Department of Transportation
Office of the Chief Information Officer

Supporting Statement
Commercial Motor Vehicle Driver Risk Factor Study

Part A. Justification

This is to request the Office of management and Budget's (OMB) review and approval of the new information collection entitled "Commercial Motor Vehicle Driver Risk Factor Study," OMB Control Number 2126-xxxx.

1. CIRCUMSTANCES THAT MAKE COLLECTION OF INFORMATION NECESSARY

Contributing factors to motor vehicle crashes are classified as human, vehicle, or roadway/environmental. Of these three causal factor types, crash causation studies of large-truck crashes and traffic crashes in general have consistently found that human causes predominate (e.g., Treat et al., 1979; Craft & Blower, 2004). Driver errors may be performance-related (e.g., recognition of and reaction to threats) or choice behavior-related (e.g., speed and headway selection). In the case of driver fatigue and medical conditions, the critical deficiency may be lack of alertness.

A complete concept of commercial driver and vehicle crash involvement involves many different interacting factors. At any given time, commercial driver crash risk is affected by personal situational risk factors (e.g., previous night's sleep), personal constitutional risk factors (e.g., aggressive personality), vehicle risk factors (e.g., tire condition), environmental factors (e.g., weather), and, of course, risks created by other drivers and traffic.

A fundamental question regarding human factors in commercial vehicle safety is the extent to which certain drivers are chronically at greater risk because of relatively enduring personal traits such as demographic factors (e.g., gender), personality factors (e.g., aggressiveness or risk-taking), performance abilities (e.g., attention, dynamic vision), or medical conditions (e.g., sleep apnea). These persistent personal traits may interact with other human, vehicle, and environmental factors to produce a differential effect on the occurrence of crashes and other negative events on the road.

In a Federal Motor Carrier Safety Administration (FMCSA)-funded, Transportation Research Board (TRB)-sponsored synthesis study of differential driver risk and "high-risk" commercial drivers, Knipling et al. (2004) presented survey results and statistical findings from a number of studies supporting the view that commercial drivers vary greatly in their levels of crash risk, and that a relatively small percentage of drivers (perhaps 10 to 15 percent) account for a disproportionate percentage of total fleet risk

(perhaps 30 to 50 percent). Moreover, the findings of this report and related analyses (e.g., Knipling 2005a, b) strongly imply relative driver risk (both general and related to specific factors like fatigue) endures across long periods of time. In other words, "risk" is to some extent a long-term personal trait, in addition to being obviously related to specific situations and conditions. A pressing research need is to verify the significance and stability over time of safety-significant personal traits, and to quantify and otherwise characterize their specific relation to crash risk.

The FMCSA has a critical need to identify risk factors associated with the personal characteristics of drivers in order to design countermeasures to reduce commercial truck accidents and improve the driving performance of those identified to be at risk. To meet this need, the FMCSA has outlined the Commercial Motor Vehicle Driver Risk Factor Study, which is a major research effort to relate detailed driver characteristics to driving records.

Because this research will break new ground, the FMCSA has determined that a robust pilot study (described herein) should be performed with a smaller sample of subjects prior to the full study envisioned. As a result, the FMCSA and its chosen research team will be able to provide preliminary results on driver risk factors, as well as select the most productive methods to perform the full study.

The Secretary of Transportation's (Secretary) authority to conduct studies pertaining to commercial motor vehicle 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).

This information collection supports the DOT Strategic Goal of Safety.

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

One objective of the Commercial Motor Vehicle Driver Risk Factor Study is to identify, verify, quantify, and prioritize commercial motor vehicle driver risk factors. Primarily, these are personal factors such as demographic characteristics, medical conditions, personality traits, attitudes, personal distress, and performance capabilities. Risk factors may also include work environmental conditions, such as carrier operations type and compensation method. The study will identify risk factors by linking the characteristics of individual drivers with their driving histories, especially the presence or absence of crashes or inspection violations. Data collection on driver characteristics will involve five methods: 1) a telephone interview; 2) a paper/web-based questionnaire; 3) an in-person interview; 4) psychological and perceptual testing; and 5) a medical examination. All respondents participating in this study will complete the first two levels of information collection (i.e., telephone and paper/web-based questionnaire). Only a sub-sample (12% of the full sample; n=72) will complete the in-person interview, psychological and perceptual testing, and medical examination.

The second objective of the study is to pilot the methods and procedures used to collect the data to determine whether these methods will be suitable for scaling up to the full study, which is about 10 times as large as the pilot (Note: This request for OMB clearance pertains only to the pilot study). Therefore, this study includes some variation in the methods used to collect the data to gauge the extent to which these methods affect the response rates for our instruments and for individual items.

