

Taxing for Transit: An Exploratory Analysis of Local Option
Transportation Taxes

A Thesis

Submitted by

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In partial fulfillment of the requirements for the degree of

Master of Arts

In

Urban and Environmental Policy and Planning

Tufts University

November 2012

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ABSTRACT

This research seeks to analyze recent trends in transportation funding – voter-approved local option transportation taxes (LOTTs) with a transit component. The research involved developing a dataset of those LOTT ballot measures to: summarize and describe characteristics of proposed LOTT ballot measures; analyze the relationship between election outcomes and characteristics of the taxes and voting locales voting; and summarize transit funding from successful LOTT county sales taxes to examine modal distribution and planned use of the funds.

While user fees remain the largest funding source, alternative mechanisms such as LOTTs are now a fixture of transit funding. In many locales, LOTTs have passed, been extended, and are resulting in real investment in bus and fixed guideway systems. This research led to future research recommendations including: development of a comprehensive LOTT ballot-measure dataset; analysis on consistency between proposed and actual expenditure; and analysis of differences in revenue allocation between LOTT investment and the traditional transportation planning process.

ACKNOWLEDGMENTS

Special thanks to Mary Davis and Jeff Levine for their guidance and support of this thesis. Thank you also to those who contributed by sharing their transportation knowledge and insights. Also, thank you to my friends and family for their support throughout the process. Finally, thanks to Chita for perspective.

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List of Acronyms

APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
CFTE	Center for Transportation Excellence
CMAQ	Congestion Mitigation and Air Quality
CTC	County Transportation Commission
FIPS	Federal Information Processing Standard
FTA	Federal Transit Administration
GAO	Government Accountability Office
HTF	Highway Trust Fund
LOTT	Local Option Transportation Tax
LTST	Local Transportation Sales Tax
MAP-21	Moving Ahead for Progress in the 21 st Century
MPO	Metropolitan Planning Organization
NHS	National Highway System
NTD	National Transit Database
O&M	Operations & Maintenance
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
STP	Surface Transportation Planning
TCRP	Transit Cooperative Research Program
TIGER	Transportation Income Generating Economic Recovery

Chapter 1: Introduction

At all levels of government, transportation funding needs are outpacing revenue growth. To overcome the obstacles traditional methods of transportation revenue generation, an increasing number of cities, counties, and transit districts have implemented or are considering alternative financing options. Two recent trends over the past two decades in transportation funding are: (1) A shift from traditional ‘user fees’ to broader-based sales and property taxes, and (2) voter approval of transportation funding measures. This thesis seeks to characterize and assess trends in on one of the most visible recent examples of alternative funding, voter-approved local option transportation taxes (LOTTs) with revenue designated for public transportation (transit) systems.

Nationwide, investment in transportation infrastructure is insufficient to maintain current infrastructure and services. An even greater challenge will be funding the improvements needed to address projected future growth in the movement of goods and people in the United States. In their “Report Card for America’s Infrastructure,” the American Society of Civil Engineers (ASCE) rated the nation’s roads and bridges a D- and the transit system a D, and projected investment shortfalls of \$549.5 billion and \$190.1 billion, respectively, from 2010-2015 (American Society of Civil Engineers 2009). The user fee revenue sources dominant for over 80 years —federal and state fuel taxes and taxes on tires and vehicles and registration fees – are insufficient to meet expenditure needs (Wachs 2003). Further, the value of the primary source of transportation funding, fuel taxes, continues to erode due to rising fuel efficiency, higher

construction costs, and general inflation. Attempts to increase revenue, particularly from fuel taxes, are met with significant opposition by the public and lawmakers. The federal gasoline tax, for example, has not been raised since 1993, during which time it has lost about one third of its value to inflation (Altshuler 2010). The limitations of these tools and the funding shortfalls they have created place increasing pressure on all levels of government to seek alternative sources of revenue within the constraints of federal and state transportation law.

This pressure is particularly strong for public transportation systems. Resources are scarce, labor and operating costs are rising, and restrictions exist on federal and state funding sources for transit. At the same time, demand for public transportation is growing. Public transportation, or transit, consists of a number of modes including buses, light rail, subways, commuter rail, streetcars, paratransit services for seniors and people with disabilities, and ferries and taxis (American Public Transportation Association 2012). Financing mechanisms increasingly used to supplement traditional financing tools are broad-based sales and property taxes with revenue designated for transportation. State and local governments are putting an increasing number of these LOTTs to the voters. In response, in spite of prevailing anti-tax sentiment in the United States, voters are approving many of these tax measures. According to the Center for Transportation Excellence, by 2007 voters in 33 states approved 70% of the transportation-finance measures on which they voted, and these mechanisms account for a relatively small, but growing amount of transit investment. The Center for Transportation Excellence

estimated the total value of all these measures to be approximately \$70 billion (Center for Transportation Excellence 2006).¹

