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What Do Americans Think About Federal Tax Options to Support Transportation? Results from Year Ten of a National Survey

Asha Weinstein Agrawal, Ph.D.
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MINETA TRANSPORTATION INSTITUTE

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REPORT 19-16

WHAT DO AMERICANS THINK ABOUT FEDERAL TAX OPTIONS TO SUPPORT TRANSPORTATION? RESULTS FROM YEAR TEN OF A NATIONAL SURVEY

Asha Weinstein Agrawal, Ph.D.
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16. Abstract

This report summarizes the results from the tenth year of a national public opinion survey asking U.S. adults questions related to their views on federal transportation taxes. A nationally representative sample of 2,723 respondents completed the online survey.

The questions test public opinions about both raising the federal gas tax rate and replacing the federal gas tax with a new mileage fee. In addition to asking directly about support for these tax options, the survey collected data on respondents' views on the quality of their local transportation system, their priorities for federal transportation spending, their knowledge of how much they pay in federal gas taxes, their views on privacy and equity matters related to mileage fees, travel behavior, and standard sociodemographic variables. This large set of variables is used to identify personal characteristics and opinions correlated with support for the tax options.

Key findings include: large majorities would support raising the federal gas tax rate under certain conditions; people hold nuanced views about the pros and cons of mileage fees; and linking a transportation tax to environmental goals raises support.

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I. INTRODUCTION

Over the past several decades, the transportation revenues available from state and federal gas taxes have fallen significantly in terms of inflation-adjusted dollars per mile traveled. At the same time, the transportation system requires critical—and expensive—system upgrades. Among other needs, a large portion of the national highway system requires major rehabilitation, and there is growing desire at all levels of government to substantially upgrade and expand infrastructure to support public transit, walking, bicycling, and micro-mobility modes such as electric kick-scooters.

This dilemma of growing needs and shrinking revenues can be resolved in only two ways: either the nation must dramatically lower its goals for system preservation and enhancement, or new revenues must be raised. If the latter is to happen, legislators must be convinced that increasing taxes or fees is politically feasible. One portion of the political calculus that legislators consider when deciding whether or not to raise new revenues is, of course, likely public support for—or opposition to—raising different kinds of taxes.

This report contributes to the understanding of current sentiment about increasing transportation taxes by presenting results from the tenth year of an annual survey investigating public opinion about a variety of federal transportation tax options. The specific taxes tested were six variations on raising the federal gas tax rate and two variations on creating a new mileage tax to replace the gas tax. In addition, the survey collected data on respondents' sociodemographic characteristics, travel behavior, views on the quality of their local transportation system, and priorities for government spending on transportation in their state. All of this information is used to assess support levels for the tax options among different population subgroups.

The survey questionnaire described the various tax proposals in only general terms, so the study results cannot be assumed to reflect support for any actual proposal put forward. Nevertheless, the results show likely patterns of support and, more importantly, the public's *relative* preferences among different transportation tax options.

The report compares the results of the ten surveys in the series in order to establish how public views may have changed from 2010 to 2019. The surveys used identical question language each year to describe some tax options so as to enable reliable trend analysis.[1] However, this year the survey was administered using an online panel, unlike previous years that gathered data through a random-digit-dial phone survey. Changes in survey *mode* can influence survey responses, so readers are advised to interpret changes from 2018 to 2019 with caution.

The remaining chapters of the report are organized as follows. Chapter 2 describes the survey methodology and presents an overview of the questionnaire and details of the implementation procedure. Discussion of the survey findings follows in Chapters 3, 4, and 5. Chapter 6 summarizes the key findings and suggests policy implications.

II. SURVEY DESIGN AND ADMINISTRATION

The online survey was completed by 2,723 U.S. adults who were recruited by Qualtrics through an online panel sample. This chapter describes the questionnaire design, survey sampling and administration, and characteristics of the respondents.

QUESTIONNAIRE DESIGN

The survey questionnaire was designed to test public support for variants on two federal taxes that could be used to raise federal transportation revenues: an increase in the federal gas tax rate and a new national mileage fee to replace the federal gas tax. The exact wording used for all questions can be found in Appendix A, which reproduces the survey questionnaire.

Because gas and mileage taxes are revenue options likely to receive considerable policy scrutiny in coming years, the survey tested support for different versions of each tax. Overall, eight different federal tax options were tested: six variants of a gas tax increase and two variants of a new mileage fee to replace the federal gas tax. All but one of the gas tax variants are identical to those tested in earlier years of the survey series, though the mileage fee questions asked this year are slightly different from those asked in previous surveys.

To make these hypothetical taxes easier for respondents to understand, the survey gave specific prices for each. The values were selected to be simple numbers within the range of mainstream current policy discussion.

Gas-tax increases. All variants of a federal gas tax increase involved raising the existing 18¢-per-gallon tax[2] to 28¢ per gallon, but each included a different set of information for respondents to consider. The six variations were:

- A “base-case” 10¢ increase in the gas tax, with respondents given no information other than the rate and that proceeds would be spent “for transportation.”
- A 10¢ increase in the gas tax, with the revenues to be spent only for projects to reduce local air pollution caused by the transportation system.
- A 10¢ increase in the gas tax, with the revenues to be spent only on projects to reduce the transportation system’s contribution to global warming.
- A 10¢ increase in the gas tax, with the revenues to be spent only on projects to maintain streets, roads, and highways.
- A 10¢ increase in the gas tax, with the revenues to be spent only on projects to reduce accidents and improve safety.
- A 10¢ increase in the gas tax, with the revenues to be spent only on projects to reduce traffic congestion. (This option was added to the survey in 2019.)

New mileage fees. Two variants of a mileage fee were presented, both of which involved replacing the federal gas tax with a new tax per mile driven that relies on electronic meters to track miles driven.[3] Respondents were also told that someone driving 10,000 miles a year would pay $100. The two variants, which differed only in the rate structure, were:

- "Flat-rate" variant: a one-cent-per-mile fee, with every car taxed at the same rate.
- "Green" variant: a mileage fee for which the *average* rate would be one cent per mile, but vehicles that pollute less would be charged less and vehicles that pollute more would be charged more.

The questionnaire also asked respondents sociodemographic and travel behavior questions, as well as questions about the quality of transportation infrastructure and services in their community, their priorities for spending federal gas tax revenues, their estimates of the federal gas tax rate and how much they spend annually on federal gas taxes, their opinions about fairness and privacy matters related to mileage fees, and their preferred frequency for paying a mileage fee.

SURVEY ADMINISTRATION

The survey was administered online, using a survey platform and panel of respondents managed by Qualtrics. Online surveys are increasingly popular, in part due to their low cost, speed at which they can be administered, convenience for respondents, and ability to include question design options that are difficult or impossible to implement via telephone or mail.[4] A 2019 analysis from the Pew Research Center found that 90% of Americans are online,[5] which suggests that online surveys are currently a reasonable method to reach a representative sample of U.S. adults, despite evidence that some population subgroups are often underrepresented in online surveys. Less well represented groups include people who are older, low-income, have less formal education, live in rural communities, and do not have high-speed internet access at home.[6]

Previous surveys in the series gathered data through random-digit-dial telephone surveys. The change in survey mode was made to take advantage of the benefits of online surveys, especially to reduce project costs and to avoid some of the challenges associated with telephone surveys, such as their intrusive nature and increased use of call screening.[7]

Survey mode can impact question responses, and so readers are cautioned that when trends are discussed in this report's findings, the change in survey mode could account for some of the difference between responses in 2018 and 2019. A study by the authors of this report, for example, found higher support levels for some of the same tax options described here when responses were collected from the online panel "SurveyMonkey Audience" than when responses were collected with a random-digit-dial phone survey.[8] However, research suggests that questions about abstract policy matters (such as those discussed in this survey) are less affected by survey mode than questions about potentially embarrassing personal topics where respondents may feel pressured to give socially acceptable answers. Researchers have also found that respondents to online polls are

less likely than phone survey respondents to answer rating questions with the most positive answers.[9]

Sampling Approach

Quota sampling was used in order to ensure a sample that closely represents the U.S. adult population. The authors requested a nationally representative sample, as defined by U.S. American Community Survey (ACS) data on gender, race and ethnicity, employment status, annual household income, and age. Table 1 shows the ACS values used to build the quotas.

Table 1. Quotas Used for Sampling

Characteristic	U.S. adult population[a] (%)
Gender	
Male	49
Female	51
Of Hispanic/Latino origin/descent	15
Race	
White only	75
Black/African-American only	12
Asian/Asian-American only	6
Other, including multiracial	7
Employment status	
Working for pay	60
Unemployed, but looking for work	5
Not working by choice (retired, etc.)	35
Income (annual household)	
$0 – $25,000	21
$25,001 – $50,000	23
$50,001 – $75,000	18
$75,001 – $100,000	12
$100,001 – $150,000	14
$150,001+	12
Age (years)	
18 – 29	22
30 – 39	17
40 – 49	17
50 – 59	18
60 – 69	14
70 – 79	8
80+	5

[a] All data are for adults 18 years and older, with the exception of household income and size, which are for all U.S. households. Statistics are American Community Survey (ACS) 2017 5-year estimates from https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t (accessed May 31, 2019).

The interviewing was conducted from April 23 to May 14, 2019. The median time to complete each survey was 11 minutes and the mean time was 14 minutes. A total of 2,723 adults responded with usable data.

Table 2 presents frequencies related to the survey administration, as well as response and cooperation rates. We calculated response and cooperation rates following standards recommended by the American Association for Public Opinion Research (AAPOR).[10] The survey had a response rate of 3.1% and a cooperation rate of 27.6%.

Table 2. Survey Administration Frequencies and Response and Completion Rates[a]

Survey administration frequencies	
Invitations sent	103,385
Participants who started the survey but voluntarily dropped out	8,177
Participants terminated from the survey by Qualtrics because they represented a subgroup whose quota had been filled	2,305
Complete surveys	3,113[b]
AAPOR Response Rate 1	3.1%
AAPOR Cooperation Rate 1	27.6%

[a] Calculated using the American Association for Public Opinion Research (AAPOR) Response Rate Calculator V4.0, "web" tab. The most conservative rates were chosen. The calculator was downloaded on June 1, 2019, from https://www.aapor.org/AAPOR_Main/media/MainSiteFiles/Response-Rate-Calculator-4-0-Clean-18-May-2016.xlsx.

[b] An additional 390 responses were cleaned from the dataset due to nonsensical responses, including straight-lining through questions presented in tables and gibberish answers in open-ended questions.

SURVEY RESPONDENTS

The 2,723 adult survey respondents with usable data were generally representative of the U.S. population in terms of Census region and sociodemographic characteristics (Table 3). For the survey findings and analysis presented in this report, we lightly weighted the data using a raking method to match the Census Bureau's 2017 ACS five-year estimates with respect to gender, race, Hispanic ethnicity, education level, household income, and age.[11]

Table 3. Comparison of Survey Respondents to the U.S. Population

Subgroup	Sample (unweighted) (%)	U.S. adults[a] (%)
Census region[b]		
Northeast	20	18
Midwest	23	21
South	37	38
West	20	23
Gender		
Male	48	49
Female	51	51
Other	1	n.a.
Of Hispanic/Latino origin/descent	15	15
Race		
White only	80	75
Black/African-American only	11	12
Asian/Asian-American only	5	6
Other, including multiracial	4	7
Education		
Less than high school graduate	2	13
High school graduate	20	28
Some college	34	31
College graduate	28	18
Graduate degree	16	10
Employment status		
Working for pay	61	61
Unemployed, but looking for work	6	4
Not working by choice (retired, etc.)	33	35
Household size (people)		
1	20	28
2	34	34
3	19	16
4+	28	23
Income (annual household)		
$0 – $25,000	19	21
$25,001 – $50,000	22	23
$50,001 – $75,000	18	18
$75,001 – $100,000	12	12
$100,001 – $150,000	14	14
$150,001+	15	12

Table 3, continued

Subgroup	Sample (unweighted) (%)	U.S. adults[a] (%)
Age (years)		
18 – 29	18	22
30 – 39	20	17
40 – 49	17	17
50 – 59	15	18
60 – 69	16	14
70 – 79	11	8
80+	2	5

[a] All data are for adults 18 years and older, with the exception of household income and size, which are for all U.S. households. Statistics are American Community Survey (ACS) 2017 5-year estimates from https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t (accessed May 31, 2019).

