

Department of Transportation Office of the Chief Information Officer

Supporting Statement A Flexible Sleeper Berth Pilot Program

INTRODUCTION

This is to request the Office of Management and Budget's (OMB's) review and approval of a new Federal Motor Carrier Safety Administration (FMCSA) information collection request (ICR) titled Flexible Sleeper Berth Pilot Program.

Part A. Justification

1. CIRCUMSTANCES THAT MAKE COLLECTION OF INFORMATION NECESSARY

During listening sessions for the hours-of-service (HOS) rulemaking, FMCSA heard from many drivers that they would like regulatory flexibility to be able to sleep when they get tired or as a countermeasure to traffic congestion. The aim of the Flexible Sleeper Berth Pilot Program is to demonstrate how HOS regulatory flexibility could be used to improve driver rest and alertness.

Laboratory studies have demonstrated that a split sleep schedule, with the same total hours dedicated to rest divided between two periods, can result in as much or more total sleep time and improved driver alertness than a consolidated daytime sleep schedule.⁽¹⁻³⁾ Maintaining and improving driver rest and alertness is a priority of the U.S. Department of Transportation (USDOT) because it is well known that driver alertness is directly related to safety.

Changes to the FMCSA HOS regulations must be data driven and support driver safety. In order to determine whether more flexible HOS regulations improve—or at the very least do not degrade—driver rest and alertness, a study must be conducted with commercial motor vehicle (CMV) drivers. Driver fatigue depends on the interaction of many factors, including the duration and quality of previous sleep, how long the driver has been awake, and time of day. To determine the effect of regulatory flexibility on driver fatigue, drivers must be given the opportunity (temporarily) to exercise such flexibility as suits their individual needs. As driver schedules may fluctuate from day-to-day, the effects of this regulatory flexibility will also vary. To meet this research need, FMCSA has developed the Flexible Sleeper Berth Pilot Program, a research study to collect detailed data on driver sleep and performance when temporarily granted regulatory flexibility.

While enrolled in this field study, drivers will be given the option to divide their required hours of rest into no more than two sleeper berth (SB) periods (each ≥ 2 h) such that the total time will be greater than or equal to 10 hours. Following study enrollment, drivers will be able to operate under the exemption or under the current HOS rules in a given duty period as they choose, while still meeting the daily minimum rest requirements. The research team will assess whether, from a

sleep and fatigue perspective, this approach is “as safe as” or “safer than” operating under the current HOS regulations, which require a single daily consolidated rest period of 10 hours, or a SB period of 8 hours with an additional 2 hours off-duty (per the current “8 + 2” SB provision).

The Secretary of Transportation’s authority to conduct studies pertaining to CMV safety and to require motor carriers to maintain driver qualification files are located in 49 U.S.C. 504, 31133, 31136, 31502, and 49 CFR 1.73 (see Attachments A–E, respectively). The SB provision is found in 49 CFR 395 (see Attachment F). The initiation of a pilot program is in 49 CFR 381.400 (see Attachment G).

This information collection supports the USDOT Strategic Goal of “Safety.”

2. HOW, BY WHOM, AND FOR WHAT PURPOSE THE INFORMATION IS TO BE USED

2.1 How Information Will Be Collected

Data will be collected from CMV drivers (hereafter referred to as “driver”) during their online application, briefing session, pilot study participation, and debriefing session. Data collection will primarily focus on sleep, fatigue, safety, and driving performance. These outcomes will be compared between duty periods in which drivers operated under the current regulations and duty periods in which drivers operated under the study-related exemption (for split sleep; see Part B for statistical methodology). All drivers interested in participating in the study must complete the online application to be considered. A briefing session will be scheduled with drivers who are found eligible for the study and whose carrier has granted permission. During the briefing session, drivers who provide informed consent will be enrolled in the study. Drivers may choose to withdraw from the study early or to complete the entire 90-day participation period; regardless of whether a driver withdraws from or completes the study, each driver will have a debriefing session.

The sample of drivers in the study will include those from small, medium, and large carriers, as well as team drivers and owner operators. As directed by FMCSA, at a minimum, the research team will enroll 50 drivers from small carriers (2–50 trucks), 50 drivers from medium carriers (51–500 trucks), 50 drivers from large carriers (501 or more trucks), 25 owner-operators, and 25 drivers who work as team drivers, for a total of 200 drivers. The research team will oversample and aim to enroll up to 240 CMV drivers, allowing for attrition, to attain the targeted distribution of drivers.

The data collected during each phase is outlined below.

2.1.1 Online Application

In the online application (see Attachment H), drivers will be asked to provide their name and contact information (telephone number and e-mail address) to allow contact from the research team regarding their eligibility for the study. They will also be asked questions about their study eligibility, including whether the driver: has a valid commercial driver’s license (CDL); has a valid medical examiner’s certificate (MEC); operates a vehicle with a gross vehicle weight rating (GVWR) of at least 10,001 lbs; drives a truck that is equipped with a SB; and regularly uses the

sleeper berth. Drivers will be asked whether they have completed modules 3 and 8 of the North America FMP; if not, they will be encouraged, but not required, to do so. They will also be asked to report where their home base is located and in what regions of the United States they drive, since the research team will be recruiting drivers who are based out of or travel through the areas of Blacksburg, VA and Spokane, WA. Drivers will be asked to provide the name of their current company and team leader so that the research team can confirm whether the carrier will allow their drivers to participate. Additionally, drivers will be asked: whether they typically operate as a solo, team, or slip-seat driver; whether their vehicle is company-owned or privately owned; their USDOT number; whether they drive outside of the United States; whether their truck has a single or double SB; whether they typically operate the same tractor each day; the make, model, year, and vehicle identification number (VIN) of their tractor; any existing safety systems currently in place in the vehicle; and whether they use a paper or electronic log (and what type) for their duty and driving hours. This will allow the research team to confirm recruitment for each driver category (small carrier, medium carrier, large carrier, owner-operators, and team drivers) and ensure that the study-related equipment is compatible with the truck and with the duty log. Carriers who have not yet granted permission will be notified that one of their drivers has requested permission to participate in the study. Identifying information, including the driver's full name and phone number, will be stored on a password-protected computer by the research team in order to code all future data related to the driver with an identification (ID) number. Drivers will be contacted by phone or e-mail regarding their eligibility and, for eligible drivers, to schedule a briefing session.