Given the vast challenges facing the transportation system and its funding sources, policymakers and elected officials may increasingly feel pressure to generate revenue to invest in the transportation system through alternative funding mechanisms, including LOTTs. However, according to Martin Wachs, there has not been sufficient consideration of the potential impacts of these measures. He cautions, “without deliberating or consciously adopting a change in policy, indeed without much discussion at all, we are gradually devolving transportation finance back to local governments...Without knowing it we may be experiencing a revolution in transportation finance, and we haven’t stopped to ask whether this is good or bad” (Wachs 2003, 9). Before we can answer that question of whether these measures are good or bad, a better understanding of these measures is necessary. A small number of researchers have started to describe these trends and consider the potential long-term planning and policy implications across different funding mechanisms for land use, governance, modal investment split (and related health outcomes), efficiency, and equity (Crabbe, et al. 2005, Wachs 2003, Wachs 2006, Crabbe, et al. 2005, Goldman 2007, Goldman and Wachs 2003); however, available information on these measures and detailed analysis remains limited.

This thesis seeks to contribute to this research through an examination of the relationship between LOTTs and transit, particularly local transportation sales

¹ The \$70 million total includes LOTT ballot measure funding for all modes of transportation.

taxes (LTSTs) designated for transit. One component of this research was the development of a detailed dataset of all transit and multimodal LOTTs that expands on data available from the Center for Transportation Excellence. A subset of this is be a detailed dataset of all county-level LTSTs with additional detail on the use of funds dedicated to transit.

Using these data, as well as information from the public transportation funding literature, this thesis examines recent trends in LOTTs. The three primary areas of analysis are:

- Summarize and describe the characteristics of the proposed LOTT ballot measures with a transit component (LOTT Ballot Measure Trend Analysis),
- Analyze the relationship between the election outcome of LOTT ballot measures with a transit component and the characteristics of the taxes, as well as the characteristics of people and places voting on them (Election Outcomes Analysis),
- Summarize transit funding from successful LOTT county ballot measures with a transit component, to examine what transit modes the measures fund and the planned use of the funds (Local County Sales Tax Transit Investment Analysis).

This final area of analysis will further explore the competition for funding between modes of transportation, the balance between maintaining existing service and expansion, and the balance between capital expenditures and operating expenditures for transit.

To the extent possible this research will ground these three areas of analysis of LOTTs and transit in existing literature and documentation of public transportation finance, as well as the history, appeal, and planning implications of LOTTs. Based on the literature review and analysis of LOTT transit ballot measures, this research will conclude by discussing their potential implications for the larger legal and regulatory and transportation funding framework.

Chapter 2: Background

This research seeks to understand recent trends in LOTT ballot measures with a transit component; the relationship of LOTT transit ballot measure election outcomes to their characteristics, and to the people and places voting on them; and their contribution to transit investment. This chapter provides background information through a review of the transportation funding and finance literature. The first section of this chapter provides a brief overview of transit funding to place local option sales taxes in the broader context of transportation funding. Topics include federal, state, and local sources of revenue; major federal transit expenditure programs; and the structured set of rules that govern the use of public transportation revenue in the United States.

The next section is specific to LOTTs and describes the history and extent of transportation ballot measures in the United States and reviews the literature on their success and appeal. The section also includes an overview of their potential policy and planning implications, such as equity and efficiency, and the implications of these tax measures for governance, land use, and modal-split of investment. This chapter concludes with a review of the literature explores how the flexibility and restrictions on transportation funding relate to LOTTs.

Public Transportation Funding in the United States

This section provides a brief overview of public transportation funding sources in the United States at the federal, state, and local levels based on available reports and information from academic and government research.

Although there exists some debate on the appropriate level of public subsidy for transit services, provision of transit is generally viewed as a public service that provides societal benefits and addresses a number of social needs including mobility for those without cars or the ability to drive, reduced roadway congestion and environmental impact, and increased alternative mode choice (Nelson, Baglino, et al. 2006, American Public Transportation Association 2011).

In the United States, federal, state, and local governments all provide funding for public transportation. The funding environment is complex, as the particular mix of funding and mechanisms used varies across the country and is different for each transit agency. Because of the complexity, there is no single, detailed, comprehensive source of information on how public transportation is funded across the United States (Coussan and Hicks 2009). The National Transit Database (NTD) provides information only on the level of government from which the funding comes and not the specific financing mechanisms used (Federal Transit Administration 2012).

Current Sources of Transportation Funding in the United States

Overview of Federal Transit Funding

Federal funding programs, primarily administered by the Federal Transit Administration (FTA) provided approximately \$13.1 billion to support public transit in 2009 (American Association of State Highway and Transportation Officials; American Public Transportation Association 2011). Currently, the primary sources of revenue are the 18.4-cent federal gasoline tax and the 24.4-

cent diesel fuel tax. Until 1983, all Highway Trust Fund (HTF) revenue was dedicated to roads, and all federal transit funding was provided from the General Fund (that is, general tax revenues not from the HTF). Growing awareness of a need for dedicated transit funding resulted in the Surface Transportation Assistance Act of 1982, which created a separate Mass Transit Account within the HTF and designated 15.5% of the gas tax and 11.7% of the diesel fuel tax for transit. This change in policy eliminated the need for revenues from the General Fund to support highways and transit. Increasingly, because of the current shortfall in HTF, General Funds are becoming part of the funding picture once again. From 2006-2008, 80% of funds were from the HTF and 20% from the General Fund (Government Accountability Office 2009).

