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How to Pay for Transportation? A Survey of Public Preferences

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How to Pay for Transportation? A Survey of Public Preferences

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ABSTRACT

States around the nation are scrambling to find new sources of revenue to maintain and expand their transportation systems. The traditional major source of funds, state and federal fuel taxes, has rarely kept pace with inflation. In most cases state legislatures have been unwilling to raise fuel taxes high enough to cover desired levels of expenditure, thus pushing state and local governments to look for new sources such as sales taxes and tolls. Another outcome of legislative reluctance to raise fees and taxes that generate transportation revenues has been to put any potential revenue measure before the voters, as a ballot proposition. As a result of these new trends in how legislatures respond to proposals for raising transportation revenues, transportation agencies are more and more asked to choose revenue options that have strong public support.

This paper investigates public opinion in California on support for a range of revenue options to fund transportation, including taxes and fees, bonds, and tolling. The analysis is based on results from two telephone surveys of California residents conducted in 2006. The survey revealed fairly strong public support for some tolling options. The most popular tax or fee option was to increase vehicle registration fees by a variable amount depending on the vehicle's air pollutant emissions and gas mileage. Three tax options – gas taxes, sales taxes, and the vehicle license fee – had virtually the same levels of overall support, about 40%. The analysis of demographic and other factors provides further insights. People living in regions that have toll roads and HOT lanes were far more supportive of these concepts. Support for pricing options was not clearly related to income or ethnicity. Lower income respondents were about equally likely to support tolls roads, express toll lanes, and HOT lanes. Younger adults were more supportive of most tolling options, the mileage fee, and the registration fee that varied by emissions and gas mileage. The survey also revealed what many researchers have found – that methodology, particularly question wording, is very important. Overall, the survey provides some optimism for implementing new options, such as tolling, and more traditional options of user fees. The positive reaction to linking fees with environmental objectives should be explored further by researchers and policy makers.

Keywords: Transportation finance, public opinion, fuel tax, toll roads, California

INTRODUCTION

States around the U.S. are scrambling to find new sources of revenue to maintain and expand their transportation systems. The traditional major source of funds, state and federal fuel taxes, has rarely kept pace with inflation. In many states and nationwide in the U.S., population and vehicle miles traveled (VMT) are outpacing growth in gas tax revenues [1, 2]. Improved fuel economy, the growing popularity of hybrid vehicles, and the expected growth in vehicles that run on fuels other than gasoline or diesel also cast doubt on the long-term viability of traditional fuel taxes [2]. Fuel taxes have long been the preferred revenue option because they are considered a user fee – users of the transportation system pay the tax somewhat in proportion to how much they use the system. In most cases state legislatures have been unwilling to raise fuel taxes high enough to cover desired levels of expenditure. As a result, state and local governments are increasing their use of non-user based sources, including sales taxes. More agencies are also using or considering tolls to build new facilities, even where tolled facilities do not currently exist. More recently, some states and the federal government are exploring mileage-based fees as a replacement for fuel taxes, though the option is considered long-term and has little political support currently [3, 4]. In addition to the reduced reliance on fuel taxes, local sources (regions, counties, and cities) are making up a greater share of transportation expenditures, as the responsibilities for funding transportation devolve down from the federal government [2].

Another outcome of legislative reluctance to raise fees and taxes that generate transportation revenues has been to put any potential revenue measure before the voters, as a ballot proposition. As a result, agencies are more and more asked to choose revenue options that have strong public support. It is often a challenge for analysts to recommend options that are not only politically acceptable, but also desirable in terms of their equity, ability to generate stable revenue streams, and capacity to encourage environmentally responsible choices by the traveling public. Thus, the transportation profession needs to develop a better understanding of how the public perceives different revenue options.

This paper examines levels of public support for various transportation funding mechanisms using surveys of California residents. To more completely understand public opinion on funding options, the analysis explores how support varies by demographics, attitudes, and travel behavior. Such an analysis may prompt agencies to consider different funding options or develop strategies to improve acceptance of strategies that may be more desirable for other reasons, such as their revenue potential, equity, or impacts on the environment and transportation system. An analysis of demographic factors may also help predict future acceptance of revenue options, as significant changes occur, such as an aging and increasingly diverse population. Several revenue options, particularly tolling, have raised concerns over equity. An examination of support among various income and racial groups can enlighten this discussion. The research also expands the base of knowledge on public opinions on transportation funding by including a wide range of revenue options. Most previous surveys focus on a narrow range of options, often only one, and many are conducted for political purposes.

The paper first reviews existing research on public opinions regarding raising transportation revenue. The focus is on recent experience in the United States and includes academic and other literature. The survey methodology is then briefly explained. The findings section presents the

results from the surveys, comparing the acceptability of 13 different revenue options based on different demographic, attitudinal, and travel behavior factors. Logistical regression models help explore the interactions between these different factors. Finally, the conclusions and suggestions for future research focus on findings of use to transportation agencies and policy makers.

LITERATURE REVIEW

Overview

Research on public support for or opposition to various transportation funding mechanisms can be found in a variety of sources. Through internet and library database searches, we identified over 50 surveys conducted in the past 10 years in the United States that included questions about changing levels of transportation funding. While the search was not exhaustive, it provides a good sense of what research is available on public opinions towards transportation funding. Most common were public opinion polls conducted by or for news agencies in response to ballot measures or other specific policy debates and for public agencies or political groups who were gauging support for a specific proposal. Results from the latter are less accessible, as they are sometimes not released to the public. In both cases, the survey questions often focused on only one or a handful of particular proposals, rather than a wide range of options. The proposals examined were often in response to a current political debate and, therefore, seldom explored new or innovative concepts. They also rarely went into much depth with follow up questions; rather they simply asked if the person supports or opposes an idea. The survey also rarely explored why respondents oppose a gas tax, for example, or what type of gas tax would be more appealing to them. There were, of course, exceptions to these generalizations [5, 6].

There were a smaller number of surveys conducted by university researchers or non-partisan policy research organizations. Some focused on particular topics, such as congestion pricing [7, 8], while others examined a variety of options [9]. The results of these surveys were often accompanied with more sophisticated analyses, including regression models predicting support based upon a wide range of variables. In contrast, the analyses of survey data conducted for news agencies was typically simple; readers were usually only given the share of respondents for each answer category. Cross tabulations by demographic or other variables were rarely provided. When they were, the analyses sometimes focused on politically useful factors, such as party affiliation.

As with polling on any subject, question wording and ordering of questions influences the responses, making it difficult to know how representative of the responses are of the general public, or if the responses would reflect public opinion at different time periods or in different geographic locations. A handful of the studies, all from academic sources, examined this topic directly. Despite the limitations in drawing universal conclusions from surveys conducted at different times and places and using different methods, some patterns of support and opposition do emerge, which are discussed below.

