WHY DO TRANSPORTATION SALES TAX MEASURES SUCCEED?

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WHY DO TRANSPORTATION SALES TAX MEASURES SUCCEED?

A Thesis

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Abstract

of

WHY DO TRANSPORTATION SALES TAX MEASURES SUCCEED?

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Local governments in California currently lack the funds to maintain their local roads and transit system. Under the reasonable assumption that further state or federal aid to do this is not likely, local officials must plan for how to raise the needed funds on their own. The addition of a local sales tax is an option, but the two-thirds majority vote, required in most cases, is an obstacle. This thesis uses regression analysis to determine the local factors that explain the success of past sales tax measures. This information, along with a review of the literature and interviews with stakeholders, offers policymakers suggestions about the viability of this option for raising local funds.

I found demographic factors are a significant factor in the success of a transportation sales tax measure. While local officials cannot change these factors, the success of these taxes is not out of their control. A better understanding of the general tendencies of voters can help policy makers as they develop future measures.

_____, Committee Chair
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Date

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

Chapter 1

WHY SALES TAX MEASURES?

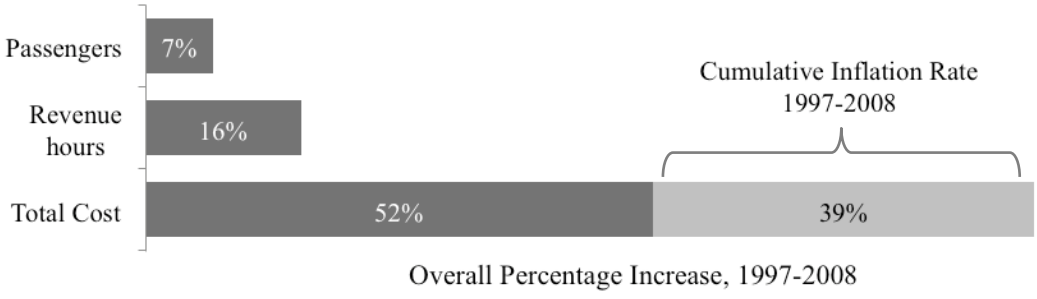
Local roads are falling apart, transit riders have been left behind, and the money to fix it all is disappearing just as quickly. After a few decades of successful local sales tax measures, a statewide infusion of bond funding in 2006, and one-time funds from the federal stimulus bill in 2009, the prospect of increases in state or federal aid for California transportation projects seem dim. It now appears that the most secure transportation funding option California's local governments can turn to is the local sales tax measure.

Understanding what factors influence transportation sales tax measure success will help localities when considering whether to propose a measure, and will also assist those who have chosen to propose a measure. This thesis aims to contribute to existing research on the general subject of local-option transportation taxes. Specifically, the research question I ask is whether there is a causal relationship between demographic, geographic, and taxation factors and the passage of local transportation sales tax measures. This chapter identifies the need for additional transportation funding, explains why transportation sales taxes may have become the best funding option for local governments, and then outlines the subsequent chapters, which will explore local-option transportation sales tax measures in greater detail.

California's Transportation Funding Problem

According to a 2007-2008 survey of local governments, the first comprehensive study in state history, an additional $71 billion is needed in the next 10 years statewide just to keep up with road maintenance and rehabilitation, based on regression analysis of available data. Over 90 percent of local governments responded to the survey, which relied on pavement management system data. Pavement management systems are kept by most cities and counties to monitor the condition of their roads. The need has been supported as well by the Federal Highway Administration, who has ranked California's roads and bridges in the second-worst condition in the nation, with 39 percent rated in poor or mediocre condition (American Road & Transportation Builders Association, 2011). The funding need is great for transit as well, as shown in figure 1. A report from the Metropolitan Transportation Commission in the Bay Area concluded that a bailout of $1 billion a year for the next 25 years would be necessary to recover from rising costs of labor and vehicle replacement, and falling revenue from declining state support for transit for the 28 transit agencies in the Bay Area (2009).

Figure 1: Inflation & Other Costs Threatening Bay Area Transit



Source: Metropolitan Transportation Commission, 2009

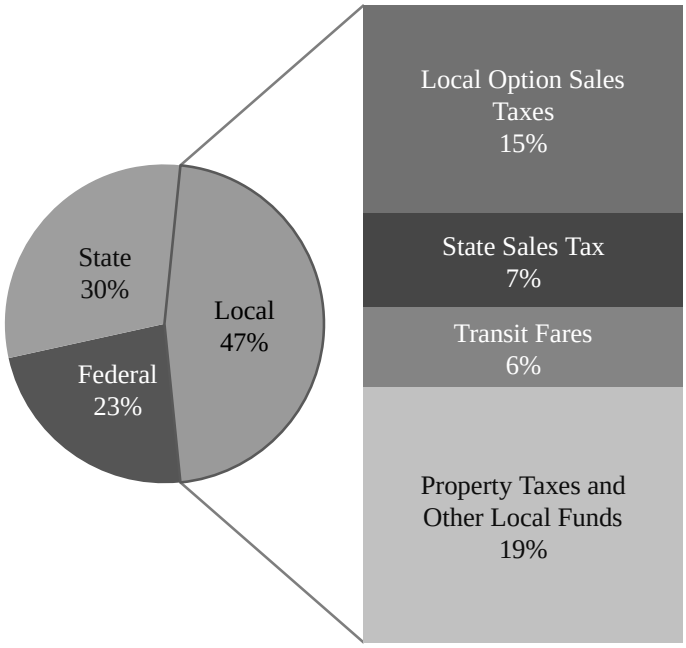
Starting in the 1970s, rising gas prices and a subsequent rise in fuel-efficient vehicles meant Americans were driving less, and buying less gas, which began the decline of revenues to the federal Highway Trust Fund. At the same time, voters in California, and many other states, enacted limitations on the ability of state and local governments to raise taxes. Due to declining shares of state and federal revenues for transportation over the past three decades from excise taxes on fuel, states and local governments, out of necessity, have asked voters to approve a variety of taxes at the local level, while at the same time voters have continued to approve restrictions on the ability of governments to raise taxes. (Goldman, Corbett, & Wachs, 2001).

What Revenues Pay for Transportation in California?

In addition to sales taxes, governments in California have several other revenue sources: property taxes; income, payroll and employer taxes; natural resource extraction taxes; real estate taxes; tourism taxes; and development impact fees (Goldman, Corbett, & Wachs, 2001).

According to the Legislative Analyst's Office, in 2005-2006, local governments and the state spent $20 billion on transportation, with the federal government contributing 23 percent, and the state contributing 30 percent, as shown in figure 2. The remaining 47 percent of funding, $9.2 billion, came from four local sources: local-option sales taxes, 0.25 percent of the state sales tax directed to counties (primarily for transit), transit fares, and property taxes and other sources (Legislative Analyst's Office, 2007).

Figure 2: Transportation
Revenues in California



Source: Legislative Analyst's Office, 2007

Nationally, local governments pay for 24 percent of highway capital expenditures (figure 3), while they pay for 43 percent of transit capital expenditures (figure 4) (National Surface Transportation Finance Commission, 2009). Unfortunately, no good data exists for state-by-state comparison of transportation funding by source, so this is the best comparison information available.

Figure 3: Highway Capital Funding Sources in the U.S.

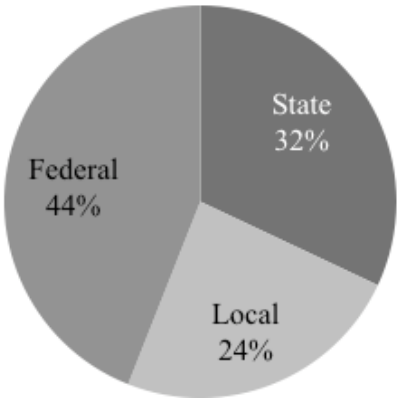
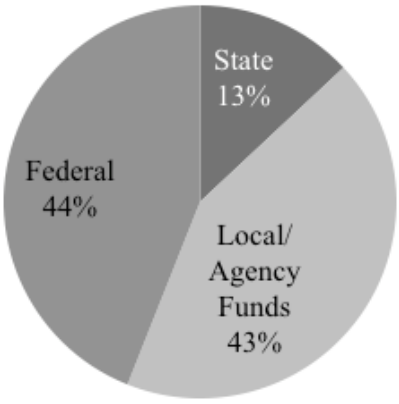


Figure 4: Transit Capital Funding Sources in the U.S.



Source: National Surface Transportation Finance Commission, 2009

Local Options to Pay for Transportation

The sales tax, either for general government purposes or dedicated to transportation, is the most common local option for transportation funding, but four alternatives exist in California: fuel taxes, vehicle taxes, property taxes, and tolls. Table 1 complements this discussion with a comparison of how these taxation methods compare in terms of equity, stability, relevance to transportation, what they are used to fund, and my assessment of the political feasibility of each in California.

While federal and state governments use fuel taxes, either on gasoline or diesel, local governments are also authorized to impose them in 15 states, but only in 10 states do they use the authority. California is one of the five states that allow local fuel taxes, but none are in place. As with all other taxes in California, voter approval is required,

which may explain why local fuel taxes have not been enacted. Nationally, many of the disadvantages of local fuel taxes are the same as those for state or national fuel taxes, but the visibility of the tax required to generate sufficient revenue is often publicly unpalatable (Goldman, Corbett, & Wachs, 2001).

The fuel tax, an excise tax on each gallon sold, is a user fee, which the state and federal governments attempt to use to pay for local roads and freeways used by drivers purchasing gas. However, fuel taxes do not compensate for the full maintenance, rehabilitation, or capital needs of the existing transportation system. Fuel taxes are also imprecise because where someone buys gas is not precisely aligned with where they will drive. If everyone who worked in Sacramento bought gas before going home to West Sacramento or Roseville, those cities (and their counties) would not get any of the funding for roads collected in Sacramento (Crabbe, Hiatt, Poliwka, & Wachs, 2005). An increase in the fuel tax is politically infeasible at the state and federal levels, because it would require a legislative act, which neither the California Legislature nor Congress is currently willing to do (Crawley, 2010).

In addition to the challenges of raising the fuel tax, the funds the state and federal taxes raise are declining, due mostly to increasing vehicle fuel efficiency (Crabbe, Hiatt, Poliwka, & Wachs, 2005). A 2009 Pew Charitable Trusts analysis found that the percentage of highway construction and maintenance funded by user fees (gas taxes and sales taxes on gasoline) has steadily declined from 71 percent to 51 percent over the past 40 years.. Additionally, inflation has kept revenues from meeting demand for

maintenance, operations, and expansion of the transportation system (Hannay & Wachs, 2007) (SubsidyScope, 2009).

Unlike fuel, vehicles are only taxed at the subnational level. Types of vehicle taxes include registration; assessments based on value, weight, age or number of axels; and special taxes, such as on rental cars. Thirty-three states have vehicle-based taxes, and many are administered locally, but there has not been any research on individual states. California allows flat-rate registration fees for air quality and transportation (Goldman, Corbett, & Wachs, 2001). In 2009, Governor Schwarzenegger signed Senate Bill 83, which allows county congestion management agencies to ask voters to approve up to $10 for a supplemental vehicle registration fee for transportation purposes (Legislative Counsel of California, 2009). In 2010, five Bay Area counties approved $10 fees for local transportation projects (TransForm, 2011). However, because the bill limited the authority to congestion management agencies, which do not exist in every county, SB 83 authority will have limited use statewide.

Property taxes are used in all 50 states to fund transportation at the local level, but property taxes are fixed in many states, including California, and property owners are largely opposed to raising property taxes for any purposes (Goldman, Corbett, & Wachs, 2001). In California, Proposition 13 in 1978 eliminated the ability of local governments to raise local property tax rates to pay for transportation purposes without gaining voter approval, which helped drive local governments to turn to sales taxes (Schwartz, 1997).

While property taxes are an efficient collection method, increasing them is not politically feasible. Furthermore, there are people who drive on local roads and freeways,

and use transit, that do not own property, or whose home value is not relative to transportation system use. Given these factors, increasing property taxes cannot be seen as a reliable new source of transportation funding, although they will continue to contribute an important share of revenue.

Tolls, a user fee, are mainly limited to bridges in California, although toll lanes and toll roads are being planned and opening up in northern and southern California (Bay City News, 2010). While economically efficient for their ability to capture revenue only from users of a specific portion of transportation infrastructure, they in many cases do not offer horizontal equity, because they charge a flat toll regardless of impact (except for trucks, which are often charged per axel), and they are highly regressive, because lower-income users pay a much greater portion of their income than higher-income users. There are also only certain transportation facilities that can operate on tolls, and there is in many places a resistance to charging for road use.

Sales taxes are a widely used method to pay for transportation, with local governments in 33 states using them (Goldman, Corbett, & Wachs, 2001). Driven by their political popularity, locally enacted retail sales taxes have grown in importance in financing each transportation sector since the mid-1980s. When enacted, most of these taxes required approval by a simple majority of voters; however, they now need a supermajority (66.7 percent) approval to continue beyond their current expiration dates (Goldman T. M., 2003).

Table 1 provides additional comparative information not covered above. First, it looks at the equity of each type of tax through three measures: do all households pay, is

the tax regressive, and do non-residents contribute. All households pay property and sales taxes, but while this may be considered societally fair, not all households drive or use transit, so some may argue they should not be expected to pay for roads and transit they do not use. Fuel and sales taxes are both highly regressive: lower-income users pay a greater share of their income to gas taxes than higher-income users. Another way to look at equity is whether visitors and people traveling through the area (non-residents) pay. On this measure, vehicle and property taxes fail to capture funding from these road users.

Second, table 1 compares the stability of these taxes. Property and sales taxes rely on a broad tax base, which means that each person taxed pays a lower amount because the burden is spread among more people. Property and sales taxes are also stable because they are taken as a percentage of assessed value, or of goods purchased, so they increase as inflation increases. However, sales taxes are also highly reliant on the economy at large, so when purchases decline, revenues also decline—even when road use may stay constant.

Third, table 1 assesses how relevant the taxes are to the transportation infrastructure and services they pay for. Fuel, vehicle, and property taxes have strong overall relevance to roads, highways and transit, although relevance must be weighed against the other factors to determine political feasibility.

Fourth, expenditures, tax rates, and revenues raised vary by tax. All pay for capital and maintenance, but fuel taxes, vehicle taxes, and tolls are used primarily for the highway system, while property and sales taxes are used for a blend of local road and highway uses, as well as for transit. Because vehicle taxes and tolls have a narrow tax

base, the assessments per user are higher than the other taxes, although the per capita revenues for tolls can be among the highest in places with high-use toll facilities.

Finally, I developed a set of political feasibility measures, based on the interaction of the other variables, which were studied by Goldman, Corbett, and Wachs (2001) and the Tax Foundation (2007). Fuel and property taxes may be the most difficult to pass, because they require two-thirds voter approval, while vehicle and sales taxes can pass with majority approval in some cases, and tolls can be set administratively. The visibility of the taxes is an important consideration when determining what type of tax is feasible. Property taxes, because they are itemized on tax bills, assessed annually and set based on property value, are quite visible and can be unpopular with voters who are wary of increases. Tolls are also visible, because they are posted and collected strictly based on use, as opposed to fuel, vehicle, and sales taxes, which are less visible because they are a portion of another transaction. Finally, the overall feasibility assesses which taxes are most feasible in California, given how voters may weigh these other factors. I argue that vehicle and sales taxes are the most feasible, because voters are familiar with being asked to increase them to pay for transportation.

Table 1: Comparison of Local Taxation Options

	Fuel	Vehicle	Property	Tolls	Sales
Equity					
Do all households pay?	No	No	Yes	No	Yes
Regressivity	High	High-Moderate	Moderate	Moderate	High
Do non-residents contribute?	Yes	No	No	Yes	Yes
Stability					
Broad tax base?	Narrow	Narrow	Very broad	Narrow	Broad
Indexed for inflation?	No	No	Yes	No	Yes
Fluctuates with economy?	Some	No	No	Some	Yes
Transportation					
Relevance	Strong	Strong	Moderate	Strong	Weak
Relevance to highways?	Strong	Strong	Strong	Weak	Weak
Relevance to roads?	Moderate	Moderate	Strong	Weak	Moderate
Relevance to transit?					
Typical Applications					
Types of projects funded	Highway Capital & Maintenance	Highway Capital & Maintenance	Road/Transit Maintenance & Operations	Highway Capital & Maintenance	Road, Highway/Transit Capital & Operations
Typical tax rate	5-cents/ gallon	$10 per vehicle	$5 per $1,000 of assessed value	$0.50-$10	0.5%
Typical revenues per capita	$20-$35	$7-$8.50	$30-$300	$12-$200 ($27 avg.)	$40-$70
Political Feasibility in California					
Voter approval	2/3	Majority-2/3	2/3	Not required	Majority-2/3
Visibility	Medium	Medium	High	High	Low
Feasibility	Medium	High	Low	Medium	High

Sources: (Goldman, Corbett, & Wachs, 2001), (Tax Foundation, 2007), and author [political feasibility]

History of local-option transportation sales taxes

In the late 1960s, Atlanta, Los Angeles and Seattle placed ballot measures on sales taxes before the voters to help pay for new transit systems. While Los Angeles and Seattle failed in their first attempts, this was the beginning of the local-option

transportation sales tax (Schroeder & Sjoquist, 1978). In 1971, California enacted the Transportation Development Act, which extended the state sales tax to gasoline, and the institutionalization of the nexus between the sales tax on gasoline and financing transportation projects.

While New York City used a mortgage recording tax to pay for transit, and Portland and Cincinnati used payroll taxes as the basis for funding transit, eight other jurisdictions across the country turned to the sales tax to fund transit between 1969 and 1978, as shown in table 2 (Goldman, Corbett, & Wachs, 2001).

Table 2: Early Permanent Transit Taxes in the U.S.

City/Region	Type of Tax	Year Adopted	Method of Enactment
New York City	Mortgage Recording	1969	State Legislation
Portland	Payroll	1969	Local Ordinance
San Francisco	Sales	1969	State Legislation
Atlanta	Sales	1971	Voter Approval
Cincinnati	Payroll	1973	Voter Approval
Denver	Sales	1973	Voter Approval
Seattle	Sales	1973	Voter Approval
Santa Clara	Sales	1974	Voter Approval
Cleveland	Sales	1975	Voter Approval
San Mateo	Sales	1976	Voter Approval
Santa Cruz	Sales	1978	Voter Approval

Source: Goldman, Corbett, and Wachs, 2001

In 1984, under special legislative authority, Santa Clara County passed the first countywide sales tax for transportation. Soon after, other counties sought the same authority, and the legislature extended it to all counties. In 1986, transportation sales tax

measures suffered a major setback with the passage of Proposition 62, which required two-thirds voter approval for all tax measures. After a decade of legal challenges to Proposition 62 and skepticism from local officials about the ability to meet the two-thirds threshold, a wave of measures passed the two-thirds mark in 2000, and started a strong decade of passage (Crabbe, Hiatt, Poliwka, & Wachs, 2005). As of 2001, the last time a comprehensive national study was done, 33 states had authorized local-option sales taxes (Goldman, Corbett, & Wachs, 2001) . Voters in 19 California counties have passed transportation sales taxes, including some that have renewed or added on to existing measures, and some cities have passed measures on their own (Hamm & Schmidt, 2008).

Prior to passage of Proposition 62 in 1986, special districts were allowed to raise sales taxes with simple-majority approval of the voters. However, compliance with Proposition 62 was not tested in court until the early 1990s. In 1995, the state appellate court in *Santa Clara County Transportation Authority v. Guardino et al.* ruled that a supermajority is required for all dedicated transportation sales taxes (California Court of Appeal, 1995). While the *Guardino* decision brought a chill on sales tax measures statewide, Santa Clara County tried to find a way around it. Their solution was to pursue a general sales tax paired with a non-binding advisory measure. The general sales tax, allowable under existing state law, was placed on the ballot as one measure. The advisory measure was placed on the ballot as a second measure, and asked voters what their preference was if new revenues were available from the sales tax increase. This so-called A+B strategy was successful for Santa Clara County in 1996, and several cities and counties across the state have used this strategy for transportation and other purposes.