Federal transit funds are distributed both through formula-based programs and discretionary grant programs. Formula-based programs provide funding to states based on population, while the discretionary grant programs are awarded through a competitive process based on a specific set of rigorous criteria. Federal transit capital programs require a state or local contribution in the form of a matching ratio for capital funding projects. The maximum permissible ratio for the primary FTA capital improvement program New Starts is 80% federal and 20% state match. Recently, however, Congress and additional regulations have discouraged a federal match of more than 60%. For operating grants for small areas the ratio is up to 50%-50% (Neff 2009).

In addition to FTA funds, recent transportation authorizations have introduced some additional flexibility in the use of certain categories of federal

surface transportation funds. The Congestion Mitigation and Air Quality (CMAQ), National Highway System (NHS), and Surface Transportation Planning (STP) funds, though primarily for highways, can be “flexed” (i.e., transferred) to directly fund transit projects. Other funds, such as the Interstate or Bridge program can be transferred to the Surface Transportation Program and then used for transit (Neff 2009, Government Accountability Office 2007). One of the economic recovery programs under the American Recovery and Reinvestment Act of 2009 is the Transportation Income Generating Economic Recovery grants (TIGER) program, which has provided a limited amount of funds for non-mode-specific competitive funds. The surface transportation authorization that will be effective October 1, 2012 adds additional flexibility to the New Starts program by making major capital projects focused on the core capacity of fixed guideway systems eligible for capital funding.

The summary above represents the current framework for public transportation funding as authorized under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU was initially intended to serve as the surface transportation reauthorization until only 2009, but remained in place until July 2012. In July 2012, Congress passed a 27-month surface transportation authorization, Moving Ahead for Progress in the 21st Century (MAP-21). MAP-21 extends SAFETEA-LU through September 30, 2012. MAP-21 keeps funding relatively level, but adds an additional program mandate for FTA in the area of safety.

Overview of State Transit Funding

State government expenditures for transit operations tripled between 1984 and 2001, from \$1.7 to more than \$5.1 billion. In 2009, states provided \$12.3 billion in transit funding (APTA 2010). Each state has a unique combination of sources to fund public transit and rules and restrictions that govern them. A review of each state these is beyond the scope of this report, but a recent report by the National Conference of State Legislatures (NCSL) provides state-by-state review of how states pay for transportation (Rall et al. 2011). While most states provide some amount of transit funding, five states – Alabama, Arizona, Hawaii, Nevada, and Utah – provided no state funding for transit (APTA 2010).

As with the federal government, state governments use fuel taxes as a primary source of transportation funding. At the state level, however, there are also a number of other types of sources (Rall et al. 2011). A survey of state funding for transit found that in 2010, the most utilized primary sources states reported for transit funding are general funds, gas taxes, bond proceeds, registration and other vehicle fees, general sales taxes, and other sources. As a percentage of all state transit funding, general sales taxes are the largest single primary sources, with nearly one quarter of state transit funding from general sales taxes. Most states (31), however, rely on a mix of other miscellaneous revenue sources as a primary source of transit funding. This ‘other’ category also comprises nearly half of all state transit funds. Of the 31 states, ten relied solely on these other sources for all transit in the state (American Association of State

Highway and Transportation Officials; American Public Transportation Association 2011).

Table 1 below summarizes the findings:

Table 1: Primary Source of Transit Funding by State

Source	Number of States Reporting Source as a Main Source of Transit Funding	Percentage of All Transit Funds
Gas Taxes	16	7%
General Funds	12	5.5%
Bond Proceeds	12	7.6%
General Sales Taxes	8	24.4%
Motor Vehicle and Rental Car Sales Taxes	8	3.2%
Registration/License/Title Fees	7	2.6%
Interest Income	6	0.1%
Other (state highway funds, trust funds, miscellaneous revenues, lottery funds, etc.)	31	49.6%

Source: American Association of State Highway and Transportation Officials/American Public Transportation Association (2011)

Overview of Local Transit Funding

Local revenue is an increasingly important component of transportation, and particularly transit finance (Brown 2005). According to the NCSL, local governments, including counties, townships, and municipalities provide about 30 percent of all surface transportation funding (Rall et al. 2011). When combined with fares and other sources, over two-thirds of transit investment can be considered as locally derived (Transportation Research Board 2009). As with states models, there are a wide array of funding mixes across regions and municipalities based on the state and local regulations and authorities regarding

the generation and use of revenue. As of 2003, 15 states authorized local option motor fuel taxes, 33 states authorized local vehicle license or registration taxes, and 33 authorized local option sales taxes for transportations. In states such as Massachusetts, where local and county taxes are not authorized, transit authorities and municipalities do not have the option to raise revenue through local-option taxes, though some may have dedicated state-level sales taxes for transit.