Public Opinion Support for Funding Options

Most polls asking about raising gas taxes found far less than majority support. A 2005 nationwide poll by ABC News found that only 32% of respondents supported a higher gasoline tax to fund transportation projects. However, when asked in a separate question how much they were willing to pay in higher gas taxes for transportation projects, 42% gave a number of one or

more cents per gallon and 52% said zero [6]. In surveys conducted since the year 2000, less than 40% of respondents supported increased gas taxes to fund transportation in the San Francisco Bay Area [10], Connecticut [11], South Carolina [9], New Jersey [12], and Washington state [13]. However, a year after the Washington poll, voters rejected a referendum that would have repealed a phased 9.5 cent increase in the gas tax that the legislature had approved [14]. In contrast to most recent polls, a 1998 poll of New Jersey residents found about an even split in support for increasing the gas tax by five cents per gallon to fund transportation programs [15].

There were fewer polls that included questions about increasing other transportation-related taxes and fees. Two surveys of Washington state residents conducted in 2004 found that if new revenues were needed for regional transportation projects, 40-45% of residents would support increasing the tax that relates to the monetary value of the person's vehicle [13]. Only 14% of South Carolina residents surveyed favored increasing property taxes on vehicles [9].

The level of support for tolls varies significantly in the polls examined, depending upon how the topic was framed and how questions were worded. Polls that ask simply whether respondents support or oppose tolls often find less than majority support. For example, 56% of Utah residents surveyed opposed "paying a toll to use a new highway" [16] and only 41% of South Carolina residents viewed tolls favorably [9]. Similarly, just over half (51%) of Texas residents surveyed agreed that people should not pay toll on new roads, with 37% disagreeing. In addition, three-quarters of the respondents agreed that the tolls should be reduced after construction costs were paid for. A type of toll facility, high-occupancy toll (HOT) lanes, may have higher levels of support than other tolled facilities. Just over half (52%) of Texas residents surveyed thought HOT lanes were a good feature [17]. However, the ABC News poll found that only 36% of respondents supported HOT lanes [6]. Of historic interest is a 1956 nationwide Gallup Poll that asked respondents to choose between four options to build more "express and super highways between large cities." At that time, 41% favored a toll of about one cent per mile, while 11% favored higher taxes on gas, oil, and tires, 21% favored higher license fees, and 11% favored borrowing [18].

Support for tolls often increased when directly compared to gas taxes and when respondents were provide more information about the topic. More of the Texas residents surveyed chose tolls over gas taxes [17]. Similarly, 23% of Minnesota residents preferred a gas tax to build new lanes on freeways, compared to 69% preferring tolls [19]. A 2006 poll of Washington state voters found that 58% favored using tolls if additional funds for transportation were needed, compared to 26% favoring an increase in the gas tax. These results were obtained at the end of the survey, after several other questions about tolls had been asked. Compared to an earlier question, support for tolls increased, indicating that exposure to the topic increased support. A survey of Colorado residents also found increased support after respondents heard more details about the proposed toll road [20].

Experience with tolling seems to be an important factor in support for this revenue option. In Texas, people who used toll roads regularly were more supportive of increasing the use of tolling [17]. In Washington state, where there are no toll roads, the lack of understanding of current toll technologies was thought to reduce support for the option in focus groups. The researchers thought that participants visualized old-style toll booths, rather than electronic toll collection systems. They also observed that participants needed an accurate picture of a HOT lane that demonstrated more of a physical separation than current HOV lanes. The Washington study also

conducted a random survey of voters that found that 25% of the respondents who disagreed with tolling changed their mind when told that they would not have to stop at toll booths [5].

The polls found little support for congestion pricing – tolls that are higher during peak times. Only 29% of respondents to a nationwide ABC News poll supported this idea and 59% did not think it would be effective in easing traffic congestion [6]. Only about one-third (32%) of San Francisco Bay Area residents preferred higher tolls during peak commute times on a major bridge, while 58% preferred the same increase at all times of the day [21]. Similarly, only 30% of Texas residents thought that varying toll rates by time of day was a good idea [7]. Residents of Washington state were more supportive of using tolls to provide funds to improve the highway system (58% in favor) compared to using varying tolls to shift traffic patterns (36% in favor). Only 44% supported tolling for *both* raising funds and shifting traffic, indicating that the congestion pricing concept was a very negative factor [5]. A survey of Los Angeles area residents found that 36% supported a congestion pricing policy that charged drivers 5-10 cents per mile on all freeways, depending upon congestion levels. However, support increased if other taxes were reduced to offset the fee and more if the pricing was restricted to one lane on the freeway [8].

Dedicated sales taxes are used in some states and counties, particularly in California, to fund transportation. Several local polls in California have demonstrated majority support for county-level sales taxes, usually of one-half cent [10, 22, 23]. Support for such taxes is also evidenced in their success at the ballot box [24]. However, there is less support for sales taxes to fund transportation outside of California. Only about one-quarter of Washington state residents [13] surveyed favored sales taxes to fund transportation. The same share of South Carolina residents favored increasing the sales tax on new car purchases to fund transportation [9].

Many surveys have found support for bond funding of transportation infrastructure. For example, a Bay Area Council poll in January 2006 found that 21% of respondents would vote for all five bond measures proposed by Governor Schwarzenegger, including one for transportation, and that an additional 49% would vote for a $6 billion bond for transportation, for a total level of support of 70% [25]. A poll conducted by the Public Policy Institute of California (PPIC) found that 68% of likely voters would vote yes on a state bond for infrastructure projects, including transportation. The survey explained that the bonds would be paid “though the state’s general fund with no new taxes” [26]. When PPIC asked how likely voters preferred that the state increase funding for roads and other infrastructure projects, 29% favored using only surplus budget funds, 23% supported state bonds, 20% chose increased user fees and 15% increased taxes. A majority of New York state residents surveyed also supported a proposal to borrow nearly $3 million for transportation projects [27].

Equity and Environmental Objectives

Only a few of the surveys examined looked at increasing taxes or fees to help achieve environmental objectives or account for externalities, with varying results. A 2006 *New York Times* poll found that 55% of adults supported an increase in the gas tax if it reduced dependence on foreign oil and 59% supported an increase if it reduced global warming. This contrasted with 85% who opposed an increase if it was presented without any direct outcomes [28]. When Atlanta area residents were asked how they felt about raising the gas tax to “get Georgians to cut

back on driving and focus on public transportation or carpooling alternatives" only 11% thought it was a good idea [29].

People may be more supportive of charging varying rates based upon the environmental impacts of vehicles. A nationwide poll conducted by ABC News found that while only 36% of respondents supported opening up HOV lanes to single drivers paying a toll, 54% supported allowing single drivers in hybrid cars to use the lanes for free "as a way of encouraging the use of these cars"[6]. A large share of Texas residents (73%) thought that charging higher tolls for larger, heavier, or higher polluting vehicles was a good idea and 62% agreed that trailer trucks should pay higher tolls [7]. Forty-two percent of Washington state voters surveyed in 2004 expressed support for a tax based on a car's weight. This was about the same level of support as for an increase in a value-based vehicle tax, but significantly higher than support for increased gas or sales taxes [13].