However, Proposition 218, also approved in 1996, may threaten the legality of A+B measures, because it requires any special-purpose tax to secure supermajority voter approval (Goldman T. M., 2003). Proposition 218 came about because voters were distrustful of what they saw as an increasing number of taxes coming from all levels of government. Like the better-known Proposition 13, Proposition 218 was sponsored by the Howard Jarvis Taxpayers Association (Rueben & Cerdán, 2003).

At this time, no courts have weighed in on the legality of A+B measures, but the strategy will most likely be challenged in the future. With many sales tax measures expiring in the coming decade, and many cash-strapped local governments seeking more reliable sources of transportation funding, the two-thirds threshold represents a threat to an increasingly important source of transportation funds (Adams, Hiatt, Hill, Russo, Wachs, & Weinstein, 2001).

Sales taxes in California

Transportation sales taxes are an addition to the total sales tax rate. The current base state sales tax rate of 6.25 percent supports state programs. Local governments directly receive 0.75 percent for cities and counties (for unincorporated areas) to augment their general funds. On top of the 1 percent, there is another 0.25 percent dedicated to county transportation, mostly transit. The local-option transportation sales tax comes on top of the combined rates (California State Board of Equalization, 2006). California allows local governments to seek up to 1 percent in sales tax add-ons for transportation and other purposes, and in some cases multiple local governments have add-on taxes,

also known as district taxes, that drive the full sales tax rate up to as high as 10.75 percent. The mode sales tax rate in California is 8.25 percent; the mean is 8.79 percent (California State Board of Equalization, 2010).

Table 3: Components of California's Sales and Use Tax Rate

Jurisdiction (Fund)	*Rate*
State (General Fund)	4.75%
State (General Fund, ASUT)	0.25%
State (General Fund) – Temporary	1.00%
State (Local Revenue Fund)	0.50%
State (Local Public Safety Fund)	0.50%
State (Fiscal Recovery Fund)	0.25%
Local (County Transportation Fund)	0.25%
Local (City or County Operations)	0.75%
BASE STATEWIDE RATE	8.25%

Source: (California State Board of Equalization, 2010)

Legislation proposed in the 2009-2010 session, ACA 15, would have placed a measure on the ballot to lower the approval threshold to 55 percent for transportation tax measures, in line with local school measures (Michel, 2009). Whether the threshold is lowered, understanding what influences support for transportation sales tax measures is important to policy makers and researchers.

What This Research Examines

While there has been a lot of research on transportation finance, the quantitative study of local transportation sales taxes has been limited. This thesis will explore whether there is a causal relationship between demographic, geographic, and taxation factors and the passage of local transportation sales tax measures. This research contributes to the literature by analyzing a dataset not previously studied and reporting the results.

This research also has benefits to practitioners considering putting a transportation sales tax measure before the voters. The costs of studying a sales tax measure, building an expenditure plan, and running a campaign typically require at least 18 months and several hundred thousand dollars, but likely into the low millions, depending on the size of the jurisdiction. This research will not replace any component of that process, but it can offer local officials information about what demographic, geographic, or taxation factors may help or hurt their efforts. Depending on the circumstances, the information gained may inform a decision to entirely forgo beginning an exploration of a measure.

There is general consensus in the literature that local-option transportation sales taxes are a popular choice for funding transportation in California for four reasons: they are approved directly by voters (Hannay & Wachs, 2007), (Zhao, 2005); they are spent on local projects (Hannay & Wachs, 2007); they expire after a certain time period (Hamideh, Oh, Labi, & Mannering, 2008), (Hannay & Wachs, 2007); and they include a specific list of projects (Hannay & Wachs, 2007), (Schroeder & Sjoquist, 1978), (Zhao, 2005). What is less clear is the effect of community demographics on the success of local-option transportation sales tax measures.

Chapter 2 is a review of relevant academic work on this topic, divided between neighborhood, community, and individual-level studies. Chapter 3 includes a more detailed explanation of the model, including what variables are used and why, and the data used, specifically what sources were used and some quantitative descriptions of the data. Chapter 4 reports the regression results after running the model through statistical software. Chapter 5 reports the results of interviews with experts in the field. Chapter 6 summarizes and compares the quantitative and qualitative findings, discusses the implications of this research, and offers ideas for how to improve future research on this topic.

Chapter 2

REVIEW OF PAST LITERATURE

This chapter reviews previous academic studies of the factors influencing passage of these measures, with a special focus on studies that use regression analysis. The literature review is organized into three themes: neighborhood-, community-, and individual-level studies of transportation sales tax campaigns and elections. Appendix A gives an overview of the local-option sales tax studies reviewed and their major findings, while appendix B gives an overview of the research methods for these studies.

This study uses regression, a statistical technique, to try to quantify the relationship between the passage of transportation sales tax measures and demographic and policy variables. Regression is used to see if there is a relationship between a dependent variable (e.g., passage of transportation sales tax measures), and independent variables (e.g., age distribution, political affiliation, proximity to benefits, existing sales tax rate) (Studenmund, 2006). Using a statistical analysis program, I will try to determine if a set of independent variables have any effect on the passage of transportation sales tax measures, and if so, how much of the success of these measures can be attributed to them. Chapter 3 will explain more about the specific variables and methods.

The most consistent finding in the neighborhood-level studies was that the closer voters lived to the transportation projects to be funded, the greater their support. In the community-level studies, four findings were consistent across several studies: the age distribution of the population, the population density of the community, the proportion

registered Democratic, and the tax rate at the time of the measure. In the individual-level studies, two found identifying as a Democrat as having a significant effect.

Neighborhood-Level Studies

Stipak (1973), Schroeder and Sjoquist (1978), and Hannay and Wachs (2007) combined precinct-level voting data with Census block group data to analyze sub-jurisdictional differences in support for sales tax measures.

Stipak (1973) used a linear multiple regression on a study of 1,527 Census block groups in Los Angeles to study the factors influencing the failure of that county's 1968 rapid transit sales tax measure. Living within one mile of a proposed transit stop increased support for the measure by 7.6 percent. The effect was positive, but diminishing, for up to five miles, where the effect on the vote is only 0.4 percent. After five miles, the relationship was negligible. For income, those making between $7,000 and $8,000 (middle class in 1960 dollars), support for the measure decreased by 7.7 percent. Above $8,000, the effect diminished, with a positive effect (0.5 percent) over $20,000. For blacks, Mexican-Americans, and orientals [sic], support for the measure was higher than among whites. Combined, these measures explained 57 percent of the variance in support for the measure (Stipak, 1973).

Stipak argues that future transit sales tax measures should more explicitly attempt to incorporate the preferences of middle-income voters, and be part of a comprehensive transit plan for the region. These two suggestions are at odds with later findings (and to some extent Stipak's findings) about the importance of project proximity to voter

support. Regional needs may simply not align with the projects that would help deliver a successful measure.

Schroeder and Sjoquist (1978) used a linear regression model to analyze a local-option property tax measure (1968) and a local-option sales tax measure (1971) for mass transit in Atlanta, comparing 263 Census block groups. They found that the percent riding the bus to work had a significant, positive effect at the 95 percent level of confidence. For every one percent increase in workers riding the bus, there was a 2.75 percent increase in support for the tax measure. The relative distance from the nearest transit station to the central business district (CBD) was significant at the 90 percent level of confidence and negative, which is consistent with Stipak's findings (1973). However, the distance to the CBD was u-shaped, which may indicate high bus utility closest to the CBD, diminishing as distance increases, and then increased rail utility farther away from the CBD (Schroeder & Sjoquist, 1978).

Hannay and Wachs (2007) used OLS regression to estimate the parameters of the factors influencing support in three separate ballot measures for 356 Census block groups in Sonoma County: Measure B (roads projects, 2000), Measure C (transit, bicycling and pedestrian projects, 2000), and Measure M (road, transit, bicycling and pedestrian projects, 2004).

Consistent with earlier findings, they found that the closer voters lived to the transportation projects to be funded, the greater their support. For Measure B, the percentage of votes by registered Democrats and proximity to Highway 101 both had significant negative effects. For every percent increase in votes by registered Democrats,

the probability of support for Measure B declined by 45 percent. For every mile in distance from Highway 101, support for Measure B declined by 35 percent. For Measure C, for every mile closer to Marin County a neighborhood was, the likelihood of support increased by 36 percent for the transit funding measure. For every percentage increase for a neighborhood with an average of one or no cars, support for Measure C increased by 32 percent. For Measure M, as with Measure B, the closer to Highway 101, the greater the support for Measure M, even stronger in this case, with a 47 percent increase per mile. Unlike Measure B, there was a positive correlation between the proportion of Democrats and support for Measure M. For every percentage increase in the proportion voting Democratic, support for Measure M increased by 38 percent. Hannay and Wachs attributed this change in direction to the addition of transit and other non-road projects (2007).

Hannay and Wachs (2007) identified three significant variables across the measures: the political leanings of a neighborhood; proximity to the primary projects; and transit, bicycle, and pedestrian projects included in the expenditure plan. The magnitude of these effects, some of which draw on qualitative research in the study, are not reported in the journal article. The study, however, ignores two potentially significant variables: an economic downturn in 2001, and other local and statewide funding measures in 2000 and 2004.

Community-Level Studies

Haas et al. (2000) used regression models to look at 57 city and county elections across the country between 1990 and 1998, and 63 county elections in California between 1980 and 1998. In the national model, a stepwise regression explained 7 percent of the variance, but only two of the variables were significant: proportion of the population over age 65 (elderly) and multiple transportation modes as part of the measure (benefits). Both had a negative effect on the proportion voting for the measure. In communities where the elderly made up more than 18 percent of the population, 67 percent of the community voted to pass the tax. When the elderly population was between below 6 percent of the population, support for tax measures rose to 71 percent. For communities with multiple modes of transportation as part of the measure, the percentage voting for the measure was 51 percent. When there was only one mode, the percentage voting for the measure was 56 percent.

In the California model, population density, proportion elderly, proportion of population change for the five years prior to the measure, and sales tax per capita explained 27 percent of the variance in margin voting for transportation measures, and 15.8 percent comes from the proportion elderly alone. The authors explain the difference in the directional effect for the elderly nationally and in California as possibly a function of the greater proportion of elderly in California counties, which is never lower than 9 percent, while in other parts of the country is less than 6 percent (Haas et al., 2000).

Between the two models, the researchers drew two findings: efforts to fund transportation with taxes where the proportion of elderly is greater than 9 percent are

more likely to succeed, and efforts to increase sales taxes for transportation programs will be less successful in communities with higher sales taxes (Haas et al., 2000).

Zhao (2005) used a discrete-time event history analysis to study counties in Georgia and the factors influencing their adoption of a local-option sales tax for property tax relief. The event history analysis looked at state data whether or when individual counties adopted a measure between 1975 and 2002. The analysis also modeled 1975 to 1980 separately to look for differences between early and late adopters.

Of relevance to the studies of transportation sales tax measures, the study found that counties with a higher existing sales tax rate and counties within the Atlanta Metropolitan Statistical Area (i.e., urban counties) are less likely to adopt the tax. For every increase in the tax rate, the percentage voting for a given measure decreased by 2 percent. Whether a county was in the Atlanta Metropolitan Statistical Area decreased chances of adoption of the tax by 3 percent. Counties whose neighbors have adopted local-option sales taxes are more likely to adopt them. The variance in number of counties who have adopted local measures can explain up to 67 percent of the probability of other counties adopting them (Zhao, 2005).

Woodhouse (2009) used multiple regression to determine predictive factors for cities' general sales tax measures in California between 2004-2008. Woodhouse only found two dependent variables to be significantly related: educational attainment and age. The study also found that a one-percent increase in voters with college degrees and voters registered Democrat would result in a 0.5-percent and 0.15-percent increase, respectively, in Yes votes, holding other variables constant.

Rueben and Cerdán (2003) made several significant findings through their quantitative analysis of 348 individual measures between 1986 and 2002. Their findings were divided between school districts, cities, and counties. Over all types of governments, their study found that Bay Area governments were more likely to pass tax measures than other regions.

For cities, those that proposed and passed measures were larger, more Democratic, and had greater population density. Cities that had a lower percentage of nonwhite households or had more revenue to begin with passed more measures. In general, cities were more reliant on property taxes were more likely to seek and pass new tax measures.

For counties, there were just two significant findings: northern counties proposed a larger percentage of measures, and county measures faced relatively low passage rates. Special districts had an interesting effect on passage: cities with fewer special districts were more likely to be successful, and when special districts pursued their own measures, they had higher overall passage rates than city and county government measures, despite requiring a supermajority for all measures.

Individual-level Studies

Stipak (1973) and Hannay and Wachs (2007) pointed out that data on individual voter behavior is difficult to obtain. Baldassare (1991) and Hamideh, Oh, Labi and Mannering (2008) attempt to add to the literature using surveys of voters.

Hamideh, Oh, Labi, and Mannering (2008) analyzed the results of a post-election survey of 800 voters to understand why voters rejected a half-cent sales tax for local transportation projects. Two binary logit models were applied: one for support of the original measure (i.e., stated preference), and one for predicted support of a revised measure (i.e., revealed preference).

In the stated preference model, 43.5 percent of voters who voted no on Measure B voted no on another local sales tax measure (for open space). Voters with a strong preference for revenues being used for freeways were 27.2 percent more likely to vote for the measure than those not voting for it. Voters who were Hispanic (28.6), a Democrat (10.2), a transit user (17.3), or in a household making less than $90,000 (9.2) all voted in higher proportion for Measure B (Hamideh et al., 2008).

There is a disagreement in the literature about the effect of income. Stipak (1973), Schroeder and Sjoquist (1978), and Hannay and Wachs (2007) found high support for transit-specific measures among high-income earners, while Hamideh and his colleagues found higher support among households making less than $90,000 (2008). Haas et al. (2000) found no significant effect. This points to the non-linear nature of income, and the desirability of using of a quadratic in many cases, although as will be described later, the effectiveness of a quadratic does not hold true in all cases.

Several of the variables held true in the Hamideh et al. revealed preference model, but there were some new variables that showed significance: those with a positive perception of the physical condition of local streets, and Republicans were less likely to vote for the hypothetical measure (21.9 and 13.4 percent, respectively). In this model, the

Hispanic variable was no longer significant. Of the revisions to Measure B in the hypothetical measure, a fixed expiration date, its presence as the only county tax measure on the ballot, and a citizen oversight committee each supplied a significant amount of the support (25.5, 30.7, and 10 percent, respectively) (Hamideh et al., 2008). One criticism of this study is that independent variables that were not statistically significant were omitted from the model, which is not helpful for others studying the data, especially those willing to accept a lower confidence interval.

Baldassare (1991) analyzed the results of a post-election survey of 1,000 voters using regression to understand why voters rejected a half-cent sales tax for local transportation projects in 1989, and to predict the factors that would influence a revised measure placed on the ballot in 1990. The study used a statewide gas tax as a proxy for support for a local transportation sales tax. None of the variables measured were statistically significant. It is interesting to note that all surrounding counties had a supplemental sales tax in place, which does not follow the policy diffusion theory that Zhao cites. The method used for trying to measure variables influencing support for a local transportation sales tax is flawed. As other studies have shown, local-option sales taxes rely on certain factors.

Myers, Pitkin and Park (2006) analyzed the results of Public Policy Institute of California polling conducted in 2001 and 2004 of 1,741 regular voters to understand who supports infrastructure investment and why. The study found a major disconnect between homeowners and support for infrastructure funding, which they believe to be a new phenomenon. Another key finding was that those who feel believe there is not adequate

infrastructure funding strongly support a sales tax or other method of correcting the funding gap. When comparing the 2001 and 2004 data, their analysis revealed a 27 percent swing in support for infrastructure sales taxes, shifting from minority support to 2:1 support.

Summary and Conclusion

There are several limitations to this research, including the limited number of studies available, the lack of comparative studies in other states, and scarce jurisdictional-level studies of individuals. On this latter point, the lack of individual studies creates a significant barrier to understanding voter behavior, and thus understanding the individual-level decisions to vote for a transportation sales tax measure.

Looking across all of the studies, there are seven categories that have some level of significance: income, party affiliation, age, race, tax level, proximity to transportation facilities, and transit use. I will focus on these, with expansion into other areas, in developing the methodology in the next chapter. The model will include several variables that try to assess these key explanatory factors.

Chapter 3

RESARCH APPROACH AND METHODOLOGY

In order to test what factors influenced the passage of supplemental sales tax measures for transportation in cities and counties in California, I develop in this chapter a model of the relationship between success in passage and key factors expected to influence it. Furthermore, I also lay out the method I use to conduct interviews of transportation professionals in California with experience in transportation sales tax measures. This chapter explains why regression is an appropriate method for answering the question of what factors are significant to passage, details the model I developed, describes the variables used to test the model, discusses the sources of data used, and details the goals of the interviews.

Regression Analysis

Regression is a statistical technique used to quantify the relationship between a dependent variable (e.g., the passage of a transportation sales tax measure in a specific election) and independent variables thought to influence the chosen dependent variable (e.g., demographics, geography, taxation) (Studenmund, 2006). Regression helps researchers understand what affect an independent variable has on a dependent variable. In this model, I try to determine if the model can predict the dependent variable—if a certain characteristic exists in a community, does that increase or decrease the probability that a transportation sales tax measure will pass. The reason for using regression is that

there are many things we can measure about communities and their residents, but what we do not know is how the voters in those communities will respond to a sales tax measure. Regression can help determine the feasibility of a measure in any community in the future based on past results across many other communities.

Using STATA version 11.1, a statistical analysis program, I determine if a set of causal variables thought to theoretically influence the passage of transportation sales tax measures have any measurable influence that we can be statistically confident exists. And if so, what is the magnitude of these influences?

Model

In order to test what factors influenced pass of supplemental sales tax measures for transportation in cities and counties in California, I developed a model that looks at the relationship between passage and key factors in each case. The dependent variable for this model is a dummy variable equal to one if measure received the required level of support to pass, either majority or two-thirds of the votes cast, and zero if it did not. I also run a regression that measures the percentage that voted for a measure as a dependent variable. Given that the percentage of votes does not matter—a measure with 50.1 percent still goes into effect as much as one with 99 percent—the use of a yes/no, or dummy variable, is appropriate.

To test what matters in the passage of these measures, I tested nine key explanatory variables, grouped into three categories, to determine their effect on passage. The literature I reviewed tested a wide range of variables, but I found that these three

categories were the most commonly studied. However, there are other variables not included that may have significant influence on the passage of measures. The composition of measures, or the share of different types of projects and programs, is something voters likely weigh in their decisions. Unfortunately, this information is not centrally available and is not in a format that makes it easy to quantitatively study. Another gap in the variables relates to individual-level information, such as perceived benefit. This is a common problem in any study of voter behavior, but one that I attempt to address by proxy using the variables discussed below. These caveats aside, I believe this model does the best job given the available data to predict the success of transportation sales tax measures.

The functional form of the model is expressed as follows:

Passage of local sales tax measure for transportation = f{demographics, geography, tax burden} where,

Demographics = f{percentage of the population between 18 and 29 years of age (-), 30-45 (+), 46-64 (+), percentage of the population over 65 years of age (+), median household income (+), percentage below poverty level (+), percentage of households with income above $100,000 (-), percentage registered Democrats (+), percentage Caucasian (-), percentage Latino or Hispanic (+), percentage Black or African American (+), percentage Asian (+), percentage married (+), percentage with children (-);

Geography = f{Set of City and County Dummy Variables for those with more than one election, percentage of the population considered urbanized (+), population of jurisdiction (+); and

Tax Burden = f{existing local transportation sales tax measure dummy (+), sales tax rate at the time the measure was proposed (-), whether there is an existing measure}.