[b] Census regions are defined at U.S. Census Bureau, “Census Regions and Divisions of the United States with State FIPS Codes” (no date), http://www2.census.gov/geo/docs/maps-data/maps/reg_div.txt (accessed May 28, 2019).

Note: Some percentages do not sum to 100% due to rounding.

III. FINDINGS RELATED TO RESPONDENTS' VIEWS ON TRANSPORTATION SYSTEM NEEDS

This chapter presents key findings from a set of questions asking respondents about their views on the quality of the current transportation system and priorities for improving it. (Appendix A presents the exact questionnaire language and complete top-line results.)

PERCEIVED QUALITY OF THE LOCAL TRANSPORTATION SYSTEM

Figure 1 shows how respondents assessed the quality of transportation infrastructure and services in their own community. The grey bars to the left indicate the percentage of respondents who assessed each type of transportation infrastructure or services negatively (as "somewhat" or "very" bad), while the blue bars to the right show the percentage of respondents who assessed each item positively (as "somewhat" or "very" good).

The majority of Americans rated the transportation system positively, though with some reservations. For every item, more than half of respondents rated it as "somewhat" or "very" good. However, most people in that group selected "somewhat" rather than "very" good.

Comparing responses across the four items, interstates, highways, and freeways were rated positively by the largest percent of respondents (70%). The other three items were rated positively by somewhat smaller majorities: 59% for bicycle and pedestrian facilities, 55% for local streets and roads, and 54% for public transit.

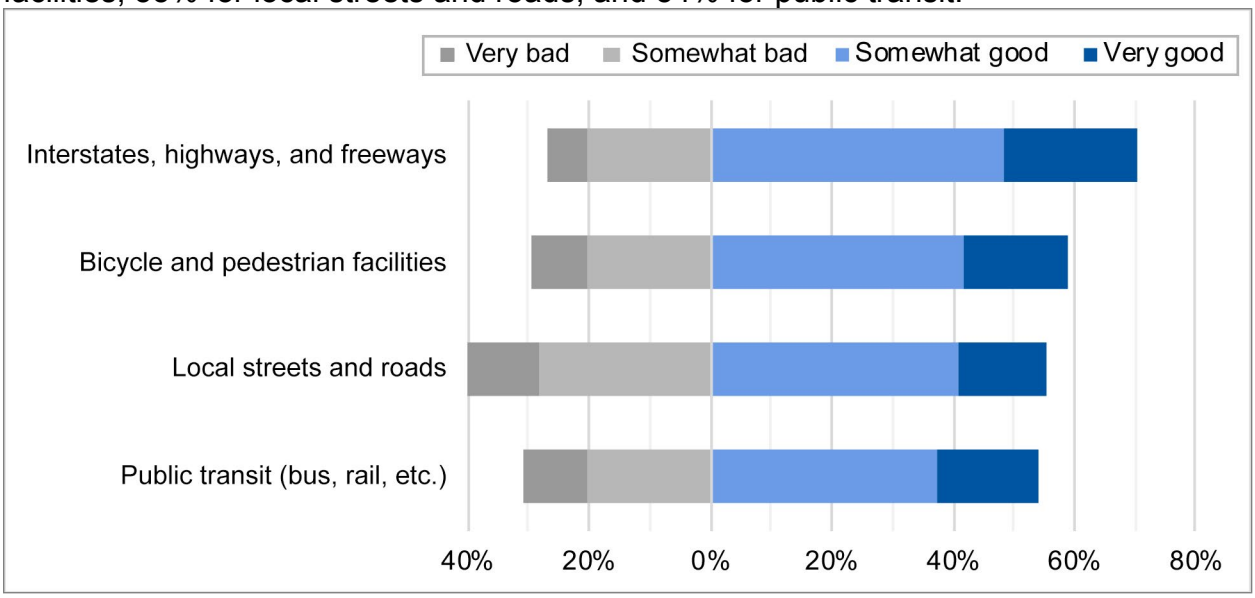

Figure 1. Assessment of the Quality of Transportation Infrastructure and Services in "Your Community"

Note: An additional 15% and 11% of respondents responded "Not sure/Doesn't apply" when asked about public transit services and bicycle and pedestrian facilities, respectively.

A separate question asked respondents if they were concerned about traffic congestion in their community. Thirty-three percent were "very" concerned, 42% "somewhat" concerned, and only 26% "not at all" concerned.

PRIORITIES FOR THE NATIONAL TRANSPORTATION SYSTEM

The next set of survey questions asked respondents about their priorities for improvements to the transportation system, asking first about national goals and then about preferred ways to spend federal gas tax revenues.

Figure 2 shows the importance that respondents placed on each of six goals for improving the national transportation system. The blue bars to the right indicate the percentages rating each goal as "somewhat" or "very" important, and the grey bars to the left represent the proportion rating the goal as "not important." Notably, virtually all respondents (89% or more) rated each of the six goals as somewhat or very important, with more selecting "very" than "somewhat" important. The two most popular goals were to improve safety (97%) and improve maintenance on roads, streets, highways, and bridges (95%).

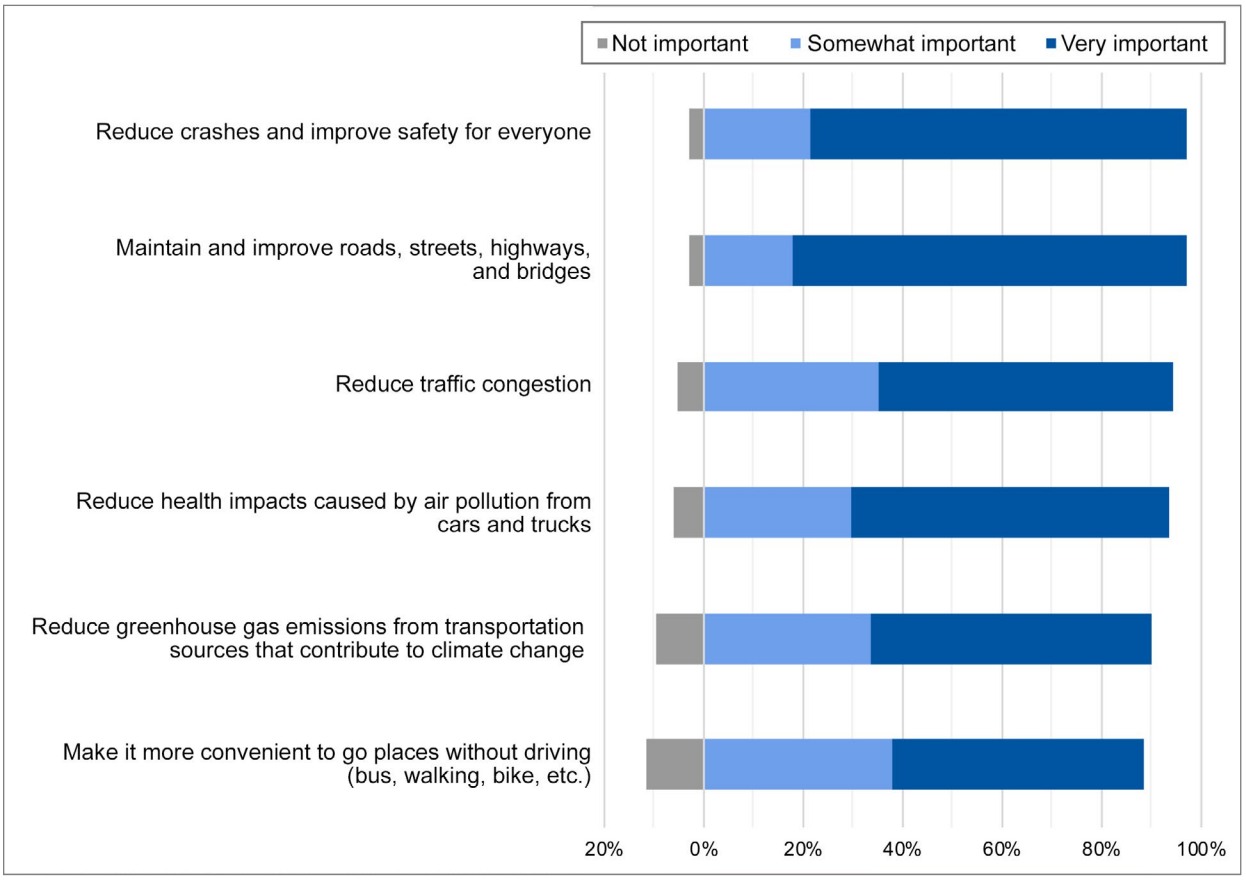

Figure 2. Assessment of the Importance of Transportation-Related Goals for the U.S.

The questionnaire then explained that the federal government collects a tax on gasoline and asked respondents to indicate how much of a priority they place on various categories of spending. As shown in Figure 3, the great majority of respondents believed that all of these options are of medium to high priority. Even the least popular option had only 13% of respondents rating it as "not at all" a priority.

Looking at respondents' relative priorities, maintenance was a priority for the largest number of respondents (92%). Large majorities also supported both road and public-transit related options, from building and widening local streets, roads, and highways, to adding more frequent transit service and subsidizing fares for low-income riders. The two options with the lowest support both related to encouraging the use of electric vehicles, but even here clear majorities supported the options as at least a "medium" priority.

Finally, a follow-up question asked respondents to choose their three highest priorities from the list of possible spending categories (Figure 4). There was little consensus here; no single option was selected by a majority of respondents. However, mirroring the findings in Figure 1, the most popular option was maintenance, both of local streets and roads (46%) and of highways and freeways (38%). And again, both road-related and public transit-related options had roughly equivalent support. For example, 20% of respondents selected expanding public transit service into new areas and 19% selected building/widening highways, interstates, and freeways. Finally, as with Figure 1, measures to support electric vehicle use had among the lowest support levels.