Few polls explore issues of equity in depth. A poll of Washington state residents found that more people felt that, if more funds were needed, tolls were more fair than increasing the gas tax. Respondents who were specifically asked about fairness to lower income groups felt even more strongly, with 52% indicating that tolls were more fair than increased gas taxes (27%) [5]. This is in contrast to the political debates over toll facilities where questions of equity with respect to income were often raised. A survey of the drivers using the HOT lanes on SR-91 in Southern California showed that lower-income drivers were almost as likely as higher-income drivers to say that they approved of the lanes [30].

Demographic Analyses

Regional differences in support for revenue options would be expected for a variety of reasons. The degree of need for increased funding (e.g. levels of congestion) and experience with certain funding sources (e.g. local sales taxes or tolled facilities) would likely influence levels of support. Demographics and political leanings (e.g. conservative vs. liberal) are also likely to vary geographically. In their survey of Texas residents Podgorski and Kockelman [17] found significant differences in support for revenue options between regions. However, perhaps unexpectedly, the research found more support for tolling and congestion pricing in non-metropolitan areas [7, 17]. A separate study found that rural South Carolina residents were also more supportive of tolls [9]. The authors of both studies hypothesized that rural residents thought tolls would be implemented in the urban areas; since they would likely not pay the tolls they were more supportive of the idea. In contrast, surveys of Washington residents found the greatest level of support for tolls and user fees in the state's largest and most congested metropolitan area (Puget Sound) [13].

Some of the surveys examined differences by demographic variables. The survey of Texas residents found that older adults were more likely to support tolls and HOT lanes, though retired respondents were less likely. Men were also less likely to support tolls on new or existing roads, but were more likely to support HOT lanes, compared to women [17]. The survey of Utah residents did not show a significant difference between men and women regarding toll roads. Respondents over 34 years old were more supportive of toll roads, though this may also be related to income, because higher income respondents were also more supportive [16]. The Texas study's findings controlled for other demographic characteristics. Older residents (age

60+) of the Santa Barbara, CA area were less supportive of a sales tax for transportation, though a majority still favored the measure [23].

A few studies examine race and ethnicity. One of the 2004 Washington state polls included a sample of Hispanic residents which found much lower levels of support for all of the revenue options examined among this population. For example, only 27% of Hispanic respondents supported tolls or user fees, compared to 47% of other respondents, and only 10% supported increasing the gas tax, compared to 31% of other respondents [13]. A study of Los Angeles area residents found that Hispanics and Asians were more favorable of congestion pricing than Caucasians and African-Americans, though the authors had no explanation for the finding [8].

Support for various funding mechanisms is likely to vary by income and/or education. More educated respondents in Texas were more supportive of tolling [17]. In contrast, the Los Angeles area study found that income and education were negatively related to support for congestion pricing, even when controlling for other variables [8].

METHODOLOGY

This research project included two phone surveys. Both questionnaires were designed by the project team[1] and administered by the Survey and Policy Research Institute at San Jose State University. Survey 1 included a random digit dialing (RDD) sample of 2,705 California adults (18 and older) and was conducted in January 2006. The margin of error is 1.9%. Survey 2 included a RDD sample of 815 adults and was conduced in March 2006. The margin of error is 3.4%. Both surveys were conducted in both English and Spanish. Because older adults and women were often more likely to answer phone surveys, surveyors asked to speak with the youngest male present, and if none was available, then the oldest female.

The first survey examined ten specific transportation funding options, including raising various taxes and fees, issuing bonds, and different tolled facilities. In the case of tax and fee options, the questions included specific amounts by which the taxes and fees would be raised. This is in contrast to some of the polls reviewed above. The amounts were chosen based on several factors. The amounts were often similar to or within the range of recent proposals or policy discussions. The amounts were also chosen to be reasonable and make question wording simple. For example, one proposal was to double registration fees from $31 to $62 per year. Another proposal was to increase the annual vehicle license fee (VLF), which is value-based property tax on vehicles, from 0.65% to 1.0%. The fee was recently lowered from 2.0%. The questionnaires' descriptions of the options appear in the findings section the follows. Survey 2 included more in-depth questions on tolling and public-private partnerships. Both surveys collected demographic information, including gender, race/ethnicity, age, education, income, voter registration, and political party. The surveys also asked about travel behavior and opinions about the transportation system. Survey 1 also asked opinions on taxes and spending on transportation infrastructure.

[1] In addition to the authors, the project team included Todd Goldman, PhD., City College of New York, Eileen Goodwin, Apex Strategies, and Phil Trounstine, Director of the Survey and Policy Research Institute (SPRI) at San José State University.

SURVEY DATA

Table 1 displays data for the independent variables used in this analysis. Though both surveys were conducted using RDD, there is some sample bias. Women represent 57% of Survey 1 respondents and 51% of Survey 2 respondents. Both surveys underrepresent younger adults; 23% of Survey 1 respondents and 22% of Survey 2 respondents over 20 years old were 20-34 years old, compared to 32% of California adults over 20 years old from the 2000 Census.[2] Consequently, older adults were somewhat overrepresented; 33% of Survey 1 respondents and 35% of Survey 2 respondents were 55 or older, compared to 26% of adults from the Census. The sample also is more educated than the State's population. Less than five percent of both surveys' respondents had less than a high school degree, compared to 23% of the population aged 25 or older according to the Census.[3] A higher share of survey respondents had a college degree (51% in Survey 1 and 46% in Survey 2) compared to the Census (34%). Consistent with this, there were some differences in income. A large share of respondents to both surveys (26% and 21%) refused to provide income information. About one-quarter of California households in the 2000 Census had incomes in 1999 under $25,000, compared to 16% of Survey 1 respondents and 18% of Survey 2 respondents who provided income information. Increasing incomes between 1999 and 2005 may account for some of this difference. In contrast, 25% of Survey 1 respondents and 23% of Survey 2 respondents had incomes of $100,000 or more, compared to 17% of households from the Census.

Direct comparisons between the Census and the survey samples for race and ethnicity were not possible because the surveys included Hispanic ethnicity with race options of white, Asian, Black, and other in a single question. The Census asked about Hispanic ethnicity separately from race. According to the Census, 32% of California's population is Hispanic or Latino. In comparison, 21% and 24% of respondents from Surveys 1 and 2, respectively, indicated they were Hispanic, Latino, or Mexican-American (excluding refusals). The geographic distribution of respondents between regions in the state closely matched 2006 California Department of Finance projections for 2006.