Because participating drivers will be granted a temporary HOS exemption from FMCSA, a company representative from each participating carrier will need to authorize their drivers to participate. This authorization will be provided through an online application (available on the study website) to be completed by a company representative (see Attachment I). The application will include an overview of the study. Applicants will be asked to verify that they have read the provided descriptions of the sleeper berth exemption, the onboard monitoring system (OBMS), and the electronic logging device (ELD). They will be asked to provide their name, contact information (telephone number and e-mail address), company name, job title, and the approximate number of trucks in the company. Additionally, they will be asked whether drivers at their company have previously been required to complete the FMP modules relevant to the study (NAFMP modules 3 and 8). Last, they will be presented with checkboxes to verify that they give permission for their drivers to participate in the field study, for OBMS and/or ELD equipment to be installed in the vehicles of participating drivers, and for enrolled drivers to use the study-provided ELD system, and that they understand the extent of the driver confidentiality in data collection. Company representatives will then be contacted by phone or e-mail to discuss the potential study participation of their drivers. Owner operators will not be required to complete the online carrier application.

2.1.2 Briefing Session

During the briefing session, a member of the research team will meet in-person with each driver to complete the following items:

- Drivers will be asked to complete the background questionnaire (see Attachment J). This form includes no identifying information and is coded with the participant ID number.

Responses to the driver information form will be used for secondary data analyses and for enriching the public-use data set to be provided through the FMCSA Data Repository and the FMCSA public website. Completed forms will be stored in a locked data room.

- Drivers will also complete a Form 1099 and a Washington State Tax Invoice Voucher in order to be paid for their study participation (see Attachments K and L). These forms require the driver to provide his/her name, address, social security number, and signature. The forms are processed through Washington State University and do not contain the driver's study ID number or any information that would identify the driver as part of the Flexible Sleeper Berth Pilot Program.
- Two digital photographs will be taken: one of the driver's face and one of the driver's CDL. The photograph of the driver's face will be used for identifying the driver in the facial video recordings during the field study. The CDL photograph will be used so that the study team may access information from the Motor Carrier Management Information System (MCMIS) concerning the roadside violations of drivers during their period of study participation. Roadside violation information will remain confidential within the research team and will be used as a potential indicator of driving safety. These digital photographs will be stored on a password-protected server.

2.1.3 Pilot Study

During the pilot study, information collection will occur through several processes:

- Wrist actigraphy.
- Smartphone applications.
- Onboard monitoring systems (OBMSs).
- Electronic logging devices (ELDs).
- Weekly phone briefings.
- Debriefing session.

These processes are discussed in detail, below.

2.1.3.1 *Wrist Actigraphy*

Information concerning sleep and wake times will be collected continuously throughout the study using wrist actigraphy. The device, worn like a wrist watch, contains an accelerometer and measures activity counts, which can be used as indicators of sleep and wake. Drivers will be asked to sync the actigraph with a smartphone app daily. The wrist actigraphy data will then be transmitted via the smartphone to a secure, password-protected server for the research team to review. The research team will monitor the data and will call the driver if there are questions or concerns, for example, if the driver appears to have removed the device.

2.1.3.2 Smartphone Applications

Drivers participating in the study will be provided with a smartphone programmed with data collection applications. The smartphone applications will include the brief Psychomotor Vigilance Test (PVT-B; a 3-minute serial reaction time task), the Karolinska Sleepiness Scale (KSS; a single Likert rating of subjective sleepiness), a caffeine log (self-reported caffeine use), and a sleep log, in which drivers will report when they are attempting to sleep, how they slept, if they used their SB, and if/why they split their sleep. Throughout their period of study enrollment, drivers will take the PVT-B three or four times daily, depending on provision use. On duty days during the initial two-week baseline period and on duty days in which drivers choose to be compliant with the current SB regulations, drivers will take the PVT-B three times: (i) prior to beginning their duty period, (ii) at the beginning of a break during the duty period, and (iii) after the completion of their duty period. On duty days following the initial baseline period, drivers can choose to be compliant with current SB regulations or use the flexible SB allowance. When drivers are using the flexible SB allowance, they will be required to take the second PVT-B at the beginning of their SB period and to take an additional PVT-B prior to resuming their duty period following their SB period. The PVT-B may not be taken while the truck is in motion.

On days off duty, drivers will take the PVT-B three times: (i) within 2 hours of waking, (ii) halfway through their waking period, and (iii) within 2 hours of going to sleep. The KSS will be taken in conjunction with the PVT-B, following each test. Drivers will be asked to complete the sleep log before and after each sleep period, including naps. This is to be completed during duty cycles and between duty cycles. The caffeine log will be used as needed by drivers whenever they consume caffeine to record the time of any caffeine consumption. Caffeine consumption will be a secondary variable in analyses.