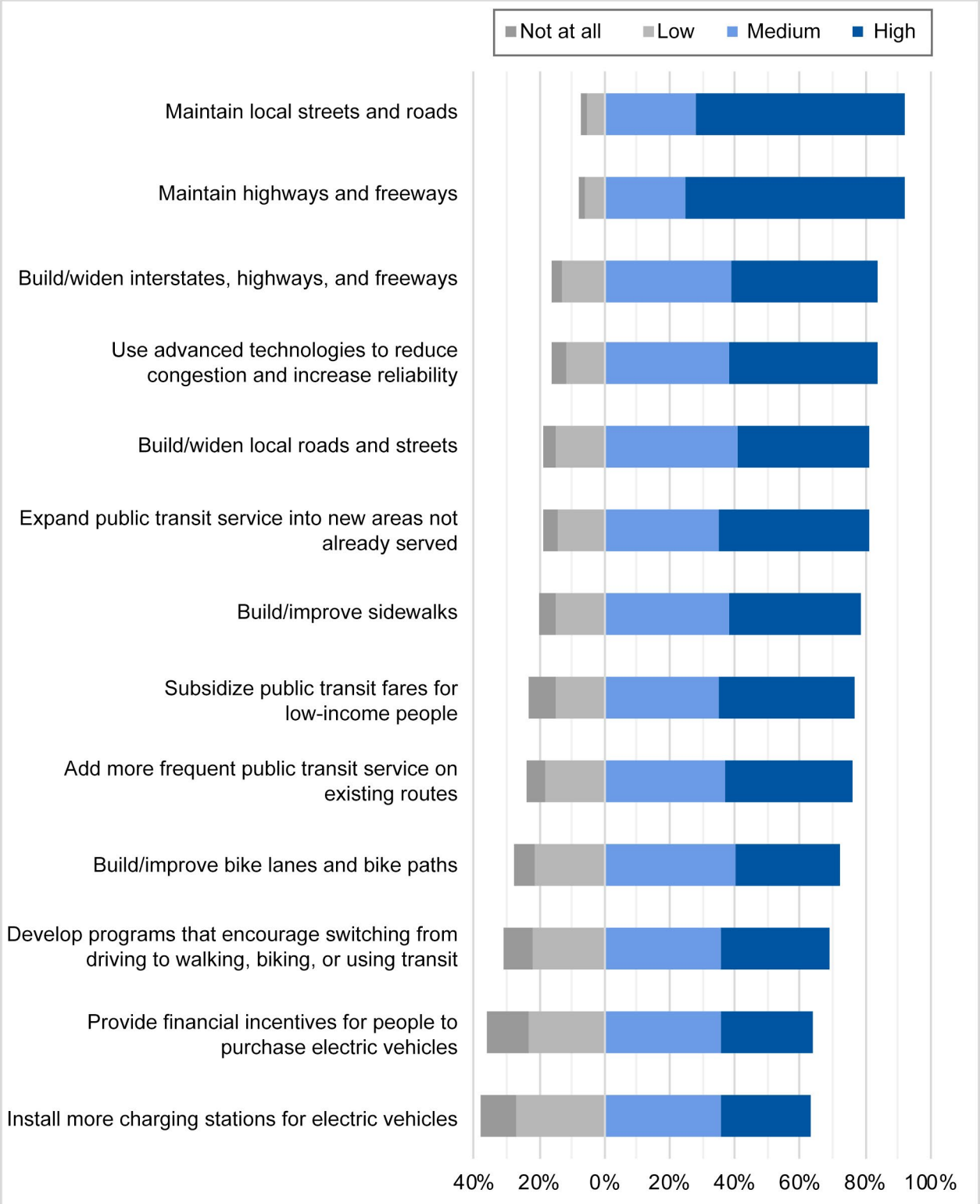

Figure 3. Priority Placed on Different Options for Spending Federal Gas Tax Revenue

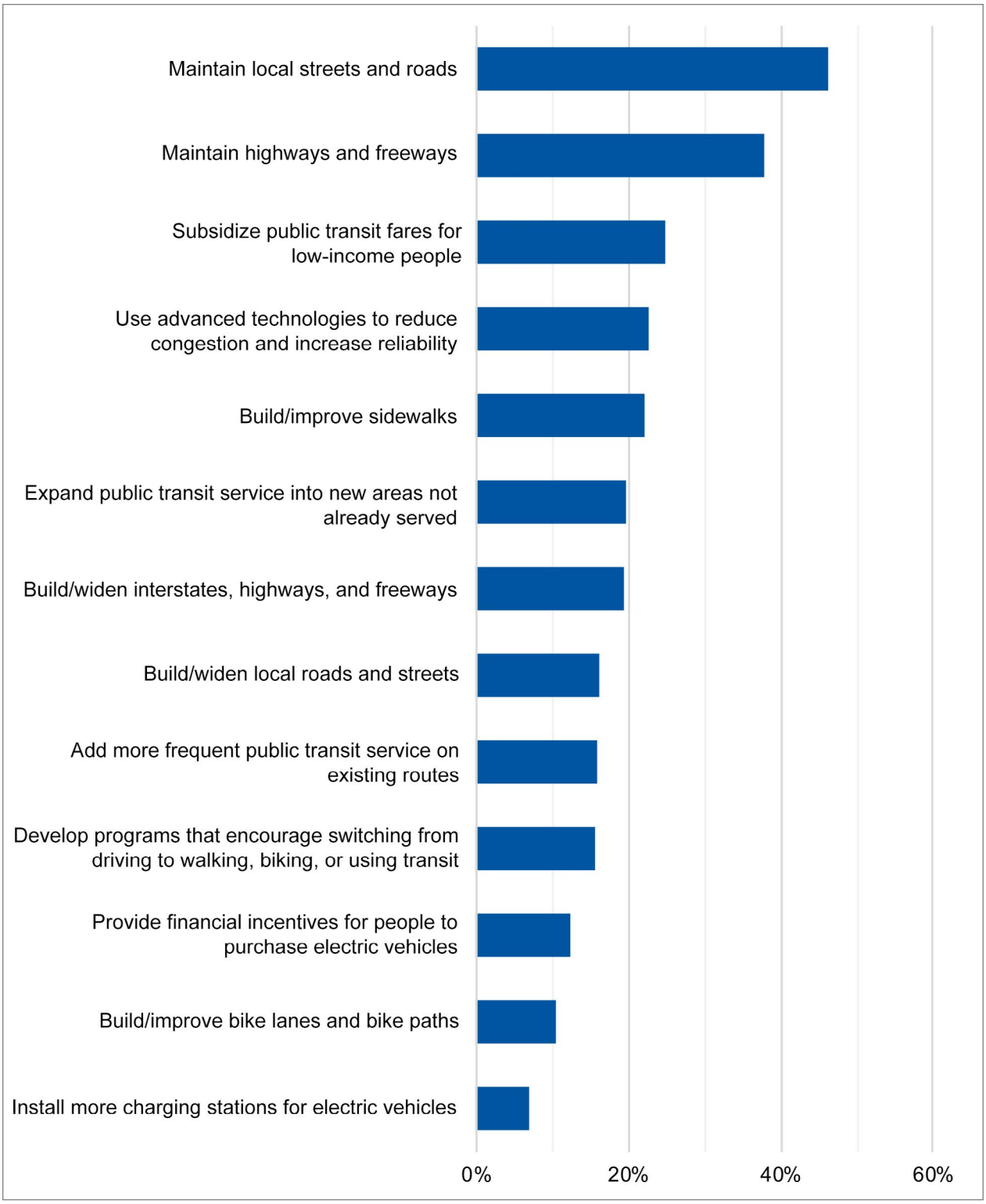

Figure 4. Options Selected as One of the Top Three Priorities for Spending Federal Gas Tax Revenue

IV. FINDINGS RELATED TO FEDERAL GAS TAXES

This chapter presents findings on questions related to knowledge and opinions about the federal gas tax. Topics covered include how much respondents think they pay in federal gas taxes and support for different variants on raising the federal gas tax rate. (Appendix A presents the exact questionnaire language and topline results.)

KNOWLEDGE OF THE FEDERAL GAS TAX RATE

There is considerable anecdotal evidence suggesting that most Americans are unaware of how much they pay in fuel taxes. To gather evidence on this point, the survey asked respondents to give their best guess about the current federal gas tax rate and also to estimate their annual gas tax payments.

The survey asked respondents to estimate the federal gas tax paid on a gallon of regular gasoline costing $3.00 per gallon. Respondents could choose among a set of ranges as the answer options (Table 4). While about a third (30%) accurately chose the option "11¢ to 25¢," the majority of respondents over-estimated the rate (55%). The over-estimates were often significant, too; 19% thought the rate was at least 76¢ per gallon.

Table 5 shows an analysis that looks at the correlation between sociodemographic characteristics and incorrectly estimating the gas tax to be substantially higher than the actual rate of 18.4¢ per gallon. Among respondents who believed that the rate is more than 50¢ per gallon, the only statistically significant difference among subgroups is that more men than women made this mistake (35% of men vs. 29% of women). Table 5 also shows a parallel analysis for respondents who overestimated the gas tax by *any* amount (selecting any option from 25¢ per gallon up). With this lower cut-off, there are more differences among subgroups. Respondents are more likely to overestimate the tax rate if they are male, white, not of Hispanic/Latino decent, in the higher two income groups ($50,000 or more), and the oldest age group (55 and older).

A separate question asked respondents how much they pay annually in federal gas taxes, and most people answered with values that are likely somewhat higher than is actually the case for them. Very roughly, Americans pay about $150 annually in federal gas tax expenditures,[12] considerably less than what the survey respondents estimated. The median value estimated by survey respondents is $200 per year, and the mean value is $452 per year.

Table 4. Estimate of the Federal Gas Tax Paid on a Gallon of Regular Gasoline Priced at $3.00 per Gallon

Gas tax rate choices	%
Less than 10¢	14
11¢ to 25¢	30
26¢ to 50¢	24
51¢ to 75¢	12
76¢ to $1.00	9
More than $1.00	10

Table 5. Percent of Respondents Thinking that the Federal Gas Tax Paid on a Gallon of Regular Gasoline Priced at $3.00 per Gallon is More than 50 Cents, by Sociodemographic Characteristics

Subgroup	Believe that federal gas tax rate is more than 50¢ (%)	Believe that federal gas tax rate is more than 25¢ (%)
All respondents	*32*	*44*
Gender		
Male	35	62
Female	29**	51**
Race		
White	31	58
Black/African-American	36	54
Asian/Asian-American	27	50
Other	29	41**
Of Latino/Hispanic descent		
Yes	29	49
No	32	58**
Education		
High school graduate or less	32	56
More than high school	31	56
Employment status		
Working for pay	31	54
Unemployed, but looking for work	32	57
Not working by choice (retired, etc.)	33	58
Income (annual household)		
0 – $50,000	31	52
$50,001 – $100,000	32	58*
$100,001+	34	62**
Age (years)		
18 – 24	30	50
25 – 54	32	54
55+	32	61**

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

SUPPORT FOR RAISING THE FEDERAL GAS TAX RATE

The survey results show that a majority of Americans would support higher taxes for transportation—under certain conditions (Figure 5). For example, only 40% of respondents supported the base-case 10¢-per-gallon gas tax increase, for which respondents were told only that the tax revenues would be spent for transportation purposes. However, five variants of that idea of a 10¢-per-gallon gas tax increase received at least 62% support. The very highest level of support among all the tax options tested was for a gas tax increase of

10¢ per gallon to fund road maintenance. That option wassupported by 75% of respondents, an increase of 35 percentage points over support for the base-case gas tax increase. The next most popular options were a gas tax increase with funds devoted to reducing accidents and improving safety (71% support) or one with funds devoted to reducing congestion (70%). The two options that linked a gas tax increase to environment objectives also had strong support: 63% support for the variant related to reducing local air pollution and 62% for the variant related to reducing global warming emissions.