[2] Census data groups ages 15-19, so the comparison to the Census is only for survey respondents age 20 or older.
[3] Respondents to a phone survey may also be more inclined than on the written Census form to overstate their education.

Table 1 Description of Independent Variables

Independent Variables	Survey 1		Survey 2	
n	2,705		815	
Attitudes				
How much of a problem is the quality of the transportation system for you personally?	Big problem Somewhat of a problem Not much of a problem No problem at all Don't know	29% 26% 22% 22% 1%	Big problem Somewhat of a problem Not much of a problem No problem at all Don't know	24% 30% 22% 22% 2%
Would you say the level of state and local taxes you pay is too high, too low, or just about right?	Too high Too low About right Don't know	46% 5% 44% 5%	Not included	
Demographic				
Gender (by observation)	Male Female	43% 57%	Male Female	49% 51%
What race of ethnicity so you consider yourself?	White, Caucasian or European Hispanic, Latino, Mexican-American Asian, Pacific-Islander, East Indian Black, African-American Other Refused	60% 19% 8% 5% 1% 6%	White, Caucasian or European Hispanic, Latino, Mexican-American Asian, Pacific-Islander, East Indian Black, African-American Other Refused	60% 23% 8% 4% 2% 4%
Age group	18-34 35-54 55+	25% 40% 5%	18-34 35-54 55+	27% 40% 33%
What is your education level?	Less than high school degree High school graduate Some college College graduate Some graduate school Graduate degree Refused	3% 16% 28% 32% 3% 17% 2%	Less than high school degree High school graduate Some college College graduate Some graduate school Graduate degree Refused	5% 19% 28% 27% 3% 16% 2%
Household income	Less than $25,000 $25,000-49,999 $50,000-74,999 $75,000-99,999 $100,000-124,999 $125,000+ Refused	12% 16% 16% 12% 8% 11% 26%	Less than $25,000 $25,000-49,999 $50,000-74,999 $75,000-99,999 $100,000-124,999 $125,000+ Refused	14% 17% 16% 13% 7% 11% 21%
Residence (California region)	San Francisco Bay Area Los Angeles County Other Southern California Central Valley Central Coast Rural California	20% 23% 26% 19% 8% 4%	San Francisco Bay Area Los Angeles County Other Southern California Central Valley Central Coast Rural California	22% 23% 26% 19% 6% 4%
Political viewpoint (asked of registered voters only)	Very conservative Conservative Moderate Liberal Very liberal Don't know/refused	4% 25% 38% 21% 6% 6%	Question not included on Survey 2	
Travel Behavior				
In a typical week, how many miles do you drive?	Mean = 158 Standard deviation = 173 Median = 100 *(Values over 1000 recoded to 1000)*		Mean = 182 Standard deviation = 209 Median = 100 *(Values over 1000 recoded to 1000)*	
In the last month, have you taken any form of transit like a bus, light rail, or a train?	Yes No Don't know	24% 75% <1%	Yes No Don't know	20% 80% <1%
When you want to go somewhere, how often do you have a car available so that you can drive yourself?	Always Most of the time Occasionally Never n.a., I don't drive	82% 7% 4% 4% 4%	Question not included on Survey 2	

FINDINGS

Overall Support for Revenue Options

The overall level of support for each specific revenue option presented to respondents is shown in Table 2. Truck-only toll (TOT) lanes and high-occupancy toll (HOT) lanes were the only options supported by a majority of respondents. Tax and fee increases were not popular, consistent with the other polls reviewed. The most popular tax or fee option was to increase the annual vehicle registration fee from $31 to an average of $62, with fee amounts varying depending upon how much the vehicle polluted and gas mileage. This option was supported by 44.1% of respondents, compared to the 31.5% that supported a flat increase of the registration fee. Support for increasing gas and sales taxes was about the same. This may seem inconsistent with recent political experience in California where a majority of voters in many counties have supported local sales tax increases, while there is virtually no political support for increasing the gas tax. One explanation is that voters support the sales taxes because they are local, accompanied with a list of specific projects to which revenues will be dedicated, and usually have an expiration date. These characteristics may make the sales tax more appealing than a gas tax.

The importance of question wording is evidenced in the low level of support (29.9%) for general obligation bonds. The question explained that "paying off the bonds from the state's general fund over 30 years would use money that otherwise might be spent for other state programs and services." This is in contrast to the poll results reviewed above that did not fully explain how bonds were paid for.

Another example of the importance of question wording is seen when respondents were asked on Survey 1 to choose between five options that would all raise about $1 billion:

> Now, suppose state officials were thinking about raising an additional $1 billion a year in funding for transportation. I'm going to read you a list of five different tax and fee options that would all raise that same $1 billion. Please tell me the one you like best.

Presented in this manner, raising the sales tax by one-quarter of a cent per dollar was far more popular than the other tax and fee increases (Table 3). The differences may be due to the amounts of the increases presented – ¼ cent, 1%, $50, and 6 cents. The intent of the question was to make the revenue options equal, though it is unclear if respondents viewed them as equal, given the contrast in results from the individual questions.

Table 2 Overall support for each revenue option

Revenue Option	Description of option from questionnaire	% of respondents supporting the option
Truck-only toll (TOT) lanes	There were proposals in some congested regions to build new toll lanes for trucks right next to existing freeways. Trucks would be required to use these toll lanes instead of the regular freeway. (Survey 2)	64.3%
HOT lanes	Open underused carpool lanes to solo drivers who were willing to pay a toll (Survey 1)	55.2
Toll roads	One option for building new highway projects without increasing taxes is to borrow money to build the road, charge tolls for driving on the new highway, and use the money collected to pay back the loans and maintain the highway. (Survey 2)	46.7
Variable registration fees (by emissions & fuel economy)	Increase the vehicle registration fee to an AVERAGE of $62 per year for all vehicle owners, but vary the fee according to how much pollution the vehicle emits and how much gas mileage it gets. Vehicles that emit more pollution or get lower gas mileage would pay HIGHER fees and those that emit less pollution or get better gas mileage would pay LOWER fees. (Survey 1)	44.1
Express toll lanes	Building new freeway lanes alongside existing highways and charging a toll to drivers who use those NEW lanes. (Survey 2)	43.8
Gas tax	Increase the 18-cents-a-gallon state gas tax by one cent per year for ten years. (Survey 1)	40.4
Sales tax	Adopt a half-cent increase in the statewide sales tax. (Survey 1)	40.2
Vehicle license fee	Raise the vehicle LICENSE fee to 1%. The vehicle license fee is currently 0.65% (point six-five percent) of your vehicle's value, so the new fee would be 1%, with the additional revenue dedicated to transportation purposes. (Survey 1)	40.1
Tolls on new highway lanes	One way to pay for new highway lanes is to charge tolls for using them. (Survey 1)	39.8
Registration fees	Increase the vehicle REGISTRATION fee to $62 per year per vehicle, from its current level of $31.	31.5
General obligation bonds	One proposal is for the state to pay for new freeways and transit programs with general obligation bonds. These don't require a tax increase. But paying off the bonds from the state's general fund over 30 years would use money that otherwise might be spent for other state programs and services.	29.9
Indexed gas tax	Index the gas tax to inflation. Under this proposal, the gas tax could increase slightly each year based upon inflation. For example, in 2004, inflation in California was about 3%, so the tax would have gone up by about a half cent per gallon. (Survey 1)	26.8
Mileage fee	Eliminate the 18-cents-a-gallon gas tax altogether and replace it with a so-called "mileage fee" based on the number of miles a vehicle is driven. Each driver would pay a fee of one cent per mile for every mile driven within the state. For example, every 100 miles driven would incur a mileage fee of $1. Each vehicle would be equipped with an electronic means to keep track of miles driven and the fee would be paid at the pump when drivers buy gas. (Survey 1)	22.4
n	Survey 1: 2705; Survey 2: 815	