Smartphone app data collected in the field will be transmitted to a secure server on a daily basis for data quality control purposes. If no mobile phone connection can be made by the app (e.g., because the driver is out of range of mobile phone signals), then the data will remain stored on the smartphone until the next available opportunity to transmit them to the server. PVT-B performance, KSS scores, and driver sleep log entries will be reviewed on a daily basis. All data will be expressed in the driver's home terminal time, coded with a driver ID number, and will not contain any personally identifiable information.

2.1.3.3 Onboard Monitoring Systems

With the consent of the driver and carrier, all participating drivers will have a SmartDrive OBMS installed in their truck. This will collect data on trigger-based events, including: hard brakes, swerves, accelerations, contact with other objects, speeding, and rough/uneven surfaces, as well as random baseline periods (1 per 400 minutes). Information collected will include a 30-second epoch surrounding the trigger and will include video of the road in front of the truck and of the driver's face as well as audio data. This will be used to identify fatigue- and safety-critical events (SCEs) while driving. This reduced data set will be sent in an Excel or SQL file via a secure file transfer portal. The data set will be stored on a secure, password-protected server. Included in the data set will be the categorical reduction for each random baseline and SCE, including unique time and date; global positioning system (GPS) location of the event, which will be converted into the local time zone of where the event occurred; carrier ID number; unique driver ID

number; unique event ID number; trigger type; severity (if a SCE, including crash, near-crash, or other); categorical reduction (including the standard SmartDrive protocol and the enhanced fatigue analysis, etc.); maximum kinematic values; Coordinated Universal Time (UTC); and offset of UTC to home terminal. A separate data key will be sent that provides coded information on the identity of the driver and carrier and definitions of the variables included in the data set. The OBMS does not require any action from the driver; data collection and data transmission is automatic and transparent.

2.1.3.4 *Electronic Logging Devices*

Information concerning drivers' duty status and driving time will be collected with ELDs. ELD data will be collected through a custom system designed for drivers in the study in order to accurately reflect their duty/driving hours and HOS compliance under the current regulations or the study-granted flexible sleeper berth option. Drivers will be provided with a custom-developed app on a tablet to log their record of duty status (RODS) data, including the start and end times of their duty, driving, and rest periods. The ELD continuously captures engine diagnostic data from the truck, which confirms driving times. Drivers will be given an exemption to maintain two HOS logs, one on the modified application and one on their current ELD system, if necessary. The ELD data will be used to measure duty and driving times and to determine in which duty periods drivers chose to use the flexible SB allowance instead of the current HOS regulations. The ELD data will be aligned to the other streams of data, such as the sleep logs and wrist actigraphy. Because duty and driving status information is needed by the carriers for purposes such as payroll, fleet managers will have web access to the ELD data for drivers from their company. The ELD data will be coded by the driver's name and company name.

2.1.3.5 *Weekly Phone Briefings*

Drivers will have a weekly phone briefing with a member of the research team (see Attachment M). Drivers will be asked to call a member of the research team weekly, so that the briefing takes place when the driver is not on duty or trying to sleep. If a driver forgets to call, the driver will be reminded by his/her preferred method, either email, phone call, or text message. During their weekly briefing, participants will receive feedback relative to adherence with study protocols and compliance with study measures. The research team will inquire about, document, and seek to rectify any data anomalies detected during the quality control process.

2.1.3.6 *Debriefing Session*

Drivers will have a debriefing session at the end of their data collection period. During the debriefing session, which will take place in-person or over the phone with a member of the research team, drivers will be asked for their opinion of the study and for a general report of how often they used the flexible sleeper berth allowance, whether it had a positive or negative impact on their alertness and performance, and how they felt about the study overall (see Attachment N). These responses will be summarized by the research team and linked to the driver's ID number used throughout the study. All personally identifying information will be removed from responses and the responses will then be presented to FMCSA as general feedback from the participating drivers.

2.2 Who Will Collect the Information

FMCSA has contracted with the Virginia Tech Transportation Institute (VTTI) at the Virginia Polytechnic Institute and State University (VT), with subcontracts to Washington State University (WSU) and SmartDrive to administer this study and analyze its results. The investigators currently performing this study are Drs. Rich Hanowski and Jeffrey Hickman, and Rebecca Hammond from VTTI; Drs. Kimberly Honn and Hans Van Dongen from WSU; and Melissa Purcell and Slaven Sljivar from SmartDrive.

In accordance with USDOT's policy on research involving human subjects, this study will be reviewed and approved by VT's Institutional Review Board (IRB) prior to beginning data collection.

2.3 Purpose of the Information Collection Effort

The purpose of this pilot program is to determine if regulatory flexibility related to the SB provision could be used to improve driver rest, alertness, and safety performance. Under a flexible SB provision, drivers would be able to nap at times when they feel sleepy, but do not yet wish to fulfill their entire rest requirement, without running down the available duty hour's clock. The minimum rest requirement will remain unchanged, but it will allow drivers the opportunity to sleep at times that best suit their needs. To evaluate the operational, safety, and fatigue impacts of flexible SB use, this study will compare duty periods where drivers used the flexible sleeper berth option ("split sleep duty periods") with duty periods where drivers were compliant with the current sleeper berth regulations (consolidated sleep).

To determine operational impacts, the research team will use collected ELD data to compare drivers' total duty time, total driving time, and total rest time across split sleep duty periods and consolidated sleep duty periods. To determine safety impacts, the research team will use collected OBMS data to compare SCEs across split sleep duty periods and consolidated sleep duty periods. Additionally, the research team will collect data concerning roadside violations by drivers through MCMIS. To determine the fatigue impacts of flexible SB use, the research team will use collected sleep data (including actigraphic measurements of sleep duration, sleep logs, KSS scores, and PVT-B scores) to compare drivers' sleep duration and fatigue/alertness levels across split sleep duty periods and consolidated sleep duty periods. Fatigue will also be assessed via the OBMS using an enhanced fatigue coding of observed drowsiness.

