Department of Transportation
Federal Motor Carrier Safety Administration

SUPPORTING STATEMENT – Part B

Safe Driver Apprenticeship Pilot Program
OMB Control No. 2126-0075

INTRODUCTION

In accordance with the Paperwork Reduction Act (PRA) of 1995, the Federal Motor Carrier Safety Administration (FMCSA) is requesting the Office of Management and Budget (OMB) grant a 3-year full clearance for the information collection entitled Safe Driver Apprenticeship Pilot Program, Control Number 2126-0075. The collection of information is associated with the Infrastructure Investment and Jobs Act (IIJA) Section 23022 requirement to provide Congress a recommendation regarding whether the level of safety achieved by the Safe Driver Apprenticeship Pilot (SDAP) program is equivalent to, or greater than, the level of safety for equivalent commercial motor vehicle drivers aged 21 years or older.

Part B. Collections of Information Employing Statistical Methods

1. DESCRIBE POTENTIAL RESPONDENT UNIVERSE AND ANY SAMPLING SELECTION METHOD TO BE USED.

The potential respondent universe for the Safe Driver Apprenticeship Pilot (SDAP) program consists of motor carriers and 18- to 20-year-old commercial motor vehicle (CMV) operators with valid commercial driver's licenses (CDLs). From this population, the SDAP program will sample data on approximately 4,800 apprentices (18- to 20- year-old CMV operators with valid CDLs) employed by approximately 1,000 motor carriers over a 3-year period.

Section 23022 of the Infrastructure Investment and Jobs Act (IIJA) limits participation to 3,000 apprentices in the SDAP program at any given time. FMCSA is estimating that 15% of drivers will choose to leave the SDAP program, leave the carrier, or be removed from the program and that an additional 5% of drivers will age out of the SDAP program every year. Therefore, FMCSA is estimating 600 drivers per year will participate in addition to the initial 3,000 drivers approved for participation. Additional carriers and apprentices will be recruited to compensate for turnover to maintain the sample populations.

There are approximately 4.0 million interstate CMV drivers in the United States.[1] Regarding intrastate drivers, the Bureau of Labor Statistics estimates that there are about 15,000 persons between the ages of 16 and 19 employed in the truck transportation industry sector, who are limited by Federal law to intrastate commerce.[2] Given that the

[1] Federal Motor Carrier Safety Administration (FMCSA). (2020). 2020 Pocket Guide to Large Truck and Bus Statistics. Retrieved from: https://www.fmcsa.dot.gov/safety/data-and-statistics/commercial-motor-vehicle-facts
[2] U.S. Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, Household Data Annual Averages, 18b. Employed persons by detailed industry and age, 2021. Retrieved from:

majority of States require a person to be at least 18 years old to operate a CMV, and drivers must be 21 or older to operate in interstate commerce, the majority of the operators in this category are likely to be 18, 19, or 20 year-old drivers who operate intrastate, but because the labor category is expressed across ages 16 through 19, there is no estimate of how many intrastate drivers are exactly 18, 19 or 20 years old.

Regarding experienced drivers, a group required but not studied under the SDAP program, the Bureau of Labor Statistics estimates that there are about 1,584,000 interstate CMV drivers aged 26 years or older.

The SDAP program will not allow the participation of any apprentice driver who would be required to operate under an FMCSA exemption other than the one granted for this SDAP program, medical or otherwise. FMCSA allows some drivers to operate in interstate commerce under various exemption programs—most commonly diabetes, vision, and hearing.

2. DESCRIBE PROCEDURES FOR COLLECTING INFORMATION, INCLUDING STATISTICAL METHODOLOGY FOR STRATIFICATION AND SAMPLE SELECTION, ESTIMATION PROCEDURES, DEGREE OF ACCURACY NEEDED, AND LESS THAN ANNUAL PERIODIC DATA CYCLES.

The hypotheses associated with studying driving performances of the apprentice drivers can be stated as:

Null hypothesis 1 (H_0): Apprentice drivers 18-20 years old operating a CMV in interstate commerce will exhibit a safety level greater than or equal to safety levels shown by non-apprentice drivers operating in interstate commerce.

Alternative hypothesis (H_1): Apprentice drivers 18-20 years old operating CMVs in interstate commerce will exhibit a level of less than safety levels shown by non-apprentice drivers operating in interstate commerce.

Additionally, within-subject analyses will be conducted to compare each apprentices' own performance prior to, during, and after each probationary period, and to compare the performance among the entire sample of apprentices as well.

The hypothesis test associated with this study will contain two steps. First, statistical testing will be done utilizing a Poisson Regression to determine differences between the two groups at a time, namely comparing apprentice drivers to non-apprentice CMV interstate drivers. This analysis will be done by considering the crash rate per 100,000 miles for the two groups as the primary dependent variable in the analysis, though the analysis will also examine other safety outcomes as dependent variables. For this study, given the expectation of thousands of drivers participating over a 3-year period, FMCSA has determined there should be no concern with utilizing crash rate and vehicle miles traveled (VMT) as the primary variables for analysis. Using the crash rates published in FMCSA's 2021 Pocket Guide to Large Truck and Bus Statistics[3], we can extrapolate the

https://www.bls.gov/cps/cpsaat18b.htm .