Table 3 Rank of Support for Options to Raise $1 billion

Option	Preferred Revenue Option
Raise Statewide Sales Tax by 1/4¢	25.2%
None of the Above	20.0
Raise Vehicle License Fee To 1%	15.3
Raise Registration Fee for Personal Vehicles by $50	13.9
Raise Gas Tax by 6¢ per Gallon	11.1
Add New Mileage Fee of 1/3¢ per Mile Driven	9.8

Levels of Support and Demographic Variables

When there was a difference between the sexes, men were more supportive of tax and fee increases and women were more supportive of the tolling options (Table 4). These findings are not consistent with those found in Texas, where men supported HOT lanes more than women [17]. The difference in support for truck-only toll lanes may reflect a stronger preference among women to have trucks separated from personal vehicles in traffic. Adding the option to vary registration fees by emissions and fuel economy increased support among women far more than men, such that support is about equal.

Table 4 Support for Revenue Options by Gender

Revenue Option	% of respondents supporting the option	
	Men	Women
Taxes and fees		
Gas tax	**44.7%**	**37.2%**
Indexed gas tax	**30.5**	**24.1**
Mileage fee	23.5	21.5
Registration fee	**36.1**	**27.9**
Variable registration fees	44.9	43.5
Vehicle license fee	41.6	39.1
Sales tax	40.9	39.7
General obligation bonds	**33.3**	**27.3**
Tolls		
Tolls on new highway lanes	39.6	39.9
Express toll lanes (Survey 2)	45.7	42.0
Toll roads (Survey 2)	**43.2**	**49.9**
HOT lanes	**52.2**	**57.4**
TOT lanes (Survey 2)	**59.8**	**68.5**
n (Survey 1)	1162	1543
n (Survey 2)	396	419

Note: **Bold** indicates that the proportions were significantly different, $p<0.05$.

Older adults appear more supportive of more traditional funding sources. Support for increasing the gas tax increases with age (Table 5). Older adults (35 and older) were also more supportive of increasing registration fees by a flat amount. However, when presented with the option of varying fees by emissions and gas mileage, support among 18-34 year-olds is significantly higher than the other age groups. This may reflect a greater concern for environment and/or a greater support for variable fees in general. Though support was weak overall, younger adults were more supportive of a mileage fee. This may be because they are more familiar with pricing schedules based upon use, such as those used for cell phones, or less reluctant to using technologies to track vehicle use.

Support for tolling options generally decreased with age. Again, this may reflect greater acceptance among younger adults of pricing systems that reflect actual use. Whether this viewpoint continues as adults age (i.e. a cohort effect) or if viewpoints change with age remains to be seen. The greatest difference between the oldest and youngest adults is for the three toll lane options, express toll, HOT, and TOT lanes. This may reflect an aversion among people 55 and older to having different types of lanes along the same facility, perhaps for safety reasons.

Table 5 Support for Revenue Options by Age

	% of respondents supporting the option			
Revenue Option	**18-34 years**	**35-54 years**	**55+ years**	**% point difference between 18-34 & 55+**
Taxes and fees				
Gas tax	**36.3%**	**40.4%**	**44.5%**	-8.2
Indexed gas tax	28.2	26.8	27.1	1.1
Mileage fee	**26.3**	21.7	19.9	6.4
Registration fee	**27.6**	32.4	35.1	-7.5
Variable registration fees	**48.1**	43.4	42.4	5.7
Vehicle license fee	41.0	41.4	41.0	0.0
Sales tax	42.7	38.9	42.7	0.0
General obligation bonds	33.5	30.0	28.5	5.0
Tolls				
Tolls on new highway lanes	39.3	42.4	38.1	1.2
Express toll lanes (Survey 2)	**54.1**	**44.2**	**37.2**	16.9
Toll roads (Survey 2)	**53.1**	44.5	43.7	9.4
HOT lanes	**64.0**	**56.7**	**48.8**	15.2
TOT lanes (Survey 2)	**74.6**	**62.3**	**60.2**	14.4
n (Survey 1)	642	1008	885	
n (Survey 2)	209	310	261	

Note: **Bold** indicates that the proportion is significantly higher or lower than *both* of the other groups, $p<0.05$, one-tailed test.

Support for increasing taxes and fees generally increased with income for taxes and fees related to vehicle ownership or use (Table 6). There were no significant differences in support for sales tax or bonds. One exception is the mileage fee, which had a higher level of support among the

lowest income respondents. That may reflect fact that they drive fewer miles and may think that they would be better off paying by the mile. Support for increasing the registration fee also increased with income. However, adding the environmental option increased support most among the lowest income group. The highest income group still supported this idea significantly more, but the difference between the lowest and middle income groups was no longer significant.

There were few differences in support between income groups for the various tolling options. Middle income respondents were least supportive of toll roads, though equally supportive of the various toll lanes. A majority of all income groups support HOT and TOT lanes.

Table 6 Support for Revenue Options by Income

Revenue Option	% of respondents supporting the option		
	<$50,000	**$50,000-99,999**	**$100,000+**
Taxes and fees			
Gas tax	**35.7%**	**40.9%**	**50.3%**
Indexed gas tax	27.5	26.5	**33.5**
Mileage fee	**26.5**	21.5	20.7
Registration fee	**26.4**	33.8	45.6
Variable registration fees	41.9	44.2	**50.9**
Vehicle license fee	40.4	43.2	46.4
Sales tax	44.3	41.1	43.4
General obligation bonds	28.0	31.1	31.8
Tolls			
Tolls on new highway lanes	**35.8**	41.1	45.6
Express toll lanes (Survey 2)	46.9	41.5	50.7
Toll roads (Survey 2)	52.7	**39.4**	51.4
HOT lanes	56.1	59.2	53.3
TOT lanes (Survey 2)	69.5	62.7	62.8
n (Survey 1)	732	755	507
n (Survey 2)	256	236	148

Note: **Bold** indicates that the proportion is significantly higher or lower than *both* of the other groups, $p<0.05$, one-tailed test.

