

Supporting Statement: Section B

Reducing the Illegal Passing of School Buses.

Background

The National Highway Traffic Safety Administration (NHTSA) is conducting a research study on the illegal passing of stopped school buses. This highly dangerous and anti-social driving behavior occurs frequently all across the country with over 17 million illegal passes estimated to have occurred during the 2018-2019 school year.¹ When a child boarding or disembarking a school bus is struck by a passing vehicle, the result is often serious injury or death. Even though every State has a law requiring drivers to stop for a stopped school bus displaying flashing red lights, violations abound. Little is known about why drivers violate the laws in spite of their universality and, more specifically, about the extent of driver knowledge of school bus passing laws.

The most recent in-depth study on the issue of illegal passing of school buses was performed over 20 years ago at the University of South Florida's Center for Urban Transportation Research (CUTR).² This single-State study found that even in the most common roadway conditions in which a driver encounters a stopped school bus (2-lane undivided roadway), 14% of drivers were still unaware that the law required them to stop when the school bus displayed red lights and extended its stop-arm. To support its safety mission and guide the development of appropriate interventions, NHTSA needs to collect current and accurate information on driver knowledge of and attitudes towards school bus passing laws.

The current study consists of two surveys that are designed to collect data to support NHTSA's effort to reduce illegal passing of school buses. The first involves a nationally representative survey of drivers to assess their knowledge and attitudes related to the passing of stopped school buses. The second involves a field study in two communities to examine the effectiveness of a high visibility enforcement approach that includes the use of automated cameras on the school bus. The study sites will be cities or counties of approximately 100,000 to 300,000 population served by no more than two law enforcement agencies. They will have existing State or local laws that permit the use of camera enforcement of school bus passing violations by sending a citation to the registered owner of the violating vehicle. The field study will also involve a review of violation rates that does not involve any contact with the public. The study's survey data collection in the test communities before and after program implementation will examine awareness of the enforcement program, driver knowledge of and attitudes towards school bus passing laws, and self-reported behavior when encountering a school bus.

In summary, this study seeks to fill a gap in the state of knowledge concerning the illegal passing of stopped school buses. NHTSA will use the information to produce a technical report that will present summary statistics and tables. No identifying information is being collected, and no

¹ National Association of State Directors of Pupil Transportation Services. (2019). *2019 Survey on Illegal Passing of School Buses*. NASDPTS.

² Baltes, M. R. (1998). Measuring Motorist Comprehension of Florida's School Bus Stop Law and School Bus Signalization Devices. *Transportation Research Record: Journal of the Transportation Research Board*, 1640(1), 10-16.

individual responses will be reported. The results of this research will assist NHTSA in better understanding how to develop successful programs to reduce illegal passing of school buses. The technical report will be distributed to a variety of audiences interested in improving highway safety.

B.1. Describe the potential respondent universe and any sampling or other respondent selection to be used.

Sample Acquisition

Study 1: National Survey. The potential respondent universe includes all current drivers 18 years of age and older who speak English and are enrolled in NORC’s AmeriSpeak panel.³ AmeriSpeak is a large probability-based sample of the U.S. population recruited from the application of NORC’s National Frame. The National Frame is an area probability sample constructed using a two-stage probability sample design.⁴ The National Frame contains almost 3 million households, including over 80,000 rural households not available from the U.S. Postal Service Delivery Sequence File but identified by direct listing by NORC field staff. The National Frame involves addresses in almost every state. For the states that are not included in the National Frame, AmeriSpeak selected an address-based sample (ABS) in 2016 through 2018 from the USPS DSF to assure AmeriSpeak sample representation for all US States and Washington, DC.

The AmeriSpeak panel is recruited from the National Frame of addresses using probability-based sampling in conjunction with mail, telephone, and in-person contacts using face-to-face recruitment. Once panel households are recruited, rigorous methods are employed to maximize survey response rates and maintain cooperation of participants. NORC has formally documented the response rate calculation.⁵

Table 1 presents the key features of how respondents of the national survey will be recruited. Samples for any subgroup (e.g., English-speaking drivers 18+ years of age) are selected using unbiased methods, and weights are calculated using the specific sample design for the study in conjunction with the probability-based AmeriSpeak panel weights. An unbiased stratified sampling method will be used to select a representative sample of English-speaking drivers 18+ years of age. The stratified sample of 18+ year old English-speaking drivers will be selected using demographic sampling strata listed in Table 1 to account for expected differential completion rates by demographic subgroups so that the set of panel members with a completed survey is proportionate to the English-speaking adult driver population. If a household has more than one active 18+ year old adult panel member, only one will be randomly selected for the study.