3. EXTENT OF AUTOMATED INFORMATION COLLECTION

The online applications (for the driver and carrier) and background questionnaire include check boxes, multiple choice, and fill-in-the-blank responses. During the field study, the OBMS and engine diagnostic data collection will be automated and will require no action by the drivers following equipment installation at the briefing session. Similarly, the wrist actigraph will continuously record data; however, drivers will be required to charge the device weekly (which can be completed during any waking period, including while driving) and sync it with a smartphone app daily (< 5 min). The ELD, PVT-B, KSS, caffeine log, and sleep log are all automated via smartphone/tablet applications to reduce paper supplies or other equipment. The debriefing questionnaire will be administered on paper (in person) or orally (over the phone).

The study is designed to collect the necessary information with minimal time demand from drivers.

4. EFFORTS TO IDENTIFY DUPLICATION

FMCSA and the VTTI research team are unaware of other research conducted currently or in the past that could be used to fulfill the research goals of the Flexible Sleeper Berth Pilot Program. Previous research has been performed in laboratory studies to determine the potential benefits of split sleep compared to consolidated daytime or nighttime sleep.^(4,5) Such studies provide the scientific basis for the present study. Before an HOS regulation change may be proposed, a field study using drivers must be completed. The Flexible Sleeper Berth Pilot Program will be conducted using a diverse sample of drivers from different sized carriers, including both owner-operators and team drivers, in order to determine the effects of flexible sleeper berth use on sleep and performance, which has not previously been done.

5. EFFORTS TO MINIMIZE THE BURDEN ON SMALL BUSINESSES

Drivers from small carriers and owner-operators are two of the required samples. Recognizing that burden may impact these groups more than medium or large carriers, steps have been taken to minimize the burden on these small business entities. The OBMS and engine diagnostic data are continuously collected, with no extra demand on the driver. The research team will work with drivers to determine when installation and de-installations are convenient for them to minimize work delays or loss of revenue. Carriers will only have to complete the application for participation, which is a minimal burden anticipated to take only one hour (maximum). Participation in the study is voluntary, so no small business will have an imposed burden that it is not willing to bear.

6. IMPACT OF LESS FREQUENT COLLECTION OF INFORMATION

FMCSA has determined that this collection of information is necessary for study completion; currently, there is no existing data set that can be used for this project. This is a request for a single collection of information for this project. While the study will space out data collection over a period of approximately 18 months, data collection will only occur over a single 90-day period (maximum) for each participating driver. Less frequent collection of information would result in FMCSA being unable to support a conclusion on how flexible duty periods impact driver safety.

Drivers will be asked to participate in the field study for up to 90 consecutive days. Using continuous enrollment, the research team plans to collect data from a maximum of 60 drivers at a time, in a maximum of four, 90-day cycles (for a total of 18 months). With participation periods of up to 90 days, the research team aims to collect data from drivers for all types of duty periods (i.e., split sleep duty periods and consolidated sleep duty periods) to allow for between- and within-subject comparisons. During these 90-day participation periods, drivers will be asked to complete the more frequent data collection requirements described in Section 2.1.3.

Other less frequent information collection measures include the online application, background questionnaire, Form 1099, invoice voucher, digital photographs, and debriefing questionnaire.

This information will each be collected once per driver, at a time that meets the driver's schedule. The weekly briefing phone call will be initiated by the driver at a time that is convenient. This weekly contact is critical to study design for maintaining study protocol adherence, providing an opportunity for the research team to rectify any data anomalies, and allowing the driver to ask questions throughout the study period.

7. SPECIAL CIRCUMSTANCES

There are no special circumstances related to this information collection.

8. COMPLIANCE WITH 5 CFR 1320.8

FMCSA published a notice in the Federal Register with a 60-day public comment period to announce this proposed information collection on June 27, 2017 (82 FR 29145, Attachment O). The comment period closed on August 28, 2017. The agency received five comments in response to this notice.

The five comments received were in general support of the study, and this section contains a summary of the comments and any action taken by FMCSA in response to the comments. If a commenter is opposed to the program without stating why or providing a reason FMCSA does not take any course of action. However, if a negative comment refers to specific aspects of the study, then the FMCSA research team will deliberate on whether to tweak the design of the study

1. Anonymous. This commenter felt that FMCSA should not have to conduct a pilot program to study a situation which is similar to previous HOS rules, and felt that the previous HOS rules (prior to 2003) should be reinstated.
 - o Agency Response: While FMCSA understands the commentator's comment, our commitment to public safety requires scientific data and statistically valid findings before attempting to revise our current HOS regulations. No data has ever been collected on driver fatigue levels under a split-sleep schedule. The Agency chose to remove the old split-sleep rule due to an NTSB recommendation. The agency now has the ability to ensure that a change in the rule will do no harm to a driver's overall sleep time and alertness, resulting in on detrimental effects to the current level of safety for both CMV drivers and the driving public.
2. Edward A. Libel. Mr. Libel expressed support for the allowing flexibility in the sleeper berth regulations and felt this would allow drivers to use common sense to drive more carefully without feeling restricted by the 14-day clock.
 - o Agency Response: FMCSA appreciates Mr. Libel's support of this pilot program. The Agency did not take any actions from this comment.
3. Michael Whitaker. Mr. Whitaker expressed appreciation for the allowance of public comment and supported allowing flexible sleeper berth time. He felt that allowing flexible sleeper berth time would create safer highways and more efficiencies.