For each of the variables, the plus or minus sign indicates how I predicted the direction of the relationship with passage of local sales tax measures for transportation.

The city and county measures serve as a control variable to measure the influence of a particular jurisdiction on the passage of a measure, so no direction is predicted.

Demographics

All of the demographics variables are scale variables, measuring specific values for a given city or county. I predict the percentage of the population between 18-29 to be negatively correlated with passage of a tax measure, because sales taxes are regressive, which would disproportionately impact those between 18-29. The 18-29 group may also be focused more on the short-term impact of taxation, rather than the long-term benefit of transportation projects. I predict the percentage of the population over age 65 to be positively correlated with the passage of a transportation tax measure, based on the results of the Haas et al. (2000) analysis of factors influencing these measures in California. For those 65 and older, this prediction may be surprising because many in this group may be cautious about raising taxes when their earning power is likely capped, but pragmatically, this group would also benefit from many of the transportation improvements, particularly those that create or expand transit options.

I predict median income to be positively correlated with the passage of a transportation tax measure, based on the findings of Hannay and Wachs (2007). I predict the percentage of registered Democrats to be positively correlated with the passage of a transportation tax measure, based on the findings of Hannay and Wachs (2007), Woodhouse (2009), Rueben and Cerdán (2003), and Hamideh, et al. (2008).

Geography

In order to measure geographic effects, I include a dummy variable for whether a measure was in a city or county, and predict that city measures will be positively correlated with passage, because people tend to trust government more the closer to them (Pew Research Center for the People & the Press, 2010).

I also include a scale variable for the percentage of the population considered urbanized and a dummy variable for whether a county has more than 250,000 residents. I predict county with more than 250,000 residents and percentage of the population considered urbanized to be positively correlated with passage of a measure, because more urbanized areas tend to support transportation sales tax measures (Haas et al., 2000).

I have also included a series of dummy variables for all counties in the state where a measure appeared either at the county or sub-county level, as well as those cities who had at least two sales tax measures. Not all jurisdictions are included, either because there were no measures in the period observed. These dummy variables are included to see whether there is a bias in different jurisdictions to support transportation sales tax measures that does not appear in the other variables.

Tax burden

For the tax burden variables, sales tax rate at the time the measure was proposed is a scale variable, and existing local transportation sales tax measure is a dummy variable. I predict the sales tax rate at the time the measure was proposed to be negatively correlated with passage of a measure, as the greater tax burden may discourage support as

Zhao found (2005). I predict whether an existing local transportation sales tax measure exists either countywide, or if the jurisdiction is a city, in that city, as having a positive correlation with passage of a measure, as Hamm and Schmidt suggest (2008).

Data

This section describes in greater detail the data used in my model, including how it was gathered, what I have done to get it ready for analysis, descriptive statistics for the variables, and an analysis of whether any of the independent variables are correlated.

Data Gathering and Preparation

My principal source for data was the California Elections Data Archive (CEDA), which is a joint project of Sacramento State and the California Secretary of State. The archive has data for all local elections in California between 1995 and 2008. Data for 2007 and 2008 was not available from CEDA online, but was obtained by email from CEDA staff. The data comes in separate data files for each year, so I had to combine the data files into one master and then filter through 6,251 local measures to pull out all transportation sales tax measures. Because there are a limited number of transportation sales tax measures, I also included sales tax measures for general government purposes. I included a dummy variable for transportation sales tax measures to measure the difference between transportation and general sales tax measures. This serves two purposes: creating a more reliable base for data, and including those measures that use the A+B strategy. The data sorting was done automatically using the codes they assign to

every measure, but also manually verified by reading the ballot language for each measure dealing with a sales tax increase.

My secondary source of data was California City Finance. California City Finance is maintained by Michael Coleman, a local finance expert who also works for the League of California Cities. He reports the results of elections from 2008 to 2010 that were not reported by CEDA (California City Finance, 2011). I also included measures reported by the Self-Help Counties Association and in Cal-Tax Digest going back to 1980, in order to add those measures passed between 1980 and 1994 (Self-Help Counties Association, 2009), (Guardino, 1999). I manually added the data to the sorted CEDA dataset.

For independent variables, my primary data source was the 2000 U.S. Census. I relied on the Census for population data for the percentage of the population 18-29 years of age, percentage of the population over 65 years of age, median income, whether a county is over 250,000 residents, percentage urban, and percentage non-Hispanic/Latino White. For all of these measures, I used the Census Bureau's online database to create custom reports by jurisdiction and then paired the results up with the cases in the dataset. Population 18-29 was not broken out as a category, so I had to sum the individual occurrences into one new variable. County over 250,000 residents was computed by sorting counties by population and then assigning a 1 to all above 250,000, and a 0 to all others. Percentage urban was calculated by dividing urban population by total population. In order to include the tax rate at the time a measure was on the ballot, I accessed annual tax rate information from the California Board of Equalization’s website.

Table 4 includes detailed information about each variable, including a short description of what it represents, what it measures, and the source.

Table 4: Description of Variable Purpose and Source

Variable	Description	Measures	Source
Pass dummy (dependent variable)	Did a transportation sales tax measure pass?	Success/failure of a given measure	California Elections Data Archive, California City Finance, Cal Tax
Year measure passed (2008 is excluded)	Year in which a given measure was on the ballot.	Effect of time, and indirectly, economy and other variables not in the model	CEDA, California City Finance, Cal Tax
General election	Whether the measure was on a ballot during a general election	Effect of voter turnout, larger number of measures or candidates on ballot	California Board of Equalization
General tax	Was the measure a general tax?	Effect of general taxes	CEDA, California City Finance, Cal Tax
Special tax	Was the measure a special tax for transportation?	Effect of special taxes	CEDA, California City Finance, Cal Tax
Advisory measure	Was the measure an advisory measure (for transportation) accompanying a general tax?	Effect of advisory measures	CEDA, California City Finance, Cal Tax
Percent	Percentage of votes in favor of a measure	Strength of support for measure	CEDA, California City Finance, Cal Tax
Rate	Proposed amount of sales tax	Effect of amount of proposed tax	CEDA, California City Finance, Cal Tax
Population	Total population of jurisdiction	Effect of population	Census 2000
County over 250,000 Dummy	Whether 250,000 residents live in the county.	Effect of population	Census 2000
Tax rate	Tax rate at the time of election	Effect of tax burden on support for a measure	California Board of Equalization
Percent urban	Percentage of the population in a given jurisdiction living in an urban area.	Effect of density	Census 2000
Percentage 18-29	Percentage of the population in a given jurisdiction, ages 18-29	Effect of a higher proportion of younger voters	Census 2000
Percentage 30-45	Percentage of the population in a given jurisdiction, ages 30-45	Effect of a higher proportion of early-mid career voters	Census 2000
Percentage 46-64	Percentage of the population in a given jurisdiction, ages 46-64	Effect of a higher proportion of mid-late career voters	Census 2000
Percentage over	Percentage of the population	Effect of a higher	Census 2000

Variable	Description	Measures	Source
65	in a given jurisdiction over age 65	proportion of older voters	
Median income	Median income in a given jurisdiction.	Effect of wealth	Census 2000
Percent Democrat	Percentage of the population in a given jurisdiction registered with the Democratic Party	Effect of party affiliation on support for measure	Secretary of State
Percent Caucasian	Percentage of the population identifying with one race: non-Hispanic or Latino White	Effect of racial homogeneity	Census 2000
Existing measure Dummy	Whether there is an existing transportation sales tax measure in the county	Satisfaction with sales tax as a funding mechanism for transportation	CEDA, California City Finance, Cal Tax, Self-Help Counties Coalition
Percent married	Percentage of the population over age 15 married	Effect of marriage	Census 2000
Poverty	Percentage of households with income below poverty level	Effect of poverty in a given jurisdiction	Census 2000
Latino	Percentage of the population identifying as Hispanic or Latino	Effect of Latino population	Census 2000
Asian	Percentage of the population identifying as Asian	Effect of Asian population	Census 2000
Black	Percentage of the population identifying as Black or African American	Effect of Black or African American population	Census 2000
Rich	Percentage of households with income above $100,000	Effect of wealth in a given jurisdiction	Census 2000
Children	Percentage of households with children	Effect of a high proportion of households with children	Census 2000
Own	Percentage of households who own their own homes	Effect of homeownership	Census 2000
City (dummy for all cities)	Which city a measure was located in (for cities with two or more measures proposed)		
County (dummy for all counties)	Which county a measure was located in (for counties with two or more measures proposed)	Effects of specific geography	CEDA, California City Finance, Cal Tax
City dummy	Whether a given jurisdiction was a city	Differences between voter support for cities and counties	CEDA, California City Finance, Cal Tax

Discussion of Descriptive Statistics

Table 5 provides descriptive statistics for all of the variables in the model. Of the 242 cases examined, it is promising that they are roughly divided between measures that passed (53.7 percent) and measures that failed (46.3 percent). Other noteworthy results from the statistics include that approximately 39 percent of all measures in this dataset are from cities, 60 percent of measures are in counties with more than 250,000 residents, 44 percent already have an existing sales tax measure for transportation, and the mean sales tax rate at the time a measure was proposed was 7.6 percent.

Table 5: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Year	242	2003.446	6.31004	1980	2010
General election	242	.8305785	.3759012	0	1
General tax	242	.5726141	.4957286	0	1
Special tax	242	.3651452	.4824729	0	1
Advisory measure	242	.0622407	.2420949	0	1
Percent	242	.5612511	.1359632	.139291	.837951
Rate	242	.502376	.2444234	0	1.5
Dummy for passage	242	.5371901	.4996484	0	1
Population	242	426137.2	1172507	261	9519338
County population over 250,000	242	.6033058	.4902254	0	1
Sales tax rate at the time of election	242	.0764184	.007727	.06	.0975
Percent urban, squared	242	.7685268	.2321656	0	1
Percent population 18-29, squared	242	.0295941	.0117977	.0076505	.065139
Percent population 65 and older, squared	242	.1160411	.0272383	.0834713	.2088047
Median income, squared	242	2.18e+09	1.27e+09	3.95e+08	7.83e+09
Percent registered Democrat, squared	242	.2215527	.0878997	.0614362	.5571564
Percent Caucasian, squared	242	.6147027	.2252074	.005776	.9312249
Existing measure	242	.4421488	.4976713	0	1
Percent married, squared	242	.3036003	.0583371	.0964724	.4365245
Poverty, squared	242	.0250327	.0227851	.000622	.1352139
Percent Latino or Hispanic, squared	242	.1468916	.1954417	.0005066	.9278539
Percent of households with income over $100,000, squared	242	.0252997	.0316735	.0001096	.1804488
Percent population 30-45, squared	242	.0546108	.0234133	.000961	.135424
Percent population 46-64, squared	242	.0360339	.0224979	.0004	.156025

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Percent of households with children, squared	242	.1731386	.0920848	.0152595	.4923283
Percent of households owning home, squared	242	.3479162	.1057005	.0866283	.6327358
Percent Black or African American, squared	242	.0107095	.0531006	0	.7396
Percent Asian, squared	242	.0334948	.0931567	9.00e-06	.839056
Population, squared	242	1.55e+12	1.01e+13	68121	9.06e+13
Dummy for Arroyo Grande	242	.0123967	.1108775	0	1
Dummy for Calexico	242	.0123967	.1108775	0	1
Dummy for Cathedral City	242	.0082645	.0907203	0	1
Dummy for Capitola	242	.0082645	.0907203	0	1
Dummy for Colusa (city)	242	.0082645	.0907203	0	1
Dummy for Davis	242	.0082645	.0907203	0	1
Dummy for Delano	242	.0123967	.1108775	0	1
Dummy for El Cerrito	242	.0082645	.0907203	0	1
Dummy for Eureka	242	.0082645	.0907203	0	1
Dummy for Gustine	242	.0082645	.0907203	0	1
Dummy for Hollister	242	.0082645	.0907203	0	1
Dummy for Lakeport	242	.0165289	.1277622	0	1
Dummy for National City	242	.0082645	.0907203	0	1
Dummy for Pacific Grove	242	.0082645	.0907203	0	1
Dummy for Richmond	242	.0082645	.0907203	0	1
Dummy for Salinas	242	.0123967	.1108775	0	1
Dummy for San Juan Bautista	242	.0123967	.1108775	0	1
Dummy for Sebastopol	242	.0123967	.1108775	0	1
Dummy for Trinidad	242	.0082645	.0907203	0	1
Dummy for Truckee	242	.0082645	.0907203	0	1
Dummy for Watsonville	242	.0082645	.0907203	0	1
Dummy for West Sacramento	242	.0165289	.1277622	0	1
Dummy for Woodland	242	.0330579	.1791582	0	1
Dummy for Alameda	242	.0206612	.142542	0	1
Dummy for Colusa	242	.0165289	.1277622	0	1
Dummy for Contra Costa	242	.0371901	.1896195	0	1
Dummy for Fresno	242	.0247934	.1558172	0	1
Dummy for Humboldt	242	.0247934	.1558172	0	1
Dummy for Imperial	242	.0371901	.1896195	0	1
Dummy for Kern	242	.0289256	.1679449	0	1
Dummy for Lake	242	.0289256	.1679449	0	1
Dummy for Los Angeles	242	.0454545	.2087306	0	1
Dummy for Madera	242	.0165289	.1277622	0	1
Dummy for Marin	242	.0247934	.1558172	0	1
Dummy for Mendocino	242	.0206612	.142542	0	1
Dummy for Merced	242	.0289256	.1679449	0	1
Dummy for Monterey	242	.0578512	.2339458	0	1
Dummy for Napa	242	.0082645	.0907203	0	1
Dummy for Nevada	242	.0165289	.1277622	0	1
Dummy for Orange	242	.0206612	.142542	0	1
Dummy for Riverside	242	.0165289	.1277622	0	1
Dummy for Sacramento	242	.0206612	.142542	0	1
Dummy for San Benito	242	.0289256	.1679449	0	1

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Dummy for San Bernardino	242	.0247934	.1558172	0	1
Dummy for San Diego	242	.0371901	.1896195	0	1
Dummy for San Francisco	242	.0123967	.1108775	0	1
Dummy for San Joaquin	242	.0165289	.1277622	0	1
Dummy for San Luis Obispo	242	.0289256	.1679449	0	1
Dummy for San Mateo	242	.0330579	.1791582	0	1
Dummy for Santa Barbara	242	.0123967	.1108775	0	1
Dummy for Santa Clara	242	.0289256	.1679449	0	1
Dummy for Santa Cruz	242	.0330579	.1791582	0	1
Dummy for Solano	242	.0206612	.142542	0	1
Dummy for Sonoma	242	.053719	.2259296	0	1
Dummy for Stanislaus	242	.0206612	.142542	0	1
Dummy for Tulare	242	.0165289	.1277622	0	1
Dummy for Tuolumne	242	.0123967	.1108775	0	1
Dummy for Ventura	242	.0206612	.142542	0	1
Dummy for Yolo	242	.0578512	.2339458	0	1
Dummy for Yuba	242	.0082645	.0907203	0	1

Expert Interviews

While I hope the regression analysis described above will yield instructive findings about transportation sales tax measures, I realize that many political and policy decisions lead up to the point of putting these measures on the ballot. In order to better understand what factors decision makers believe are important in the success of transportation sales tax measures, I interviewed several of them.

Interview structure

Each interview consisted of a pre-selected list of questions, although related follow-up questions may result in further discussion. The questions are attached as appendix C. Each of the interview subjects is an expert in the field of California transportation policy and has had direct experience with transportation sales tax measures. Each interview

subject was asked for 30 minutes, although some ran longer at the discretion of the interview subject. Each interview subject was informed of the purpose of the interview in advance, along with the list of questions. Answers to questions were not anonymous, unless requested by the interview subject. The Public Policy and Administration Department Human Subjects Review Committee approved the questions and methods.

Experts

Brian Williams is the executive director of the Sacramento Transportation Authority. He worked on the renewal of Measure A, a half-cent transportation sales tax in Sacramento County in 2004. The Sacramento Transportation Authority oversees the implementation of Measure A.

Celia McAdam is the executive director of the Placer County Transportation Planning Agency, which explored putting a transportation sales tax measure on the ballot, but ultimately decided it would not be successful.

Christina Watson is a senior transportation planner at the Transportation Agency for Monterey, and authored a qualitative study of four transportation sales tax measure campaigns in 2006. She will be joined in responding to questions by Debbie Hale, executive director at the Transportation Agency for Monterey, Don Bachman, deputy director at the Transportation Agency for Monterey, and Eileen Goodwin campaign consultant to the Transportation Agency for Monterey.

Pete Hathaway is the former director of transportation planning at the Sacramento Area Council of Governments. Prior to joining SACOG, Mr. Hathaway spent 27 years

working for the California Transportation Commission, Governor's Office of Planning and Research, and Caltrans. He also teaches classes in transportation finance for the Institute of Transportation Studies at UC Berkeley.

The following chapter will discuss the results of the regression analysis. Chapter 5 will include the interviews.

Chapter 4

RESULTS

Using the model outlined in Chapter 3, I ran two different types of regression: a logistic regression and an ordinary least squares (OLS) regression. This chapter reports the correlation of these models, followed by the regression results. I first report the correlation coefficients for both regression types at the 90% confidence level and discuss any evidence of multicollinearity. I found several variables that moved very closely together, which may be a sign of multicollinearity.

The second half of this chapter reports the results of refined models in OLS and binomial logistic form. I determined that the binomial logistic form is the most appropriate for this model. I found several significant explanatory variables using both forms, but the logistic model works better overall.

The next chapter will provide analysis of the findings.

Correlation Coefficients

Tables 6a, 6b and 6c provide correlation coefficients for all of the variables used in the model as a logistic regression, with the dependent variable being a dummy variable for whether the measure passed. Control variables for year of election, city and county are not included because they take up a considerable amount of space and are mostly irrelevant. Tables 7a, 7b, and 7c provide correlation coefficients for all of the variables used in the model as an OLS regression, with the dependent variable being the percentage

voting for the measure. I tested for significance at the 90 percent level or higher, which is noted with one asterisk for 90 percent, two for 95 percent, and three for 99 percent.