[3] https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2021-12/FMCSA%20Pocket%20Guide

number of crashes we anticipate occurring during a study of this magnitude. If we expect each driver to operate an average of 100,000 miles per year, then assuming 3,000 apprentices operating 100,000 miles per year over a 3-year period, we can expect to collect approximately one billion miles of data on these drivers. Table 1 shows the amount of crash data expected based on various VMT totals between one million and one billion miles. As evidenced, the expected number of crashes begins significantly increasing around 50,000,000 miles and there should be significant amounts of data to analyze independent of safety events.

Table 1. Expected number of crashes based on total VMT collected.

Total VMT	Expected Number of Property Damage Only Crashes (Crash Rate per 100 million VMT = 130.6)	Expected Number of Injury Crashes (Crash Rate per 100 million VMT = 38.0)	Expected Number of Fatal Crashes (Crash Rate per 100 million VMT = 1.5)
1,000,000	1	0	0
5,000,000	7	2	0
10,000,000	13	4	0
50,000,000	65	19	1
100,000,000	131	38	2
500,000,000	653	190	7
1,000,000,000	1,306	380	15

Examples of other variables to analyze include incidence of driving violations, inspection violations per 100,000 miles, inspection violations per total number of inspections, and safety events (SEs) such as hard braking or sudden lane changes, as available from onboard monitoring systems (OBMS) and electronic logging device (ELD) logs.

After the statistical testing is completed, the analysis and supporting data, as required by the Infrastructure Investment and Jobs Act, will complete a report to Congress and a public-facing account of the SDAP program and its finding.

Information Collection Tools

The information collected will provide data on driver safety outcomes, driver activity, and driver and motor carrier demographics. For the SDAP program, each group's crash rates per 100,000 miles, incidence of safety critical events, incidence of moving violations, and other safety-relevant markers will be examined relative to activity and demographic correlates that have been documented in scientific literature.

Carriers will submit information on driver activity, crashes, and other safety outcomes on a monthly basis. All data will be submitted electronically. Driving and safety data will be derived from OBMSs, and electronic logging devices (ELDs). Additional required data submission will summarize the number of crashes, moving violations, the total number of

%20to%20Large%20Truck%20and%20Bus%20Statistics%202021.pdf roadside inspection violations, the total number of inspections, and the total number of motorist incident reports (complaints filed against participating drivers by other motorists using the toll-free phone number on a driver's CMV) for each apprentice driver during the reporting period. In the event of a crash, motor carriers will also submit the findings of their post-crash investigations and post-crash drug and alcohol tests, as required by the Federal Motor Carrier Safety Regulations, as well as the investigation report from the investigating law enforcement agency.

OBMSs with forward (roadway-facing) cameras will be required for carriers participating in this study. Inward (driver-facing) cameras are optional, and motor carriers will be asked whether they are using this technology and given the option to provide data from these systems if they are choosing to use them. The project team will be asking carriers to submit both OBMS summary data and ELD logs for additional data points. This will allow identification of SEs, such as instances of hard braking, rollover stability activation, and excessive speed relative to the posted speed limit. While the research team may request to view video data in unique circumstances when required, motor carriers will only be required to submit a summary of the SEs for each month, including participating driver ID, date, time, and description of event for each SE.

These logs will also include VMT, time of day when driving, and trip lengths. VMT is essential for analyzing driving safety records, as it informs each driver's level of exposure to potential poor safety outcomes. Trip-level information for the participating drivers will allow the project team to categorize driver activity by time of day and day of week, and to measure the number of hours since an individual driver's last break. These types of variables have been documented in the scientific literature as correlative to safety outcomes (Campbell, 1991).

Demographic data on motor carriers will be collected via application forms to participate in the study. Carrier demographic information includes company contact information (i.e., motor carrier name, motor carrier [MC] and/or U.S. Department of Transportation [DOT] number, place of business address, and phone number) and information on the scope and scale of their operations. This includes whether they operate interstate or intrastate (or both), their fleet size, the number of drivers they employ, and how many of those drivers could be employed for the apprentice driver group and the experienced driver group. Participating drivers will be required to fill out a background information form that contains demographic data (e.g., gender, years of experience operating heavy vehicles, etc.) that could be correlative to safety outcomes.

Information Collection Procedures

The plan for data collection is to recruit motor carriers to participate in the study who would then identify and employ apprentice drivers. A participating carrier must provide at least one apprentice driver and one experienced driver. The maximum study size would include 3,000 apprentice drivers and a pool of approximately 6,000 experienced drivers available for new apprentices to be paired with. These drivers will operate under an estimated maximum of 1,000 participating motor carriers.

The information collection will take place over three steps:

1. Motor carriers wishing to participate in the SDAP program will submit a completed application to the contracted research team, who will send these applications to FMCSA for final approval.
2. Motor carriers will collect driver background information forms and signed informed consent forms for all participating drivers and send these (electronically) to the contracted research team.
3. Each carrier's point of contact will submit the required data for each apprentice driver on a monthly basis through the secure file-transfer site.