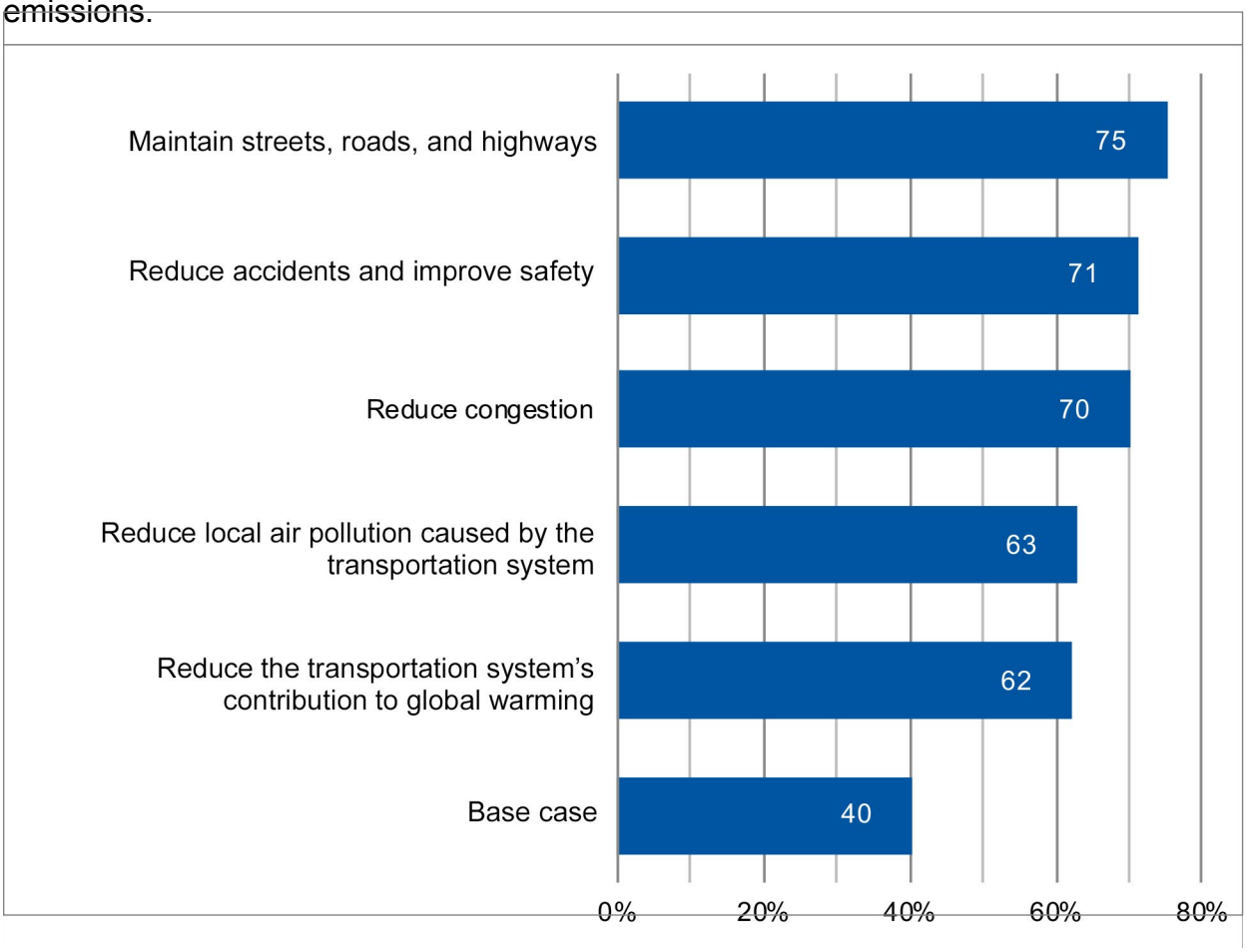

Figure 5. Support[a] for the Gas Tax Options

[a] "Support" is the sum of those who said that they "strongly" or "somewhat" support the tax option.

VARIATIONS IN SUPPORT BY POPULATION SUBGROUPS

This section presents support for the tax options by different subgroups within the population, categorized by sociodemographics, political characteristics, travel behavior, estimates related to the federal gas tax, and geographic location. The statistical test of two proportions was used to check whether differences among subgroups (e.g., men versus women) are statistically significant at the 95% and 99% confidence levels. Tables 6 through 10 present the results from statistical testing in which the first subgroup listed in a table for that set of population categories is the reference case against which the other subgroups are compared.

Readers should note that the significant differences among subgroups shown in the tables are not necessarily the only important differences that exist. Rather, the differences are those that were statistically significant according to the particular statistical tests used. It is also important to keep in mind that "statistical significance" is not an automatic indicator of scientific or policy importance, as discussed in a 2016 statement from the American Statistical Association.[13]

The most striking result from the analysis by subgroups is how *few* differences appear. For example, the five gas tax options that have majority support among all respondents also have majority support among every single group except for three specific cases: only 46% of Republicans support the global warming gas tax increase, 41% of people affiliated with a party *other than* the Democratic or Republican Parties support the maintenance gas tax option, and 48% of that same group support a gas tax to reduce congestion.

The taxes that had the most statistically significant variation among subgroups were the least popular—namely, the base-case ten-cent gas increase tax and the variant with revenues dedicated to reducing the transportation system's contribution to global warming.

Just three subgroups had notably lower support, looking across all six tax options: the oldest respondents (55 and older), Republicans, and people who describe their community as "rural." Many variables that one might expect to correlate with opposition did not prove statistically significant, including annual household income, voter status, annual miles driven, fuel efficiency of the vehicle the respondent drives, estimated federal gas tax rate, and estimated federal gas tax paid annually.

Table 6. Support[a] for the Gas Tax Options, by Sociodemographic Characteristics

Subgroup	Base-case 10¢ increase (%)	Revenue to . . . Reduce local air pollution (%)	Reduce global warming (%)	Maintain streets/ highways (%)	Improve safety (%)	Reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Gender						
Male	45	60	57	76	70	71
Female	37**	66**	66**	74	72	69
Race						
White	39	62	60	76	71	69
Black/African-American	44	68*	68**	76	75	75*
Asian/Asian-American	53**	71	67	77	77	74
Other	36	62	72**	72	72	66
Of Latino/Hispanic descent						
Yes	42	69	70	73	70	71
No	40	62**	60**	76	72	70
Education						
High school graduate or less	42	63	62	72	68	68
More than high school	39	63	62	78**	74**	72*
Employment status						
Working for pay	42	65	62	75	70	71
Unemployed, but looking for work	46	62	70**	65**	68	66
Not working by choice (retired, etc.)	36**	61*	60	78	74	70
Income (annual household)						
0 – $50,000	37	63	63	75	71	68
$50,001 – $100,000	39	61	61	75	73	73*
$100,001+	51**	64	62	75	72	73*
Age (years)						
18 – 24	54	74	72	72	71	68
25 – 54	40**	64**	63**	74	70	69
55+	35**	57**	57**	78*	74	73

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who “strongly” or “somewhat” supported the option.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 7. Support[a] for the Gas Tax Options, by Political Characteristics

Subgroup	Base-case 10¢ increase (%)	Revenue to . . . Reduce local air pollution (%)	Reduce global warming (%)	Maintain streets/ highways (%)	Improve safety (%)	Reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Registered voter						
Yes	41	63	60	76	72	71
No	39	64	69**	70**	71	68
Likely voter[b]						
Yes	42	63	60	77	72	72
No	36*	62	64	74	67	65*
Political affiliation						
Republican (and lean Republican)[c]	38	52	46	75	69	70
Democrat (and lean Democrat)[c]	45**	73**	74**	77	75**	73
Independent, no party affiliation	36	61**	66**	76	73	69
Some other party[d]	29	53	51	41**	51**	48**

* Statistically significant at p<0.05.
** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" support the option.
[b] Likely voters are those respondents who said that they are registered voters and that they vote "all of the time" or "most of the time."
[c] Includes registered members of the political party and those respondents who stated that they were independent or a member of another political party, but chose to indicate which party they "leaned" towards.
[d] Registered member of any other party.
Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 8. Support[a] for the Gas Tax Options, by Travel Behavior

Subgroup	Base-case 10¢ increase (%)	Revenue to … Reduce local air pollution (%)	Reduce global warming (%)	Maintain streets/ highways (%)	Improve safety (%)	Reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Annual miles driven						
1 – 7,500	34	64	59	73	70	71
7,501 –12,500	38	58	57	77	71	68
12,501+	34	58*	56	74	70	71
Don't drive	47**	68	72**	76	76*	70
Miles per gallon[b]						
≤ 19	31	60	52	76	70	70
20 – 30	37*	58	59*	76	71	70
31+	43**	65	65**	79	77	74
Transit used in last 30 days						
Yes	51	69	69	75	73	71
No	35**	60**	59**	75	71	70

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who "strongly" or "somewhat" supported the option.

[b] Categories drawn from EPA's "SmartWay" vehicle rating system (U.S. Environmental Protection Agency, "SmartWay Vehicle Thresholds MY 2015" (January 2014), https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100HP2R.TXT (accessed May 28, 2019).

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who support the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 9. Support[a] for the Gas Tax Options, by Estimate of the Federal Gas Tax Rate and Gas Tax Paid Annually

		Revenue to …				
Respondents' estimates	Base-case 10¢ increase (%)	Reduce local air pollution (%)	Reduce global warming (%)	Maintain streets/ highways (%)	Improve safety (%)	Reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Estimate of federal gas tax rate on a $3 gallon of regular gas						
25¢ or less	36	65	65	76	72	70
More than 25¢	44**	62	60**	75	71	70
Estimated federal gas tax paid annually[b]						
$1 – $49	40	65	65	70	67	66
$50 – $99	31*	57	51**	81*	68	72
$100 – $199	44	68	68	76	76*	73*
$200 – $399	36	60	60	75	73	71
$400 – $999	39	64	60	80*	77*	74
$1,000+	35	54*	53*	68	66	66

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" support the option.

[b] This analysis excludes respondents who reported paying no gas tax at all.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 10. Support[a] for the Gas Tax Options, by Census Region and Community Type

Subgroup	Base-case 10¢ increase (%)	Revenue to … Reduce local air pollution (%)	Reduce global warming (%)	Maintain streets/ highways (%)	Improve safety (%)	Reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Census region						
Northeast	40	65	65	70	67	69
Midwest	41	64	63	78**	73*	67
South	41	61	60	76**	72*	73
West	38	63	63	75	74*	70
Community type (self-reported)						
Urban	47	67	65	74	72	71
Suburban	39**	63	63	78*	73	73
Small town	44	61	60	75	72	66
Rural	30**	57**	57**	70	65**	65*

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who “strongly” or “somewhat” supported the option.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who support the individual policies in each of the other subgroups within that category is compared to the reference case.

TRENDS IN SUPPORT OVER TIME, 2010 – 2019

The surveys have asked about support for many of the same gas tax variants each year in order to allow an assessment of trends. Figure 6 and Table 11 both show support for these five tax options over time. In every case, support has risen over the years, with an increase of 13 percentage points or more.

In the past year, support for the tax options has gone up from three to seven percentage points. This increase continues a well-defined pattern seen across the previous surveys. However, readers should note that the survey mode changed in 2019; earlier surveys collected data from an RDD phone survey, whereas this year responses came from an online panel survey. Evidence suggests that changes in survey mode can influence both *who* responds and *how* people respond to surveys. For example, Nixon and Agrawal ran a survey experiment with the same gas tax questions presented here, using both an RDD phone survey and an online panel from SurveryMonkey. That study found systematically higher support for the taxes among the online respondents as compared to the phone survey respondents, even though both samples were weighted to match the U.S. population across age, gender, ethnicity, race, and income.[14]