Table 6a: Logistic Simple Correlation Coefficients

	Pass dummy	General election	General tax	Advisory	Special tax	Rate	Rate^2	Tax rate	Tax rate^2	City	County >250k	% urban	% urban^2	Popu-lation	Popu-lation^2
General election	.0889	1													
General tax	-.0783	.0122	1												
Advisory	.2386***	-.1123	-.2986	1											
Special tax	-.0392	.0437	**-.8782**	-.1943	1										
Rate	-.2228***	-.1119	.3099	-.5294	-.0531	1									
Rate^2	-.1563**	-.1831	.2859	-.2682	-.1594	**.932**	1								
Tax rate	.0557	-.0773	.4374	-.0695	-.4148	.0473	.0614	1							
Tax rate^2	.0615	-.0729	.429	-.0791	-.4013	.0525	.0621	**.9967**	1						
City	.1363**	-.0698	.6258	.0312	-.6589	.1249	.1942	.4236	.4129	1					
Co.>250k	.0944	.1517	-.0318	-.2119	.1389	.0746	.0229	.1697	.187	-.1157	1				
% urban	.2284***	.0785	-.0125	.0637	-.0191	-.0895	-.1012	.2098	.2275	-.0227	.61	1			
% urban^2	.2284***	.0785	-.0125	.0637	-.0191	-.0895	-.1012	.2098	.2275	-.0227	.61	1	1		
Population	.118*	.1141	-.3252	-.0477	.3581	-.0413	-.0864	-.2183	-.2015	-.4012	.2584	.2535	.2535	1	
Population^2	.1119*	.0654	-.1705	-.034	.1923	-.0069	-.0344	-.1264	-.1158	-.1899	.1243	.1376	.1376	**.9249**	1
%Democrat	.0867	.0005	.2053	-.0791	-.1713	.0548	.083	.3398	.341	.1707	.164	.2697	.2697	-.0619	.0203
% Dem.^{2}	.082**	-.0031	.2131	-.0916	-.1732	.0681	.0909	.348	.3496	.1921	.1761	.2655	.2655	-.0664	.0133
Caucasian	-.0679	-.0911	-.0377	.117	-.0199	-.1016	-.0651	-.2185	-.2335	.0463	-.4134	-.463	-.463	-.2122	-.1478
Caucasian^2	-.0688	-.0945	-.0142	.1245	-.0478	-.0978	-.0562	-.1982	-.2137	.0965	-.4379	-.509	-.509	-.2552	-.1709
Latino	-.0395	-.0406	.115	-.1088	-.0637	.156	.138	.0098	.0086	.0771	.0725	.1718	.1718	.0224	.0592
Latino^2	-.0395	-.0599	.1618	-.1088	-.1118	.1675	.157	.0593	.0559	.1406	.0334	.1124	.1124	-.0425	.0155
Black	.0244	.0763	.0171	-.0922	.0286	.0822	.045	.0785	.0867	-.0561	.2806	.2831	.2831	.1601	.1469
Black^2	.0428	.0533	.0775	-.0396	-.0598	.028	.0092	.1008	.1027	.0593	.1314	.134	.134	.0227	.0347
Asian	.1242*	.077	.0158	-.0826	.0252	.0452	.016	.1751	.1884	.0333	.2687	.2841	.2841	.1527	.0942
Asian^2	.1039	.0625	.0383	-.0603	-.0092	.0264	.0045	.1179	.1246	.1004	.0837	.035	.035	.0235	.0173

	Pass dummy	General election	General tax	Advisory	Special tax	Rate	Rate^2	Tax rate	Tax rate^2	City	County >250k	% urban	% urban^2	Popu-lation	Popu-lation^2
Med. inc.	.0774	.0576	-.13	.0233	.1219	-.115	-.1202	.1886	.209	-.2162	.3639	.4323	.4323	.1514	.0125
Med. inc.^{2}	.0635	.0681	-.1147	.0224	.1067	-.1018	-.1052	.1983	.218	-.2055	.3286	.4058	.4058	.1356	.0001
% Poverty	-.0515	.0677	.0968	-.0872	-.0558	.1159	.0823	-.162	-.1758	.0839	-.2168	-.1687	-.1687	-.031	.0408
% Poverty^2	-.0234	.0799	.1279	-.091	-.0859	.1122	.0791	-.1155	-.1292	.1316	-.1836	-.132	-.132	-.0642	.0137
% Rich	.078	.1054	-.171	-.0016	.1765	-.1222	-.1426	.1616	.1812	-.2823	.3056	.3985	.3985	.2108	.0612
% Rich^2	.0663	.112	-.1277	.0117	.1254	-.1002	-.1111	.1645	.1806	-.2492	.2368	.3547	.3547	.1646	.0271
% 18-29	.155**	-.0852	.1131	.1683	-.2006	-.0641	-.0349	.0445	.0427	.1413	.099	.4961	.4961	.0779	.0618
% 18-29^2	.1747***	-.1201	.0953	.2225	-.2095	-.0977	-.0549	.0383	.0342	.1634	.0101	.4549	.4549	.0508	.0479
% 30-45	.1121*	-.0329	-.0641	.068	.0317	-.0034	.0307	-.0647	-.0678	-.0736	.1116	.2297	.2297	.0984	.0704
% 30-45^2	.1251*	-.0274	-.0559	.0456	.0346	-.01	.0162	-.031	-.0315	-.0794	.1595	.2466	.2466	.1135	.0737
% 46-64	.0062	-.0611	-.0821	.1315	.0185	-.0246	.0273	-.0918	-.1006	-.0651	-.1552	-.0822	-.0822	-.02	0
% 46-64^2	-.032	-.0657	-.0402	.1101	-.0139	.003	.0462	-.0569	-.0653	-.0402	-.1882	-.1637	-.1637	-.0569	-.0262
% 65+	-.0137	-.0233	-.0979	.0689	.0662	-.102	-.0746	.0193	.0137	-.1022	-.2184	-.4384	-.4384	-.0964	-.081
% 65+^{2}	-.0131	-.0317	-.1056	.0837	.0666	-.1059	-.0759	.0109	.0044	-.1	-.2468	-.4522	-.4522	-.1025	-.082
% Married	-.2049***	-.1366	-.1612	.0697	.1307	.0176	.0202	-.1488	-.1441	-.2381	-.0331	-.0321	-.0321	-.0182	-.0483
% Married^2	-.2088***	-.1344	-.1543	.0689	.124	.0185	.0182	-.1557	-.151	-.2373	-.0488	-.0459	-.0459	-.0311	-.0577
% Children	-.0628	-.0282	.05	-.077	-.0128	.1254	.1116	-.0219	-.0199	.0355	.1404	.1665	.1665	-.0019	.0083
%Children^2	-.054	-.0294	.1003	-.0927	-.0566	.1532	.1375	.0072	.0085	.0866	.1324	.1595	.1595	-.0364	-.011
% Own	-.1421**	-.0516	-.1752	.0661	.1469	-.0535	-.0577	-.0528	-.0433	-.2122	-.0835	-.1765	-.1765	-.0816	-.1163
% Own^2	-.1368**	-.042	-.1599	.0625	.133	-.0305	-.0332	-.0343	-.0239	-.1955	-.0777	-.1806	-.1806	-.0938	-.1217
Existing	.1088*	-.0193	.1269	-.0563	-.1022	.0425	.0514	.5627	.563	.1193	.2967	.4202	.4202	.0756	.054

* significant at 90% level ** significant at 95% level *** significant at 99% level

Table 6b: Logistic Simple Correlation Coefficients (continued)

.	% Democrat	% Democrat^2	% Caucasian	% Caucasian^2	% Latino	% Latino^2	% Black	% Black^2	% Asian	% Asian^2	Median income	Median income^2	% Poverty	% Poverty^2	% Rich	% Rich^2
% Dem.^{2}	**.9911**	1														
Caucasian	-.5113	-.5338	1													
Caucasian^2	-.4899	-.5063	**.9845**	1												
Latino	.3815	.4047	-.3435	-.3721	1											
Latino^2	.4614	.4927	-.3086	-.332	**.9581**	1										
Black	.3824	.4215	-.6709	-.6256	.1772	.1101	1									
Black^2	.3218	.3758	-.4499	-.3611	.0691	.031	**.865**	1								
Asian	.3481	.3471	-.6886	-.6833	.2765	.2792	.1783	.0254	1							
Asian^2	.2212	.2181	-.43	-.3954	.1982	.214	.0563	-.0005	**.9107**	1						
Med. inc.	.0299	.0027	-.0692	-.0898	-.349	-.3744	-.056	-.0587	.1181	-.0205	1					
Med. inc.^{2}	.0445	.0164	-.0792	-.0984	-.3361	-.3488	-.0698	-.0638	.1478	.0138	**.9867**	1				
% Poverty	.1502	.1698	-.1868	-.1928	.579	.5693	.1734	.109	.0658	.0831	-.7904	-.7364	1			
% Poverty^2	.1989	.2153	-.1908	-.1938	.5556	.5713	.1507	.0956	.0822	.0906	-.7163	-.647	**.9719**	1		
% Rich	.0423	.0175	-.0722	-.0945	-.4027	-.3971	-.0761	-.0712	.1466	.0065	**.944**	**.9534**	-.707	-.6238	1	
% Rich^2	.059	.033	-.0774	-.0977	-.3383	-.3217	-.095	-.0733	.1768	.0503	**.8878**	**.9363**	-.5919	-.4974	**.9622**	1
% 18-29	.0528	.0456	-.1806	-.2157	.2435	.1739	.0414	.0082	.1369	.0276	-.0823	-.1133	.1859	.1634	-.0971	-.1242
% 18-29^2	.0313	.0213	-.1312	-.1619	.1943	.1304	.0069	-.0042	.1012	.0074	-.0984	-.127	.1784	.1528	-.1107	-.1321
% 30-45	-.0481	-.0617	.0278	.0138	.0397	.0136	-.0762	-.0537	-.0319	-.0698	.2546	.2441	-.1833	-.1669	.2282	.2188
% 30-45^2	-.0574	-.0718	.0062	-.0119	.0065	-.0249	-.0621	-.0487	-.006	-.0585	.3385	.3301	-.2338	-.2062	.3074	.298
% 46-64	-.1407	-.1583	.3248	.3508	-.3514	-.2916	-.2418	-.1088	-.2449	-.1578	.1823	.177	-.3367	-.3135	.2254	.2044
% 46-64^2	-.1346	-.1522	.3681	.4042	-.4443	-.3574	-.2551	-.1092	-.2688	-.1559	.1846	.1831	-.3824	-.349	.2455	.2239
% 65+	-.0762	-.0842	.2517	.2986	-.5363	-.4113	-.195	-.0758	-.1245	-.0221	.1764	.2044	-.3476	-.3213	.2441	.2592

.	% Democrat	% Democrat^2	% Caucasian	% Caucasian^2	% Latino	% Latino^2	% Black	% Black^2	% Asian	% Asian^2	Median income	Median income^2	% Poverty	% Poverty^2	% Rich	% Rich^2
% 65+^{2}	-.0889	-.0968	.2618	.3092	-.5312	-.4071	-.1999	-.0781	-.1366	-.0302	.1535	.1821	-.3286	-.3046	.222	.2403
% Married	-.1684	-.1544	-.006	-.0218	.3421	.2758	-.0198	-.099	.0133	.0147	.1373	.1398	-.1239	-.1256	.0169	.0388
% Married^2	-.1777	-.163	.0002	-.0149	.3406	.2761	-.0251	-.1042	.0117	.0167	.1304	.1349	-.1075	-.1055	.0136	.0369
% Children	.2602	.2829	-.3802	-.3986	**.8714**	**.8023**	.2382	.1035	.2895	.2255	-.2546	-.2402	.469	.4539	-.3767	-.3119
%Children^2	.3221	.3477	-.3886	-.4029	**.8966**	**.861**	.2193	.0909	.3121	.2489	-.2895	-.2706	.5054	.5031	-.3919	-.3221
% Own	-.2879	-.2836	.2497	.2601	-.1809	-.1927	-.1478	-.1474	-.2013	-.1422	.3026	.301	-.4053	-.3722	.2309	.2013
% Own^2	-.2866	-.2815	.2443	.2599	-.1985	-.2025	-.1364	-.1312	-.1995	-.1378	.3101	.3107	-.4161	-.3775	.2389	.2118
Existing	.1729	.174	-.2921	-.3024	.0493	.0163	.1998	.1363	.1887	.0716	.3484	.3333	-.2325	-.218	.2873	.2626

* significant at 90% level ** significant at 95% level *** significant at 99% level

Table 6c: Logistic Simple Correlation Coefficients (continued)

	% 18-29	% 18-29^2	% 30-45	% 30-45^2	% 46-64	% 46-64^2	% 65+	% 65+^{2}	% Married	% Married^2	% Children	% Children^2	% Own	% Own^2
% 18-29^2	**.9856**	1												
% 30-45	.114	.109	1											
% 30-45^2	.1056	.0965	**.9775**	1										
% 46-64	-.0969	-.0671	.724	.6511	1									
% 46-64^2	-.1535	-.1219	.5068	.4491	**.9469**	1								
% 65+	-.6639	-.6013	-.0154	.0056	.2918	.3589	1							
% 65+^{2}	-.6637	-.5951	-.0178	.0003	.2944	.3595	**.9979**	1						
%Married	-.1058	-.1206	.029	.0063	-.0788	-.1038	-.1976	-.1868	1					
%Married^2	-.0972	-.1119	.028	.0113	-.0915	-.1168	-.1962	-.1845	**.9961**	1				
% Children	.1311	.0873	.02	-.0109	-.4249	-.5345	-.5477	-.5413	.5474	.5464	1			
%Children^2	.1434	.0968	.0207	-.0116	-.3999	-.4926	-.5275	-.5212	.4969	.5	**.9836**	1		
% Own	-.3382	-.3205	-.0546	-.0678	.1354	.1819	.1271	.1346	.6793	.6788	.0512	-.0034	1	
% Own^2	-.3495	-.3315	-.0431	-.0498	.1436	.1912	.1554	.1633	.6612	.6645	.034	-.0145	**.9928**	1
Existing	.1134	.1079	.0379	.0824	-.1054	-.1092	-.1421	-.1481	-.012	-.0248	.073	.0587	-.0037	.0063

* significant at 90% level ** significant at 95% level *** significant at 99% level

Table 7a: OLS Simple Correlation Coefficients

	Percent	General election	General tax	Special tax	Advisory	Rate	Rate^2	Tax rate	Tax rate^2	City	County >250k	% urban	% urban^2	Popu-lation	Popu-lation^2
General election	.0506	1													
General tax	-.3687***	.0122	1												
Special tax	.2341***	.0437	**-.8782*** **	1											
Advisory	.2890***	-.1123*	-.2986***	-.1943***	1										
Rate	-.1940***	-.1119*	.3099***	-.0531	-.5294***	1									
Rate^2	-.1326**	-.1831***	.2859***	-.1594**	-.2682***	**.9320*** **	1								
Tax rate	-.038	-.0773	.4374*	-.4148*	-.0695	.0473	.0614	1							
Tax rate^2	-.0432	-.0729	.4290*	-.4013*	-.0791	.0525	.0621	**.9967***	1						
City	-.0305	-.0698	.6258*	-.6589*	.0312	.1249*	.1942 *	.4236*	.4129*	1					
Co.>250k	.0215	.1517**	-.0318	.1389**	-.2119***	.0746	.0229	.1697*	.1870*	-.1157*	1				
% urban	.1297**	.0785	-.0125	-.0191	.0637	-.0895	-.1012	.2098*	.2275*	-.0227	.6100 *	1			
% urban^2	.1297**	.0785	-.0125	-.0191	.0637	-.0895	-.1012	.2098*	.2275*	-.0227	.6100 *	**1.00***	1		
Population	.0484	.1141*	-.3252***	.3581***	-.0477	-.0413	-.0864	-.2183*	-.2015*	-.4012*	.2584 *	.2535 *	.2535 *	1	
Population^2	.0187	.0654	-.1705***	.1923***	-.034	-.0069	-.0344	-.1264*	-.1158*	-.1899*	.1243 *	.1376 *	.1376 *	**.9249 ***	1
%Democrat	.0851	.0005	.2053***	-.1713***	-.0791	.0548	.083	.3398*	.3410*	.1707*	.1640*	.2697*	.2697*	-.0619	.0203
% Dem.^{2}	.0641	-.0031	.2131***	-.1732***	-.0916	.0681	.0909	.3480*	.3496*	.1921*	.1761*	.2655*	.2655*	-.0664	.0133
Caucasian	.0017	-.0911	-.0377	-.0199	.1170*	-.1016	-.0651	-.2185*	-.2335*	.0463	-.4134*	-.4630*	-.4630*	-.2122*	-

	Percent	General election	General tax	Special tax	Advisory	Rate	Rate^2	Tax rate	Tax rate^2	City	County >250k	% urban	% urban^2	Popu-lation	Popu-lation^2
															.1478*
Caucasian^2	-.0085	-.0945	-.0142	-.0478	.1245*	-.0978	-.0562	-.1982*	-.2137*	.0965	-.4379*	-.5090*	-.5090*	-.2552*	-.1709*
Latino	-.0631	-.0406	.1150*	-.0637	-.1088*	.1560**	.1380*	.0098	.0086	.0771	.0725	.1718*	.1718*	.0224	.0592
Latino^2	-.0609	-.0599	.1618**	-.1118*	-.1088*	.1675***	.1570*	.0593	.0559	.1406*	.0334	.1124*	.1124*	-.0425	.0155
Black	-.045	.0763	.0171	.0286	-.0922	.0822	.045	.0785	.0867	-.0561	.2806*	.2831*	.2831*	.1601*	.1469*
Black^2	-.0464	.0533	.0775	-.0598	-.0396	.028	.0092	.1008	.1027	.0593	.1314*	.1340*	.1340*	.0227	.0347
Asian	.0616	.077	.0158	.0252	-.0826	.0452	.016	.1751*	.1884*	.0333	.2687*	.2841*	.2841*	.1527*	.0942
Asian^2	.052	.0625	.0383	-.0092	-.0603	.0264	.0045	.1179*	.1246*	.1004	.0837	.035	.035	.0235	.0173
Med. inc.	.0869	.0576	-.130**	.1219*	.0233	-.1150*	-.1202*	.1886*	.2090*	-.2162*	.3639*	.4323*	.4323*	.1514*	.0125
Med. inc.^{2}	.0801	.0681	-.1147*	.1067*	.0224	-.1018	-.1052	.1983*	.2180*	-.2055*	.3286*	.4058*	.4058*	.1356*	.0001
% Poverty	-.0337	.0677	.0968	-.0558	-.0872	.1159*	.0823	-.1620*	-.1758*	.0839	-.2168*	-.1687*	-.1687*	-.031	.0408
% Poverty^2	-.0074	.0799	.1279**	-.0859	-.091	.1122*	.0791	-.1155*	-.1292*	.1316*	-.1836*	-.1320*	-.1320*	-.0642	.0137
% Rich	.1049	.1054	-.171***	.1765***	-.0016	-.1222*	-.1426*	.1616*	.1812*	-.2823*	.3056*	.3985*	.3985*	.2108*	.0612
% Rich^2	.0927	.1120*	-.1277*	.1254*	.0117	-.1002	-.1111*	.1645*	.1806*	-.2492*	.2368*	.3547*	.3547*	.1646*	.0271
% 18-29	.0872	-.0852	.1131*	-.2006*	.1683*	-.0641	-.0349	.0445	.0427	.1413*	.099	.4961*	.4961*	.0779	.0618
% 18-29^2	.1052	-.1201*	.0953	-.2095*	.2225*	-.0977	-.0549	.0383	.0342	.1634*	.0101	.4549*	.4549*	.0508	.0479
% 30-45	.1204*	-.0329	-.0641	.0317	.068	-.0034	.0307	-.0647	-.0678	-.0736	.1116*	.2297*	.2297*	.0984	.0704
% 30-45^2	.1167*	-.0274	-.0559	.0346	.0456	-.01	.0162	-.031	-.0315	-.0794	.1595*	.2466*	.2466*	.1135*	.0737
% 46-64	.0846	-.0611	-.0821	.0185	.1315*	-.0246	.0273	-.0918	-.1006	-.0651	-.1552*	-.0822	-.0822	-.02	0
% 46-64^2	.0542	-.0657	-.0402	-.0139	.1101*	.003	.0462	-.0569	-.0653	-.0402	-.1882*	-.1637*	-.1637*	-.0569	-.0262
% 65+	-.0065	-.0233	-.0979	.0662	.0689	-.102	-.0746	.0193	.0137	-.1022	-.2184*	-.4384*	-.4384*	-.0964	-.081
% 65+^{2}	-.0022	-.0317	-.1056	.0666	.0837	-.1059	-.0759	.0109	.0044	-.1	-.2468*	-.4522*	-.4522*	-.1025	-.082
% Married	-.1949***	-.1366*	-.1612*	.1307*	.0697	.0176	.0202	-.1488*	-.1441*	-.2381*	-.0331	-.0321	-.0321	-.0182	-.0483
% Married^2	-.1963***	-.1344*	-.1543*	.1240*	.0689	.0185	.0182	-.1557*	-.1510*	-.2373*	-.0488	-.0459	-.0459	-.0311	-.0577
% Children	-.0829	-.0282	.05	-.0128	-.077	.1254*	.1116*	-.0219	-.0199	.0355	.1404*	.1665*	.1665*	-.0019	.0083