This study affords a unique opportunity to examine a wide array of driver and situational safety factors and to determine the prevalence of these factors and increased or decreased crash and incident risk associated with them. The major analysis paradigm of the study is "frequency risk". Project data will measure the frequency, incidence, magnitude, and/or range of each safety factor examined and then compare the baseline incidence of the factor to the frequency and incidence associated with crashes or other measures of risk. Extreme groups (e.g., drivers with no crashes versus drivers with one or more at-fault crashes) will be examined to maximize contrast between groups and thus associations with correlating factors. The comparison of cases (crash-involved drivers) to controls (no crash involvement) will permit the derivation of odds ratios and other statistics quantifying the risk associated with various driver factors. Not only will the risk associated with individual factors be determined; assessments of individual risk factors will be combined into a multiple-factor "best prediction" of increased risk. The risk predictions, whether based on single or multiple combined factors, have important, near-term applications to improving motor carrier safety management.

The study is divided into three phases:

- In **Phase 1**, we will analyze existing data (e.g., MCMIS, SafeStat; described below) to define and identify two extreme outcome groups of drivers, define and identify extreme groups of carriers, and perform a top-level analysis of available data on antecedent variables.
- In **Phase 2**, we will survey 600 drivers, selected based on analyses of carriers and drivers from the Phase 1 data set. We will collect additional data from the carriers employing the drivers. The survey content will augment Phase 1 by gathering information on driver characteristics that is not present in any national database.
- **Phase 3** will include in-person interviews, psychological and perceptual testing, and a medical examination of a subset of 72 drivers from Phase 2. The interview and exam will provide information about the physical and psychological risk factors for drivers.

3. EXTENT OF AUTOMATED INFORMATION COLLECTION

In Phase 2, one of the study questionnaires will be available in both paper and electronic form. This is a brief (30 minute) questionnaire which addresses personality, attitudes, and job satisfaction. We plan to offer the questionnaire in both paper and electronic form to give respondents the choice if they have a preference. We anticipate giving respondents a choice will increase our response rate. In addition, the electronic version will save some time related to returning the questionnaire, as well as postage costs which would accompany the return of the paper version to the researchers. However, we expect less than 10% of the questionnaire responses to be completed online/electronically.

All of the Phase 2 questionnaire items include check boxes and multiple-choice responses. The electronic version will be located on a secure website hosted by the Virginia Tech Transportation Institute (VTTI). Respondents who prefer the electronic version will be given a username and password to access the website so only those invited to respond may access it. Responses will automatically be directed to a secure database, thus saving person-hours with respect to data entry and verification.

Phase 3 will include three computer-based psychological and perceptual tests. The first measures general intelligence, which has been shown to be the most valid predictor of future job performance and learning in a wide variety of job settings. This test is comprised of a series of picture-based test items. By relying on pictures, the test more accurately focuses on fluid intelligence as opposed to reading comprehension. The second test is a set of approximately 80 questions addressing risk-taking, hostility, and distractibility. The third test measures a person's Useful Field of Vision (UFOV), which has been studied extensively as a predictor of driving performance over the past 20 years.

4. EFFORTS TO IDENTIFY DUPLICATION

Previous research has been performed to identify risk factors associated with crash involvement (for reviews see Beirness, 1993; Lancaster & Ward, 2002; Tsuang, Boor, & Fleming, 1985). However, these studies have been limited in scale with respect to the level of detail involved in analyzing risk factors, the number of subjects sampled, and the representativeness of the samples to the commercial vehicle driver population.

The proposed research will investigate a variety of potential individual driver risk factors (demographics, personality, personal distress, physical health, attitudes, job satisfaction, and sleeping differences) to gain a comprehensive understanding of these variables' association with crash risk among a representative sample of commercial motor vehicle drivers.

This research will develop in phases, with each phase informing the next, so that the study will become increasingly in-depth and that variables shown to be most important can further analyzed at each cumulative phase.

5. EFFORTS TO MINIMIZE THE BURDEN ON SMALL BUSINESSES

Commercial vehicle drivers employed by large, national carrier organizations will comprise most of this study's sample. However, it is likely that some owner-operators, or independent drivers, will be contacted. These individuals can be considered small businesses. Respondents will be encouraged to complete the information collection sessions when convenient for them, so as to reduce any work-related time conflicts. In addition, respondents will be compensated for their time.

6. IMPACT OF LESS FREQUENT COLLECTION OF INFORMATION

There are two potential issues if the collection is not conducted. First, if driver factors associated with crash involvement are not identified, then the appropriate steps toward rectifying these issues can not be taken. Crashes and violations will continue to occur which may be potentially preventable. This information collection will help the Federal government understand what driver factors are associated with vehicle crashes and travel violations. The FMCSA will use this information collection to understand how better to develop Federal policies and programs to assist commercial motor vehicle drivers and companies with their safety-related efforts.