While support for any measure by a single racial/ethnic group was rarely significantly different than all of the other groups, there were some interesting differences and patterns (Table 7). Whites and Asians were generally more supportive of tax and fee options related to travel and vehicles than Hispanics and blacks. An exception was the mileage fee, where support was significantly higher among blacks than whites. Whites were significantly more supportive of a flat increase of the registration fee. But, when the fees vary by emissions and fuel economy, Asians were most supportive, significantly more so than Hispanics and blacks.

All of the racial/ethnic groups support HOT lanes; support among blacks is highest and significantly higher than support among whites. Whites were least supportive of express toll lanes and toll roads. Hispanics were much more supportive of TOT lanes. They were significantly less supportive of the concept of tolls on new highway lanes on Survey 1. However,

in Survey 2, which described the tolled facilities more specifically, support among Hispanics was much higher.

Table 7 Support for Revenue Options by Race/Ethnicity

Revenue Option	% of respondents supporting the option			
	White	**Asian**	**Hispanic**	**Black**
Taxes and fees				
Gas tax	44.3	38.4	33.3	34.6
Indexed gas tax	27.9	33.8	20.9	24.1
Mileage fee	21.3	23.6	23.8	28.6
Registration fee	**36.9**	30.6	21.6	19.5
Variable registration fees	46.0	51.9	37.5	37.6
Vehicle license fee	42.5	41.7	37.6	36.8
Sales tax	41.0	37.5	42.6	40.6
General obligation bonds	28.5	34.3	33.5	35.3
Tolls				
Tolls on new highway lanes	42.0	43.5	**33.5**	44.4
Express toll lanes (Survey 2)	**37.9**	54.5	55.7	
Toll roads (Survey 2)	**42.0**	56.1	56.2	
HOT lanes	54.6	57.4	58.0	62.4
TOT lanes (Survey 2)	57.8	65.2	**82.2**	
N (Survey 1)	1627	216	526	133
N (Survey 2)	486	66	185	a

Note: **Bold** indicates that the proportion is significantly higher or lower than *all* of the other groups, $p<0.05$, one-tailed test.
[a]Too few respondents in this category to report

As was found in some of the other research, there were significant differences in level of support for funding options between regions. In general, residents of the San Francisco Bay Area were most supportive of gas tax and registration fee increases and least supportive of general obligation bonds. These differences may reflect the more liberal political views of Bay Area residents. The Bay Area residents surveyed were more likely to indicate that their views were liberal or very liberal compared to the other urban areas. Residents of the Central Valley were more supportive of a sales tax increase than residents from other urban areas (Bay Area, Los Angeles and Southern California). This may reflect the fact that some Central Valley counties have not already imposed local option sales taxes for transportation, as most of the other urban counties have. Residents in areas that have already imposed the extra taxes seem less willing to increase overall sales taxes more.

Table 8 Support for Revenue Options by Region

Revenue Option	% of respondents supporting the option				
	Bay Area	Los Angeles	Other So. California	Central Valley	Central Coast and Rural
Taxes and fees					
Gas tax	**48.4**	39.7	38.4	35.6	40.2
Indexed gas tax	**33.5**	27.7	22.4	25.5	25.7
Mileage fee	19.8	23.8	21.8	23.7	23.0
Registration fee	**39.8**	28.7	29.5	28.2	32.0
Variable registration fees	**51.1**	43.2	42.5	41.1	42.3
Vehicle license fee	44.2	39.6	38.8	37.9	40.8
Sales tax	39.5	37.9	38.9	44.7	41.4
General obligation bonds	**24.4**	32.7	29.7	32.5	29.9
Tolls					
Tolls on new highway lanes	36.0	40.1	44.3	38.5	38.1
Express toll lanes (Survey 2)	44.1	48.7	48.4	36.4	33.7
Toll roads (Survey 2)	41.8	51.3	51.2	44.4	38.6
HOT lanes	51.5	54.9	**60.3**	55.3	51.1
TOT lanes (Survey 2)	64.4	68.6	68.1	56.3	59.0
N (Survey 1)	550	614	696	514	331
N (Survey 2)	177	191	213	151	83

Note: **Bold** indicates that the proportion is significantly higher or lower than *all* of the other regions, $p<0.05$, one-tailed test.

Experience with tolled facilities appears to influence levels of support. Residents of Southern California outside of the Los Angeles County (including Orange, Riverside, San Bernardino, and San Diego counties) were significantly more likely to support converting existing under-used carpool lanes to HOT lanes. This likely reflects that region's experience with HOT lanes, including converting the I-15 carpool lane to a HOT lane and the SR-91 HOT lane. This indicates that local positive experiences with new funding mechanisms influence opinions. Support for toll roads was significantly higher in Los Angeles and Southern California than in the Bay Area or Central Coast/rural areas. The only general purpose toll roads in California are in Orange County, which is adjacent to Los Angeles County. Comparing the three specific tolling options affecting personal vehicles – express lanes, HOT lanes, and toll roads – HOT lanes were the only option gaining majority support in the Bay Area, Central Valley, and Central Coast/rural areas. In contrast, a majority of Los Angeles and Southern California residents supported both HOT lanes and toll roads, with close to half supporting express lanes.

Some of the options examined might be placed on a ballot for voters to decide the outcome. Likely voters were identified in the survey as people who indicated that they were registered to vote and provided a party affiliation. Seventy-two percent of Survey 1 respondents and 68% of Survey 2 respondents were classified as likely voters. Likely voters were significantly more likely to support increasing and indexing gas taxes, increasing registration fees (flat and variable), and increasing the VLF. However, they were less likely to support toll roads and TOT

lanes. These differences may be explained by differences in age; older adults were far more likely to be likely voters.

Levels of Support and Travel Behavior

Support for various funding options could vary by the amount people drive. However, the expected direction of the relationship is not clear. People who drive more might be less willing to pay more gas taxes or mileage-based fees because they could end up paying a lot more, compared to increases in vehicle-based fees or sales taxes. However, people who drive more may also be more willing to pay increased fees or taxes if they think it might reduce congestion and save them time. Neither of these hypotheses is clearly supported by the data (Table 9). People who drive the least (50 or fewer miles per week) were least supportive of increasing the gas tax (significantly less than people driving 101-200 miles per week), most supportive of the mileage fee (significantly more than people driving over 200 miles per week), and least supportive of increasing registration fees (significantly less than people driving more than 100 miles per week). However, people driving the most (200 or more miles per week) were least likely to support the variable registration fees (significantly more than people driving 0-50 and 101-200 miles per week). This indicates that there may be a relationship between support for environmental objectives and miles driven. People driving the most were also significantly more likely than people driving 50 or fewer miles per week to support general obligation bonds.