	Percent	General election	General tax	Special tax	Advisory	Rate	Rate^2	Tax rate	Tax rate^2	City	County >250k	% urban	% urban^2	Popu-lation	Popu-lation^2
%Children^2	-.0714	-.0294	.1003	-.0566	-.0927	.1532*	.1375*	.0072	.0085	.0866	.1324*	.1595*	.1595*	-.0364	-.011
% Own	-.1302*	-.0516	-.1752*	.1469*	.0661	-.0535	-.0577	-.0528	-.0433	-.2122*	-.0835	-.1765*	-.1765*	-.0816	-.1163*
% Own^2	-.1312*	-.042	-.1599*	.1330*	.0625	-.0305	-.0332	-.0343	-.0239	-.1955*	-.0777	-.1806*	-.1806*	-.0938	-.1217*
Existing	.0476	-.0193	.1269*	-.1022	-.0563	.0425	.0514	.5627*	.5630*	.1193*	.2967*	.4202*	.4202*	.0756	.054

* significant at 90% level ** significant at 95% level *** significant at 99% level

Table 7b: OLS Simple Correlation Coefficients (continued)

.	% Democrat	% Democrat^2	% Caucasian	% Caucasian^2	% Latino	% Latino^2	% Black	% Black^2	% Asian	% Asian^2	Median income	Median income^2	% Poverty	% Poverty^2	% Rich	% Rich^2
% Dem.^{2}	**.9911***	1														
Caucasian	.1502*	.1698*	1													
Caucasian^2	.1989*	.2153*	**.9719***	1												
Latino	-.5113*	-.5338*	-.1868*	-.1908*	1											
Latino^2	-.4899*	-.5063*	-.1928*	-.1938*	**.9845***	1										
Black	.3815*	.4047*	.5790*	.5556*	-.3435*	-.3721*	1									
Black^2	.4614*	.4927*	.5693*	.5713*	-.3086*	-.3320*	**.9581***	1								
Asian	.3824*	.4215*	.1734*	.1507*	-.6709*	-.6256*	.1772*	.1101*	1							
Asian^2	.3218*	.3758*	.1090*	.0956	-.4499*	-.3611*	.0691	.031	**.8650***	1						
Med. inc.	.3481*	.3471*	.0658	.0822	-.6886*	-.6833*	.2765*	.2792*	.1783*	.0254	1					
Med. inc.^{2}	.2212*	.2181*	.0831	.0906	-.4300*	-.3954*	.1982*	.2140*	.0563	-.0005	**.9107***	1				
% Poverty	.0299	.0027	-.7904*	-.7163*	-.0692	-.0898	-.3490*	-.3744*	-.056	-.0587	.1181*	-.0205	1			
% Poverty^2	.0445	.0164	-.7364*	-.6470*	-.0792	-.0984	-.3361*	-.3488*	-.0698	-.0638	.1478*	.0138	**.9867***	1		
% Rich	.1502*	.1698*	1.0000*	**.9719***	-.1868*	-.1928*	.5790*	.5693*	.1734*	.1090*	.0658	.0831	-.7904*	-.7364*	1	
% Rich^2	.1989*	.2153*	**.9719***	1.0000*	-.1908*	-.1938*	.5556*	.5713*	.1507*	.0956	.0822	.0906	-.7163*	-.6470*	**.9719***	1
% 18-29	.0423	.0175	-.7070*	-.6238*	-.0722	-.0945	-.4027*	-.3971*	-.0761	-.0712	.1466*	.0065	**.9440***	**.9534***	-.7070*	-.6238*
% 18-29^2	.059	.033	-.5919*	-.4974*	-.0774	-.0977	-.3383*	-.3217*	-.095	-.0733	.1768*	.0503	**.8878***	**.9363***	-.5919*	-.4974*
% 30-45	.0528	.0456	.1859*	.1634*	-.1806*	-.2157*	.2435*	.1739*	.0414	.0082	.1369*	.0276	-.0823	-.1133*	.1859*	.1634*
% 30-45^2	.0313	.0213	.1784*	.1528*	-.1312*	-.1619*	.1943*	.1304*	.0069	-.0042	.1012	.0074	-.0984	-.1270*	.1784*	.1528*
% 46-64	-.0481	-.0617	-.1833*	-.1669*	.0278	.0138	.0397	.0136	-.0762	-.0537	-.0319	-.0698	.2546*	.2441*	-.1833*	-.1669*
% 46-64^2	-.0574	-.0718	-.2338*	-.2062*	.0062	-.0119	.0065	-.0249	-.0621	-.0487	-.006	-.0585	.3385*	.3301*	-.2338*	-.2062*
% 65+	-.1407*	-.1583*	-.3367*	-.3135*	.3248*	.3508*	-.3514*	-.2916*	-.2418*	-.1088*	-.2449*	-.1578*	.1823*	.1770*	-.3367*	-.3135*

.	% Democrat	% Democrat^2	% Caucasian	% Caucasian^2	% Latino	% Latino^2	% Black	% Black^2	% Asian	% Asian^2	Median income	Median income^2	% Poverty	% Poverty^2	% Rich	% Rich^2
% 65+^{2}	-.1346*	-.1522*	-.3824*	-.3490*	.3681*	.4042*	-.4443*	-.3574*	-.2551*	-.1092*	-.2688*	-.1559*	.1846*	.1831*	-.3824*	-.3490*
% Married	-.0762	-.0842	-.3476*	-.3213*	.2517*	.2986*	-.5363*	-.4113*	-.1950*	-.0758	-.1245*	-.0221	.1764*	.2044*	-.3476*	-.3213*
% Married^2	-.0889	-.0968	-.3286*	-.3046*	.2618*	.3092*	-.5312*	-.4071*	-.1999*	-.0781	-.1366*	-.0302	.1535*	.1821*	-.3286*	-.3046*
% Children	-.1684*	-.1544*	-.1239*	-.1256*	-.006	-.0218	.3421*	.2758*	-.0198	-.099	.0133	.0147	.1373*	.1398*	-.1239*	-.1256*
%Children^2	-.1777*	-.1630*	-.1075*	-.1055	.0002	-.0149	.3406*	.2761*	-.0251	-.1042	.0117	.0167	.1304*	.1349*	-.1075*	-.1055
% Own	.2602*	.2829*	.4690*	.4539*	-.3802*	-.3986*	**.8714***	**.8023***	.2382*	.1035	.2895*	.2255*	-.2546*	-.2402*	.4690*	.4539*
% Own^2	.3221*	.3477*	.5054*	.5031*	-.3886*	-.4029*	**.8966***	**.8610***	.2193*	.0909	.3121*	.2489*	-.2895*	-.2706*	.5054*	.5031*
Existing	-.2879*	-.2836*	-.4053*	-.3722*	.2497*	.2601*	-.1809*	-.1927*	-.1478*	-.1474*	-.2013*	-.1422*	.3026*	.3010*	-.4053*	-.3722*

* significant at 90% level ** significant at 95% level *** significant at 99% level

Table 7c: OLS Simple Correlation Coefficients (continued)

	% 18-29	% 18-29^2	% 30-45	% 30-45^2	% 46-64	% 46-64^2	% 65+	% 65+^{2}	% Married	% Married^2	% Children	% Children^2	% Own	% Own^2
% 18-29^2	**.9856***	1												
% 30-45	.1140*	.1090*	1											
% 30-45^2	.1056	.0965	**.9775***	1										
% 46-64	-.0969	-.0671	.7240*	.6511*	1									
% 46-64^2	-.1535*	-.1219*	.5068*	.4491*	**.9469***	1								
% 65+	-.6639*	-.6013*	-.0154	.0056	.2918*	.3589*	1							
% 65+^{2}	-.6637*	-.5951*	-.0178	.0003	.2944*	.3595*	**.9979***	1						
%Married	-.1058	-.1206*	.029	.0063	-.0788	-.1038	-.1976*	-.1868*	1					
%Married^2	-.0972	-.1119*	.028	.0113	-.0915	-.1168*	-.1962*	-.1845*	**.9961***	1				
% Children	.1311*	.0873	.02	-.0109	-.4249*	-.5345*	-.5477*	-.5413*	.5474*	.5464*	1			
%Children^2	.1434*	.0968	.0207	-.0116	-.3999*	-.4926*	-.5275*	-.5212*	.4969*	.5000*	**.9836***	1		
% Own	-.3382*	-.3205*	-.0546	-.0678	.1354*	.1819*	.1271*	.1346*	.6793*	.6788*	.0512	-.0034	1	
% Own^2	-.3495*	-.3315*	-.0431	-.0498	.1436*	.1912*	.1554*	.1633*	.6612*	.6645*	.034	-.0145	**.9928***	1
Existing	.1134*	.1079*	.0379	.0824	-.1054	-.1092*	-.1421*	-.1481*	-.012	-.0248	.073	.0587	-.0037	.0063

* significant at 90% level ** significant at 95% level *** significant at 99% level

Discussion of logistic simple correlation results

With the logistic simple correlations, I found three explanatory variables significant at the 99% level: advisory measure, rate of the proposed measure, and percent 18-29 years old (squared); as well as the measure for Yolo County (dummy). I found several more variables significant at the 95% level: rate of the proposed measure (squared), percent 18-29, city (dummy), percent owning home (squared and linear), and 1990 (year dummy). Those at the 90% level included: percent 30-45 (squared and linear), percent Asian, total population (squared and linear), existing measure (dummy), San Juan Bautista (city dummy), West Sacramento (city dummy), Woodland (city dummy), Imperial (county dummy), Los Angeles (county dummy), and San Luis Obispo (county dummy).

In the tables, I highlighted coefficients that have a high probability of multicollinearity (r value is 0.8 or greater). I will discuss multicollinearity in greater detail below, but this is the first test of whether the similarity of variables will have an effect. While the squared variables track very closely with their linear counterparts, there are several variables that may be multicollinear.

Discussion of OLS simple correlations

With the OLS simple correlations, I found five explanatory variables with significance of 99% or greater: dummy variables for whether the measure was a general tax, advisory measure, or special tax, the rate of the proposed measure (linear), percent married (squared and linear). Dummy variables for Nevada County and three years, 1999,

2008, and 2009, were also significant at the 99% level. Variables at the 95% level included: rate of the proposed measure (squared), percent urban (squared and linear), and percent owning home (squared and linear). I found one explanatory variable with significance between 90-94.9%, percent 30-45 (squared and linear), and five dummy variables: Truckee (city), Imperial (county), Sacramento (county), Yolo (county), and 2003. As with the logistic correlation, I highlighted coefficients that have a high probability of multicollinearity, which I discuss below.

Overview of Regression Method

This section covers the results of running the model in both OLS and binary logistic regression formats. It includes why the binary logistic format is more appropriate for this study, some statistical issues considered, and what the significant results are from the regression.

I performed regression two ways: first as a simple binary regression measuring whether the measure passed, and second as a ordinary least squares (OLS) regression that measures the strength of support for a measure, using the percentage who voted in support as the dependent variable. For binary dependent variables, the relationship is non-linear: values are either at one point on the Y axis or the other.

Statisticians use binomial logistic because it limits the range of outcomes to between zero and one. When measuring whether a measure passed, this is the preferred technique. Logistic regression uses a different technique from OLS. Logistic regression uses an iterative process to estimate the maximum likelihood of the data being observed.

So given what we know about past transportation sales tax measures, logistic regression will help us estimate as best we can what would happen in a hypothetical election. OLS assumes a linear relationship between the possible values of the dependent variable and is appropriate in its different functional forms when the dependent variable is continuous (Studenmund, 2006).

Binomial logistic is my preferred method because the result I am trying to predict is whether a measure will pass. Transportation professionals and elected officials will make decisions to maximize the measure to meet the given threshold, so this study is measure the effect of many factors that are similar across all transportation sales tax measures. If a measure is very close to passing, they will also be interested in knowing what explanatory variables increase the percentage voted in favor and the relative magnitudes of the effects. Binary logistic and OLS regression results are reported in tables 8 and 9, respectively.

Multicollinearity and Heteroskedasticity

Multicollinearity occurs when two variables move very closely, or correlate, together. If multicollinearity occurs, it may skew the regression results, so identifying multicollinearity and correcting for it is important. In each set of coefficients, there were several variables that had correlations of .6 or greater. Most of the variables with high correlation are intuitive: percentages of rich and poor move closely with median income, and the percentage of a jurisdiction that is urbanized moves with whether that county has more than 250,000 residents. There was high correlation between whether a measure was

in a city and whether a measure was a general or special tax. I believe this may be attributed to the much higher use of the A+B strategy in cities. In the logistic set, there were correlations between the percentage of households owning homes and the percentage of the population married, as well as between percentage with children and percentage Latino. I dropped most of these variables in the process of creating the regression models.

With OLS regression, Variance Inflation Factors (VIF) can also be used to measure for multicollinearity. With binary logistic regression, there is no comparable measure for multicollinearity, but to approximate it, I have performed an OLS operation using the binary dependent variable of whether the measure passed to obtain VIF scores. A VIF of 5 or greater is an indicator of severe multicollinearity. With binary logistic regression, heteroskedasticity, a difference in the variance of the results, does not exist, so there is no need to test for it. Heteroskedasticity occurs when the error term varies by observation, and it results in increased variance of estimates, miss-estimations of variables, or bias in the standard error results (Studenmund, 2006). I report the Breusch-Pagan test for heteroskedasticity in the regression results.

Logistic Regression

For logistic regression, I used a binary dependent variable of whether the measure passed. I omitted advisory measures, because those were paired with a tax measure in almost every case, so they would skew the results. As mentioned above, I also ran this set of variables through an OLS regression to obtain a variance inflation factor (VIF) for

each independent variable (Pevalin & Robson, 2009). The VIF is used to check for multicollinearity in OLS, but because there is no similar measure for logistic regression, I am including the VIF results and omitting the OLS results.

I ran this model several different ways. I went through a separate process of testing statistically significant variables to see whether their squared versions improved the significance. I omitted the following variables from the logistic model because they predicted success perfectly: Arroyo Grande, Capitola, Davis, El Cerrito, Sebastopol, Truckee, West Sacramento, 1990, Alameda, and Marin. The following variables predicted failure perfectly: Colusa (city), Eureka, San Juan Bautista, Trinidad, Napa, Solano, 1992, 1996, 1998, and 1999. In order to avoid omitted variable bias, I did not omit other variables. STATA omitted special tax and advisory measure for collinearity.

Table 8: Logistic Regression Results

Log likelihood	-95.030819	LR $chi^2(77)$	124.59
Number of observations	**227**	Prob>chi^2	.0004
Mean VIF	4.9	Pseudo R^2	.396

Independent variable	Coefficient	Standard Error	Lower Bound	Upper Bound	% Change in Likelihood Measure Passes	OLS VIF
Constant	2.701007	16.1641	-23.88657	29.28859		
Tax Burden						
General election	1.194708	0.7441772	-0.0293543	2.418771		1.85
General tax	-1.047041	0.817698	-2.392034	0.2979529		3.88
Existing measure	-1.869614**	0.9076128	-3.362504	-0.3767233	-286.9614	4.86
Proposed rate	0.3884253	1.293808	-1.7397	2.51655		
Existing tax rate	70.75724	56.9896	-22.98231	164.4968		4.87
Geography						
City (dummy)	2.350104**	1.149629	0.4591326	4.241075	135.0104	5.3
% Urban	4.67E+00	4.22E+00	-2.28E+00	1.16E+01		8.49
Population	1.12E-06	7.68E-07	-1.47E-07	2.38E-06		2.41
Demographics						
% Democrat	12.70808**	6.476551	2.055098	23.36105	1170.808	8.68
% 18-29	-64.97204***	24.05229	-104.5345	-25.40955	-6597.204	10
%30-45	42.12828***	10.76958	24.4139	59.84266	4112.828	10.57
% 46-64	-34.07502***	11.42375	-52.86543	-15.28462	-3507.502	9.18
% 65+	-24.04811	23.73375	-63.08667	14.99044		12.83
Median income	-0.0000587	0.0000963	-0.0002171	0.0000997		40.94
% Poverty	2.569247	10.69872	-15.02858	20.16708		11.49
% Rich	3.809649	13.57397	-18.51754	26.13684		31.16
% Children	-10.21201	9.468529	-25.78635	5.362339		23.83
% Own	8.564024	5.39945	-0.317281	17.44533		6.27
% Married	-7.381832	13.78788	-30.06088	15.29722		9.93
Asian	5.968163	3.675098	-0.0768348	12.01316		4.39
Black	-1.721233	4.939424	-9.845862	6.403397		4.96
Caucasian	0.4593999	4.031707	-6.172168	7.090968		10.3
Latino	-0.1369374	4.291547	-7.195903	6.922029		21.83

Independent variable	Coefficient	Standard Error	Lower Bound	Upper Bound	% Change in Likelihood Measure Passes	OLS VIF
Dummy variables for year of election						
1984	-0.4754511	1.863474	-3.540593	2.589691		1.41
1986	0.3869442	1.622129	-2.28122	3.055109		1.68
1988	4.287596**	1.928284	1.115852	7.45934	328.7596	2.01
1989	-0.0859573	1.766964	-2.992355	2.82044		1.78
2000	-0.2666246	1.340666	-2.471824	1.938575		1.49
2002	-1.55494	1.533415	-4.077183	0.9673026		1.66
2003	16.59868	3573.273	-5860.913	5894.11		1.87
2004	0.422064	0.783908	-0.86735	1.711478		2.31
2005	0.9766057	1.153153	-0.9201623	2.873374		2.02
2006	1.178731	0.8069711	-0.1486181	2.506081		2.54
2007	-0.256817	1.316998	-2.423085	1.909451		1.72
2008	1.940192**	0.9547483	0.3697707	3.510613	94.0192	2.46
2009	-0.3359941	1.277449	-2.437212	1.765223		1.88
Dummy variables for city						
Calexico	-1.293691	2.298523	-5.074426	2.487043		2.16
Cathedral City	-19.90705	4235.962	-6987.445	6947.631		2.37
Delano	-3.58209	2.913881	-8.374998	1.210817		2.83
Gustine	-0.0110187	2.594715	-4.278946	4.256908		1.79
Hollister	-0.0450034	2.732282	-4.539208	4.449201		1.76
Lakeport	30.13502	5314.724	-8711.808	8772.078		2.72
National City	-1.733915	2.379904	-5.648509	2.18068		1.81
Pacific Grove	3.939836*	2.212477	0.3006346	7.579038	293.9836	1.54
Richmond	-1.981038	2.315055	-5.788964	1.826888		1.88
Salinas	-0.1626302	1.915393	-3.313172	2.987912		1.67
Watsonville	-2.357219	2.439975	-6.37062	1.656183		1.74
Woodland	-14.45857	5983.735	-9856.826	9827.909		2.73
Dummy variables for county						
Colusa	-0.2141166	2.792306	-4.807051	4.378818		2.43
Contra Costa	-1.193169	1.62412	-3.864608	1.47827		3.13
Fresno	3.220174*	1.846859	0.1823609	6.257986	222.0174	2.5
Imperial	-2.684784	2.030043	-6.023907	0.6543389		3.57
Kern	-3.735318	2.429397	-7.731321	0.2606844		2.77
Lake	-32.44442	5314.724	-8774.387	8709.498		3.78
Los Angeles	-1.784108	1.96254	-5.012199	1.443983		4.01

Independent variable	Coefficient	Standard Error	Lower Bound	Upper Bound	% Change in Likelihood Measure Passes	OLS VIF
Madera	2.566861	2.017331	-0.7513537	5.885076		2.09
Merced	-3.41842*	2.030302	-6.757969	-0.0788702	-441.842	2.64
Monterey	-2.24364	1.487236	-4.689925	0.2026448		3.22
Nevada	-1.494739	2.237286	-5.174746	2.185269		2.32
Orange	-1.227821	2.221616	-4.882054	2.426411		2.29
Riverside	17.95699	4235.962	-6949.58	6985.494		3.09
Sacramento	-2.456915	1.722258	-5.289778	0.3759476		1.75
San Benito	-2.491034	2.394073	-6.428934	1.446865		3.32
San Bernardino	0.7575481	1.912903	-2.388897	3.903994		2.27
San Diego	1.28637	1.97324	-1.95932	4.532061		3.04
San Joaquin	0.9272551	1.687296	-1.8481	3.70261		1.65
San Luis Obispo	3.760138	2.284427	0.0025892	7.517687		2.01
San Mateo	-3.430628**	1.522663	-5.935185	-0.9260713	-443.0628	2.2
Santa Barbara	3.483413*	1.98804	0.2133773	6.753448	248.3413	1.58
Santa Clara	-2.291973	1.782746	-5.224329	0.6403824		2.35
Santa Cruz	-0.1320083	1.803276	-3.098133	2.834117		2.64
Sonoma	0.490102	1.313553	-1.670501	2.650705		2.66
Stanislaus	-3.984451**	1.765337	-6.888173	-1.080729	-498.4451	1.71
Ventura	-3.714725*	1.927408	-6.885029	-0.5444209	-471.4725	1.89
Yolo	21.55302	5983.735	-9820.815	9863.921		4.47
Yuba	-1.004402	2.508446	-5.130428	3.121625		1.35

Discussion of logistic results

After constructing the regression model as described earlier, I tried several iterations to improve the statistical significance. For each category of explanatory variables, I ran the model with and without variables that were not significant, had a high OLS VIF, and were similar to another variable. I did this for the variables City (dummy), Percent Rich, Percent Married, and Percent Caucasian, and was not successful in improving the significance of other variables, so I left all of the variables in the model.