³ NORC at the University of Chicago is an independent research institution that delivers reliable data and rigorous analysis. NORC was founded and incorporated in 1941 as the National Opinion Research Center, and this remains their legal name, although they use the registered name “NORC” as their externally facing, to-do-business (TDB) name.

⁴ NORC at the University of Chicago: 2010 National Sample Frame. Available at: <http://www.norc.org/Research/Projects/Pages/2010-national-sample-frame.aspx>

⁵ Montgomery, R., Dennis, J.M., & Ganesh, N. (2016). Response rate calculation methodology for recruitment of a two-phase probability-based panel: The case of AmeriSpeak [White paper]. Retrieved June 16, 2020 from AmeriSpeak, NORC at the University of Chicago: http://d3qi0qp55mx5f5.cloudfront.net/amerispeak/i/research/WhitePaper_ResponseRateCalculation_AmeriSpeak_2016.pdf

Table 1. Sampling Features of National Survey

Feature	AmeriSpeak National Sample
Target Population	U.S. adults, age 18 or older, who drive and speak English
Sampling Frame	AmeriSpeak Panel using the USPS sample frame enhanced with field listings
Stratification	Panelist age, gender, race/ethnicity, and education within each Census region
Initial Recruitment	Web, phone, mail
Survey Administration	Web
Within-Household Selection	Probability-based selection of one adult per household

Table 2 shows the expected number of completed surveys for major demographic groups based on the distribution of the characteristics in the general adult population provided by the latest population survey.⁶ These values are estimates according to the planned sampling techniques. Actual counts could vary in the final sample.

Table 2. Expected Demographic Distribution and Estimated Completes

Variable	Category	Distribution	Estimated Completes
Age	18-34	29.65%	890
	35-49	24.49%	735
	50+	45.86%	1376
Race/Ethnicity	Non-Hispanic White	63.14%	1894
	All Other	36.86%	1106
Education Level	Some college or less	66.68%	2000
	Bachelor's or Above	33.32%	1000
Gender	Male	48.41%	1452
	Female	51.59%	1548

Study 2: Community Survey. The potential respondent universe for the test community surveys includes all drivers 18 years of age and older who speak English and are driving in the test communities. These drivers will be sampled at locations such as malls, gas stations, motor vehicle licensing offices, or other public venues. The same locations will be used for both data collection waves in each community. Recruitment will involve research staff intercepting a potential respondent, explaining the study and remuneration, and asking the individual to

⁶ U.S. Census Bureau (2019). *National Population by Characteristics: 2010-2019*.

<https://www.census.gov/content/census/en/data/datasets/time-series/demo/popest/2010s-national-detail.html>.

volunteer. Participants will complete an Internet-hosted survey on a computer device provided by the research team.

Sample Size Considerations

Study 1: National Survey. In any study of this type, it is critical to minimize margin of error (MOE) to ensure the survey results reflect the true knowledge and opinions of the population. MOEs at 90%, 95%, and 99% confidence levels were calculated with the constants of population parameter = 0.5, standard deviation = 0.5, DEFF = 2 and sample size varied from 1,000 to 4,000. Table 2 summarizes the expected MOEs under these conditions. As shown in the table, the proposed sample size of 3,000 will result in an MOE of $\pm 2.5\%$ at a 95% confidence level.

Table 1. \pm Margin of Error for Various Samples Sizes and Confidence Levels

Confidence	Sample Size			
	1000	2000	3000	4000
90%	3.7	2.6	2.1	1.8
95%	4.4	3.1	2.5	2.2
99%	5.8	4.1	3.3	2.9

Study 2: Community Survey. The study expects to utilize Chi-Square Statistical Tests to determine if the proportion of responses among independent samples changed in the test community from before to after the enforcement program. A power analysis for the goodness-of-fit-test was conducted with $df = 1$ and $\alpha = .05$ held constant. Table 3 provides the number of respondents needed to detect a given effect size with power set at .80 or .90. As shown in the table, the proposed sample size of 300 per wave (600 total across both waves) for the intervention site will be sufficient to detect relatively small effect sizes at both .80 and .90 power levels.