The specific data items that will be collected are described in Table 2.

Table 2. Driver activity data to be collected monthly.

Data Item	Description
Vehicle Miles Traveled	The number of miles driven, per driver, during the reporting period.
All Crashes	The total number of crashes, per driver, that occurred during the reporting period. This includes non-reportable crashes that were property-damage only crashes and where the vehicle did not need to be towed.
FMCSA Reportable Crashes	The total number of FMCSA-reportable crashes, per driver, that occurred during the reporting period.
Carrier Post-Crash Investigation Summary	Post-crash reports that provide more detailed crash information (e.g., date, time, location, conditions, etc.) as well as driver information, such as the number of hours since the driver's last break.
Roadside Inspection Violations	The total number of inspection violations (including hours of service, unsecured load, etc.) per driver, recorded with corresponding Compliance, Safety, Accountability (CSA) points accrued during the reporting period.
Moving Violations	The total number of driving violations (e.g., speeding, illegal lane changes, etc.) per driver during the reporting period.
Motorist Incident Reports	The total number, per driver, of complaint calls from motorists during the reporting period.
Time of Day	The proportion of vehicle miles traveled during the daytime and the nighttime, per driver.
Day of Week	The proportion of vehicle miles traveled by day of the week, per driver.
Hours Since Last Break	The number of hours between break periods, per driver, during the reporting period.
Truck Type	The proportion of vehicle miles traveled by truck type, per driver.
OBMS or ECM Safety Events Recorded	The total number and type of safety events, per driver, as recorded by drivers' OBMS or ECM recording equipment during the reporting period (e.g., hard braking events, rollover stability activation, excessive speed relative to the posted speed limit, near crash events).

Analysis Methodology

In past transportation safety studies, regression models such as the Poisson or Negative Binomial have been utilized (Washington et al., 2011). These approaches allow researchers to properly model data (non-negative integers), which is the typical form of driver-level safety data, while controlling for the bias that can result from having a dependent variable with a large proportion of observations equal to zero. As previously mentioned, crashes are relatively rare events which results in several zero observations in statistical analyses of crash data. Therefore, analysis will be done comparing two groups at a time utilizing a Poisson regression model.

The IIJA requires a comparison between the apprentice drivers and current CMV drivers. Poisson regression models will be used for this comparison.

In summary, multiple poisson regression models will be looked at to test the following hypothesis ("Hypothesis Test 1"):

$H_0: \lambda_2 - \lambda_1 \leq 0$

$H_1: \lambda_2 - \lambda_1 > 0$,

where λ_2 represents the average crash rate of apprentice drivers, while λ_1 represents the average crash rate of a comparison group of currently eligible CMV drivers for the hypothesis test. Similar tests will be applied to the other comparisons of interest described above.

In general, the appropriateness of these or any other models will be determined based on the actual data collected and checking the models' results for any violations of the statistical assumptions on which they are premised. Thus, the evaluation will be dictated by the actual data collected given the unknown factors surrounding the data collection, such as the number of drivers that will participate, the number of drivers that will transition out of the SDAP program, and carriers' abilities to provide information on safety outcomes and driver activity.

Accuracy and Confidence

The accuracy and strength of all analyses will be contingent on the size of the apprentice driver sample. The functional control groups for analyses are the entire non-apprentice interstate CMV driver population. Data on the safety performance of this group—notably crash rates—are well-documented.

3. DESCRIBE METHODS TO MAXIMIZE RESPONSE RATE AND TO DEAL WITH THE ISSUES OF NON-RESPONSE.

To increase the level of participation in the SDAP program, the project team will conduct outreach to motor carriers. During the SDAP program, if a carrier is not submitting the monthly data reports in a timely manner, the research team will reach out to the carrier to remedy the situation by ensuring the carrier understands how and when to submit the data (as well as what data to submit). If no data are submitted, FMCSA will be immediately notified. If this should continue for a second month, FMCSA will reach out to the carrier and attempt to work with the carrier to obtain the data. If a carrier fails to submit information for a third month, they will be removed from the SDAP program. The research team will work throughout the month to ensure the data sets received are complete and accurate. If necessary, carriers may be asked to submit additional information or clarifying information in the next month's data delivery.

4. DESCRIBE TESTS OF PROCEDURES OR METHODS TO BE UNDERTAKEN.

There are no planned tests of procedures or methods.

5. PROVIDE NAME AND TELEPHONE NUMBER OF INDIVIDUALS WHO WERE CONSULTED ON STATISTICAL ASPECTS OF THE INFORMATION COLLECTION AND WHO WILL ACTUALLY COLLECT AND/OR ANALYZE THE INFORMATION.

FMCSA is sponsoring this information collection. The FMCSA point of contact is:

Nicole Michel
1200 New Jersey Avenue, SE
Washington, D.C. 20590
202-366-4354
nicole.michel@dot.gov

6. REFERENCES

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