Of the 24 explanatory variables, I found seven to be statistically significant using this model. Using an approximation technique from Studenmund, I multiplied the coefficient of each variable by 0.25 to determine the effect a one-unit change would have on the dependent variable (2006). Among the variables measuring tax burden, the odds decrease slightly (0.47 percent) if there is an existing measure in place. Only one variable measuring geography was significant: if the measure is proposed by a city, the chances of success increase by 0.59 percent.

Looking at the variables measuring demographics, for every increase in the percentage of registered Democrats in the jurisdiction, the odds of passage increase 3.18 percent. The odds decrease by 16.24 percent for every percentage increase in the percentage of the population between 18-29 years old. The odds increase by 10.53 percent for every percentage increase in the percentage of the population between 30-45 years old. The odds decrease by 8.52 percent in the percentage of the population between 46-64.

I also found several dummy variables measuring specific election years and jurisdictions to be statistically significant. If the election took place in 1988 or 2008, the odds of passage increased 1.07 or 0.49 percent, respectively. In one city, Pacific Grove, the odds of passage increased 0.98 percent. In two counties, the odds of passage were statistically higher than others: Fresno (0.81%) and Santa Barbara (0.871%). In four counties, the odds were lower: Merced (-0.85 %), San Mateo (-0.86%), Stanislaus (-1%), and Ventura (-0.93%).

OLS Regression

For OLS, I used percentage of votes in favor of the measure as the dependent variable. I omitted advisory measures, because those were paired with a tax measure in almost every case, so they would skew the results. I omitted the variables Special, Advisory, Davis (city dummy), and West Sacramento (city dummy), because they were perfectly correlated. I also tried a log-lin functional form, where I took the natural log of the dependent variable, but that did not deliver more statistically significant results.

Table 9: OLS Regression Results

Source	SS	Degrees of freedom	MS	Number of observations	227
Model	2.30487602	94	0.024519958	F(94, 132)	1.91
Residual	1.69560761	132	0.012845512	Prob > F	0.0003
Total	2.30487602	226	0.017701255	R-squared	0.5761
				Adj R-squared	0.2743
Breusch-Pagan		Chi2(1)	3.36	Root MSE	0.11334
Test for Heteroskedasticity		Prob>chi2	0.0667	Mean VIF	6.53

Independent Variable	Coefficient	Robust Standard Error	Lower Bound	Upper Bound	VIF
(Constant)	1.079393*	0.6780472	-0.1343795	2.293165	
Tax Burden					
General election	0.0158022	0.0379907	-0.0430653	0.0746698	2.09
General tax	-0.1115644***	0.0425011	-0.1785318	-0.044597	4.81
Existing measure	-0.0462531	0.0349903	-0.1260196	0.0335134	7.11
Proposed rate	0.0969947*	0.0631599	-0.0118053	0.2057947	2.44
Existing tax rate	1.894827	2.695589	-4.097955	7.887609	10.17
Geography					
City (dummy)	-0.0132279	0.0448643	-0.092253	0.0657973	6.75
County>250k	0.0379846	0.1381481	-0.1940735	0.2700427	56.69
% Urban	0.0475365	0.2311427	-0.3087642	0.4038372	30.5
Population	-4.48E-09	6.76E-09	-2.55E-08	1.65E-08	2.88
Demographics					
% Democrat	0.439219*	0.1942246	-0.0456087	0.9240467	9.19
% 18-29	-1.954284	1.620735	-4.461571	0.5530026	26.6
%30-45	1.160434**	0.5257909	0.0793367	2.241531	25.17
% 46-64	-6.99E-01	0.5735781	-1.79E+00	3.90E-01	24.4
% 65+	-1.68391*	0.9169492	-3.547562	0.1797427	20.74
Median income	9.45E-07	2.41E-06	-4.37E-06	6.26E-06	20.66
% Poverty	3.79E-01	0.3861477	-4.35E-01	1.19E+00	13.9
% Children	-0.3834389	0.3599085	-1.083469	0.3165911	27.36
% Own	-0.0281504	0.2280611	-0.4506883	0.3943875	7.31
% Married	0.0286399	0.4896146	-0.9379496	0.9952294	13.81
Asian	0.0956346	0.0774558	-0.151064	0.3423332	5.53
Black	-0.1672073	0.1397568	-0.5660215	0.2316068	5.3
Caucasian	-7.61E-02	0.1482876	-3.86E-01	2.33E-01	13.21

Independent Variable	Coefficient	Robust Standard Error	Lower Bound	Upper Bound	VIF
Dummy variables for year of election					
1984	-0.1967706*	0.0974258	-0.4229326	0.0293913	2.02
1986	-0.0984863	0.078973	-0.2910806	0.0941081	2.9
1988	-0.0017285	0.0633092	-0.1757272	0.1722701	3.52
1989	-0.0597223	0.0707746	-0.2388189	0.1193744	3.12
1990	-0.0680012	0.0534823	-0.2318278	0.0958253	2.61
1992	-0.0990248	0.0460506	-0.2953446	0.097295	1.52
1996	-0.0503665	0.0694095	-0.2529847	0.1522516	1.62
1998	-0.0992011	0.0451911	-0.2286411	0.030239	2.26
1999	-0.1907761*	0.114786	-0.4035241	0.0219719	1.79
2000	-0.059696	0.0745034	-0.1867574	0.0673654	2.18
2002	-0.066185	0.0609116	-0.1854428	0.0530728	2.45
2003	0.0843285	0.0577415	-0.0879831	0.25664	2.32
2004	-0.0078512	0.0374601	-0.0913994	0.0756969	4.84
2005	0.0325688	0.0587732	-0.0801146	0.1452522	2.87
2006	0.0248245	0.0408761	-0.0629243	0.1125732	4.95
2007	0.0164238	0.0482708	-0.1104401	0.1432877	2.17
2008	0.0888922**	0.03419	0.000619	0.1771653	4.48
2009	-0.0824429	0.0499075	-0.1888999	0.0240141	1.95
Dummy variables for city					
Arroyo Grande	-0.0248067	0.0483961	-0.2828513	0.2332379	1.32
Calexico	0.0020669	0.1010015	-0.1972285	0.2013623	2.34
Cathedral City	-0.2883578**	0.1118401	-0.5322324	-0.0444833	2
Capitola	0.0848528	0.1172343	-0.1405937	0.3102992	2.35
Colusa	-0.1063632	0.0590882	-0.3675578	0.1548314	2.69
Delano	-0.1570484	0.0924085	-0.395331	0.0812341	3.34
El Cerrito	-0.0751758	0.0816663	-0.3139879	0.1636363	2.25
Eureka	0.1398277	0.0975796	-0.081954	0.3616094	1.94
Gustine	-0.0411354	0.1189684	-0.2578205	0.1755498	1.85
Hollister	-0.1709519	0.1180093	-0.4298761	0.0879722	2.64
Lakeport	0.1802397	0.1051081	-0.0403341	0.4008134	2.87
National City	-0.0923255	0.1198872	-0.3138461	0.1291951	1.94
Pacific Grove	0.0699663	0.073152	-0.1481126	0.2880452	1.88
Richmond	-0.1179388	0.1542724	-0.3535659	0.1176883	2.19
Salinas	0.0137118	0.0581099	-0.1574011	0.1848248	1.72
San Juan Bautista	-0.192375	0.1073151	-0.4430923	0.0583424	3.7
Sebastopol	0.1356042	0.1289247	-0.0538942	0.3251026	2.11

Independent Variable	Coefficient	Robust Standard Error	Lower Bound	Upper Bound	VIF
Trinidad	0.1686454	0.1584401	-0.1298408	0.4671317	3.51
Truckee	0.0696163	0.1932068	-0.2516616	0.3908941	4.07
Watsonville	-0.0691477	0.1582076	-0.2992447	0.1609493	2.53
West Sacramento	-0.028338	0.1142147	-0.2815945	0.2249186	2.09
Woodland	-0.001012	0.1104416	-0.2410166	0.2389926	4.5
Dummy variables for county					
Alameda	0.0898368	0.1240385	-0.1490424	0.328716	5.55
Colusa	0.0879637	0.0888861	-0.1560523	0.3319798	4.66
Contra Costa	0.0036255	0.146442	-0.2477488	0.2549999	10.87
Fresno	0.0335761	0.1224809	-0.1859766	0.2531287	5.6
Imperial	-0.1460424	0.124501	-0.35801	0.0659252	7.73
Kern	-0.1316814	0.058787	-0.3024594	0.0390966	3.94
Lake	-0.0881677	0.0875761	-0.2833166	0.1069812	4.43
Los Angeles	-0.1148639	0.079317	-0.2839444	0.0542166	5.95
Madera	0.0275685	0.08916	-0.1756584	0.2307954	3.23
Marin	0.0535882	0.1976421	-0.2864381	0.3936145	11.25
Merced	-0.0804581	0.1193813	-0.2959242	0.1350081	6.27
Monterey	-0.1020648	0.0526089	-0.2539139	0.0497842	6.03
Napa	-0.069332	0.119325	-0.3275992	0.1889352	2.63
Nevada	0.1386387	0.1815677	-0.1295255	0.4068029	5.62
Orange	-0.0676309	0.0878885	-0.2554922	0.1202304	3.43
Riverside	0.1510906	0.0800333	-0.0724915	0.3746728	3.91
Sacramento	-0.1665011*	0.1229539	-0.3380782	0.005076	2.86
San Benito	0.0928403	0.1444979	-0.213243	0.3989235	12.65
San Bernardino	0.0392267	0.0770923	-0.1363612	0.2148146	3.58
San Diego	-0.0368827	0.0722757	-0.1932241	0.1194586	4.2
San Joaquin	-0.0905686	0.1174612	-0.2849401	0.1038029	2.95
San Luis Obispo	0.1786955*	0.1030386	-0.0187451	0.3761361	3.79
San Mateo	-0.0954237	0.1196451	-0.3056779	0.1148305	6.79
Santa Barbara	0.0243874	0.0841678	-0.158243	0.2070177	1.96
Santa Clara	-0.0719457	0.1088984	-0.2912366	0.1473452	5.59
Santa Cruz	-0.0342604	0.1181695	-0.2121058	0.1435851	4.86
Solano	-0.1044348	0.106321	-0.3079364	0.0990668	3.24
Sonoma	0.0054131	0.0850473	-0.1652574	0.1760835	6.59
Stanislaus	-0.1228022	0.0630992	-0.2832345	0.0376302	2.5
Ventura	-0.1071609	0.1060273	-0.2944855	0.0801637	3.41
Yolo	0.1806506	0.1602846	-0.1187885	0.4800898	13.77
Yuba	-0.1122798	0.1812547	-0.344074	0.1195145	2.12

Discussion of OLS regression results

For the OLS model, I performed the Breusch-Pagan test for heteroskedasticity. The result was a 99.3 percent chance of heteroskedasticity. I therefore used a regression method that allowed for the calculation of robust standard errors.

As with the logistic form, I tried several iterations to improve the statistical significance of the explanatory variables. For each category of explanatory variables, I ran the model with and without variables that were not significant, had a high VIF, and were similar to another variable. I found two variables where the significance of related variables increased: in the Demographic category, omitting Percent Latino made Percent Democrat significant, and omitting Percent Rich made Percent age 65 and older significant. This procedure was not successful for the variables City (dummy), County over 250,000, Median Income, Percent Married, Percent Children, and Percent Caucasian, so I left these in the model. I even tried leaving out Percent Married and Percent with Children together, but the results did not improve.

Of the 23 explanatory variables, I found five to be statistically significant using this model. Among the variables measuring tax burden, the odds of a sales tax measure passing are slightly lower (0.11%) if it is a general tax. The odds increase slightly (0.09%) for every one-unit increase in the proposed rate.

Looking at the variables measuring demographics, for every one-point increase in the percentage of registered Democrats in the jurisdiction, the odds of passage increase 0.44 percent. The odds increase by 1.16 percent for every percentage increase in the

percentage of the population between 30-45 years old. The odds decrease by 1.68 percent for every percentage increase in the percentage of the population 65 years old and above.

I also found several dummy variables measuring specific election years and counties to be statistically significant. If the election took place in 1984, 1999, or 2008, the odds of passage changed -0.2, -0.2, or 0.19 percent, respectively. In one city, Cathedral City, the odds of passage were statistically lower (0.29 percent), in Sacramento County, the odds of passage were statistically lower (0.17), and in San Luis Obispo County, the odds were statistically higher (0.18 percent).

Chapter 5

EXPERT INTERVIEWS

In this chapter, I will cover the findings of the interviews I conducted with four transportation experts familiar with transportation sales tax measures. In this chapter, I let the interviews speak for themselves. The following chapter will include thoughts drawing on both these interviews and the regression results in the previous chapter. The experts interviewed for this chapter are: Pete Hathaway, former director of transportation planning at the Sacramento Area Council of Governments and lecturer in transportation finance for the Institute of Transportation Studies at UC Berkeley; Brian Williams, executive director of the Sacramento Transportation Authority; Celia McAdam, executive director of the Placer County Transportation Planning Agency; and Christina Watson, senior transportation planner at the Transportation Agency for Monterey. The following chapter will discuss the results of the regression analysis and interviews.

Pete Hathaway

Pete Hathaway offered a history of transportation policy and finance in California from the mid-20th century through today. He provided insightful information about transportation sales tax measures since the early 1980s, and strategies for future success.

Transportation in California prior to the transportation sales tax measure

Transportation projects in the early 1950s through the early 1970s were decided and delivered in a much different fashion in an area before today's state and federal environmental regulations. Caltrans and the California Transportation Commission had to work hard to keep projects in the pipeline because the average project took just 18 months to complete, rather than the years it takes today.

In 1968, an increase in inflation resulted in an increase in project costs. In the early years of the Nixon Administration, this was exacerbated by a slowdown in population growth. Defense and aerospace stagnated, people did not move, and baby boomers with high school-age children had less mobility.

From 1968 to 1973, the pipeline of transportation projects jammed up. One of the early projects to feel the effects of state and federal environmental regulations was the Central Freeway (Interstate 105), which took 8 years for environmental review.

In 1973, Caltrans and the California Transportation commission realized they had too many projects. Governor Reagan hired McKinsey consulting group to go through the list of highway projects and pull out the most difficult and unfeasible ones.

In 1973-74, the Mideast oil embargo further hit the economy and people began to change their driving as well as their locations. Average vehicle miles traveled per year dropped from 12,000 to 8,000. People moved closer to work. Because of this, the federal Highway Trust Fund, funded by gas taxes, dropped 25 percent overnight.

In 1974, Governor Jerry Brown was elected. During this period, there was also a huge growth in population on Orange and Santa Clara counties (50-100% increase).

The dawn of the transportation sales tax measure

In the early 1980s, Santa Clara County realized it needed more than Interstates 680, 280, and 237. It sought and received special legislation to pursue a sales tax measure. Will Kempton, a former Caltrans employee who knew the state and federal issues, led the Santa Clara initiative.

In the late 1980s, Governor Deukmejian was not open to extending the local-option sales tax to other counties. However, Orange and Los Angeles counties were eager to get their own funding, and so they were successful in opening the authority to all counties in 1987. Los Angeles County had separate authority for a local option for transit.

Los Angeles County created the Los Angeles County Transportation Commission to pursue and manage the sales tax. Supervisor Kenneth Han had a large low-income population, and at the time, the SCRT was going to raise fares. Supervisor Han said the first three years of the sales tax would subsidize fares while environmental work was done on projects. The measure passed as a result of high turnout in low-income areas. Los Angeles is an interesting case because all of its measures are permanent.

In 1988, several counties went to the ballot thinking it was good timing for local-option sales tax measures. Measures were polled. Campaigns used projects that had been promised for a long time, especially in congested areas, to attract support. Non-interstate transportation projects were particularly popular.

Establishing a strategy for transportation sales tax measures

After the early years of the transportation sales tax measure, a common strategy emerged for counties considering developing their own. First, proponents needed to determine who are the likely voters. Second, polling of likely voters was key to determine the mix of expenditures and the project list. Third, proponents would need to get the list of projects down to just one controversial project, lest the voters reject the whole measure because of a few projects they did not like. Finally, proponents had to follow conventional wisdom: build what you tell voters you intend to. The project list is a contract with the voters, and proponents can point to those distrustful of government as a guarantee of what the funds are intended for.

Transportation sales tax measure mature

Between 1988 and 1992, three rural counties passed measures (Madera, San Benito and Imperial) that were customized to appeal to “no” voters. Madera included an extension of Highway 41, San Benito included Highway 156, and Imperial dedicated 95 percent of proceeds to road maintenance.

According to Hathaway, there are two kinds of counties, and measures in each should be tailored accordingly. First, there are conservative counties with suburban voters: appeal to congestion, limit to non-controversial, get development-industry supporters. Second, there are urban counties, including Fresno, San Joaquin, San Francisco, and San Mateo. In these counties, proponents need to appeal to a more Democratic base. Congestion is not the only priority of urban voters, so in these areas

customized lists based on polling is important, as not all urban areas have the same interest in transit, for instance.

Kern, Ventura, and a few others tried in 1994, at the bottom of the recession, and voters turned all of them down. They felt that polling, a defined project list, and a sunset date were enough. What they did not see as key to passage was how voters would react to passing a tax increase during a recession.

The decline of traditional funding sources

By the late 1980s and early 1990s, the gas tax had been eliminated by 300 percent inflation through the Nixon and Carter administrations. As a result, road maintenance declined. The Road building lobby had disbanded, so there was little pressure on the state or federal government to increase funding.

Perhaps in response to the decline in other sources of road maintenance funding, most local-option transportation sales tax measures include road maintenance funding. This also makes the case for renewing measures with sunset dates much easier. The lack of funding and the need for maintenance are good arguments for voters. The focus on maintenance also incentivized the road-building industry, business, and local governments to get active in campaigns.

Measures in California have roots in the auto-centric land use patterns of our communities. Because the state and federal governments stopped building large-scale expansions of the highway and freeway systems, local governments, particular suburban ones, had to find new revenue to pay for roads to connect to suburban development.

Transit-dominant measures

Some transit dominant measures exist, including ones in Santa Cruz, San Mateo, Marin, Los Angeles and San Diego counties. These measures came about when transit funding collapsed or new rail was proposed.

Los Angeles's measure in the early 1990s dedicated about half to subways: 25 percent fare subsidy, 25 percent for capital. The remainder went to carpool lanes and other road projects. The preponderance of Los Angeles voters are middle or low income Democrats. This is an example of balance towards local interests and concerns.