Table 3. Total Sample Size Required to Detect Effect Sizes at .80 or .90 Power

Power ($1 - \beta$)	Effect Size (w)				
	0.1	0.2	0.3	0.4	0.5
0.80	785	197	88	50	32
0.90	1,051	263	117	66	43

Statistical Analysis Plan

Study 1: National Survey. The primary objective of the national survey is to obtain a nationally representative estimate of correct knowledge of laws related to passing of stopped school buses for English-speaking drivers, 18+ years of age. To maintain representativeness of the target population, various stages of sample design and weighting adjustments are required to derive the final survey weights. The national sample weights will reflect the following design features from both the AmeriSpeak Panel and application of weighting adjustments:

- Probability of selection of the housing unit in the Panel,
- Adjustments for unknown eligibility of the housing unit in the Panel,
- Nonresponse associated with Panel recruitment,
- Panel attrition,
- Nonresponse from eligible adults in households where at least one adult was recruited,
- Probability of selection of the national sample from the Panel,
- Nonresponse associated with the selected sample for the national survey, and
- A raking ratio adjustment of national survey respondents to external population control totals (from the Current Population Survey) for the population drivers 18+ by age-group, sex, Census Division, Education, Race/Hispanic ethnicity, Housing tenure, and Household phone status.

These weights will be applied to arrive at final estimates of knowledge for each item with an MOE of $\pm 2.5\%$. For example, the results are expected to include statements such as, “XX% ($\pm 2.5\%$) of English-speaking Americans over the age of 18 correctly identified the legally required behavior (stop or go) when presented with the item involving a stopped school bus on a divided four-lane highway.”

Descriptive results will be provided for the various demographic information being collected. Minimal statistical analyses comparing groups will be performed to describe whether significant differences in knowledge and attitudes exist between major subgroups of the sample (e.g., sex, age), but the primary focus of sampling remains the acquisition of a nationally representative sample of drivers to provide a stable estimate of knowledge at the national level.

Study 2: Community Survey. The study expects to utilize a series of 2 x 2 Chi-Square Tests to determine if the proportion of correct responses among independent samples (i.e., the study does not expect to sample the same participants more than once) changed in the test community from before to after the enforcement program in a manner that was different than the comparison community that received no intervention from the study. Changes over time in each community will be tested by separate analyses.

While it is expected the comparison community will show no change over time, additional analyses may be warranted if an increase in knowledge in the comparison community is observed. Such an increase could theoretically indicate some general change in knowledge not associated with the intervention program or a spillover effect. Should this situation occur, a more sophisticated multi-way frequency analysis will be undertaken.

Alternatively, the study may utilize logistic regression with community and time period entered as predictors of the binary outcomes of correct/incorrect responses as the dependent variables. Available demographics would be entered as predictors as well with a variety of models executed to arrive at the most parsimonious model. This more complicated analysis would only be conducted if a review of the descriptive statistics for demographics and the baseline knowledge rates indicates some apparently meaningful differences in the populations sampled that could be contributing to any observed effects. In any case, no inferences will be made to populations beyond the test communities.

B.2. Describe the procedures for the collection of information.

Study 1: National Survey. NORC will send email invitations and reminders if necessary to the sampled web-mode AmeriSpeak panelists. The Attachment contains the format of the standard AmeriSpeak invitation and reminder. In some cases, SMS (text message) reminder(s) will also be sent if the participant opted-in for these messages. In addition, for the panelists with AmeriSpeak online member accounts, survey invitations can be viewed at the online member portal (amerispeak.org) or on the AmeriSpeak mobile app. The recruitment emails will provide potential respondents with the survey link and information about the AmeriSpeak incentive that applies to participation in the survey. No topic or survey length will be mentioned within the recruitment materials. The participant will have the option of completing the survey through the mobile app which works on most mobile devices or through an Internet browser on a computer. The incentive will be deposited in the participant's AmeriSpeak account upon completion of the survey. These are normal procedures for the AmeriSpeak Panel.