Transit Cooperative Research Program (TCRP) Special Report 129 compiled a list of local and regional funding sources for public transportation. The report uses National Transit Database data from 2005, which show that \$26 billion was available for transit systems from local and regional transportation sources. Approximately three-quarters of this amount was used for operations and the remainder for capital improvements. The 2005 data also show transit fares and other earned revenue accounted for half of local and regional funding sources (Transit Cooperative Research Program 2009).

Table 2 shows the complete 2005 breakdown based on NTD data.

Table 2: Breakdown of Transit Funding by Source

Category	Percent of total	Breakdown of sources within category (if available)
Fares and Earned Income	51%	
Local dedicated sources	18%	Sales taxes (57.5%) Property Taxes (5.5%) Gas taxes (3.8%) Others (32.8%)
Directly generated taxes	16%	Sales taxes (45.5%) Property taxes (7.0%) Tolls (5.0%) Others (42.3%)
Local General Funds	10%	
Other local sources	5%	

Source: TCRP Special Report 129, based on 2005 NTD data

Limitations of Transit Funding

As described in the introduction, there is a shortage of funding for all types of transportation infrastructure. Transit is not exempt. As noted in the introduction, the American Society of Civil Engineers rated the nation's roads and bridges a D- and the transit system a D, and projected investment shortfalls of \$549.5 billion and \$190.1 billion, respectively, from 2010-2015 (American Society of Civil Engineers 2009). The primary cause of this shortfall of revenue for transportation is the eroding value of traditional funding sources. The shortfall increases the competition for available funds, and increases pressure on public transportation systems.

Eroding Value of Traditional Funding Sources

Federal and state fuel taxes remain the largest source of revenue for transportation – but these traditional sources of funding no longer come close to covering the costs of building, operating, and maintaining the transportation system (Wachs 2006). The value of these fuel taxes continues to erode due to improved fuel efficiency of vehicles, the cost of system maintenance and repair of a mature system, rising construction costs, and general inflation. Attempts at the federal and state level to increase revenue, particularly from fuel taxes, is met with significant opposition. Only six states increased motor fuel taxes between 2000 and 2009. Three states actually froze scheduled increases or decreases (Transit Cooperative Research Program 2009). As a result of the recent economic

crisis, local governments, dependent on revenue from property taxes and sales taxes that are cyclical with the economy, are also facing funding shortfalls.

At the federal level, the HTF faces a near-term insolvency crisis, with revenues forecasted to fall short of needs by approximately \$400 billion between 2015 and \$2.3 trillion through 2035 based on current trends (National Surface Transportation Infrastructure Financing Commission 2009).

Increased Demand on Transit Systems

According to the Surface Transportation Policy Project, the growing popularity of public transportation is also a factor in the limited availability of funds (Surface Transportation Policy Partnership 2002). Between 1995 and 2009, public transportation ridership increased by 34% and ridership levels from 2006 to 2009 were at their highest since 1956 (American Public Transportation Association 2011). Recent studies have shown a statistically significant relationship between fuel cost and transit ridership, as gas prices increase, transit ridership also increases (Currie and Phung 2008, Stover and Bae 2011). Public transit has also been promoted as part of recent livability and public health initiatives because of its reported environmental, mobility, and public health benefits. For example, APTA reports that without public transportation, congestion costs would have been an additional \$19 billion in 2009 (American Public Transportation Association 2011). A number of studies have shown that those who commute by transit are more physically active, because they must walk to, from, and between transit services (Morabia and Costanza 2010). In addition,

observational studies in multiple countries have demonstrated inverse relationships between active transit and risks of being overweight or obese and medical problems such as hypertension, high cholesterol, and heart attacks (Samimi and Mohammadian 2010, Lindstrom 2008, Gordon-Larsen, Nelson and Beam 2005).

While a positive development for public transportation, this greater demand for public transportation intensifies the competition for the already limited funding. The primary large-scale federal funding program for fixed-guideway and bus corridor transit capital projects is the New Starts program. The application process for New Starts funding already subjects applications to greater scrutiny than most other federal surface transportation programs for roads and highways. The process is also highly competitive because demand for New Starts funding is greater than available funding (Emerson and Ensor 2010). FTA has tried to maximize its limited resources by increasing the non-federal match required of applicants. The legislation authorizes up to 80% federal funding, but the average share is now about 50%. FTA also assesses the ability of the project sponsor to maintain its existing system with the addition of new service. These requirements are more stringent than most highway funding program criteria. As these program constraints and criteria create a greater demand for local and state transit funding sources as the non-federal New Starts match, LOTTs become valuable as a way to generate these revenue or possibly to substitute funding in the absence of federal grants.