Second, the safety goals inherent within the FMCSA are shared by commercial motor vehicle carriers and other organizations which would like to decrease the numbers of crashes and violations on our nation's roadways. This information collection will provide information which will benefit other researchers whose goal is to develop programs to increase transportation safety in public and private sectors.

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 March 23, 2007 (72 FR 13855) (see Attachment F). Two comments were received regarding the utility of the proposed information collection (see Attachment G & H). One of the respondents suggested that more effort should be spent on getting truck drivers to slow down. The Owner-Operator Independent Drivers Association, INC. (OOIDA) recommended that FMCSA consider in its evaluation commercial driver training issues, loading and unloading operations and scheduling pressures as each element may relate to driver risk. The FMCSA will consider these comments during the information collection activities for the study where practical. FMCSA replies to comments are provided at Attachment I.

FMCSA published a notice in the Federal Register on July 20, 2007 (72 FR 39877) (see Attachment J) with a 30-day public comment period that announced this information would be sent to OMB for approval.

9. PAYMENT OR GIFTS TO RESPONDENTS

Respondents will be compensated $20 for completing the initial telephone interview (20 minutes or less to complete), $30 for completing a paper-and-pencil (or online) questionnaire (30 minutes or less to complete), and if applicable, $200 for undergoing an in-person interview, psychological and perceptual testing, and medical examination (3 hours or less to complete; only 12% of the sample will complete this phase).

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

Availability and time burden: Commercial truck drivers are a hard-to-reach group due to irregular schedules and long working hours. Depending on whether a driver is selected for inclusion in the in-person interview, psychological and perceptual testing and medical examination phase of this study (N=72), the data collection requests between 50 minutes (telephone interview and paper/online questionnaire only) and nearly 4 hours (if all 4 information collection methods are completed) of their time, thus, compensation seems justified by this burden. In addition, this study requests that respondents provide personal information. 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 of respondents, each of whom is important to the achievement of the study goals. For example, the same subjects will be asked to complete a telephone interview, a written questionnaire, and perhaps an in-person interview, psychological and perceptual testing, and medical examination (12% of the sample). The medical examination is an invasive activity that will require substantial incentives to ensure sufficient respondent cooperation. Compensation may substantially reduce attrition as the research goals are met.

Past experience: Several of the research team members have extensive experience conducting research with commercial motor vehicle drivers (e.g., Hanowski et al., 2005; Knipling, Hickman, Hanowski, & Blanco, 2005). Past experience has revealed it is difficult to obtain a reasonable number of participants for studies with this population without providing adequate monetary compensation. Past experience supports the notion that drivers will participate if they feel they are being provided with sufficient compensation.

10. ASSURANCES OF CONFIDENTIALITY

All information collected will be kept strictly confidential. Respondents' identifying information will not be included on study materials and provided confidentiality to the extent allowed by the Privacy Act of 1974. A unique study code will be developed for each participant so as to link their responses for the telephone interview, paper/online questionnaire, in-person interview, psychological and perceptual testing, and medical examination. A link between the respondents' study code and identifying information is needed to track participation and compensate respondents. This link will be stored separately in an electronic file on a password protected, firewalled computer at VTTI. Once an individual is finished with the project (by completing the information collection

instruments or withdrawing), their compensation will be mailed to them, and their personal information will be deleted from the tracking file.

11. JUSTIFICATION FOR COLLECTION OF SENSITIVE INFORMATION

While the information collection will not include questions about sexual behavior/attitudes or religious beliefs, there will be questionnaire items designed to assess personality, which one may consider sensitive information. For example, questions ask respondents to rate their perceptions of their emotional stability and their comfort level interacting with others. These questions are no more sensitive than those normally posed by psychological measures.

As personality is one of the primary individual differences being assessed by this research, asking questions about one's perceptions of themselves, their emotions, thoughts, and behaviors are necessary to meet the research goals.

12. ESTIMATES OF BURDEN HOURS INFORMATION REQUESTED

A total of 600 respondents will be contacted for the Phase 2 telephone interview and paper/online questionnaire portions of this information collection. Of these individuals, 72 (12%) will also be asked to participate in Phase 3 by completing an in-person interview, psychological and perceptual testing, and a medical examination. The estimates of burden hours for each are listed below in Table 1. In addition, motor vehicle carriers will be asked to provide driving records for those drivers who agree to participate. Time estimates for hours spent pulling and delivering driving records to the researchers are also provided below.

