo has already recorded a public service announcement regarding electronic device usage by railroaders. A link to this public service announcement will be included in the pre-notification announcement.

The pre-notification and survey invitations will contain contact information for both union representatives and FRA personnel who can be contacted for additional information about the survey including questions about how the data will be used and how a person's responses will be kept confidential.

The survey will be a web-based data collection effort. Prior to determining the survey delivery method, FRA reviewed the literature comparing web-based survey methods with traditional paper-based survey methods. Research findings revealed no significant differences in survey answers given by respondents regardless of the method of survey administration. However, studies by Tse (1998) and Shannon and Brandshow (2004) found a higher response rate for mail in surveys but a faster response rate for web-based surveys. Respondents will be invited to respond via an e-mail containing a hyperlink to an electronic form. FRA is asking for response by survey respondents within a few days of receipt of the information as e-mails tend to get lost and respondents may forget about the survey invitation. However, to alleviate forgetfulness, reminder notices will be sent two days, one week, two weeks, three weeks, one month, and 45 days after the initial invitation is sent (Borg & Gall, 1983). In an effort to increase response rates for this survey data collection effort, reminder email subjects will be modified based on recent research findings (Henderson, 2011). The Henderson study found that follow ups were more effective if the email subject was changed for each reminder. Additionally polite requests were more effective than subject lines with questions and final reminders with deadlines to respond were more effective than those that did not indicate a deadline. Respondents will be given the flexibility to respond at any time up to 60 days after the initial survey invitation is sent. These reminders should build in additional waves of data collection for those groups where response is inadequate. So doing will increase the number of respondents and also provide opportunity for checking data quality by comparing responses across waves of data collection.

If after 45 days FRA finds a low response rate, time to response will be extended out to 90 days and union leadership in conjunction with FRA and rail management will encourage those who have received an invitation to complete the survey within the new extended timeframe.

FRA is specifically targeting railroaders with a history of active participation in these types of

qualitative data collection efforts and who already have some experience with electronic communication (i.e., those who are comfortable receiving information electronically via email) for this survey data collection effort. A 2001 study by Dillman, Phelps, Tortora, Swift, Kohrell, and Berck found success in getting initial non-responders to participate by switching to a second mode of communication to send a follow up invitation. Given this, in addition to email follow ups, a survey reminder will be printed in relevant labor organization newsletters, and union leaders will encourage survey participation among those members who have been selected to respond.

Although FRA anticipates a 100% electronic data collection rate, this may not be possible. FRA understands that some individuals may be more comfortable completing a paper version of the survey. The email invitation to participate will also include information regarding how to request and complete a paper survey for those who are uncomfortable or unable to complete the survey online.

A printable electronic copy of the survey will be provided to all the participating unions. Participants who receive an email invitation to complete the survey but would prefer to do so via paper will receive instructions in that email invitation to request a paper copy from their union leader. Union leaders will collect the paper copies of the survey and return them to FRA for data entry/analysis. This will help to insure that survey participants' remain anonymous.

A study by Lozar Manfreda and Vehovar (2002) compared mail and web based survey administration. Results indicated no major differences in responses. However, data did show that the web-based survey had a higher item non-response rate. In consideration of this, FRA has designed the web survey to require answers to all questions before moving to the next section of the survey. This has been done in an effort to avoid missed responses due to carelessness, inattention, or unintentional error. Each question in the survey has a "prefer not to answer" option for those questions where the decision by the respondent not to respond was intentional.

As this data collection effort is for qualitative purposes only, and the underlying sample represents one of convenience, further non-response bias analyses will not be pursued.

4. Describe any test procedures for procedures or methods to be undertaken.

The initial required pre-testing will have already been completed by the time of this submission.

The pre-testing process proceeded as follows:

- Key personnel at the FRA were interviewed to elicit their views on what topics were critical for the survey.
- Similar views were volunteered by key stakeholders representing the populations

being sampled. (This information did not come from any formal survey development process. Rather, it emerged as discussions through the RSAC electronic device working group process proceeded about whether they would be willing to cooperate, and how the survey might best serve their needs.)

- Stakeholders provided input on potential questions, frequency of survey administration, the instructions provided to respondents, and the decision to conduct the survey as a web-based as opposed to a paper-based collection. It is based on these recommendations that the survey instrument and instructions were developed, and the data collection and analysis plan, the frequency of data collection, and the means to make data available to stakeholders were determined.
- Knowledge derived from the above was augmented by literature reviews of electronic device distraction in the railroad industry, in particular and transportation, in general.
- A paper copy of the survey was developed and revised several times by a team consisting of contractor and FRA personnel.
 - i. These revisions included:
 1. Reviewing the impact of altering wording of questions for clarity and how that affected stability of responses,
 2. Combining questions where appropriate, and
 3. Organizing questions in a logical order.
 - ii. Each revision was then tested by FRA personnel not involved in this effort.
 - iii. Results of each revision were reviewed, and the questionnaire was refined as necessary.
- A draft final survey was created in web form and tested by FRA personnel to insure proper functionality.
- In an effort not to unduly place a burden on the public in the draft survey piloting process, 20 FRA regional inspectors were selected to complete the web-based draft survey based on their extensive railroad experience and recent interactions with the railroads as former employees. These pilot respondents received an email invitation similar to what will be used for the actual data collection and were invited to respond to the survey. After survey completion, each respondent participated in a detailed interview to discuss the survey and its validity for the railroad industry. These testers were asked a set of questions concerning: 1- overall impressions (length, layout, etc.); 2- questions content (vocabulary, etc.); and 3- content (should some questions be added, removed, changed, etc.) The survey was refined based on feedback from these interviews.

- i. Five of these inspectors completed the survey after the initial survey completion date to insure response stability.
- Revisions were made and nine (9) non-federal employees were recruited to test the survey. They were debriefed as were the federal employee testers.
 - The web survey was then finalized.

After the initial survey administration in year one, FRA plans to review the survey with relevant stakeholders prior to subsequent annual deployment. FRA will discuss any changes to survey questions, sampling, or administration strategy that emerge from these reviews with OMB and resubmit the survey information to OMB for approval.

5. Provide name and phone number of individuals consulted on statistical aspects of study design and other persons who will collect/analyze information for agency.

Jonathan A. Morell, Ph.D. (734) 995-1795 Fulcrum Corp. (Consultant)

Amanda Emo, Ph.D. (202) 493-6413 Federal Railroad Admin. (Collect and Analyze)

Miriam Kloeppe (202) 493-6224 Federal Railroad Admin. (Collect and Analyze)

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