In addition to insufficient funds for transportation generally, these funds are often restricted in one way or another. At all levels of government, there are restrictions on spending gasoline tax revenues on non-highway investments. While a major source of transit revenue in some states, averaged nationwide, state and local fuel tax revenues account for only about two percent of revenues from state and local governments used for transit (Transit Cooperative Research Program 2009). Rich Williamson, Chairman of the Texas Transportation Commission testified, “our revenue expenditure system is focused on road construction, which is a process, as opposed to reducing congestion, improving air quality, or transferring the movement of hazardous materials away from our urban centers” (National Transportation Policy and Revenue Study Commission 2007, 20). Although these restrictions create challenges, their popularity continues because of many groups interested in preserving the road-centric status quo, and also because dedication is seen to reduce vulnerability to funds being shifted away from transportation to competing priorities (Baldwin Hess and Lombardi 2005).

Limitations of Federal Transit Funding

While a growing flexibility exists for federal transportation funding in terms of the programs in which funds can be ‘flexed’ to transit, this new flexibility is not necessarily being taken advantage of for multimodal investment, especially given competition with road and highway projects for limited funding. Over the 17 years between 1992 and 2008, only 4.3% of funds that could be used for either highway or transit, or could be transferred from a highway program to

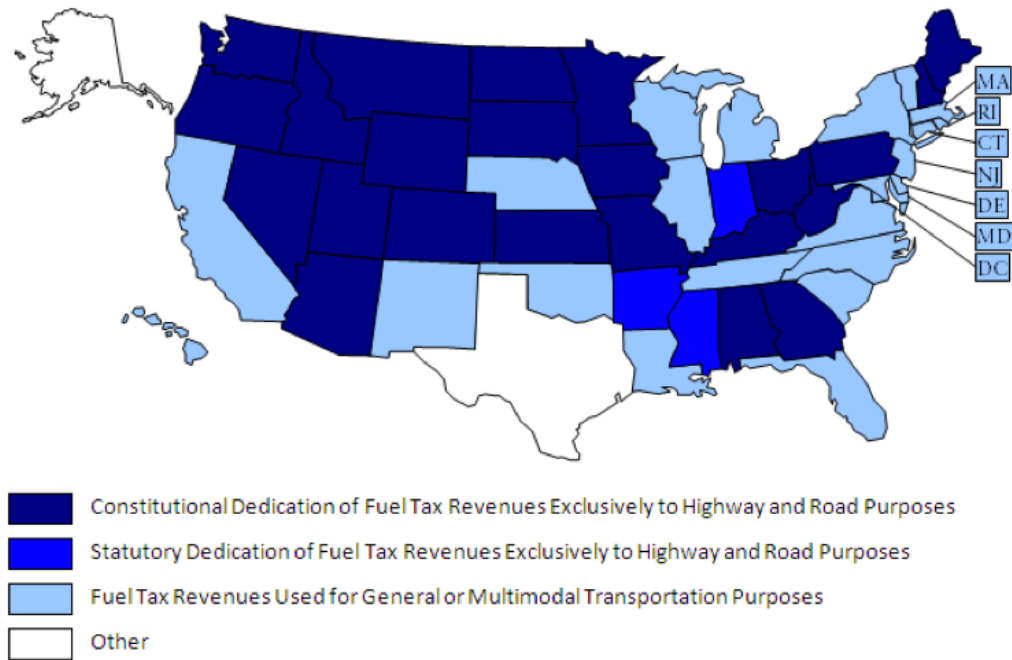
the Federal Transit Administration (i.e., ‘flexed’) were used in this way (American Association of State Highway and Transportation Officials; American Public Transportation Association 2011). California flexes the most funding, having transferred almost 40 percent of possibly flexible funds between 1992 and 2006 (Government Accountability Office 2007). Others taking the most advantage of the ability to flex transportation funds are also states with large urban populations – Pennsylvania and New York, and Oregon. Delaware, North Dakota, and South Dakota have never flexed funds (Government Accountability Office 2007, Puentes 2000). Transportation officials interviewed by the Government Accountability Office (GAO) thought flexible funding was beneficial to transit overall (Government Accountability Office 2007).

Within federal public transportation assistance programs, there exists limited flexibility for recipients on how to use the funding. Baldwin and Hess describe recent trends as a “decade long retreat from large-scale federal operating support” (Brown 2005, 2). Operating expenses comprise about two-thirds of transit agency’s expenses, so a federal policy eliminating operating assistance in 1998 affected existing agencies and budgets. Concern exists that the federal focus on capital assistance over operating assistance may encourage inefficiency and overcapitalization (Baldwin Hess and Lombardi 2005). As a result, they argue, it is increasingly necessary for state and local governments to provide support for public transportation. This trend is part of a broader devolution of responsibilities from higher to lower levels of government (Giuliano 2007).

Limitations of State Transit Funding

At the state level, there are also restrictions that limit the availability of funding for public transportation. One of the primary restrictions on all transportation funding is whether or not fuel taxes can be used to pay for public transportation. As of 2006, ten states spend no gasoline tax receipts on transit and 19 states spend less than one percent on transit (Upchurch 2006). Also at the state level, 26 states have constitutional and 3 have statutory provisions that limit the use of state gasoline tax revenues to highways (Rall, et al. 2011). Figure 1 shows these restrictions.