- o Agency Response: FMCSA appreciates Mr. Whitaker's support of this pilot program. The Agency did not take any actions from this comment.
4. Phil Killerlain. Mr. Killerlain expressed support of allowing for flexible sleeper berth splits and felt that the sooner this was put into effect the better.
 - o Agency Response: FMCSA appreciates Mr. Killerlain's support of this pilot program. The Agency did not take any actions from this comment.
 5. Joe Almon. Mr. Almon expressed his feelings that the HOS rules should never have been changed and need to be re-evaluated for every different aspect of the company (i.e., have different limits for dry vans, flatbeds, tankers, etc.).
 - o Agency Response: FMCSA appreciates Mr. Almon taking the time to comment. While the Agency understands his position on the current regulations, the Agency believes that they are the correct HOS regulations for the industry. While the rest of the HOS is not currently under review, the Agency hopes that a favorable finding from this Pilot Program will allow drivers more flexibility in their HOS.

Additionally, a federal register notice announcing the Pilot Program was published on June 6, 2017 to allow for 60-days of public comment regarding the proposed program (82 FR 26232, Attachment P). The comment period closed on August 7, 2017 and has received 232 unique (233 total, one duplicate) public comments to date. A brief overview of these comments is included, as some of them were pertinent to the study design.

The vast majority (over 175) of these comments were positive in nature. Several commenters expressed a desire to participate in the study, and several wanted the study expanded to incorporate other exemptions. While FMCSA understands the desire from drivers to re-look the HOS rules, specifically the 14-hour rule, the Pilot Program is designed to look at only Flexible Sleeper Berth times in order to achieve statistically significant results without the potential for introducing confounding variables into the study.

Approximately 40 commenters responded in a negative manner to the 14-hour rule, or having too many regulations in place, but were not specific to the Flexible Sleeper Berth Program. The majority of commenters who responded agreed that the NAFMP should be recommended, not mandatory. One commenter felt the NAFMP should be mandatory; however, FMCSA felt that the majority of commenters agreeing with the current study design showed that we should move forward without changing the design. One commenter felt that the cameras in the vehicle were too burdensome, however, several others expressed that the data collection was reasonable for the scope of the study.

9. PAYMENT OR GIFTS TO RESPONDENTS

Participating drivers will be compensated for whichever aspects of the study they complete. Drivers will earn:

- \$100 for agreeing to participate and signing the ICF and completing the background questionnaire.
- \$100 a month for three months of participation.
- \$200 bonus for completing the entire 90 days of data collection.

Drivers completing all aspects of the study can earn \$600. Drivers will be paid (by check) at three different time periods: at the end of month 1, at the end of month 2, and at the end of month 3 (conclusion of study). Checks will be issued by WSU and mailed to the home address provided by the driver. Drivers will be given their final payment once the equipment has been returned and de-installed from their vehicle.

Compliance will be determined by daily actigraph wear time, PVT performance (e.g., frequently skipping tasks or excessively poor performance indicating lack of effort or distraction), and proper ELD usage. If non-compliance is observed in any of the data, the driver will be called; if the driver receives three calls regarding compliance, they will be withdrawn from the study. However, in cases of extreme non-compliance (no PVTs are taken for multiple consecutive days, the actigraph is removed for multiple days (but not broken), tampering with the SmartDrive system, etc.), drivers may be withdrawn immediately.

Monetary compensation for drivers participating in the information collection is considered essential for the reasons listed below:

Availability and time burden: CMV drivers are difficult to reach for research studies due to irregular schedules and long working hours. The introductory briefing session (in-person) will last approximately 1 hour. Daily data collection requirements are estimated to take approximately 30 minutes per day. Weekly telephone briefings are estimated at approximately 10 minutes per week. Compensation for this time burden seems justified. This study also requests that respondents provide personal information, such as their names and video recordings of their driving performance (collected via OBMS). Monetary compensation may influence respondents' initial resistance to providing such information, which is essential for the study to be successful.

Data quality: Compensating respondents will significantly increase response rates for the information collection, thus improving the validity and reliability to an extent beyond that possible through non-compensation.

Complex study design: The proposed research requires ongoing participation for up to 90 consecutive days in order to achieve an accurate representation of drivers' schedules, which can vary significantly by day. As FMCSA is relying on naturalistic variation in duty and driving schedules and sleeper berth use, obtaining sufficient data from drivers is critical to determining the performance and safety impacts of allowing flexible sleeper berth use. Compensation may substantially reduce attrition.

Past experience: Previous field studies with drivers have shown that it is difficult to obtain enough participants for studies of this size without providing adequate monetary compensation, but that drivers will participate if they feel they are being provided with sufficient compensation.

We don't feel that a non-monetary incentive will encourage this population to participate in this study. The compensation provided for daily participation in this study is appropriate based on the highest minimum wage in the nation.

10. ASSURANCES OF CONFIDENTIALITY

All data collected during this study will be stored on a secure, password-protected server, except for the 1099 Tax Form and WSU Tax Invoice Voucher, which will be kept in secure, locked facilities at all times. A unique participant number will be generated for all drivers linking their responses to the background questionnaire, field study data collected (PVT-B, KSS, caffeine log, sleep log, and OBMS), weekly briefings, and debriefing questionnaire. Driver name and carrier will be required to link the ELD and OBMS data and to track participation and compensate drivers. A study ID number will be used to label the background questionnaire, PVT-B, KSS, caffeine log, sleep log, weekly briefings, and debriefing questionnaire. A key code tying the driver name to the study ID number will be stored separate from the study data in an electronic file on a password-protected, firewalled computer.