Other strategies for transportation sales tax measures

Newer measures are redesigned for the times. They have more for paratransit, bicycles and pedestrians, and transit operations. Some contain HOT lane projects. Some measures have failed originally but have retried. Sometimes they changed the project mix, or coupled the measures with open space protection, development mitigation, or a development impact fee. Every campaign usually has to be sweetened to court the backers. Local government staff see it as a new revenue source, so they do not see it as a threat to existing projects.

Perception from elections is that you now have leverage over the state. If you have a sales tax, you can be shelf-ready, can cover cost increases, and can give matching funds up front. Caltrans will build state highway projects that locals want to self-fund. The State-Local Partnership account at Caltrans is only open to jurisdictions with a local-option measure or a development impact fee.

There still have been some mistakes over the years that others can learn from. San Mateo's measure did not allow enough flexibility for local government staff. Only 50 percent of the funding from its measure went to projects, which meant every project had to be federalized, which increases time and costs. Some jurisdictions that don't have a large sales tax base are unlikely to pass measures.

Table 10: County Transportation Measures

County	Start	End	Rate	Capital	Transit Operations	Road maintenance	2009 Revenue (millions)
Santa Clara	1984	2036	½%	75%	21%	4%	$156
Alameda	1986	2022	½%	40%	32%	22%	$110
Contra Costa	1988	2034	½%	34%	34%	32%	$75
San Mateo	1988	2034	½%	42%	30%	23%	$60
San Francisco	1990	2033	½%	10%	65%	25%	$67
Marin	2004	2028	¾%	25%	57%	18%	$31
Sonoma	2004	2028	½%	50%	28%	20%	$37
Sacramento	1988	2039	½%	20%	38%	30%	$118
San Joaquin	1990	2041	½%	35%	30%	35%	$47
Fresno	1986	2027	½%	35%	24%	35%	$60
Madera	1990	2027	½%	26%	2%	72%	$7
Tulare	2006	2037	½%	50%	15%	35%	$18
Santa Barbara	1989	2038	½%	20%	12%	65%	$31
San Diego	1987	2048	½%	40%	30%	20%	$243
Riverside	1989	2039	½%	60%	0	40%	$157
San Bernardino	1989	2040	½%	81%	0	19%	$146
Orange	1990	2041	½%	43%	25%	32%	$295
Imperial	1989	2048	½%	5%	2%	93%	$31
Los Angeles	2009	2038	½%	60%	25%	15%	$670

Source: Pete Hathaway, UC ITS PATH/Technology Transfer

Brian Williams, Sacramento Transportation Authority

In 2004, Sacramento County renewed its half-cent transportation sales tax measure (with 74.3 percent support), which was originally approved in 1988 (with 57 percent support). For the renewal measure, the Metro Chamber, a business organization representing the Sacramento region, was the primary champion for the measure in public, working in close coordination with Sacramento Transportation Authority (STA), the agency tasked with implementing the original Measure A and developing the expenditure plan for the new Measure A. The chamber hired a political consultant to do voter research and help with community outreach. The North State Building Industry Association was also a strong public supporter of the renewal measure.

The original Measure A had a 20-year term and produced over $1.5 billion over its lifetime, representing 20 percent of all transportation revenue in the county. The new Measure A has a 30-year term (2009-2039), and will generate $4.7 billion in 2004 dollars.

STA was formed to act as the transportation sales tax authority for the original Measure A. Its board is comprised of elected officials from Sacramento County and its cities. STA is primarily responsible for administering the Measure A program. It also administers the Sacramento Metropolitan Freeway Service Patrol program in cooperation with Caltrans and the California Highway Patrol.

A measure tailored to Sacramento County

Sacramento County is an interesting blend of rural, suburban and urban places. Home to the largest city in the region, it also is home to over 600 square miles of farmland. Approximately a third of the 1.4 million residents live in the unincorporated county. In addition to the geographic diversity, STA found in the course of its renewal work that there was a difference in values between residents of different parts of the county, as well as differences in support for different forms of transportation, with strong bicycling and transit advocates in some communities and strong advocates for freeway improvements in others.

STA also had to confront a wide range of community interests, elected officials, public works staff, transit agencies, and likely voters with divergent priorities. On top of this, the media was suspicious of the renewal.

Several STA board members wanted a broad advisory group operating at the time, the Sacramento Transportation and Air Quality Collaborative, to help form the measure, but the collaborative's recommendations were seen by some as social engineering. Ultimately, STA relied on an advisory group representing 31 stakeholder groups to help inform the measure.

Electoral success

Williams finds it important to distinguish between public opinion and voter opinion. With transportation sales tax measures, high voter turnout is necessary, because there are always some voters who turn out to all elections that vote no. The voters that a

measure's proponents want to attract are those that come out for something they feel has personal value for them. The economy was a crucial factor to the success of Measure A.

Williams also believes that there is a pain threshold to secure enough willingness from voters to tax themselves: congestion has to be persistent, and the projects in the measure need to deliver near-term relief.

In addition to the professional expertise of campaign consultants, Williams found that they help bring in an objective party to work between staff, elected officials, and community groups.

Voter-opinion research

STA's political consultant hired a pollster who polled different options. They conducted three voter-opinion surveys, with a sample size of 800 in each. They also held four evening focus groups. They analyzed eight sub-regions and tested specific projects for voter support.

Likely voters had six priorities: address traffic congestion; fix bottlenecks through additional road capacity or light rail expansion; fill potholes; build a new southeast peripheral roadway; be accountable, with an independent audit committee, enhanced audit requirements, and performance standards; and make developers pay their way.

There were four things that the voter-opinion research revealed likely voters were not interested in: bicycle and pedestrian projects, an increase above the half-cent rate, a strict urban limit line, and using sales tax revenue to purchase open space.

A balanced measure

As a result of their research and the priorities of the STA board, the expenditure plan was determined to include 30 percent of funds for road maintenance, 34 percent for light rail expansion, and 20 percent for road construction and operations.

Voter outreach

Once the proponents determined the ideal contents of the measure, they began a 2-3 month voter outreach campaign. They had two primary mail pieces that were sent to high-propensity voter households only: one was a general overview of the entire measure, and the other was tailored to eight different communities. STA spent $400,000, or 47 cents per voter, in public funds for these educational pieces.

Expenses and time

In total, Sacramento Transportation Authority spent $900,000 on education and research, and business interests spent another $1 million on the campaign. After 15-16 months of preparation, 2-3 months of campaigning, Measure A was successful in November 2004.

Politics

The Sacramento Area Bicycle Advocates and the Environmental Council of Sacramento were the two most vocal opponents of the measure, because they felt it did not have enough funding for bicycling and transit. They did not have much funding for

running an opposition campaign, so they were mostly limited to media stories at the time. The Sacramento Taxpayers Association also opposed the measure. Organized labor was split.

The political champions for the measure were Los Rios Community College District Chancellor Brice Harris, who at the time was the Metro Chamber Board President, Sacramento Mayor Heather Fargo, and Rancho Cordova Councilmember Ken Cooley. The Sacramento Transportation Authority Board of Directors unanimously supported the measure.

A majority vote? Or A+B measure

If California lowered the approval threshold for transportation sales tax measures, Williams believes that would give elected officials participating in countywide measures more opportunity to reflect local priorities. It would also allow proponents to offer projects and funding levels that attract greater stakeholder support. Doing either of these under the two-thirds majority system threatens turning off enough voters to let a measure fail.

On the subject of an advisory and general tax, the so-called A+B strategy, Williams felt that this would not work over such a large geography, because there is a higher level of trust required for local leaders to follow the advisory measure. If voters feel far away from a countywide board, they are unlikely to do this. People also worry about how much tax money goes to other purposes, and an A+B strategy would not fare well in a bad economy.

Future measures

Sacramento County voters in the next several years will likely vote on measures to fund libraries, police, and Regional Transit, the county's light rail and bus transit provider. Another option is an across-the board quality of life tax to pay for multiple types of services. However, Williams feels that 9 percent sales tax rate is as high as local voters are willing to go, so the state's temporary sales tax will have to go away before any of these other entities can pursue their own measures.

Other options for revenue

In addition to local-option sales taxes, Williams sees promise in vehicle license surcharges and property taxes as alternatives to fund transportation. Regional Transit already has the statutory authority to assess a district-wide property tax assessment.

Williams agrees with many other transportation experts who see increased state and federal gas taxes as inevitable to pay for transportation.

Celia McAdam, Placer County Transportation Planning Agency

In Placer County, there have never been any elections held for transportation sales tax measures, but there has been significant work over the years that has come just short of putting a measure on the ballot.

In 2000, the Placer County Transportation Planning Agency adopted a Regional Transportation Funding Strategy that identified $1.7 billion in needs over 20 years. Over

that same period, PCTPA only expected $267 million in assured funding, so the board started to explore local funding options.

The first effort was to establish a separate joint powers authority in southern Placer County to manage a transportation and air quality mitigation fee for all new development, including residential, commercial, and industrial. While the fee program is projected to generate $191 million, there is still a significant funding cap.

In 2004, PCTPA formed the Regional Transportation Funding Strategy Steering Committee to study all funding options and make a recommendation to the Board of Directors. In 2005, PCTPA released a draft expenditure plan prepared by the steering committee. In 2006, as PCTPA was moving towards a local transportation sales tax measure, the state placed two measures on the ballot related to transportation. Proposition 1A secured existing funding for transportation, and Proposition 1B was a $19.95 billion bond measure for transportation projects statewide. The steering committee was concerned the timing was not right for pursuing a sales tax measure at the same time voters were considering another large transportation funding measure, so they recommended postponing the measure until the 2008 presidential election.

Unfortunately, in 2007, PCTPA determined that there was not adequate public support for a sales tax measure to proceed in 2008. An independent group of community and business leaders conducted a poll in late 2007 and found that 58-60 percent of likely voters supported a transportation sales tax measure—far short of the two-thirds majority required. According to McAdam, polling needs to be at 70 percent or greater to move forward with a campaign. PCTPA has not considered taking a measure to the voters since

that time, but as the economy comes back, a measure later this decade would make sense for Placer, given its growing population and unmet funding gap.

Celia McAdam believes that the onus for a transportation sales tax measure is based on need and local control. The current funding for transportation is unsustainable, not only for expansion, but for basic maintenance. However, development will have to come back before they can consider putting another measure forward.

Why local option sales taxes?

In Placer County's experience, the development community favored the local-option sales tax path because it spread costs over a large base, in comparison to the impact fee enacted in 2002.

Alternatives

McAdam believes that the A+B strategy is an unworkable one in Placer County. While other jurisdictions have used it, the conservative nature of the county would most likely make it a fertile place for challenging the legality of this structure.

Success

For Placer County, the pain has to be there first for voters to tax themselves. Local officials also need to demonstrate that the need exists. Unfortunately, the lag time really hurts. If transportation projects take up to 16 years from preliminary discussion to

completion, when the pain comes, the voters will inevitably be frustrated that it continues for several years after they pass the measure.

Placer County's expenditure plan dedicated 40 percent of revenue to local jurisdictions to prioritize themselves, and 60 percent to countywide capital projects.

McAdam agrees with other experts that electoral timing is important, and specifically believes that the ideal elections are contested presidential elections, so perhaps 2016 or 2020 will be when Placer voters decide on a local sales tax measure.

Elected officials

Elected officials in Placer County were overall supportive of the work leading up to the measure. While not in favor of taxes, they understand that there is a critical need for transportation, and at the same time a critical lack of funding for transportation. Elected officials were also more supportive because annual audits and oversight were included as part of the package.

Opposition

Despite several years of very public work in developing the expenditure plan and exploring funding options, there was no organized opposition. Had the measure proceeded to the ballot, opposition would have come from the California Republican Assembly and the Placer County Republican Central Committee.

Steering committee

The steering committee had 45 members, which while difficult to manage, ensured that all interests were at the table. One strategy McAdam used was to get everyone's ideas and interests brought up in front of the committee so that they could as a group decide what priorities were shared, and which were not commonly held. In a group with membership ranging from the Sierra Club to the Placer Taxpayers Association, this was a critical exercise in consensus building.

Christina Watson, Transportation Agency for Monterey County

Christina Watson has worked on two local transportation sales tax measures in Monterey County: Measure A (June 2006) and Measure Z (November 2008). Both measures were for a half-cent sales tax increase. Measure A was a 14-year measure, with 66 percent for regional road improvements, 20 percent for local projects, 8 percent for bus transit, 5 percent for regional rail, and 1 percent for administration. Measure Z was a 25-year measure, with 50 percent for safety and congestion relief, 25 percent for local projects, 20 percent for transit, 3 percent for bicycle and pedestrian projects, 1 percent for smart growth, and 1 percent for habitat preservation.

Both measures were unsuccessful: Measure A achieved a simple majority (57.13%), short of the two-thirds requirement; Measure Z was much closer to the required two-thirds (62.17%), but still did not reach the required threshold. TAMC's Executive Director Debbie Hale has pointed out that President Obama won with 53% and it was considered a landslide. Measure Z lost in the same election, even though it won

62% of the vote. According to Watson, the biggest barrier to passage is the two-thirds supermajority voter threshold requirement.

Another important and relevant factor for the 2008 election was the worsening national economic crisis. The crisis has hit Monterey County especially hard. Currently, their unemployment rate is 16% average, compared to the 9% national average. Watson thinks the housing crash and foreclosure crisis and associated debt crisis also had a bigger than average impact on Monterey County. Voters would be less likely to support sales tax increases when the country is in an economic crisis than they would be during flush years.

Assessment of Measure Z

Analysis of Measure Z poll results by a consulting firm showed that voters that who are generally less likely to vote came to the polls because it was a major presidential election, and were more likely to support Measure Z than the high-propensity voters, who generally vote in every election. Therefore, it likely helped the measure that it was on the same ballot as a major presidential election with higher turnout in general and of the low-propensity voters in particular.

The consultants also found nine elements of the Measure Z campaign that worked well: high turnout, signs/visibility, strong spokespeople/speakers forum, broad local coalition, good campaign consultant, on message, good transportation plan, good media coverage, and multiple/targeted mail pieces.

The consultants found five elements that hurt Measure Z: the campaign started late (5-6 months before the election, versus the preferred 12 months), no campaign structure or money in the bank when placed on the ballot, unable to rely on free media to tell their story, raised only one-third of target budget, and not enough money to communicate, despite having great messages and endorsements.

In the same election, several other counties were able to spend much more per voter. Monterey had a total campaign budget of $158,000, or $1.20 per voter. Santa Barbara County spent $450,000 ($2.20 per voter, 79% in favor), Santa Clara spent $1.3 million ($1.92 per voter, 67% in favor), and Stanislaus spent $450,000 ($2.76 per voter, 66.4% in favor). This limited sample indicates that although a higher campaign budget does not directly translate to a higher vote count, there does appear to be some correlation. It also shows that the Monterey County effort had far less financial support compared to the other measures in both total budget and per-voter funding. This was in large part due to competing efforts on the ballot as well as the tightened budgets of supporters during the time of economic crisis.

Future options for Monterey County

The Transportation Agency for Monterey County may consider another attempt at a sales tax measure in the future, but so far there is no plan to do so. The earliest they could consider would be 2014. They would need to make a decision to do so about 2 years ahead of time.

Watson does not believe the A+B strategy is a viable one, mostly because taxpayers associations would likely challenge them. However, they are considering other revenue options in the absence of a sales tax measure, including: toll lanes, assessment districts, hotel tax increases, countywide gas tax increases, and traffic impact fees.

TAMC's Executive Director Debbie Hale, Deputy Director Don Bachman, and consultant Eileen Goodwin also contributed to the information in this interview.

Chapter 6

FINDINGS AND INTERPRETATIONS

The need for additional transportation revenues is unquestionable, but what revenues are most appropriate is a separate matter. In this thesis, I have tried to lay out the best information available about one local option. While the regression findings are limited, this brings together information about what factors can influence a sales tax measure passing. Some issues in the control of a measure's proponents, such as expenditure balance and political strategy, are not covered in this review. And unpredictable factors, such as the economy, are not included.

In this chapter, I analyze the regression results and discuss the opinions I heard from experts. I also address the implications of this research, including what other considerations are necessary for policy makers, and what future researchers may want to study.

Major findings of regression analysis

As reported in the last chapter, seven of 24 explanatory variables in the binomial logistic model and five of 23 in the OLS model were statistically significant. While the findings are interesting, their applicability is limited due to the diversity of the composition (i.e., spending balance, life and other controls) of transportation sales tax measures, and omitted variable bias, especially for economic measures. With those

caveats, the results do support previous research and present interesting questions for future research.

Demographics

In both models, the demographic explanatory variables demonstrated the highest levels of influence on transportation sales tax measures. In the logistic model, for every increase in the percentage of registered Democrats, the probability of a sales tax measure being successful increased 3.18 percent. In the OLS model, the effect was smaller: for every percent increase in the population of registered Democrats, the percent voting in favor of the measure increased 0.44 percent. This variable is perhaps as much about what is in the measure as acceptance of taxation, but it is difficult to draw conclusions statewide just on this variable. In earlier studies, Hannay and Wachs found that Democratic opposition shifted to support when transit and bicycle and pedestrian projects were added to subsequent measures in Sonoma County (2007). Woodhouse found that an increase in Democratic registration had a positive effect across all general sales tax increases—not just transportation (2009).

These findings also support the opinions of the interview subjects. In Placer County, which has the second-highest Republican registration in the state, McAdam is more conservative than other interview subjects in determining when the electorate would be willing to support a sales tax measure. According to Hathaway, the political leanings of a community are more of a factor in the types of projects and spending priorities in a measure. In Placer County the makeup of a potential measure was crafted

to address this very point, but even with a fairly road-dominant measure, the politics of the county still produced low levels of support that prevented the measure from moving forward to the ballot. These factors will likely be reflected in more conservative counties being slower to return to the voters, and when they do, their measures will be optimized to attract conservative support.

Age was the most influential variable of all in the binomial logistic model. A percent increase in the proportion of 18-29 year olds in a community led to a 16.24 percent decrease in the probability of success. This specific measure has not been reported in earlier research, but it is a logical conclusion: younger voters would have a lower time-value of money. Younger voters, therefore, would be less likely to support a sales tax increase because they would lose an amount of money now, even though they would benefit in the medium-to-long term. This theory seems to be supported by the results of the 30-45 year old and 46-64 year old variables in the logistic model: an increase in the proportion of these group would yield a 10.53 and 8.52 percent increase in the probability of success, respectively. These age groups, as opposed to those 65 and older, are more likely to vote for a measure, because their transportation needs are greater, and they also may see the longer-term benefits more so than the oldest and youngest voters.

In the OLS model, for every percentage increase in the proportion of 30-45 year olds, the votes in favor of a measure increased 1.16 percent, and in the percentage 65 and older, votes in favor decreased by 1.69 percent. This supports the findings above.

In the literature, Haas et al. (2000) found in a sample of 63 county elections in California that the percentage of the elderly explained 15.8 percent of the outcome. I cannot determine why there is such a variation in findings, other than that my sample population was much greater, and I also used a different set of variables that may have picked up different interactions. In my interviews, the age of voters was not a factor we discussed.

Tax burden

In the logistic model, the variables measuring tax burden unfortunately did not yield statistically significant results for the key measures of tax burden: the rate of the proposed measure, and the existing sales tax measure. The variable for whether there was an existing measure predicted a slight negative effect on passage. This is at first contrary to the research and opinions of the experts who believe that having results to point to increases success, but this variable does not control for the presence of existing measures covering the existing jurisdiction but imposed by a different entity. For example, several cities in Los Angeles County proposed individual measures for the first time in the late 2000s, but countywide measures were already in place.

In the OLS form, looking at the percentage voting for the measure as the dependent variable, both the general tax and proposed rate variables were statistically significant, with the first having a negative effect and the latter a positive one. If the proposed rate being higher actually has a positive effect, this is a critical piece of information for policy makers. As discussed in the literature and my interviews, adequate

revenues are needed to make a measure worthwhile. Especially in communities with a low sales tax base, the rate of the sales tax measure is perhaps the determining factor on whether to proceed.