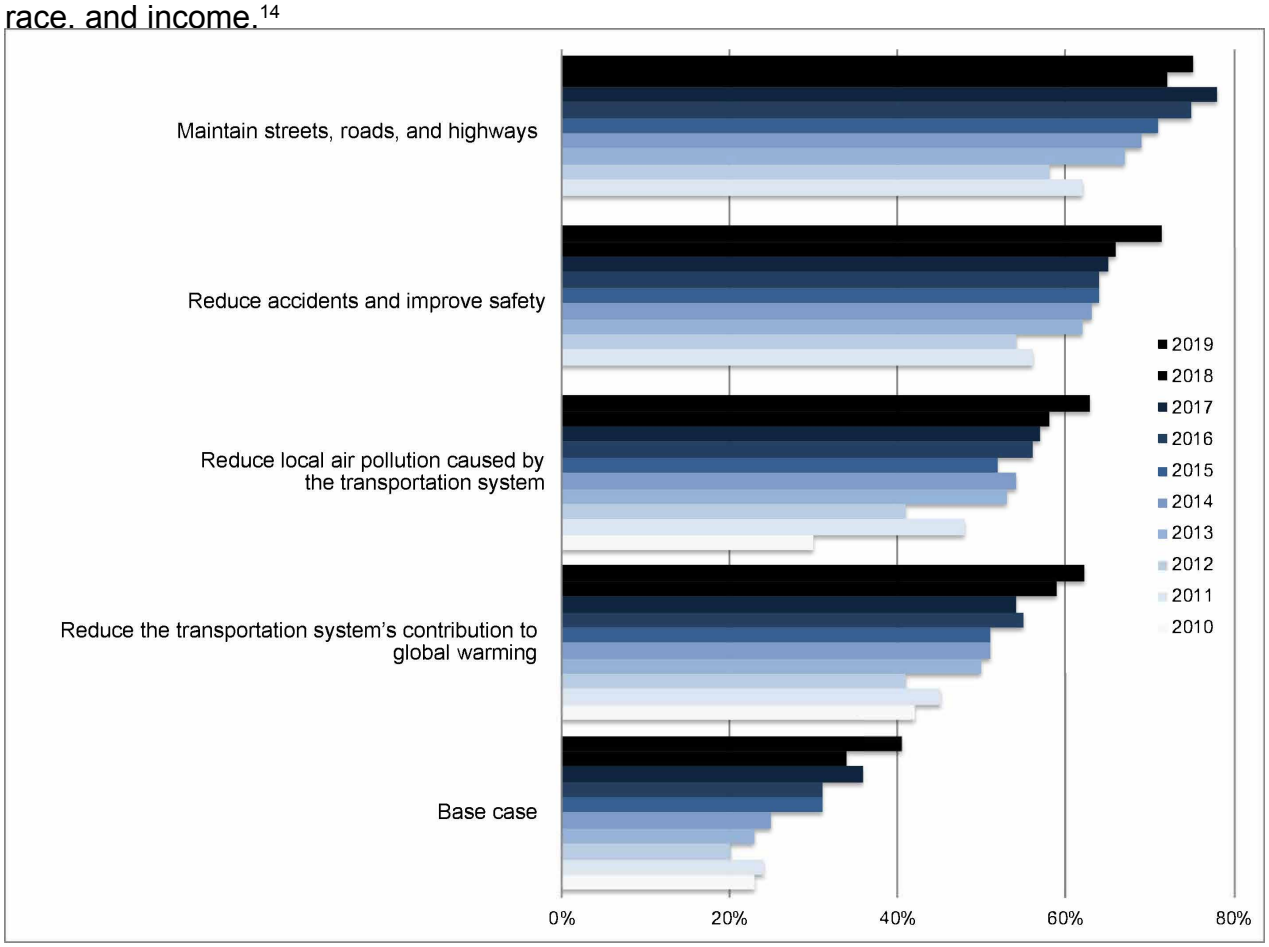

Figure 6. Trends in Support[a] for the Gas Tax Options, 2010 – 2019

[a] "Support" is the sum of those who "strongly" or "somewhat" supported the tax option.

Note: In 2019, the survey mode changed from a random-digit-dial phone survey to an online panel survey. Readers should interpret changes from 2018 to 2019 with care, since changes in survey mode can affect responses.

Table 11. Trends in Support[a] for the Gas Tax Options, 2010 – 2019[b]

Tax option	2010 (%)	2011 (%)	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	Differences: 2019 – 2010 (%)	Differences: 2019 – 2011 (%)	Differences: 2019 – 2018 (%)
Base case	23	24	20	23	25	31	31	36	34	40	17**	16**	7**
Revenues spent to reduce local air pollution	30	48	41	53	54	52	56	57	58	63	33**	15**	5**
Revenues spent to reduce global warming	42	45	41	50	51	51	55	54	59	62	20**	17**	3
Revenues spent to maintain streets, roads, and highways	--[c]	62	58	67	69	71	75	78	72	75	--[c]	13**	3*
Revenues spent to reduce accidents and improve safety	--[c]	56	54	62	63	64	64	65	66	71	--[c]	15**	5**

* Statistically significant at $p<0.05$.

** Statistically significant at $p<0.01$.

[a] Sum of those who "strongly" or "somewhat" supported the option.

[b] In 2019, the survey mode changed from a random-digit-dial phone survey to an online panel survey. Readers should interpret changes from 2018 to 2019 with care, since changes in survey mode can affect responses.

[c] This option was not included in the 2010 survey.

Note: The test of two proportions was used to check if there is a statistically significant difference in support for the different tax options from 2010 to 2019, 2011 to 2019, and 2018 to 2019.

SUPPORT FOR SPENDING SOME GAS TAX REVENUES ON PUBLIC TRANSIT

Another survey question probed support for spending some gas tax revenue on public transit. The question was worded as follows:

> Some people say that money from gas taxes should only be spent on roads and highways, since drivers pay the tax. Other people say gas tax money should be used to pay for public transit in addition to roads and highways, because transit helps reduce traffic congestion and wear-and-tear on the roads. Would you support or oppose spending some gas tax money on public transit?[15]

Two-thirds of respondents (68%) agreed with the concept of using some gas tax revenue to support public transit. Tables 12 and 13 compare how different subgroups answer the question. Unlike many other tax-related questions in the survey, this question generated many statistically significant variations by subgroup. In fact, there are significant differences among subgroups in each category (age, income, etc.). The subgroups significantly *less* likely to support the concept are men, white respondents, non-Hispanics, people with education beyond high school, people not working (by choice), people with household incomes over $50,000 a year, people 25 and older, people who drive any amount (as compared to those who do not drive at all), people with inefficient vehicles (no more than 19 mph), and people who had used transit within the previous 30 days.

We also looked at whether support for spending gas tax money for transit is correlated with support for the different gas tax options (Table 14). The pattern is strikingly clear, with people who oppose this less likely to support all six of the gas tax variants. The magnitude of the differences is also among the largest to show up in the subgroup analysis. There is a 12-percentage-point difference even for the gas tax variant for maintenance, which is the most universally popular among the gas tax options. For the other variants, the percentage point difference rose much higher, including a 31-percentage-point difference for the air pollution gas tax variant.

Table 12. Support for Spending Some Gas Tax Revenue for Transit, by Sociodemographic Characteristics

Subgroup	Support for using gas tax revenues for transit (%)
All respondents	*68*
Gender	
Male	65
Female	70*
Race	
White	64
Black/African-American	80**
Asian/Asian-American	75*
Other	81**
Of Latino/Hispanic descent	
Yes	81
No	65**
Education	
High school graduate or less	71
More than high school	65**
Employment status	
Working for pay	70
Unemployed, but looking for work	86**
Not working by choice (retired, etc.)	60**
Income (annual household)	
0 – $50,000	70
$50,001 – $100,000	65*
$100,001+	65*
Age (years)	
18 – 24	82
25 – 54	72**
55+	55**

* Statistically significant at $p<0.05$.

** Statistically significant at $p<0.01$.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 13. Support for Spending Some Gas Tax Revenue for Transit, by Travel Behavior

Subgroup	Support for using gas tax revenues for transit (%)
All respondents	*68*
Annual miles driven	
1 – 7,500	63
7,501 – 12,500	58
12,501+	62
Don't drive	79**
Miles per gallon[b]	
≤ 19	57
20 – 30	61
31+	69**
Transit used in last 30 days	
Yes	84
No	60**

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who "strongly" or "somewhat" supported the option.

[b] Categories drawn from EPA's "SmartWay" vehicle rating system (U.S. Environmental Protection Agency, "SmartWay Vehicle Thresholds MY 2015" (January 2014), https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100HP2R.TXT (accessed May 28, 2019).

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 14. Support[a] for the Gas Tax Options, by Opinion on Spending Some Gas Tax Revenue for Transit

		Revenue to …				
Opinion	Base-case 10¢ increase (%)	Revenue to reduce local air pollution (%)	Revenue to reduce global warming (%)	Revenue to maintain streets/ highways (%)	Revenue to improve safety (%)	Revenue to reduce congestion (%)
All respondents	*40*	*63*	*62*	*75*	*71*	*70*
Support	51	73	71	79	77	76
Oppose	18**	42**	43**	67**	59**	57**

** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" support the option.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

V. FINDINGS ABOUT MILEAGE FEES

The survey asked several types of questions related to mileage fees, including whether people agreed or not with arguments for or against them, support for two variants on replacing the gas tax with a mileage fee, and the way people would prefer to pay for a mileage fee.

OPINIONS ABOUT THE ADVANTAGES AND DISADVANTAGES OF MILEAGE FEES

The survey presented a series of statements describing possible advantages and disadvantages of mileage fees and asked respondents how much they agreed or disagreed with each statement. The survey asked multiple questions related to the ideas of privacy (two questions), equity across owners of different vehicle types (three questions), and equity for people with certain driving patterns (two questions).

Figure 7 shows the percentage of respondents agreeing and disagreeing with each statement. The three statements that have the highest proportion of agreement are that a mileage fee is unfair to people who have to drive long distances (76%), that it is unfair to people who live in rural areas (74%), and that it is an invasion of privacy (70%).

Notably, people appear to show nuanced opinions on these topics. For example, when asked if tracking mileage invades privacy, 70% said yes. However, 48% of respondents agreed with the statement that, “I’m already tracked everywhere I go through my phone, so having my mileage tracked for a mileage fee wouldn’t really bother me.” A total of 45% of people who agreed with the statement about invasion of privacy agreed with the second statement as well. One possible explanation for these apparently contradictory results is that even though people instinctively consider tracking mileage an invasion of privacy, when reminded about tracking through phones they realize that a mileage fee would not be an unreasonable new layer of “tracking.”

A similar nuanced understanding of equity is revealed by the way people answered three questions relating to fuel efficiency and the fairness of mileage fees. On the one hand, 60% of respondents agreed that a mileage fee is fairer than a gas tax because everyone pays the same for using the roads, regardless of fuel efficiency or fuel type. On the other hand, 62% thought that less polluting vehicles should pay a lower rate than more polluting vehicles, including 60% of the people who agreed with the statement that the mileage fee is fairer than the gas tax because everyone pays. Also, 59% of respondents agreed that the mileage fee is less fair than the gas tax because it does not “give a break” to people who buy cleaner vehicles, including 72% of the respondents who had earlier agreed that a mileage fee is fairer than a gas tax because everyone pays equally for using the roads. Analysis of these three questions as a group suggests that many people who believe it is fair for everyone to pay for road use nevertheless see value in rewarding owners of less polluting vehicles with a break on the tax rate.

Table 15 looks at the variation in views on privacy among subgroups with different sociodemographic characteristics. There is only one statistically significant difference for

the statements that tracking mileage invades privacy, and it is only a three percentage point difference. (Slightly more woman than men felt this way.) By contrast, the second privacy statement has more diversity of opinion among subgroups. The subgroups with statistically significantly higher percentages agreeing are Black/African-American or of “other” race, people with no education beyond high school, people unemployed but looking for work, and people in the lowest income group.

Finally, Table 16 looks at the variation in views on fairness among subgroups with different sociodemographic characteristics. The statement with the most variation across subgroups is that the mileage fee is fairer than the gas tax because all drivers pay the same for using roads, regardless of vehicle type. The subgroups with statistically significantly higher percentages agreeing are people who are Black/African-American and of “other” race (compared to whites), people of Latino/Hispanic descent, people with no education beyond high school, and people in the youngest age group.