11. JUSTIFICATION FOR COLLECTION OF SENSITIVE INFORMATION

The Flexible Sleeper Berth Pilot Program will collect participants' driving information via ELD and OBMS data. This driving data may be considered sensitive information. For example, the OBMS data collection will involve video recording of the driver's face. This is a critical component of data collection; if a SCE occurs (e.g., hard braking, swerving, etc.), it is necessary to observe the driver for signs of drowsiness in comparison to a video of the road. The event may be due to a sleepy driver (i.e., yawning, eyes closed, etc.) or due to a pedestrian or animal entering the roadway. Identifying information concerning these SCEs will not be shared with the driver's carrier.

12. ESTIMATES OF BURDEN HOURS INFORMATION REQUESTED

The online application will be available to all drivers who are interested in participating in the Flexible Sleeper Berth Pilot Program. In order to recruit between 200 and 240 eligible drivers who will be enrolled in the study, an estimated 1,000 drivers will complete the online application. Of the 1,000 drivers estimated to complete the online application, approximately 25 percent (250) will complete the background questionnaire. A maximum of 240 will be enrolled in the study and begin daily data collection. All drivers who enroll in the study will complete the debriefing questionnaire. It is estimated that these drivers will be drawn from approximately 10 carriers. These carriers will bear some burden due to their drivers' participation in the study. It is estimated that one manager from each carrier will be needed to grant permission for drivers to participate via the online carrier application.

The total number of respondents is 1,010 (1,000 drivers + 10 carriers).

The Flexible Sleeper Berth Pilot Program will comprise two categories of burden, one associated with carrier tasks (IC1), the other associated with driver tasks (IC2).

IC1—Carrier Tasks:

It is estimated that the driver sample will be drawn from 10 carriers, each responsible for an average of 22 enrolled drivers.ⁱ Reviewing the study materials and granting permission for drivers to participate via the online carrier application is estimated to take 1 hour per carrier. The estimates of burden hours for the carrier tasks in IC1 are presented below in Table 1.

Table 1. IC1: carrier tasks and burden hours.

Task	Respondents	Responses per Respondent	Burden per Response	Total Burden Hours
Online carrier applications	10	1	1 hour	10
18-month Total*	10	1	–	10
Annual Average	7	1	–	7

* Using continuous enrollment, the research team plans to collect data from a maximum of 60 drivers each, in a maximum of four 90-day cycles (for a total of 18 months).

The total annual number of responses for IC1 is 7. The total annual burden is 7 hours.

It is assumed that first-line supervisors of drivers at carriers will undertake the carrier tasks. Table 2 shows the costs of carrier participation agreements. The mean hourly wage (\$28.41) of First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators for the Truck Transportation industry (NAICS code 484000) is taken from the U.S. Bureau of Labor Statistics (BLS) May 2016 National Industry-Specific Occupational Employment and Wage Estimates.⁽⁶⁾

To arrive at a loaded wage, we first estimated a load factor of 1.421 by dividing the total cost of compensation for private industry workers of the trade, transportation, and utilities industry (\$27.44) by the average cost of hourly wages and salaries (\$19.31) as reported by the BLS in its Employer Costs for Employee Compensation for March 2017 ($\$27.44 \div \$19.31 = 1.421$).⁽⁷⁾ Multiplying the mean hourly wage by the load factor results in a loaded hourly wage of \$40.37 ($\$28.41 \times 1.421 = \40.37).

Table 2. IC1: carrier occupation and wage estimates.

BLS OES Occupation Code	BLS OES Occupation Description	Mean Hourly Wage	Load Factor	Loaded Hourly Wage
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	\$28.41	1.421	\$40.37

ⁱ Of the 240 CMV drivers enrolled in the study, 25 are expected to be owner-operators, thus not be required to complete the online carrier application. The 10 carriers will be responsible for an average of 22 drivers each (240 CMV drivers – 25 owner-operators = 215 drivers; 215 drivers ÷ 10 carriers = 21.5 drivers per carrier).

As shown in Table 3, multiplying the loaded wage figure (\$40.37) by 10 expected respondents, 1 response per respondent, and 1 hour per response, results in a total cost over 18 months of \$404, which averages to \$269 per year. Each carrier respondent will incur a total cost of approximately \$40.37.

Table 3. IC1: carrier burden hours and labor costs.

Task	Loaded Hourly Wage	Respondents	Responses per Respondent	Responses	Hours per Response	Total Labor Cost
Online Carrier Applications	\$40.37	10	1	10	1	\$404
18-month Total	–	–	–	10	–	\$404
Annual Average	–	–	–	7	–	\$269

IC2—Participating Driver Tasks:

Participating driver burden is associated with completing the online application, background questionnaire, daily data collection during the field study period, and debriefing questionnaire. All 1,000 drivers anticipated will spend 15 minutes each completing the online application. An estimated 250 of those 1,000 drivers will each spend an additional 10 minutes completing the background questionnaire, 10 minutes completing the 1099 form, and 10 minutes completing the invoice voucher.

Of those 250 drivers, 240 are expected to start daily data collection during the field study, which is estimated to take a maximum of 30 minutes per day for up to 90 days for a total of 10,800 burden hours, as shown in Table 4. Daily data collection includes PVT-Bs; KSSs; sleep logs before and after each sleep period, including naps; ELD entries; and the caffeine log whenever drivers consume caffeine. Drivers are estimated to spend an average of approximately 3 minutes completing the PVT-Bs 3.5 times per day (total of 10.5 minutes per day); 1 minute completing the KSS 3.5 times per day (total of 3.5 minutes per day); 2 minutes completing the sleep log 3 times per day (total of 6 minutes per day); 1 minute completing ELD entries 6 times per day (total 6 minutes per day); and 1 minute completing the caffeine log 4 times per day (total of 4 minutes per day). Weekly phone briefings are estimated to take 10 minutes per week. The one-time debriefing questionnaire is expected to take approximately 15 minutes to complete. The estimates of burden hours for the participating driver tasks in IC2 are presented below in Table 4.