Figure 1: Map of Fuel Tax Revenue Restrictions



Source: (Rall, et al. 2011)

Overview of Local Option Transportation Taxes in the United States

A growing trend in transportation finance is the increase in general government revenues as a source of finance, compared to traditional user fees such as fuel taxes and vehicle registration (Rand Corporation 2007). One trend that is part of this shift is the growing use of voter-approved transportation option sales and property taxes. These referenda are utilized primarily at the local level, rather than regional or state levels. California started the trend when it began authorizing countywide voter-approved sales taxes for capital projects in 1984 as a way to avoid raising the gas tax (Goldman 2007). The first nationwide wave of these measures occurred in the late 1980s when several states authorized local jurisdictions to raise transportation revenues. In the 1990s, 21 states adopted authorizing laws or expanded use of LOTTs (Goldman and Wachs 2003). The CFTE reports that by 2007, voters in 33 states approved 70% of the transportation-finance measures on which they voted, many of which were local sales or property taxes (Center for Transportation Excellence 2006). For transportation projects in California, local transportation sales taxes have been the fastest growing transportation revenue source over the past decade (Crabbe, et al. 2005). Goldman and Wachs describe the traditional system of providing transportation in the United States as a “complex system of intergovernmental partnerships” and argue that these argue that these LOTTs are changing the nature of those partnerships (Goldman and Wachs 2003, 1).

Appeal and Success of LOTT Measures

One focus of the existing literature on LOTTs is an examination of what makes them a popular mechanism for revenue generation. In spite of prevailing anti-tax sentiments across the nation, transportation ballot measures achieve a relatively high success rate, even in California where a supermajority (two-thirds) is required. Characteristics commonly found appealing in successful measures include: finite periods of implementation, specific project and expenditure plans, more local control of transportation investment decisions (Crabbe, et al. 2005, Hannay and Wachs 2007, Rand Corporation 2007), inclusion of citizen oversight committees (Hamideh, et al. 2008), multimodal project lists including transit (Werbel and Haas 2001, Surface Transportation Policy Partnership 2002), and an appeal to social justice promoting mobility for the “young, elderly, disabled, unemployed, and poor” (Levine, et al. 1999, 87).

Analyses of transportation ballot referenda also reveal that voters perceive these measures as having a transparent planning process, a fairer distribution of benefits across transportation modes and geography (Baldwin Hess and Lombardi 2005). However, Don Pickrell cautions that some of these characteristics may help proponents achieve victory more based on marketing skill than true merit of the project or projects (Pickrell 1992).

A further appeal of local transportation sales and property taxes is their broad tax base. For sales taxes, the appeal is greater, as the transaction is spread out over multiple, small transactions over the course of a year (Schweitzer and Taylor 2008). This feature allows a locality to generate higher revenues for a

lower marginal tax rate compared to other transportation financing mechanisms because the tax is spread out over a larger population that includes all consumers, not just users of the transportation system (Hannay and Wachs 2007). For example, an illustrative example used in a study conducted in Northern Virginia estimated a half-cent sales tax increase from 4.5 to 5 cents would raise \$140 million per year, while a similar increase of 5-cents per gallon increase in the gasoline tax would generate only \$60 million in revenue in the first year. The authors attribute this difference to the fact that a broad tax limits the ability for taxpayers to lower their tax liabilities by changing their spending behavior (Nelson, Parry and Wachs, *Is Northern Virginia Voting on the Right Transportation Tax* 2002).

Another aspect of LOTTs found to be appealing to those seeking their approval is that they can be adapted to public opinion. If a ballot initiative fails, the proposal may be revised and submitted for a future election. Sonoma County, California, for example, tried to pass five LTST measures before the sixth and current measure succeeded (Hamideh, et al. 2008).

The existing literature primarily focuses on the popularity of LOTTs as a funding mechanism compared to other types of transportation funding tools. This literature emphasizes the high success rate of the ballot measures focusing on the percentage of total wins over the total number of ballot measures. However, this simple figure does not provide a more nuanced understanding how LOTT ballot measures with a transit component are received, how many truly new taxes exist, and the characteristics of the people and places voting for transit. Those studies

that do seek to test the relationship between specific characteristics and election outcomes are limited in geographic scope and sample size, and are mainly focused on California (Hamideh, et al. 2008, Schweitzer and Taylor 2008, Rand Corporation 2007, Crabbe, et al. 2005, Sorenson 2006, E. R. Johnson 2011, Hannay and Wachs 2007).

Planning, Policy, and LOTTs

As discussed earlier in this section, there are a number of restrictions and rules related to how transportation funding can be spent. Three tensions these restrictions surface that are most relevant to LOTTs and transit are competition for funding between transportation modes, capital expenditures versus operating expenditures, and improvements to an existing system versus system expansion.