Geography

The only geographic measure that was statistically significant in the logistic model was the dummy variable for whether the measure was proposed by a city, which increased the likelihood of passage by a half percent. This is logical, given that Californians, much like Americans in general, are most trustful of local government, and cities are the level of local government most people can see. They are also, in general, more urbanized than counties, so they have more of the conditions that would lead to a transportation sales tax measure being proposed.

Yolo County, for example, has several cities with local-option sales taxes, but no countywide measures have ever been attempted. This is as much about home rule as it is the contrast between the urbanized cities and the sparsely populated unincorporated areas of Yolo County. It is also hints at the basic rationale for a sales tax measure: raising revenue. Counties where the population and retail centers are concentrated in cities are better off focusing on city-level measures and forgoing countywide measures, which have lower chances of passage and generate only a small increment more of sales tax than the collective cities.

No geographic measures in the OLS model were significant.

Dummy variables for jurisdictions

In the logistic and OLS models, I found several dummy variables measuring specific jurisdictions to be statistically significant: Cathedral City (OLS, -0.29), Fresno County (logistic, 0.81%), Pacific Grove (logistic, 0.98%), Santa Barbara (logistic, 0.87%), Merced (logistic, -0.85 %), Sacramento County (OLS, -0.17%), San Luis Obispo County (0.18%), San Mateo (logistic, -0.86%), Stanislaus (logistic, -1%), and Ventura (logistic, -0.93%).

There is no clear pattern among these jurisdictions that leads to a general finding, but the results are important to understanding the feasibility of measures in these jurisdictions. The significant variables do vary between the two models, but this is most likely a factor of the dependent variable measuring the intensity of support rather than simply the outcome.

Dummy variables for year of election

I found several years to have a statistically significant effect on both models. In the OLS model, if a measure took place in 1984 or 1999, the percentage voting for the measure declined by 0.2 percent. At first, I thought that the year could be a proxy measure for the state of the economy, but when I looked up the unemployment rates in these years, I found they were quite different: 7.7 and 5.3 percent, respectively. It was also revealing that in 2008, when the current economic downturn was occurring, measures received statistically significant support in both models: 0.09 (OLS) and 1.94 (logistic). No previous researched studied year of election, although all interview subjects

discussed the influence of the year on passage. According to Hathaway, however, the success in any given year is not necessarily predictable.

Improvements and suggestions for future research

Future researchers have many options for studying transportation sales tax measures. The electoral process is fascinating and presents many questions about what worked in different communities at discrete points in time. The implementation process is equally fascinating and presents many questions about the efficacy of the transportation sales tax for paying for transportation.

There are several limitations to this research, including the limited number of studies available, the lack of comparative studies in other states, and scarce jurisdictional-level studies of individuals. On this latter point, the lack of individual studies creates a significant barrier to understanding voter behavior, and thus understanding the individual-level decisions to vote for a transportation sales tax measure.

Among the issues not addressed in this study, the largest single variable could be the economic conditions at the time of election. There were also limitations to the statistical options available, based on the sample size. Finally, one of the greatest challenges was finding practitioners to participate in the study. Here again, the number of interviews conducted potentially limited the extent of global learning in this research.

Practical applications of this research

While most of the statistically significant findings of this research are limited to unchangeable demographic factors, local policymakers can improve the success of future measures by understanding the elements they can control, and the general leanings of certain groups.

The first lesson for future policymakers is that cities in general are more successful at passing sales tax measures. While there are economic and political benefits to having countywide measures, that luxury does not exist in every place. Cities in conservative areas, such as Roseville in Placer County, would improve the odds of a measure passing by going it alone. In Yolo County, the population and the sales tax generating locations are in cities, so only the cities have taken measures forward, and they have been successful.

Second, having an existing measure does not necessarily ensure the success of a future measure. Sometimes jurisdictions have to take a measure for renewal several times before it passes, but there is significant time and expense involved with every campaign. Once a measure initially passes, implementing agencies need to remind voters of what projects they supported and show how their sales tax dollars are being used. This makes it much easier when a renewal is up. While one of the benefits of local-option sales taxes is that they are practically invisible to most consumers, this is also a downside, as many voters are not able to discern the value of an increment of tax from their total sales tax burden.

Third, the politics of the voters matter, and Democrats, in general, are more likely to vote for sales tax measures. Once the decision is made to pursue a sales tax measure, it needs to be crafted with electoral success as the primary goal. Proponents can determine their success in part by choosing their voters—when is the election, what interests are backing the campaign, and who is actively targeted to turnout.

Finally, the age of the electorate can have a very significant impact on the results. In general, voters under 30 and over 64 years old are less likely to support measures than those in between. Whether this is because of greater transportation needs in midlife, or because of a higher time-value of money, proponents should target both sets of voters accordingly, and perhaps consider more short-term benefits, such as transit operating subsidies, in communities with a greater share of voters in the youngest and oldest groups.

Final considerations

If you refer back to table 1, there are many difficult choices for policy makers in choosing local taxation options. No single local option provides an optimal combination of adequate (and stable) funding, social equity, and political feasibility. However, local sales taxes do provide many simultaneous benefits that make them the most viable option for local governments in California.

While transportation planning is essential for many reasons, the sales tax measure is not the place to plan. In Sacramento County, for example, there were political battles among interest groups over the split between road, transit, highway and bicycle and

pedestrian funding. This was an obstacle, but ultimately was overcome when proponents pointed to the necessity of electoral success. Ultimately, the sales tax measure is a means to an end.

While considering planning and implementation, the right agency is necessary to implement the sales tax measure, with the right strategy for how it will be used. The Sacramento County Board of Supervisors intentionally set up the Sacramento Transportation Authority as a special-purpose agency focus, which allowed them to focus on the successful implementation of the measure. However, special-purpose agencies have their limitations, including their relative invisibility to the general public and their political and legal limitations to addressing transportation policy and revenue issues more comprehensively.

The sales tax measure should be thought of as one of many funding options, and it should be used to both match state and federal dollars and completely fund local projects. Local governments without a local measure are not just losing out on the revenue it would create—they miss out on state and federal funds that require local sources. This is a result of those officials trying to make their dollars go farther as well as the lobbying efforts of existing self-help jurisdictions.

Finally, the broader policy question outside of the scope of local policy makers is the role of state and federal governments in funding transportation. How much should be funded by users of transportation? What types of transportation projects or services are priorities, and how should they be funded? The state legislature and Congress must answer these questions, but neither is likely to significantly revisit the framework of our

transportation system in the near term. Policy makers need to understand these issues, even though they exist outside the realm of local control.

APPENDICES

Appendix A: Research on Local-Option Transportation Sales Taxes

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(1973) Stipak	1968 ballot measure in Los Angeles Discrete transit project Analysis of election and Census data 1/2-cent sales tax measure Measure failed	Proximity to the proposed transit system, income-level, and ethnicity had the greatest effects. Population density, age, partisanship, and election turnout rate had little or no effect. "Mood-of-the-electorate" explanation of bond-issue failures in general, and transit proposals in particular, underestimates the quality of the electoral decision. The design of future mass transit proposals should (1) more explicitly attempt to incorporate the preferences of middle-income voters, and (2) be part of a comprehensive transit plan for the entire metropolitan area.	<u>Relationship of Distance and Vote</u> *Distance (miles)* — *Coefficient for dummy variable* 0-1: 7.6 1-2: 4.7 2-3: 2.1 3-4: 1.1 4-5: 0.4 5-6: -0.7 6-7: -1.7 7-8: -1.9 8-9: -1.1 9-10: -1.7 10 up: 0 <u>Relationship of Income and Vote</u> *Median income (000s)* — *Coefficient for dummy variable* to 5: 0 5-6: -3.0 6-7: -7.4 7-8: -7.7 8-9: -5.8 9-10: -6.3 10-15: -5.2 15-20: -2.7 20 up: 0.5

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(1978) Schroeder and Sjoquist	1968 (property tax) and 1971 (sales tax) ballot measures in Atlanta 1971 measure passed Discrete transit projects weighted logit regression	Individual voters act in their own economic self interest Rejects non-economic arguments regarding voter behavior, including public regardedness theory Current use of transit and working in the central business district, and income had positive correlation with support for the measures.	Percentage of workers using bus: 1.039*** (1968), 2.752*** (1971) Median family income: .075*** (1968), .069*** (1971) Distance to the central business district: -.013** (1968), -.023*** (1971) Distance to closest rail station relative to distance to central business district: -1.452*** (1968), -.890*** (1971)

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2006) Hannay and Wachs	2000 and 2004 ballot measures in Sonoma County Separate transit/highway measures in 2000; joint in 2004 1/2 cent sales tax measures 2000 measures failed; 2004 passed	The political leanings of a neighborhood had a significant impact on voting for these measures. Proximity to the primary projects had a significant effect on support. Transit, bicycle, and pedestrian projects included in the expenditure plan had a significant impact on support, despite relatively low county-wide transit use.	<u>Measure B</u> Percentage of votes by registered Democrats: -.452*** Proximity to Highway 101: -.348*** Proportion of block group with bachelors degree: -.178*** Proportion Asian: .237*** Proportion of households that rent: -.128*** Population density: .198*** Proximity to Marin County: -.175*** <u>Measure C</u> Percentage of votes by registered Democrats: -.310*** Proximity to Highway 101: -.081** Proportion of households that rent: -.237*** Proximity to Marin County: -.357*** Median household income: .239*** Proportion of households in block group with 0 or 1 vehicles: .316*** <u>Measure M</u> Percentage of votes by registered Democrats: -.383*** Proportion of households in block group with 0 or 1 vehicles: .213*** Proportion Asian: .125*** Proximity to Highway 101: -.469*** Proximity to Marin County: -.364*** Median household income: .119**

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2000) Haas, Massey, Valeny, Werbel	A statistical analysis of community-level characteristics to determine what factors seem to affect the outcome of such local transportation tax increase elections. Separate regression equations for sample of California county elections and national city/county elections	Efforts to fund transportation with taxes where the proportion of elderly is greater than 9 percent are more likely to succeed Efforts to increase sales taxes for transportation programs will be less successful in communities with higher sales taxes.	National Model In communities where the elderly made up more than 18 percent of the population, 67 percent of the community voted to pass the tax. When the elderly population was between below 6 percent of the population, support for tax measures rose to 71 percent. For communities with multiple modes of transportation as part of the measure, the percentage voting for the measure was 51 percent. When there was only one mode, the percentage voting for the measure was 56 percent. California Model Population density, proportion elderly, proportion of population change for the five years prior to the measure, and sales tax per capita explained 27 percent of the variance in margin voting for transportation measures, and 15.8 percent comes from the proportion elderly alone.

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2005) Zhao	Analysis of local-option sales taxes in Georgia counties from 1975-2002 Revenue used for property tax relief 1-cent sales tax	Counties with higher property tax rate and higher potential of sales tax exportation show higher propensity to adopt the LOST, and these effects are especially strong in the early years. The effects of policy diffusion loom larger later when many counties in Georgia have already adopted the tax. Fiscal stress does not have a significant effect on the LOST adoption.	Tax rate: -2.03*** Whether the county was in the Atlanta MSA: -3.02*** Annual percentage change of real per capita personal income: 4.45*** Number of counties that have adopted the local-option sales tax: .004** Ratio of taxable sales base to personal income: 1.31*** Dummy for presence of an interstate highway: .57** Total property tax millage rate in unincorporated county: .04** Ratio of property tax to personal income: -.26* Percentage of neighboring counties with local-option sales tax: .87*

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2008) Hamideh, Oh, Labi and Mannering	Discrete choice models to discover factors that significantly affect an individual's likelihood of voting favorably on a transportation sales tax. Telephone survey of Ventura County residents who voted in November 2004 Binary logit model regression	The likelihood of sales tax initiative support increases when an independent citizen oversight committee is designated to track expenditures of tax revenues, a transportation sales tax is the only tax measure on the ballot, and there is a fixed expiration date for the tax. Democrats, Hispanics, households making less than $90,000, and public transit users tend to support sales tax initiatives.	More inclined to support measure with fixed expiration date: .114 More inclined to support measure if only local tax measure on the ballot: .255 More inclined to support measure if expenditures monitored by citizen committee: .307 Believe 40 percent of tax revenues allocated to freeway is too low or just right: .100 Believe 20 percent of tax revenues allocated to buses, train, and bicycle paths is too low or just right: .098 Believe local streets are in excellent condition: -.219 Rate traffic conditions as good or excellent: -.145 Household income less than $90,000: .076 Democrat: .112 Republican: -.134
(1991) Baldassare	1989 telephone survey of Orange County residents Studied transportation trends, attitudes, behaviors and policy preferences, including support for a statewide gas tax	Republicans and conservatives are not more likely to oppose state gasoline tax increases Those who perceive traffic as the worst problem and rate the freeways as unsatisfactory are no more likely to favor a state gasoline tax than others.	<u>Transportation tax preferences</u> Age: .09* Education: -.10* Conservative: -.10*

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2009) Woodhouse	Multiple regression study to determine predictive factors for cities general sales tax measures in California between 2004-2008. Qualitative research involved interviews with four professionals.	Educational attainment and age are significantly related. A 1% increase in voters with college degrees and voters registered Democrat would result in a 0.5% and 0.15% increase, respectively, in Yes votes, holding other variables constant.	Age 45 and older (% of city population): .054* College degree or higher (% of city population): .008***

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2003) Rueben and Cerdán	Mixed methods quantitative study studying the effect of voter approval requirements on tax measures for schools and local governments.	Bay Area governments were more likely to pass than other regions Cities that proposed and passed measures were larger, more Democratic, and had greater population density Cities more reliant on property taxes were more likely to seek and pass new tax measures. Cities that had a lower percentage of nonwhite households passed more measures Northern counties proposed a larger percentage of measures Cities that successfully passed measures had more revenue to begin with County measures faced relatively low passage rates Cities with fewer special districts were more likely to be successful Special districts had higher overall passage rates than city and county government measures, despite requiring a supermajority for all measures.	*Not reported*

(Date) Authors	Description of Research	Relevant Findings	Significant Coefficients
(2006) Myers, Pitkin and Park	Secondary analysis of PPIC polling data on support for infrastructure funding	Major disconnect between homeowners and support for infrastructure funding, which they believe to be a new phenomenon. Those who feel believe there is not adequate infrastructure funding strongly support a sales tax or other method of correcting the funding gap Between 2001 and 2004, there was a 27 percent swing in support for infrastructure sales taxes, shifting from minority support to 2:1 support	Homeowner: -.088*** Believes there is not adequate funding: .207*** Low confidence in state planning: -.112*** Low confidence in local planning: -.061** Latino: .07* Household income $20,000-$40,000: .11** Household income $40,000-$60,000: .144*** Household income $60,000-$80,000: .133*** Household income $100,000 and up: .08*

Appendix B: Research Methods of Regression Studies

(Date) Authors	Location, year, N	Unit of Analysis	Dependent variable	Independent variables
(1973) Stipak	Los Angeles, 1968, 1527	Census block group	Affirmative support for local transit sales tax	Distance from census tract geographical centroid to the nearest transit terminal of the proposed system, median income, black (dummy), Spanish surname (dummy), Mexican-American (dummy), white, oriental (dummy), age, population density, partisanship, voter turnout, percent Democratic registration, support for other bond-issue or finance-related propositions
(1978) Schroeder and Sjoquist	Atlanta, 1968 and 1971, 263	Census block group	Voter preferences for public mass transit	Total price of the service (including time costs), availability and demand for alternative transportation modes, quality of service, income
(2006) Hannay and Wachs	Sonoma County, 2000 and 2004, 356	Census block group	Logit-transformed proportion of voters supporting the measure	Racial and ethnic makeup of block groups, commuting characteristics, education, age, vehicle ownership, household income, proportion of renters, distance from Highway 101, distance from the Marin County boundary to the south, residential density, proportion registered as Democrat (2000), proportion voting Democratic (2004)
(2000) Haas, Massey, Valeny, Werbel	U.S. (1990-98) and CA (1980-98), 57 and 63	local government	Percentage voting for passage of a transit tax	Percentage greater than 65 years of age, per capita income, per capita taxes, percentage driving to work by automobile, number of housing units/population, average number of minutes to commute to work, population, population change from 1980 to 1992, continuous variable based upon the number of modes described in the ballot measure. California analysis also included per capita local taxes, per capita sales taxes, percentage commuting by transit, density of vehicles registered by county, population density, population change during the five years prior to passage of the measure, and population change during the two years prior to passage of the measure.

(Date) Authors	Location, year, N	Unit of Analysis	Dependent variable	Independent variables
(2005) Zhao	Georgia, 1975-2002, 160	County	Successful adoption of a tax measure	Total property tax millage rate levied in the unincorporated area of a county, ratio of property tax to personal income, percentage of local roads that are unpaved, annual percentage change in real property and utility digest, dummy variable for highway passing through a county, ratio of taxable sales base to personal income, percentage of neighboring counties with a local option sales tax (LOST), number of counties that have adopted a LOST, percentage of Republican votes in gubernatorial elections, accumulated state and local sales tax rate that has been collected in a county, dummy variable for county within the Atlanta Metropolitan Statistical Area, annual percentage change of real per capita personal income, annual percentage change of population
(2008) Hamideh, Oh, Labi and Mannering	Ventura County, 2004, 609 and 723	Individual	Support for local transportation sales tax	Dummy variable for "no" vote on Measure A, dummy variable for believe 40 percent of tax revenues allocated to freeway is too low or just right, dummy variable for current transit user, dummy variable for Hispanic indictor, dummy variable for moderate income indicator (i.e., household income is less than $90,000 per year, dummy variable for registered Democrat
(1991) Baldassare	Orange County, 1989, 1000	Individual	Preference for a gasoline tax increase	Income, south Orange County resident, education, age, full-time work, registered Republican (dummy), Conservative
(2009) Woodhouse	California, 2004-2008, 87	City	Percentage voting yes on a general sales tax measure	Age, percentage of college degrees (educational attainment), percentage registered Democratic (partisanship), fiscal health ratio, median household income
(2003) Rueben and Cerdán	California, 1986-2002, 348	Local government	Successful passage of tax measure	per capita general revenues, percentage of general revenues from property tax, per capita income, population, density, percentage of registered Democrats, percentage of homeowners, percentage of residents living in the same house for five years, number of special districts in the county

(Date) Authors	Location, year, N	Unit of Analysis	Dependent variable	Independent variables
(2006) Myers, Pitkin and Park	California, 2001 and 2004, 1,741	Individual	Support for sales tax measure	Frequency of voting, homeowner, renter, believe infrastructure adequate, believe local area in future will be better, believe state government planning effective, believe local government planning effective, age, race, educational level, household income

Appendix C: Interview Questions

1. Please tell me what sales tax measures you've been involved in during your career.
2. What are the top factors for electoral success?
3. How important is the make-up of the measure (transit/roads, operating/capital)?
4. Is it better to campaign with specific projects to point for, or to keep it more general?
5. What role do stakeholders play in shaping the contents of the measures?
6. What role do elected officials play in the shaping a measure?
7. What opposition have you seen either within a stakeholder coalition or from without? What's the effect?
8. Is election timing important (e.g., presidential vs. odd-year/special)?
9. How much do you think the economy factors in to the minds of stakeholders or voters? Are there always 25% of people who will vote against any tax?
10. Does the urban/suburban/rural nature of a community rank as a factor?
11. How about the political makeup?
12. How important is including an oversight role in achieving voter support?
13. What has the impact of the media been on your campaigns? Is it better to seek coverage or keep a low profile?
14. What affect does the vote threshold (2/3) have for measures, both in ballot support as well as in crafting the measure?
15. Do you see a shift to more "A+B" measures (i.e., general sales tax + advisory)?
16. What other observations do you have about transportation sales tax measures in California?

17. Do you see other alternatives for locals to self-finance transportation in California?

18. Is there anything else you would like to add?

19. Is there anyone else you think I should talk to?

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