Table 4. IC2: driver tasks.

Task	Respondents	Responses per Respondent	Annualized Total Responses	Burden per Response	Annualized Total Burden Hours*
Online application	1,000	1	666.67	15 minutes	166.67
Background questionnaire	250	1	166.67	10 minutes	27.8
Form 1099	250	1	166.67	10 minutes	27.8
Washington State Tax Invoice Voucher	250	1	166.67	10 minutes	27.8

Task	Respondents	Responses per Respondent	Annualized Total Responses	Burden per Response	Annualized Total Burden Hours*
Daily Field Study Data Collection: PVT	240	315	50,400	3 minutes	2,520
Daily Field Study Data Collection: KSS	240	315	50,400	1 minute	840
Daily Field Study Data Collection: Sleep Log	240	270	43,200	2 minutes	1,440
Daily Field Study Data Collection: ELD Entry	240	540	86,400	1 minute	1,440
Daily Field Study Data Collection: Caffeine Log	240	360	57,600	1 minute	960
Weekly phone briefings during field study data collection	240	13	2,080	10 minutes	347
Debriefing questionnaire	240	1	160	15 minutes	40
Annualized Total*	–	–	291,407	–	7,837
Study Total**	–	–	437,110	–	11,755

*Total may not equal the sum of previous items due to rounding.

** Using continuous enrollment, the research team plans to collect data from a maximum of 60 drivers each, in a maximum of four 90-day cycles (for a total of 18 months).

The total annual number of responses for IC2 is 291,407. The total annual burden is 7,837 hours. The 750 drivers that complete the online application only will incur a burden of 15 minutes each. The 10 drivers that complete the online application, background questionnaire, Form 1099, and Washington State Tax Invoice Voucher will incur a burden of 45 minutes each. The 240 drivers expected to fully participate in the survey by completing all 11 tasks are expected to incur a burden of approximately 48 hours.

We assume that the impacted driver occupation corresponds to the BLS Occupational Employment Statistics is Heavy and Tractor-Trailer Truck Drivers, which has a mean hourly wage of \$21.38 for the Truck Transportation industry (NAICS code 484000), also from the BLS May 2016 National Industry-Specific Occupational Employment and Wage Estimates.⁽⁸⁾ Using the same load factor (1.421) as for the Carrier Tasks, we arrive at a loaded hourly wage of \$30.38, shown in Table 5 below.

Table 5. IC2: driver task occupation and wage.

BLS OES Occupation Code	BLS OES Occupation Description	Mean Hourly Wage	Load Factor	Loaded Hourly Wage
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$21.38	1.421	\$30.38

The loaded hourly wage for drivers (\$30.38) is applied to each of the driver tasks' expected number of responses and hours per response to arrive at a total cost per task for the eleven tasks. In total, these tasks involve 437,110 responses and cost \$357,117 over 18 months, which are annualized at 291,407 responses and \$238,289, as shown in Table 6.

The 750 drivers that complete the online application only will incur a cost of \$7.60 each. The 10 drivers that partially participate by completing the online application, background questionnaire, Form 1099, and Washington State Tax Invoice Voucher will incur a cost of \$22.79 each. The 240 drivers expected to fully participate in the survey are expected to incur a cost of approximately \$1,463 each.

Table 6. IC2: driver task annualized costs: 53-3032 heavy and tractor-trailer truck drivers: 53-3032 heavy and tractor-trailer truck drivers.

Task	Loaded Hourly Wage	Respondents	Responses per Respondent	Annualized Total Responses	Burden per Response	Annualized Cost per Task
Online Application	\$30.38	1,000	1	666.67	15 minutes	\$5,063
Background Questionnaire	\$30.38	250	1	166.67	10 minutes	\$844
Form 1099	\$30.38	250	1	166.67	10 minutes	\$844
Washington State Tax Invoice Voucher	\$30.38	250	1	166.67	10 minutes	\$844
<i>Daily Field Study Data Collection: PVT</i>	\$30.38	240	315	50,400	3 minutes	\$76,557
<i>Daily Field Study Data Collection: KSS</i>	\$30.38	240	315	50,400	1 minute	\$25,519
<i>Daily Field Study Data Collection: Sleep Log</i>	\$30.38	240	270	43,200	2 minutes	\$43,747
<i>Daily Field Study Data Collection: ELD Entry</i>	\$30.38	240	540	86,400	1 minute	\$43,747
<i>Daily Field Study Data Collection: Caffeine Log</i>	\$30.38	240	360	57,600	1 minute	\$29,165

Task	Loaded Hourly Wage	Respondents	Responses per Respondent	Annualized Total Responses	Burden per Response	Annualized Cost per Task
Weekly phone briefings during field study data collection	\$30.38	240	13	2,080	10 minutes	\$10,743
Debriefing Questionnaire	\$30.38	240	1	160	15 minutes	\$1,215
Annualized Total*	–	–	–	291,407*	–	\$238,289*
Study Total**	–	–	–	437,110**	–	\$357,117**

*Totals may not equal the sum of previous items due to rounding

**The study total (an 18-month period) is equal to 1.5 times the annualized total

Totals for this ICR:

- **Estimated Total Annual Burden Hours:** 7,844 hours
(7 hours for IC1 Carrier Tasks + 7,837 hours for IC2 Driver Tasks).
- **Estimated Total Annual Responses:** 291,414
(7 responses for IC1 + 291,407 responses for IC2).
- **Estimated Total Respondents:** 1,010 respondents
(1,000 drivers + 10 carriers).
- **Estimated Total Annual Burden Costs:** \$238,558 (\$269 for IC1 Carrier Tasks + \$238,289 for IC2 Driver Tasks).