Study 2: Community Survey. Community survey participants will be contacted in-person by project researchers trained in human subject protocols at selected locations such as malls, gas stations, motor vehicle licensing offices, or other public locations. Prospective respondents will be approached and screened verbally to determine if they meet the sampling requirements (i.e., age 18 or above, English-speaking, and a current driver). Before beginning the survey, participants will review a brief description of the study on the study-provided computer device and indicate their consent to participate by tapping/clicking a button on the opening survey screen. Participants will provide their responses in a private area at the sampling site. A researcher will monitor their progress and be available to answer any questions about how to proceed through the survey. Researchers will not answer any questions about survey content. The respondent will receive the \$10.00 survey incentive upon completion in the form of a voucher, coupon, or cash (to be determined after sites are selected).

B.3. Describe methods to maximize response rates.

Study 1: National Survey. AmeriSpeak motivates panel members to participate through a rewards program. Participants in the National Survey will already be registered with AmeriSpeak, and will be offered "points" that can be redeemed for rewards such as gift cards for retailers. For this project, points will be worth approximately \$10 cash value. Panelists who do not respond to the initial survey invitation within three weeks will receive a reminder email/message emphasizing the importance of their participation in the project. Additional reminders will be sent every two weeks until the desired sample size is achieved.

Study 2: Community Survey. Respondents in the test communities will receive an incentive of \$10 in cash or a cash equivalent for completing the survey.

B.4. Describe any tests of procedures or methods to be undertaken.

Study staff will conduct extensive internal pilot testing of both surveys. The National Survey will be tested on a wide variety of portable electronic devices and web browsers to ensure it works on as many platforms as possible. Testing of the community survey will be limited to the single device chosen for administration in the field. Pilot testing of the national and community surveys will be conducted with up to eight non-staff members. This pilot testing will evaluate the amount of time needed to complete the surveys as well as participant comprehension of items. Pilot test data will be reviewed for inconsistent responses that could signal problems

with item structure. These findings will be used to identify potential improvements to the survey prior to beginning actual data collection.

B.5. Provide the name and telephone number of individuals consulted on statistical aspects of the design

The following individuals have reviewed technical aspects of this research plan:

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Attachment
AmeriSpeak Standard Invitation to Selected Respondents and Reminder

AmeriSpeak Standard Survey Invitation Text

Subject line: You're invited to complete your new AmeriSpeak survey (SID: [\${Survey.ID}]).

BEGIN YOUR SURVEY

and, if you are eligible, get X,000 AmeriPoints.

Dear FIRSTNAME,

Thank you for the valuable insights you provide to us at AmeriSpeak® .

We have a new survey for you. Please complete it at your earliest convenience, and if you are eligible, get X,000 AmeriPoints.

Remember, once you have 10,000 AmeriPoints, you can redeem them for a variety of things, such as a Mastercard® Reward Card or an Amazon.com gift card.

BEGIN YOUR SURVEY [Hyperlink]

Thank you for your time today. We look forward to hearing from you — and hearing your opinions!

Sincerely,

The AmeriSpeak Support Team

This email is intended for FIRSTNAME (PMID#).

Having trouble with the link? You can copy and paste this into your browser: URL. You can also go to my.AmeriSpeak.org or the AmeriSpeak app, log in using your member credentials, and click on the "Start Survey" button in your dashboard page.

Need more help or have questions? Email the AmeriSpeak Support Team at

support@AmeriSpeak.org or call toll-free (888) 326-9424. AmeriSpeak Support: 55 E Monroe St, 19th Floor, Chicago, IL 60603. Copyright AmeriSpeak 2019. Use of any content or images is prohibited without prior written approval.

AmeriSpeak Standard Survey Reminder Text

Subject line: A reminder to complete your new AmeriSpeak survey (SID: [{\$Survey.ID}]).

BEGIN YOUR SURVEY

and, if you are eligible, get X,000 AmeriPoints.

Dear FIRSTNAME,

Please do not forget to take your latest AmeriSpeak survey.

BEGIN YOUR SURVEY [Hyperlink]

Thank you for your time today. We look forward to hearing from you — and hearing your opinions!

Sincerely,

The AmeriSpeak Support Team

This email is intended for FIRSTNAME (PMID#).

Having trouble with the link? You can copy and paste this into your browser: URL. You can also go to my.AmeriSpeak.org or the AmeriSpeak app, log in using your member credentials, and click on the "Start Survey" button in your dashboard page.

Need more help or have questions? Email the AmeriSpeak Support Team at

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