Table 1: Estimated Burden Hours for Information Collection

Task	Estimated Burden per Respondent	Number of Respondents	Total Burden Hours
Carriers Agreeing to Participate, Providing List of Drivers, and Announcing Study to Drivers	2 hours	~100 carriers	200
Carrier Non-Response or Declining Participation	30 minutes	~100 carriers	50
Driver Non-Response or Declining Participation	5 minutes	600	50
Telephone Interview	20 minutes	600 drivers	200
Paper/Online Questionnaire	30 minutes	600 drivers	300
In-Person Interview, psychological and	4 hours	72 drivers	288

perceptual testing, & Medical Examination			
Carriers locating and delivering respondents' driving records of 72 drivers	30 minutes per driver	~20 carriers providing info on 72 drivers	36

Estimated Total Annual Burden Hours to Respondents: 1,124 hours [100 participating carriers x 2 hours to provide information to researchers + 100 non-response carriers x 30 minutes/60 minutes + 600 non-response CMV drivers x 5 minutes/60 minutes + 600 CMV driver telephone interviews x 20 minutes/60 minutes + 600 CMV driver paper/online questionnaires x 30 minutes/60 minutes + 72 in-person interviews, psychological and perceptual testing, and medical examinations x 4 hours + 20 carriers locating and delivering 72 drivers' driving records x 30 minutes per driver/60 minutes = 1,124 hours]. As the number of carriers to be contacted has yet to be determined, we estimate carrier burden (i.e., time spent pulling and delivering individual driving records) on a per driver basis. We estimate it will take carrier personnel 30 minutes or less to locate and deliver an individual driver's driving record to the researchers, totaling 36 hours for 72 drivers.

Estimated Number of Respondents: 700 respondents [(600 CMV drivers completing telephone interviews and paper/online questionnaires + 72 of the 600 CMV drivers completing in-person interviews, psychological and perceptual testing, and medical examinations) + 100 motor carriers providing driving records = 700].

13. ESTIMATES OF TOTAL ANNUAL COSTS TO RESPONDENTS

As noted above, truck driver respondents will be compensated for their time. Thus, there are no costs to these respondents. However, there will be costs to participating carrier operations, which will provide the researchers with information on their employed drivers. These costs, along with non-respondent costs, are estimated below.

Estimated Total Annual Cost to Respondents: $12,045.56

<u>Cost to Carriers (Recruitment and Provision of Driver Contact Information)</u>: Carrier Safety Directors will be contacted for recruitment purposes, and will provide driver information to the researchers if the carrier agrees to participate. Based on the time burden estimates above, the cost estimate for Safety Directors is $11,390.00 [100 participating carriers x 2 hours X $45.56 per hour + 100 non-response carriers x 30 minutes/60 minutes x $45.56 per hour = $11,390.00].

Cost to Carriers (Time to Provide Driver Information on 72 Drivers who will participate in in-person interviews, psychological testing, and medical interviews): Carrier Administrative Assistants will locate and deliver to the researchers driving records of 72 drivers who will complete the in-person interview and medical examination portion of the information collection. Based on the time burden estimates above, the cost estimate for Carrier Administrative Assistants is $655.56 [72 driving records x 30 minutes per record/60 minutes x $18.21 per hour = $655.56].

Thus, the total estimated cost to carrier respondents is $11,390 + $655.56 = $12,045.56

Note: $45.56 per hour for Carrier Safety Director and $18.21 per hour for Carrier Administrative Assistant pay is based on the 2006 median annual salary for these positions in Washington, DC (obtained October 2, 2006 from http://aolsvc.salary.aol.com/).

14. ESTIMATE OF COST TO THE FEDERAL GOVERNMENT

The research design and questionnaire/examination development occurred in FY 2006 and implementation of the research methods will be completed in FY 2007. FMCSA has contracted with Booz Allen Hamilton, Inc. for this study and the total cost for the contract is $672,051.

15. EXPLANATION OF PROGRAM CHANGES OR ADJUSTMENTS

This new data information collection will result in a program change of 1,124 annual burden hours.

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. The project timeline is included in Appendix B.

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

No such approval is being requested.

18. EXCEPTIONS TO THE CERTIFICATION STATEMENT

None.

Attachments

A. 49 U.S.C. 504, Reports and records, June 9, 1998.
B. 49 U.S.C. 31133, General powers of the Secretary of Transportation, June 9, 1998.
C. 49 U.S.C. 31136, United States Government regulations, January 7, 2003.
D. 49 U.S.C. 31502, Requirements for qualifications, hours of service, and equipment standards, June 9, 1998.
E. 49 CFR 1.73, Delegation to the Administrator of the Federal Motor Carrier Safety Administration, October 3, 1997.
F. 60-day comments request Federal Register notice (72 FR 13855), March 23, 2007.
G. Comments 1 to 60-day Federal Register notice.
H. Comment 2 to 60-day Federal Register notice.
I. FMCSA replies to comments.
J. 30-day comments request Federal Register notice (72 FR 39877), July 20, 2007.

Information Collection Instruments