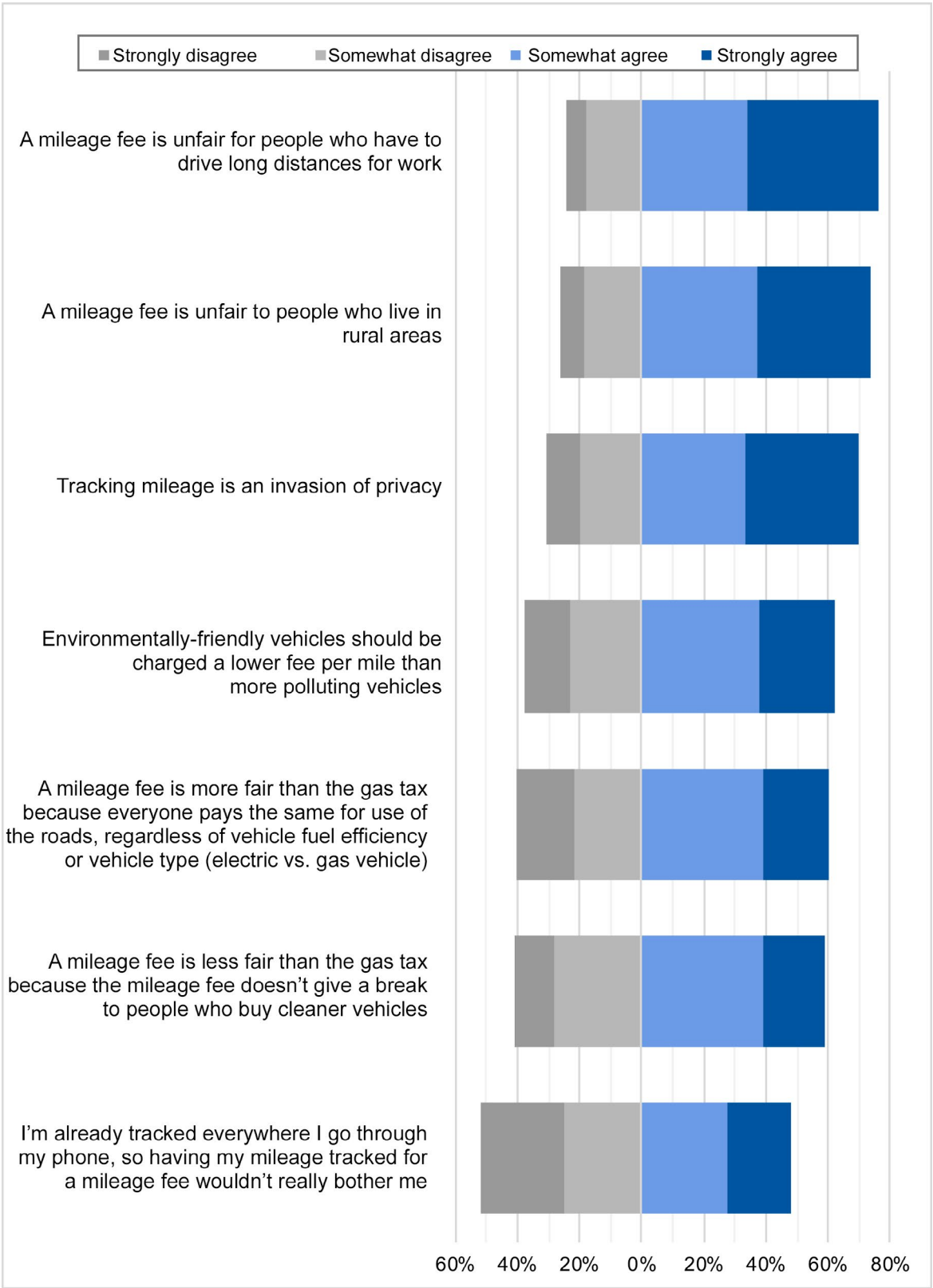

Figure 7. Agreement with Statements about Mileage Fees

Table 15. Agreement [a] with Statements about Mileage Fees and Privacy, by Sociodemographic Characteristics

Subgroup	Tracking mileage is an invasion of privacy (%)	I'm already tracked everywhere I go through my phone, so having my mileage tracked for a mileage fee wouldn't really bother me (%)
All respondents	*70*	*48*
Gender		
Male	68	50
Female	71*	47
Race		
White	70	46
Black/African-American	69	55**
Asian/Asian-American	67	51
Other	69	58**
Of Latino/Hispanic descent		
Yes	68	50
No	70	48
Education		
High school graduate or less	70	51
More than high school	69	46**
Employment status		
Working for pay	71	49
Unemployed, but looking for work	68	56*
Not working by choice (retired, etc.)	68	44*
Income (annual household)		
0 – $50,000	69	49
$50,001 – $100,000	71	43*
$100,001+	69	53
Age (years)		
18 – 24	71	48
25 – 54	70	49
55+	69	46

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" agreed with the statement.

Note: The test of two proportions was used to check if there is a statistically significant difference between agreement levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 16. Agreement [a] with Statements about Mileage Fees and Fairness, by Sociodemographic Characteristics

Subgroup	A mileage fee is more fair than a gas tax because everyone pays the same for use of the roads, regardless of vehicle fuel efficiency or vehicle type (electric vs. gas vehicles) (%)	A mileage fee is less fair than the gas tax because the mileage fee doesn't give a break to people who buy cleaner vehicles (%)	Environmentally friendly vehicles should be charged a lower fee per mile than more polluting vehicles (%)	A mileage fee is unfair to people who live in rural areas (%)	A mileage fee is unfair for people who have to drive long distances for work (%)
All respondents	*60*	*59*	*62*	*74*	*76*
Gender					
Male	60	60	61	71	73
Female	60	58	63	76**	78**
Race					
White	57	58	61	75	76
Black/African-American	70**	68**	68*	73	75
Asian/Asian-American	63	74**	70	74	77
Other	68**	53	66	71	75
Of Latino/Hispanic descent					
Yes	65	56	64	67	74
No	59*	60	62	75**	76
Education					
High school graduate or less	64	58	61	72	75
More than high school	57**	60	63	75*	77
Employment status					
Working for pay	59	61	64	75	78
Unemployed, but looking for work	64	55	65	69	69**
Not working by choice (retired, etc.)	60	58	59*	74	75
Income (annual household)					
0 – $50,000	60	57	61	72	75
$50,001 – $100,000	57	60	61	77*	77
$100,001+	63	62*	66*	76	76
Age (years)					
18 – 24	70	57	65	72	75
25 – 54	57**	61	64	73	76
55+	60**	57	59*	75	75

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" agreed with the statement.

Note: The test of two proportions was used to check if there is a statistically significant difference between agreement levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

SUPPORT FOR REPLACING THE GAS TAX WITH A MILEAGE FEE

Overall, 45% of respondents supported a flat-rate mileage fee and 50% supported a variable version. The fact that nearly half of respondents supported the flat-rate mileage fee, in particular, is surprising through not completely unexpected. A 2016 meta-analysis of 22 survey questions from the U.S. that asked about replacing the gas tax with a mileage fee found mean support was only 23%, though support rates ranged from 8% to 42%, depending on the survey.[16]

The high support rate in this survey may be partially explained by the fact that many respondents may have thought this tax would be cheaper for them than the federal gas tax. The survey explained that the average driver would pay about $100 per year for the mileage fee, whereas earlier in the survey respondents had been asked to estimate how much they paid annually in federal gas taxes, and the majority of drivers estimated paying more than $200 annually.

Tables 17 through 20 look at support for the mileage fees by subgroup. The subgroups statistically significantly less likely to support both mileage fee variants are white (as compared to Black/African-American), not working by choice, in the lowest income group, in the oldest age group, drive the least fuel-efficient vehicles, have not used transit in the last 30 days, and live outside urban areas (suburbs, small towns, and rural areas).

Table 17. Support[a] for the Mileage Fee Options, by Sociodemographic Characteristics

Subgroup	Flat (%)	Green (%)
All respondents	*45*	*50*
Gender		
Male	50	50
Female	41**	51
Race		
White	43	48
Black/African-American	53**	63**
Asian/Asian-American	52	59*
Other	41	53
Of Latino/Hispanic descent		
Yes	46	52
No	44	50
Education		
High school graduate or less	47	52
More than high school	43*	50
Employment status		
Working for pay	47	52
Unemployed, but looking for work	51	55
Not working by choice (retired, etc.)	40**	48*
Income (annual household)		
0 – $50,000	42	49
$50,001 – $100,000	46	48
$100,001+	50**	58**
Age (years)		
18 – 24	49	60
25 – 54	45	51**
55+	42*	45**

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who “strongly” or “somewhat” supported the option.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 18. Support[a] for the Mileage Fee Options, by Political Characteristics

Subgroup	Flat (%)	Green (%)
All respondents	*45*	*50*
Registered voter		
Yes	44	51
No	48	50
Likely voter[b]		
Yes	46	51
No	36**	46
Political affiliation		
Republican (and lean Republican)[c]	45	43
Democrat (and lean Democrat)[c]	48	59**
Independent, no party affiliation	37**	47
Some other party[d]	41	33

** Statistically significant at p<0.01.

[a] Sum of those who said that they "strongly" or "somewhat" support the option.

[b] Likely voters are those respondents who said that they are registered voters and that they vote "all of the time" or "most of the time."

[c] Included registered members of the political party, plus those respondents who stated that they were independent or a member of another political party, but chose to indicate which party they "leaned" towards.

[d] Registered member of any other party.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who supported the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 19. Support[a] for the Mileage Fee Options, by Travel Behavior

Subgroup	Flat (%)	Green (%)
All respondents	*45*	*50*
Annual miles driven		
1 – 7,500	46	48
7,501 – 12,500	44	49
12,501+	40	45
Don't drive	41	55**
Miles per gallon[b]		
≤ 19	36	39
20 – 30	42	45*
31+	47**	56**
Estimated federal gas tax paid each year[c]		
$1 – $49	49	54
$50 – $99	40*	47
$100 – $199	45	53
$200 – $399	44	46
$400 – $999	43	50
$1,000+	46	47
Used transit in the last 30 days		
Yes	53	60
No	40**	45**

* Statistically significant at p<0.05.

** Statistically significant at p<0.01.

[a] Sum of those who "strongly" or "somewhat" supported the option.

[b] Categories drawn from EPA's "SmartWay" vehicle rating system (U.S. Environmental Protection Agency, "SmartWay Vehicle Thresholds MY 2015" (January 2014), https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100HP2R.TXT (accessed May 28, 2019).

[c] This analysis excludes respondents who reported paying no gas tax at all.

Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who support the individual policies in each of the other subgroups within that category is compared to the reference case.

Table 20. Support[a] for the Mileage Fee Options, by Census Region and Community Type

Subgroup	Flat (%)	Green (%)
All respondents	*45*	*50*
Census region		
Northeast	49	53
Midwest	41**	49
South	44	50
West	46	52
Community type (self-reported)		
Urban	52	60
Suburban	44**	50**
Small town	44**	45**
Rural	33**	38**

** Statistically significant at p<0.01.

[a] Sum of those who "strongly" or "somewhat" supported the option.
Note: The test of two proportions was used to check if there is a statistically significant difference between support levels among subgroups. The first subgroup listed in each category is the reference case for the test; the proportion of respondents who support the individual policies in each of the other subgroups within that category is compared to the reference case.

PREFERRED WAY TO PAY FOR MILEAGE FEES

A final question about mileage fees asked respondents to select their preferred way to pay for the fees, should these be introduced. The options were to pay at the time of purchasing gas or when charging an electric vehicle, with a monthly bill, or with an annual bill. The most popular option, selected by 47% of respondents, was "Pay each time I purchase gas/diesel or charge an electric vehicle." Between the billing options, a monthly bill was preferred by somewhat more (30%) than an annual bill (23%). Figure 8 shows preference for payment option by sociodemographic groups. The same pattern holds for the subgroups; paying with each gas purchase or charging session is the most popular option for every subgroup except for Black/African-American respondents.