13. ESTIMATES OF TOTAL ANNUAL COSTS TO RESPONDENTS

There are no additional costs to respondents beyond those associated with the hourly burden presented above, which are not to be included in this section.

14. ESTIMATE OF COST TO THE FEDERAL GOVERNMENT

The research design, protocol development, and implementation of the research methods will be completed between FY 2015 and FY 2019. The total cost for the study/contract is \$2,695,100. There is no specific cost to the government for government personnel incurred by this study, as all government personnel are working within their normal position duties. It is estimated that the contracting officer's representative (COR)/project lead will spend an average of 20 percent of their time on this project throughout the period of performance, which is 45 months. Hourly employee compensation for the COR is shown in Table 7.

Table 7. Estimate of hourly employee compensation (Federal Government).ⁱⁱ

Federal Wage Series	Occupation	General Schedule Designation	Hourly Wage	Locality Benefit	Hourly Cost
1529	Mathematical Statistician	13 Step 5	\$40.10	24.78%	\$50.04

The COR will spend approximately 32 hours a month on this project, which is equivalent to 1,440 hours over the 45 months, or 384 annualized hours. This leads to an estimated annualized cost of \$19,215.36 (384 annualized hours x \$50.04 = \$19,215.36) which leads to a total cost of \$72,057.60 over the life of the study (\$19,215.36 annualized x 3.75 years = \$72,057.60).

Table 8. Estimated annualized and total cost of Federal Labor.

Federal Wage Series	Occupation	General Schedule Designation	Yearly Hours Worked	Annualized Cost to Government	Total Cost to Government
1529	Mathematical Statistician	13 Step 5	384	\$19,215.36	\$72,057.60

15. EXPLANATION OF PROGRAM CHANGES OR ADJUSTMENTS

This is a new data information collection.

16. PUBLICATION OF RESULTS OF DATA COLLECTION

The results of this information collection will be documented in a technical report to be delivered to and maintained by FMCSA. In addition, a public-use data set will be produced for the FMCSA Data Repository and FMCSA website, with no driver identifying information included. Identifying information will be made available to qualified researchers through a secure data enclave.

17. APPROVAL FOR NOT DISPLAYING THE EXPIRATION DATE OF OMB APPROVAL

No such approval is being requested.

18. EXCEPTIONS TO THE CERTIFICATION STATEMENT

None.

ⁱⁱ Office of Personnel Management, “2017 General Schedule (GS) Locality Pay Tables,” January 2017. <https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/2017/general-schedule> (accessed January 25, 2017).

ATTACHMENTS

- A. Title 49 U.S.C. § 504 titled, “*Reports and records.*”
- B. Title 49 U.S.C. § 31133 titled, “*General powers of the Secretary of Transportation.*”
- C. Title 49 U.S.C. § 31136 titled, “*United States Government regulations.*”
- D. Title 49 U.S.C. § 31502 titled, “*Requirements for qualification, hours of service, safety, and equipment standards.*”
- E. Title 49 CFR § 1.87 titled, “*Delegation to the Federal Motor Carrier Safety Administrator.*”
- F. Title 49 CFR Part 395 titled, “*Hours of Service of Drivers.*”
- G. Title 49 CFR Part 381.400 titled, “*What is a pilot program?*”
- H. Online Driver Application.
- I. Online Carrier Application.
- J. Background Questionnaire.
- K. 1099 Tax Form.
- L. Washington State University Tax Invoice Voucher.
- M. Weekly Phone Briefing.
- N. Debriefing Questionnaire.
- O. Initial Contact Form.
- P. Driver Information Form.
- Q. 82 FR 29145 titled, “*60-Day Notice of Proposed Information Collection: Flexible Sleeper Berth Pilot Program.*”
- R. 82 FR 26232 titled, “*Hours of Service of Drivers; Pilot Program to Allow Commercial Drivers to Split Sleeper Berth Time.*”
- S. Sample Smart Phone Apps

REFERENCES

¹ Mollicone, D.J., Van Dongen, H.P.A., Dinges, D.F. “Optimizing sleep/wake schedules in space: Sleep during chronic nocturnal sleep restriction with and without diurnal naps.” *Acta Astronautica* 60: 354–361, 2007.

³ Jackson, M.L., Banks, S., Belenky, G. “Investigation of the effectiveness of a split sleep schedule in sustaining sleep and maintaining performance.” *Chronobiology International* 31(10): 1218–1230, 2014.

⁴ Mollicone, et al., 2007.

⁵ Jackson, et al., 2014.

⁶ Bureau of Labor Statistics, U.S. Department of Labor, May 2016 National Industry-Specific Occupational Employment and Wage Estimates for NAICS 484000 - Truck Transportation, accessed July 19, 2017.

⁷ Bureau of Labor Statistics, U.S. Department of Labor, Employer Costs for Employee Compensation – March 2017, Table 10. Private industry, by industry group, accessed July 19, 2017.

⁸ Bureau of Labor Statistics, U.S. Department of Labor, May 2016 National Industry-Specific Occupational Employment and Wage Estimates for NAICS 484000 - Truck Transportation, accessed July 26, 2017.