An examination of LOTTs shows that the factors that make them successful can have real effects on land use, governance, and infrastructure investment, and the following discussion provides a basic overview of some of these potential effects. The literature includes a number of criticisms of these local tax measures based on their potential implications for equity, land use, projects of regional and national significance, and governance. As noted above, two of the reasons for the success of ballot measures for LTSTs are the broad base upon which the tax draws from, as well as the apparent shift from the current planning bureaucracy to a mechanism that encourages direct democracy (Goldman and Wachs 2003). In a separate paper, Goldman asserts, “local direct democracy is increasingly changing the character of transportation funding and decision making in the United States” (Goldman 2007, 9). The following

discussion reviews the literature related to these two topics relevant for policy–equity and policy/planning implications.

Incidence and Efficiency of LOTTs

Local option transportation taxes, like any revenue tool, have accompanying equity and efficiency implications for policymakers and voters to consider. Neither the fuel tax nor the local sales tax conforms to the benefits or ability-to-pay principles that are often used to evaluate the fairness of these tools. The benefit principle states that the tax payment for a public service or good should be equal to the value of the benefit received by the consumer of that good or service. The ability to pay principle states that the amount an individual pays in taxes should directly relate to their economic status (Raimondo 1992). To provide a relative comparison, the fuel tax based on these principles as applied to road users is also provided. Fuel taxes are regressive with respect to income but are more or less progressive with respect to road use, while sales taxes are regressive both with respect to income and also with respect to driving behavior (Schweitzer and Taylor 2008, Sorenson 2006).

A paper examining the comparative distributional effects of transportation finance tools in Orange County, CA, found that under a sales tax financing system, lower-income households in Orange County who did not use the facility to be improved through the revenue would pay a larger share of their income and receive the least benefit (Schweitzer and Taylor 2008). Theoretically, if a measure existed with a significant portion of the funding designated for transit projects that

would actually benefit lower-income populations, rather than drivers, the issue of regressivity with respect to driving would be reduced. Alternatively, Reed proposes that the use of broad-based sources, rather than user fees is consistent with the beneficiary principle. He argues that because transportation underlies the nation's economy and quality of life it is a common good, rightly supported with general revenue (Reed 2009).

Further, from an economic theory perspective, the use of LOTTs also has efficiency implications for transportation systems. Economic efficiency is achieved when the marginal benefit of consuming a good or service is equal to the associated marginal cost. In a transportation context, drivers not faced with the true marginal cost consume more road space than is otherwise efficient, which leads to congestion and associated environmental damage (Downs 2004). Broad-based sales taxes and property taxes remove that opportunity to internalize costs (Sorenson 2006). Finally, LOTTs do not create incentives to use existing road space more efficiently or drive less, which could then contribute to inefficient land use and urban sprawl (Crabbe, et al. 2005, Sorenson 2006).

The Transportation Planning Process and LOTTs

Transportation issues, by nature, cross jurisdictional lines, which is one of the justifications for the creation of the Metropolitan Planning Organization (MPO)-driven transportation planning process. In metropolitan areas with a population greater than 50,000, a regional transportation planning and policy body (the MPO) has the authority and responsibility to develop short- and long-range

transportation plans and prioritize and program funding. Under the federal surface transportation authorization, the SAFETEA-LU, MPOs are required to consider planning factors such as the economy, safety, security, accessibility, sustainability, multimodalism, and efficiency (23 USC 134 (h) (1)).

One of the implications of most local ballot initiatives that have been passed, particularly at the county or regional level, is that they generally shift governance away from the MPO to a more local level with no requirement to consider the social, environmental, and land use goals MPOs must consider as planning factors.

In most cases, control over revenue generated from LOTTs actually bypasses this metropolitan-area transportation planning process. In Nevada, MPOs have control over local option gasoline and transit sales taxes, but this is the exception. Arizona MPOs have a very limited oversight role, and in California, County Transportation Commissions (CTCs) have oversight and are completely independent of MPOs.

This removal from the regional governing body also reduces the likelihood of investment in projects of regional significance, or projects perceived to primarily benefit other jurisdictions (Crabbe, et al. 2005, Nelson, Baglino, et al. 2006). If LOTTs already dedicate a significant portion of all of the transportation funding that will be available in the region, the regional planning body loses flexibility to address what the traditional transportation planning process identifies as regional transportation needs and priorities (Ward 2004).

Implications of Transportation Funding Flexibility & Restrictions on LOTTs

While many may hail the direct democratic nature of voter-approved project lists as positive, there are also potential negative impacts to overall investment in transportation infrastructure. Studies of past LOTTs found the expenditure plans were more likely to include large capital projects, especially high-profile projects, such as a light rail line or a major improvement to a highway. While these projects may be important and necessary, and potentially not possible without the LOTT, some may come at the expense of much-needed funding for operations and maintenance (O&M) of existing transportation infrastructure (Rand Corporation 2007). A further challenge was that the capital improvement projects sometimes resulted in additional operating costs to the system, but did not set aside tax revenues to cover those costs (Crabbe, et al. 2005). These challenges are further undermined by inaccurate forecasting and revenue shortfalls (National Cooperative Highway Research Program 2009), rising labor and energy costs (Crabbe, et al. 2005) as well as insufficient environmental mitigation funding (Rand Corporation 2007).