There is also no clear relationship between how much people drive and their support for the various tolling options. In two cases – express toll lanes and HOT lanes – people driving 51-100 miles per week were significantly more likely to support the option than people driving less. However, this group was also more likely to support those options than people driving more, though the differences were not statistically significant. People who drive the most (over 200 miles per week) were significantly less likely than people driving the least (0-50 miles) to support toll roads. Support for TOT lanes is lowest for the people who drive the most, significantly different from people driving 51-200 miles per week.

Table 9 Support for Revenue Options by Miles Driven in a Typical Week

Revenue Option	% of respondents supporting the option			
	0-50	**51-100**	**101-200**	**Over 200**
Taxes and fees				
Gas tax	*38.4%*	40.3%	*44.6%*	42.3%
Indexed gas tax	26.8	28.0	28.4	25.4
Mileage fee	*24.2*	21.9	22.1	*20.2*
Registration fee	*26.7*	30.6	37.4	38.7
Variable registration fees	46.4	43.4	47.2	*40.9*
Vehicle license fee	39.7	42.1	40.5	43.8
Sales tax	39.6	39.8	42.5	41.9
General obligation bonds	*28.8*	28.7	30.5	*33.9*
Tolls				
Tolls on new highway lanes	38.8	40.2	40.5	41.3
Express toll lanes (Survey 2)	*40.4*	*49.4*	44.0	43.3
Toll roads (Survey 2)	*49.8*	48.2	46.8	*40.4*
HOT lanes	*54.3*	*59.1*	55.4	55.4
TOT lanes (Survey 2)	63.1	68.7	70.9	*60.1*
n (Survey 1)	768	585	511	504
n (Survey 2)	255	166	141	208

Note: **Bold** indicates that the proportion is significantly higher or lower than *all* of the other groups, $p<0.05$, one-tailed test.
Italics indicates that the proportion is significantly higher or lower than *at least one* of the other groups, $p<0.05$, one-tailed test. See text for details.

Respondents who had used transit in the past month, were more likely to support increasing and indexing the gas tax and variable registration fees. They were also more supportive of toll roads, but not the other tolling options.

Levels of Support and Attitudes

One hypothesis is that people who perceive that there are significant problems with the transportation system may be more likely to support increased funding. Both surveys asked respondents how much of a problem the transportation system was for them personally. The question aimed to more accurately assess a person's concern for fixing transportation problems, rather than whether transportation is a problem for "the state." There were few differences in level of support for the revenue options based on whether the respondent thought the system was a somewhat or big problem versus not much or no problem. The only differences were that respondents who thought the system was a problem were more likely to support increasing the gas tax and both registration fee options. The differences in levels of support, though statistically significant, were only 4-5% points. The lack of differences between the two groups indicate that there is not a clear relationship between how much of a problem people said the system was and their willingness to raise funds to fix the system. This may suggest that people do not think that many of the increased funding options will address the problem or that they overstate the magnitude of the problem.

Survey 1 asked respondents about their priorities for transportation spending. One question asked if government funds for transportation should focus more on improving roads and highways, mass transit, or both. People who favored focusing spending on transit were most likely to support increasing the gas tax, registration fees (flat and variable), the vehicle license fee, and tolls on new highway lanes. People favoring a focus on roads and highways were most likely to support bond funding. There were no differences in support regarding mileage fees, the sales tax, and HOT lanes.

Multivariate Models of Support for Revenue Options

The findings presented above reveal interesting patterns of support. However, some of the differences may be explained by other factors because independent variables may be correlated. For example, the differences in support between likely and unlikely voters might be explained by differences in age. There are often correlations between education and income that also confound findings. For this reason, several binary logit models were estimated to predict support for the revenue options.

The models predicting support for increasing gas taxes and registration fees are shown in Table 10.[4] Two variables were significant in all three models. People who feel that taxes are too high were far less likely to support increasing gas taxes or registration fees, though the absolute magnitude of the coefficient is smaller for the variable registration fee. This indicates that even people with anti-tax sentiments were swayed somewhat by the option of varying fees consistent with environmental objectives. People who think that funding should focus on improving transit also consistently supported the three options. Support for increasing the gas tax and registration fees by a fixed amount increased with income and age. This effect disappeared in the model predicting support for the variable registration fees, indicating that that option persuades lower income and younger adults to a greater degree. Similarly, women were less supportive of the gas tax and flat registration fee but were a significant variable in the third model.

People with a college degree were more likely to support an increase in the gas tax and variable registration fees, but not the flat registration fee. This may indicate that higher educated adults support the concept of user fees – linking payment to use or impact – more than other adults. The correlation coefficient between income and having a college degree was 0.34, the highest among all pairs of variables tested in the models.

Consistent with the attitudes towards taxes, liberal respondents were more likely to support a gas tax increase. While the two variables were correlated, the correlation was weak (Pearson coeff. = -0.10). The Bay Area resident variable was not significant in the gas tax model, indicating that the greater level of support for gas taxes seen in the region is explained by the other variables in the model. Being a Bay Area resident was positively correlated with being liberal, riding transit, income, having a college degree, and age. The race/ethnicity variables were also not significant in the models, except for white respondents supporting the flat registration fee. The explanation for this is unclear.

[4] Models predicting support for mileage-based fees, VLF, sale tax, bonds, and HOT lanes had low explanatory power (pseudo-R^2<0.07) and were not presented here.

Overall, the models have only modest explanatory power; the pseudo-R^2s were only 0.09-0.12. This is consistent with models predicting support for congestion pricing using similar types of survey data [7, 8, 17]. A model predicting support for congestion pricing in Great Britain had greater explanatory power [31]. In addition to variables similar to those in our models, that model included several variables that described the charging system in more detail, how revenues would be allocated, and the extent to which the system would improve the environment.

Table 10 Binary logit models predicting likelihood of support for revenue options

	Increasing Gas Tax		**Registration Fee (flat)**		**Registration Fee (varies by emissions and gas mileage)**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-1.012	0.00	-1.659	0.00	-0.584	0.00
Demographic						
Income	0.003	0.06	0.006	0.00		
Female	-0.336	0.00	-0.291	0.02		
Age (years)	0.011	0.00	0.007	0.09		
White			0.361	0.01		
Bay Area resident			0.482	0.00	0.262	0.07
College graduate	0.247	0.05			0.444	0.00
Attitudes						
Taxes were too high	-0.789	0.00	-0.647	0.00	-0.446	0.00
Transportation system is a problem			0.307	0.01	0.233	0.04
Focus spending on transit	0.270	0.02	0.299	0.01	0.398	0.00
Liberal	0.560	0.00			0.318	0.01
Travel behavior						
Miles driven per week			0.001	0.08	-0.001	0.07
Transit user	0.363	0.01			0.394	0.01
Variables omitted from model (p>0.10)	Miles driven per week Race (White, Hispanic, Asian) Region (Bay Area, LA/So. Calif.) Transportation is a problem Likely voter		Race (Hispanic, Asian) College graduate Region (LA/So. Calif.) Transit user Liberal Likely voter		Income Female Age Race (White, Hispanic, Asian) Region (LA/So. Calif.) Likely voter	
N	1347		1347		1347	
Nagelkerke R-squared	0.12		0.11		0.09	

Models predicting support for the toll facilities from Survey 2 had very modest explanatory power (pseudo-R^2 of 0.07). Each model had only two or three significant variables, providing little insight beyond the tables presented above.