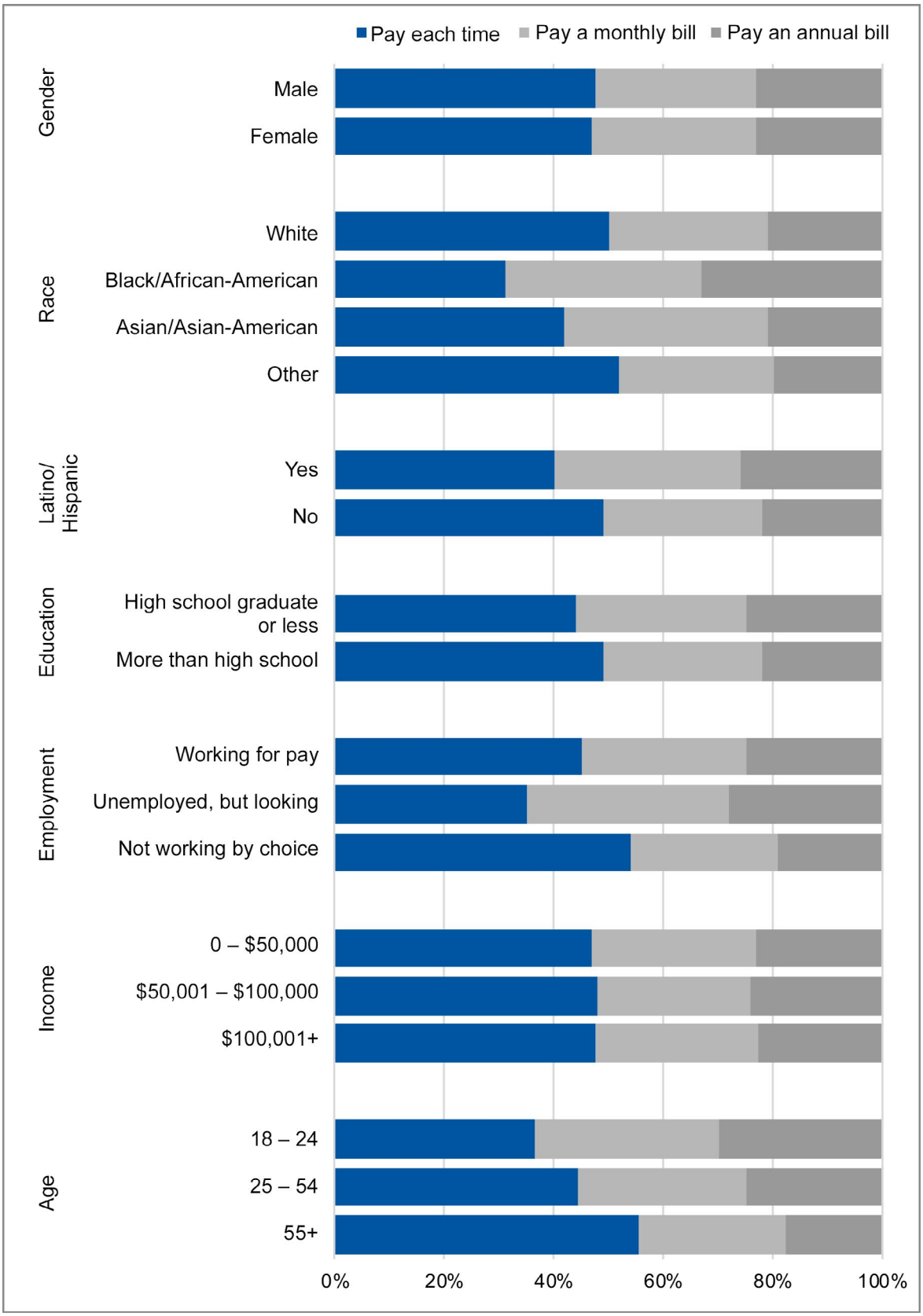

Figure 8. Preferred Way to Pay a Mileage Fee, by Sociodemographic Characteristics

VI. CONCLUSIONS

The study findings suggest that policymakers can build support for transportation tax measures through careful program design that takes into account the following key study findings.

1. Large majorities value transportation improvements across transportation modes. When respondents were asked to indicate their priorities for how federal gas tax revenues are spent, large majorities supported both road and public-transit-related options. Maintaining both local streets and roads and highway and freeways were high or medium priorities for 92% of respondents. Public transit programs were also very popular; for example, expanding public transit into new areas was a high or medium priority for 81%.

2. People do not have an accurate understanding of how much they pay in federal gas taxes. Most respondents did not know the federal gas tax rate or have an accurate estimate of how much they pay annually in federal gas tax. For example, when asked to estimate the federal gas tax rate, 19% of respondents thought it was at least 76¢ per gallon, far higher than the correct rate of 18.4¢ per gallon.

3. Support for raising the gas tax rate depends on how the revenue will be spent. When it comes to earning public support, all gas taxes are not alike. Policymakers can increase support by crafting tax measures that dedicate the revenues to purposes the public values. For example, people want better maintenance—and will pay for it. The gas tax variant with proceeds dedicated for maintenance was the most popular variant tested, with 75% supporting this increase. This is close to double the 40% who supported the "base case" gas tax for which the proceeds would be dedicated more generally to "transportation."

4. Support for raising the gas tax has risen slowly but steadily since 2010. For all five of the gas tax variants that were tested throughout the survey series, support has risen. In 2019, support is at least 13 percentage points higher than it was in 2010.

5. Linking transportation taxes to environmental objectives can increase support. Several survey questions suggest that linking a transportation tax increase to environmental benefits can increase support. The gas tax increase variants that linked the increase to projects reducing air pollution and global warming both had clear majority support (63% and 62%), and the green mileage tax variant was more popular than the flat-rate version (50% as compared to 45% support).

6. People prefer paying a mileage fee "at the pump" rather than being billed periodically. Respondents were asked if they would like to pay for mileage fees at the pump or time of vehicle charging, monthly, or annually. The first option was the most popular of the three (47%) and the annual billing option the least popular (23%).

7. People hold nuanced views on mileage fees with respect to equity and privacy. Results from the survey suggest that privacy and equity are issues of concern to the public,

but also that people are willing to consider different sides to these issues. Almost half of respondents who first agreed that mileage fees are an invasion of privacy also agreed with the follow-up statement: “I’m already tracked everywhere I go through my phone, so having my mileage tracked for a mileage fee wouldn’t really bother me.”

* * *

In sum, the public is most likely to support transportation tax measures that dedicate the revenues to purposes the public values, including maintenance, safety, and reducing environmental impacts. With respect to mileage fees, the way the rates are structured and payments collected will also impact support. Support is likely to be higher for a tax that is collected at the time of purchasing fuel or charging a vehicle, as well as one that varies the tax rate such that less polluting vehicles pay somewhat less.

APPENDIX A: SURVEY QUESTIONNAIRE AND TOPLINE RESULTS

This appendix presents the survey questionnaire and results for the 2019 survey.

The results have been weighted to match the Census Bureau's 2013 – 2017 *American Community Survey* five-year estimates with respect to gender, race, Hispanic ethnicity, education level, annual household income, and age.[17]

The authors removed missing and refused responses from the dataset before calculating the response rates.

Note that some categories in the tables do not sum to 100% due to rounding.

* * *

Researchers at the Mineta Transportation Institute, San Jose State University, are conducting a survey to gather your thoughts about transportation in the United States. Your opinions are very important, no matter how much or little you travel. Public officials can use the survey results to shape transportation services in communities throughout the country. The survey takes about 10 minutes and is anonymous. Your participation is completely voluntary. You can refuse to participate or stop the survey at any time without any negative effect on your relations with San Jose State University. If you participate, there are no anticipated risks to you and no anticipated benefits other than the satisfaction of sharing your views with the researchers. For more information about the study, contact Professor Asha W. Agrawal at asha.weinstein.agrawal@sjsu.edu. By agreeing to participate in the study, it is implied that you have read and understand the above information. Please do not write any identifying information on the survey/questionnaire.

We are interested in your opinions about the transportation system. The "transportation system" means local streets and roads, highways, and public transit services like buses, light rail, and trains.

Q1. In your community, how is the quality of each of the following

	Very good (%)	Somewhat good (%)	Somewhat bad (%)	Very bad (%)	Not sure / doesn't apply (%)
Interstates, highways, and freeways	22	48	20	7	3
Local streets and roads	14	41	28	15	1
Bicycle and pedestrian facilities	17	42	20	9	11
Public transit (bus, rail, etc.)	17	37	20	11	15

Q2. How concerned are you about traffic congestion in your community?

	%
Very concerned	33
Somewhat concerned	42
Not at all concerned	26

The next questions ask for your opinion about what government can do to improve transportation in the United States.

Q3. How important are the following transportation-related goals for the United States?

	Very important (%)	Somewhat important (%)	Not important (%)
Reduce traffic congestion	59	35	5
Reduce crashes and improve safety for everyone	76	21	3
Reduce health impacts caused by air pollution from cars and trucks	64	30	6
Reduce greenhouse gas emissions from transportation sources that contribute to climate change	57	33	10
Maintain and improve roads, streets, highways, and bridges	79	18	3
Make it more convenient to go places without driving (bus, walking, bike, etc.)	51	38	11

Q4. As you may be aware, the federal government charges a gas tax and spends the money collected for transportation. Listed below are different ways the government could spend that money to improve the transportation system. How much of a priority should each one be?

	High (%)	Medium (%)	Low (%)	Not at all (%)
Build/improve sidewalks	41	38	15	5
Subsidize public transit fares for low-income people	42	35	15	8
Develop programs that encourage people to switch from driving their cars to walking, biking, or using transit	33	36	22	9
Provide financial incentives for people to purchase electric vehicles	28	36	23	13
Build/improve bike lanes and bike paths	32	40	21	7
Use advanced technologies to reduce congestion and increase reliability	46	38	12	4
Install more charging stations for electric vehicles	27	36	27	11
Add more frequent public transit service on existing routes	39	37	18	6
Expand public transit service into new areas not already served	46	35	14	5
Maintain local streets and roads	64	28	5	2
Build/widen local roads and streets	40	41	15	4
Build/widen interstates, highways, and freeways	45	39	13	3
Maintain interstates, highways, and freeways	67	25	6	2

Q5. Here is the same list of transportation purposes that the federal government could spend the gas tax money on. Select the three you think are most important.

	Selected as top 3 (%)
Build/improve sidewalks	22
Subsidize public transit fares for low-income people	25
Develop programs that encourage people to switch from driving their cars to walking, biking, or using transit	15
Provide financial incentives for people to purchase electric vehicles	12
Build/improve bike lanes and bike paths	11
Use advanced technologies to reduce congestion and increase reliability	23
Install more charging stations for electric vehicles	7
Add more frequent public transit service on existing routes	16
Improve safety for pedestrians and bicyclists	17
Expand public transit service into new areas not already served	20
Maintain local streets and roads	46
Build/widen local roads and streets	16
Build/widen interstates, highways, and freeways	19
Maintain interstates, highways, and freeways	38

Now we have a few questions about your personal transportation and how you get around.

Q6. What is the most recent time you used each type of transportation?

	Last 7 days (%)	Last 30 days (%)	Not used (%)
Drive yourself (car, truck, motorcycle, etc.)	75	4	20
Ride as a passenger in a personal vehicle	51	22	28
Public transit (bus, train, ferry, etc.)	16	19	65
Taxi	5	13	82
Ridesharing services like Uber or Lyft	12	16	72
Walk to get somewhere (a store, work, friend's house, etc.)	44	19	37
Bicycle to get somewhere (a store, work, friend's house, etc.)	12	11	77
Electric kick-scooter, skateboard, or other small device	5	6	89
Other	2	3	95

Q7. Do you have any physical or other health conditions that limit your ability to do any of the following?

	Yes (%)	No (%)
Walk	29	71
Bike	26	74
Drive	15	85
Take public transit	13	87

Q8. About how many miles did you, personally, drive during the past 12 months in all motorized vehicles? If you work, include the commute to and from work, but not any miles driven while on the job.

	%
1 to 7,500 miles	36
7,501 to 12,500 miles	22
More than 12,500 miles	19
Don't drive	23

Q9. Now think about the vehicle you drove the most in the past 12 months, to get around for personal reasons like shopping, commuting to work, or vacation trips. How many miles per gallon does the vehicle get?

	%
Less than 19 mpg	17
20 to 30 mpg	45
More than 30 mpg	12
Have an electric vehicle	3
Don't know	23

Now, we have a few questions about what you spend on transportation. In a typical month, how much do you spend on the following expenses?

Expenditure Category	Mean ($)	Median ($)
Q10. Fuel for personal vehicles	119	100
Q11. Parking	43	25
Q12. Tolls on bridges and highways, including express lane fees	58	24
Q13. Public transit (buses, trains, subways, ferries, etc.)	57	25
Q14. Ride-hailing services (e.g., Lyft or Uber)	64	40
Q15. Vehicle rental charges, including car-share programs like Zipcar and Car2go	74	40
Q16. Shared bikes, e-scooters, or other micro-mobility devices	37	22
Q17. Other expenses	68	34

Q18. The federal government charges a tax on gasoline. If a regular gallon of gas costs $3.00, how much of that cost do you think is the federal gas tax?

	%
Less than 10¢	14
11¢ to 25¢	30
26¢ to 50¢	24
51¢ to 75¢	12
76¢ to $1.00	9
More than $1.00	10

Q19. What is your best guess of how much you pay per year in federal gas taxes?

	$
Mean	452
Median	200

There are many ways the U.S. Congress could raise money to pay for maintaining and improving the transportation system. The next few questions ask your opinion about some of these options. In each case, assume that the money collected would be spent only for transportation purposes.

Q20. Right now the federal government collects a tax of 18¢ per gallon when people buy gasoline. One idea to raise money for transportation is to increase the federal gas tax by 10¢ a gallon, from 18¢ to 28¢. Would you support or oppose this gas tax increase?

	%
Strongly support	12
Somewhat support	28
Somewhat oppose	27
Strongly oppose	32

Q21. Now, imagine that the U.S. Congress decided that the best option to raise money for transportation is to increase the federal gas tax by ten cents per gallon. Would you support or oppose the gas tax increase if the new money were spent only on the following types of projects?

	Strongly support (%)	Somewhat support (%)	Somewhat oppose (%)	Strongly oppose (%)
Reduce local air pollution caused by the transportation system	30	33	19	18
Reduce the transportation system's contribution to global warming	31	32	18	20
Maintain streets, roads, and highways	44	31	13	12
Reduce accidents and improve safety	42	29	14	14
Reduce traffic congestion	37	33	15	15

Q22. Some people say that money from gas taxes should only be spent on roads and highways, since drivers pay the tax. Other people say gas tax money should be used to pay for public transit in addition to roads and highways, because transit helps reduce traffic congestion and wear-and-tear on the roads. Would you support or oppose spending some gas tax money on public transit?

	%
Support	68
Oppose	32

Note on Q22: Half of respondents received the question as worded here, and the other half received the question with the two statements in reverse order: Some people say gas tax

money should be used to pay for public transit in addition to roads and highways, because transit helps reduce traffic congestion and wear-and-tear on the roads. Other people say that money from gas taxes should only be spent on roads and highways, since drivers pay the tax. Would you support or oppose spending some gas tax money on public transit?"

Now, imagine that the U.S. Congress decides to replace the gas tax with a mileage fee of one penny per mile driven. That means someone driving 10,000 miles a year would pay $100. Vehicles would have an electronic meter to keep track of the miles driven.

Q23. Would you support or oppose replacing the gas tax with such a mileage fee?

	%
Strongly support	14
Somewhat support	31
Somewhat oppose	23
Strongly oppose	32

Q24. A variation on the mileage tax just described is to have the tax rate vary depending upon how much the vehicle pollutes. On average, vehicles would be charged 1¢ per mile, but vehicles that pollute less would be charged less, and vehicles that pollute more would be charged more. Would you support or oppose this new mileage tax?

	%
Strongly support	16
Somewhat support	35
Somewhat oppose	23
Strongly oppose	26

Q25. Do you agree or disagree with the following statements about a federal mileage fee?

	Strongly agree (%)	Somewhat agree (%)	Somewhat disagree (%)	Strongly disagree (%)
A mileage fee is more fair than a gas tax because everyone pays the same for use of the roads, regardless of vehicle fuel efficiency or vehicle type (electric vs. gas vehicles)	21	39	22	18
A mileage fee is less fair than the gas tax because the mileage fee doesn't give a break to people who buy cleaner vehicles	20	39	28	13
Environmentally-friendly vehicles should be charged a lower fee per mile than more polluting vehicles	25	38	23	15
Tracking mileage is an invasion of privacy	37	33	20	11
I'm already tracked everywhere I go through my phone, so having my mileage tracked for a mileage fee wouldn't really bother me	20	28	25	27
A mileage fee is unfair to people who live in rural areas	37	37	19	8
A mileage fee is unfair for people who have to drive long distances for work	42	34	18	6

Q26. If Congress does create a federal mileage fee, how would you prefer to pay? Remember that the total amount you pay annually would be the same in each option.

	%
Pay a bill that comes once a year	23
Pay a bill that comes once a month	30
Pay each time I purchase gas/diesel or charge an electric vehicle	47

ABBREVIATIONS AND ACRONYMS

ACS	American Community Survey
AAPOR	American Association for Public Opinion Research
EPA	Environmental Protection Agency
EV	Electric Vehicle
MPG	Miles Per Gallon
RDD	Random Digit Dialing

ENDNOTES

1. For the results of the first nine years of polling in this series, see Asha Weinstein Agrawal and Hilary Nixon, *What Do Americans Think about Federal Transportation Tax Options? Results from a National Survey* (San José, CA: Mineta Transportation Institute, June 2010), http://transweb.sjsu.edu/MTIportal/research/publications/documents/2928_09-18.pdf (accessed April 20, 2016); Asha Weinstein Agrawal and Hilary Nixon, *What Do Americans Think About Federal Transportation Tax Options? Results from Year 2 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2011), http://transweb.sjsu.edu/PDFs/research/Transportation_taxes_public_opinion_1031.pdf (accessed April 20, 2016); Asha Weinstein Agrawal, Hilary Nixon, and Vinay Murthy, *What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 3 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2012), http://transweb.sjsu.edu/PDFs/research/1128-american-survey-federal-taxes-public-transit-highways-streets-roads.pdf (accessed April 20, 2016); Asha Weinstein Agrawal and Hilary Nixon, *What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 4 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2013), http://transweb.sjsu.edu/PDFs/research/1228-American-tax-poll-2013-public-transit-highways-streets-roads.pdf (accessed April 20, 2016); Asha Weinstein Agrawal and Hilary Nixon, *What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 5 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2014), http://transweb.sjsu.edu/PDFs/research/1328-road-tax-public-opinion-poll-2014.pdf (accessed April 20, 2016); Asha Weinstein Agrawal and Hilary Nixon*, What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 6 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2015), http://transweb.sjsu.edu/PDFs/research/1428-road-tax-public-opinion-poll-2015.pdf (accessed April 20, 2016); Asha Weinstein Agrawal and Hilary Nixon*, What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 7 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2016), https://transweb.sjsu.edu/sites/default/files/1528-road-and-transit-taxes-public-opinion-survey-2016.pdf; Asha Weinstein Agrawal and Hilary Nixon*, What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 8 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2017), http://transweb.sjsu.edu/PDFs/research/1728-what-do-americans-think-about-federal-tax-options-to-support-public-transit-highways-and-local-streets-and-roads.pdf; and Asha Weinstein Agrawal and Hilary Nixon*, What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year 9 of a National Survey* (San José, CA: Mineta Transportation Institute, June 2018), http://transweb.sjsu.edu/research/1828-Survey-Transportation-Tax-Year-Nine.

2. The current federal tax on gasoline is 18.4¢ per gallon, but respondents were told that it was 18¢ per gallon, to make the survey simpler to understand.

3. The description of the mileage fee options in the 2019 survey is slightly different from the description presented in previous years' surveys.

4. Valerie M. Sue and Lois A. Ritter, *Conducting Online Surveys*, 2nd edition, (Sage Publications, 2012), https://dx.doi.org/10.4135/9781506335186 (accessed June 6, 2019).

5. Monica Anderson, et al., "10% of Americans Don't Use the Internet; Who Are They?" Pew Research Center, April 22, 2019, https://www.pewresearch.org/fact-tank/2019/04/22/some-americans-dont-use-the-internet-who-are-they/ (accessed June 1, 2019).

6. Pew Research Center, *Collecting Survey Data* (no date) https://www.pewresearch.org/methods/u-s-survey-research/collecting-survey-data/ (accessed June 6, 2019).

7. Valerie M. Sue and Lois A. Ritter, *Conducting Online Surveys*, 2nd edition, (Sage Publications, 2012), https://dx.doi.org/10.4135/9781506335186 (accessed June 6, 2019).

8. Hilary Nixon and Asha Weinstein Agrawal, *Do Americans' Opinions About Federal Transportation Tax Options Depend on Survey Mode? A Comparison of Results from Telephone and Online Surveys* (San Jose: Mineta Transportation Institute, April 2018),http://transweb.sjsu.edu/research/Do-Americans-Opinions-About-Federal-Transportation-Tax-Options-Depend-Survey-Mode (accessed June 3, 2019).

9. Courtney Kennedy and Claudia Deane, "What Our Transition to Online Polling Means for Decades of Phone Survey Trends," Pew Research Center, February 27, 2019, https://www.pewresearch.org/fact-tank/2019/02/27/what-our-transition-to-online-polling-means-for-decades-of-phone-survey-trends/ (accessed June 6, 2019).

10. The formulas used to calculate these rates are available at American Association for Public Opinion Research, "Response Rates: An Overview," (no date) http://www.aapor.org/Education-Resources/For-Researchers/Poll-Survey-FAQ/Response-Rates-An-Overview.aspx (accessed June 1, 2019).

11. The U.S. Census Bureau's 2013-2017 American Community Survey 5-Year Public Use Microdata Samples were downloaded from American FactFinder, https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t# (accessed June 2, 2019).

12. The estimate was calculated as follows. We divided the U.S. Energy Administration's 2017 estimated annual gas expenditures per household ($1977) by the estimated average annual price per gallon of gasoline ($2.41) to estimate the average number of gallons of gas purchased per household (820). This figure was then multiplied by the federal gas tax rate of 18.4 cents per gallon. Sources: U.S. Energy Information Administration, "U.S. Gasoline Prices Increased in 2017" (January 4, 2018), https://www.eia.gov/todayinenergy/detail.php?id=34392 (accessed June 6, 2019); and U.S. Energy Information Administration, "U.S. Household Spending for Gasoline is

Expected to Remain Below $2,000 in 2017" (October 6, 2017), https://www.eia.gov/todayinenergy/detail.php?id=33232 (accessed June 6, 2019).

13. For more information about the use of p-values in scientific research, see: American Statistical Association, "Statement on Statistical Significant and P-values," *ASA News*, March 7, 2016, https://www.amstat.org/newsroom/pressreleases/P-ValueStatement.pdf (accessed June 16, 2019).

14. Hilary Nixon and Asha Weinstein Agrawal, *Do Americans' Opinions About Federal Transportation Tax Options Depend on* Survey *Mode? A Comparison of Results from Telephone and Online Surveys* (San Jose: Mineta Transportation Institute, April 2018),http://transweb.sjsu.edu/research/Do-Americans-Opinions-About-Federal-Transportation-Tax-Options-Depend-Survey-Mode (accessed June 3, 2019).

15. Half of respondents received the question as worded here, and the other half received the question with the two statements in reverse order: "Some people say gas tax money should be used to pay for public transit in addition to roads and highways, because transit helps reduce traffic congestion and wear-and-tear on the roads. Other people say that money from gas taxes should only be spent on roads and highways, since drivers pay the tax. Would you support or oppose spending some gas tax money on public transit?"

16. Asha Weinstein Agrawal, Hilary Nixon, and Ashley M. Hooper, *Public Perception of Mileage-Based User Fees,* NCHRP Synthesis 487 (Washington*,* D.C.: Transportation Research Board, 2016).

17. The U.S. Census Bureau's 2013-2017 American Community Survey 5-Year Public Use Microdata Samples were downloaded from American FactFinder, https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t# (accessed June 2, 2019).

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