CONCLUSIONS AND FUTURE RESEARCH

This analysis of support for transportation revenue options provides some useful insights for transportation professionals and policy makers. The overall levels of support indicate fairly strong public support for some tolling options, particularly HOT lanes, which are a viable near-term option in many areas. Support for TOT lanes was very high, likely because the survey indicated that trucks would be required to use them, thus separating trucks from personal vehicle traffic. TOT lanes are a relatively new idea, though they are being seriously considered in some regions [32, 33]. As discussion of the concept increases, trucking interests are likely to present more vocal opposition to the concept, which may influence public opinion.

The most popular tax or fee option was to increase vehicle registration fees by a variable amount depending on the vehicle's air pollutant emissions and gas mileage. The concept of linking transportation taxes or fees to environmental objectives and externalities has not been implemented widely in the U.S., nor has it been explored in much depth by policy makers. Given the significant increase in support for this option compared to a flat fee, policy makers should seriously examine varying all types of fees to meet environmental objectives. The concept was particularly salient with women, younger adults, lower income adults, and some racial/ethnic groups.

Three tax options – gas taxes, sales taxes, and the vehicle license fee – had virtually the same levels of overall support. This may indicate that it would be possible to choose the option that performs best under other criteria such as equity and transportation effectiveness, rather than just choosing the option thought to appeal to voters. Also of note is the fact that 40% of respondents supported a fairly high increase in the gas tax – 10 cents per gallon spread over 10 years. A smaller increase, particularly one tied to specific funding objectives or projects, might garner more support.

The analysis of demographic and other factors provides further insights. People living in regions that have toll roads and HOT lanes were far more supportive of these concepts. In addition, younger adults, who may have more experience with different types of pricing systems for other products, were more supportive of tolls and mileage fees. These findings and the literature reviewed indicate that personal experience is very influential in levels of support. Therefore, agencies wishing to implement new options, such as tolls, should choose and implement initial projects carefully. Negative feedback from a poorly executed project may have long-term implications for the viability of the option on a broader scale.

Regional differences in levels of support for non-tolling options, including fuel taxes and registration fees, may indicate that regional solutions will be more successful in the public arena than statewide solutions. This is already evident in the widespread use of local option sales taxes in California. The concept might be expanded to other revenue options.

Support for pricing options was not clearly related to income or ethnicity, as might be expected based upon the debates over equity that arise when tolling options are considered. Lower income respondents were about equally likely to support tolls roads, express toll lanes, and HOT lanes. With few exceptions, Asians, Hispanics, and blacks were also equally likely as whites to support the tolling options. While these survey results don't refute the argument that tolls are regressive, they do demonstrate that lower-income people may be willing to accept this inequity in exchange for the benefits that the facility provides. Alternatively, they may like the certainty that they

won't be paying through sales or fuel taxes for a facility they do not plan to use. These results call out for a more sophisticated analysis and debate of equity implications of pricing strategies. While equity concerns must be addressed, pricing should not be dismissed simply because of stated concerns for lower income households.

Differences in levels of support by age present some interesting questions. Younger adults were more supportive of most tolling options, the mileage fee, and the registration fee that varied by emissions and gas mileage. A key question is whether there will be a cohort effect (i.e. younger people will maintain these attitudes as they age) or if attitudes change with age. Older adults were more supportive of traditional gas taxes. If a cohort effect occurs, supporters of new concepts, such as mileage-based fees, should be optimistic.

The survey also revealed what many researchers have found – that methodology, particularly question wording, is very important. That fact is most evident in the very low level of support for general obligation bonds when respondents were told that the bonds would be paid back with money that might otherwise be spent on other programs or services. Most other surveys on the topic do not explain how bonds are actually paid for. Moreover, public campaigns for such measures rarely cover the topic of bond repayment or the implications for future spending in much depth. The influence of question wording is also evident in the relatively high level of support for increasing the vehicle license fee (VLF). The VLF was the topic of recent heated political debate in California, with the current governor pledging to cut the "car tax." Similar movements have occurred in other states. The VLF was cut by over 50% and was the topic discussion in many popular forums, including talk radio. Raising the fee is considered a political impossibility by many in the state. This survey indicates otherwise. One explanation is the way the proposal was presented. Our survey question used the official name for the fee, rather than "car tax." In addition, the question explained the current fee level, the proposed level of increase, and that the increased fee would go to fund transportation. Current VLF revenues are not dedicated to transportation. The level of support for increasing the VLF when presented in this manner points to the need for public debate based more upon facts than rhetoric.

While this research added to the understanding of public opinions regarding transportation revenue options, several questions remain. Additional research should delve more deeply into the concept of environmental fees. For example, our focused survey question on the topic included the concept varying registration fees based on *both* emissions and fuel economy. Two earlier questions on the survey asked more generically, but separately, whether people felt that fees should take into account emissions and gas mileage. Respondents were much more supportive of fees that took emissions into account (63%) versus gas mileage (48%).

The survey results also indicate that policy makers should not dismiss traditional taxes and fees as future revenue sources. Rather, future research should explore the reasons for lower support and methods of shifting support, given the revenue potential and other desirable features of these options (e.g. maintaining the user fee concept with fuel taxes). For example, experience shows that voters support local sales taxes that are tied to a list of specific transportation projects. While choosing infrastructure projects solely based upon political acceptability is not desirable, the message that the public is more supportive of funding when they know where the funds go is important. This concept has not been applied equally to traditional funding sources, such as the gas tax. Simply educating the public about how funds are spent, the potential environmental

benefits, or the equity implications may also shift support for some options. More in depth survey data could help identify these messages.

This survey included a few new concepts, notably TOT lanes and mileage fees, that are not well known to the public. However, other options, such as congestion pricing and other types of taxes were not included. Future research should explore other new and untested options.

As with most research based on survey data, there are limitations. Views of California residents may not be consistent with other areas of the country. Views also change over time, as evidenced in Washington state where voters supported a gas tax increase after earlier polls predicted otherwise. These survey results also reflect the specific options and levels (e.g. 10 cents and $62) included in the questionnaire. Despite these limitations, many of the findings are consistent with the literature.

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