While the literature focuses primarily on the adverse implications of LOTTs, not all potential planning implications of LOTTs are adverse. Goldman acknowledges the potential problems associated with more direct local control over transportation investment decisions, but also contends that they create the flexibility and opportunity to address transportation problems in ways currently not possible under state and federal programs and restrictions (Goldman 2007).

For proponents of a more multimodal approach, in which the transportation networks for each mode are looked at as one interconnected transportation system, the success of multimodal expenditure plans generates revenues that may increase investment in transit and non-motorized transportation, especially in urban areas. As discussed above, current restrictions on federal and state fuel taxes limit the amount of money that can be spent on transit from these sources. LOTT measures, on the other hand provide the flexibility to assign funding to a number of modes of transportation. The Alameda County sales tax measure, for example, passed in 2000, designates 61% of revenue to non-automobile modes (Crabbe, et al. 2005).

In light of the restrictions operating assistance on federal formula and grants programs, LOTTs may also have the positive impact of increasing funding levels and funding security for O&M. For a transit agency, operating expenses comprise approximately two-thirds of expenses, while passenger fares cover on average approximately one-third of these expenses. With current federal transit funding primarily supporting capital investment, to address the operating fund shortfall, a number of state and local governments have sought to raise funds through these dedicated local tax measures.

The public transportation funding system that has evolved in the United States is complicated, with a particular mix of funding and mechanisms used that varies across the country and is different for each transit agency. These funding tools are then governed by rules and restrictions on what revenue may be spent on. In this funding environment, LOTTs are not simply an extension of existing

transportation tax mechanisms. These financing mechanisms also bring with them a surprising complexity and scope, with real implications for equity, efficiency, governance and especially, land use and transportation investment decisions. Given the vast challenges facing the transportation system, local policy makers and elected officials may increasingly feel pressure to generate revenue to invest in the transportation system; however, these potential long-term implications should be carefully weighed and considered, and whenever possible, localities should advance practices that avoid or mitigate potential adverse impacts described above. Addressing the broad set of potential impacts listed above is beyond the scope of this research, especially given the limited information available about LOTTs nationwide. The methodology, results, and discussion in the sections that follows seeks to provide additional insight into the relationship between public transportation funding and LOTTs that will serve to inform future research.

Chapter 3: Methodology

This research project seeks to contribute to existing knowledge through an examination of the relationship between LOTTs, particularly local transportation sales taxes (LTSTs) designated for transit, a relationship that remains largely unexplored in the transportation policy and planning literature. Specifically, this thesis examines recent trends in LOTTs through describing and analyzing:

- Trends and characteristics of the proposed LOTT ballot measures with a transit component from 2000-2011 (LOTT Ballot Measure Trend Analysis),
- The relationship between the outcome of LOTT ballot measures with a transit component and the characteristics of the taxes, as well as the characteristics of people and places voting on them (Election Outcomes Analysis)
- Transit funding from successfully local option county sales tax ballot measures with a transit component, investment by transit mode, and the planned use of the funds (Local County Sales Tax Transit Investment Analysis)

Something that does not emerge clearly from a review of the literature is a sense of who is voting on these LOTT ballot measures and how they fit into the broader picture of transportation finance, especially public transportation finance. For example, what are the demographics of places voting for and against these ballot measures and are revenues being used for operating existing service or expanding service? In my research I hope to explore these areas of analysis, while also addressing some of the gaps in the literature, using data that represent

wider geographic diversity, more current trends, and micro-level analysis of investment decisions.

Dataset Development

Underlying the analysis of the three components above was the development of a more in-depth dataset of LOTT ballot measures with a transit component. As the dataset is common to all three parts of the analysis, this methodology section first describes the data and information sources used to develop a LOTT transit ballot measure dataset. The second section of the methodology describes the methods used to conduct the three components of the analysis described above.

Underlying this research was the development of a dataset of local option sales and property tax ballot measures. Initially the goal was to find a comprehensive source that contained information on all LOTT ballot measures for all modes of transportation across the United States between 2000 and 2011; however, this information was not readily available and the effort required to gather these data are outside the scope of this thesis. While a comprehensive list of all transportation ballot referenda was unavailable, I was able to identify a resource that maintains a relatively comprehensive list of those ballot measures with a transit component. The Center for Transportation Excellence has sought to track and monitor all LOTT ballot measures with a transit component from 2000 to the present and maintains a resource with basic summary and outcome information for each of these measures. The CFTE election resource served as the source for dataset development (Center for Transportation Excellence 2012).

However, to conduct the analysis additional data were necessary, and in some cases, assumptions had to be made about how to characterize or measure certain variables. Table 3 presents an overview of the variables included in the dataset and the information sources used to gather the information.

Table 3: Initial Database Information

	Field	Description	Source(s)
1	State	State abbreviation	Center for Transportation Excellence Past Elections Resource
2	Ballot Year	Year of Initiative	Center for Transportation Excellence Past Elections Resource
3	Name of Geographic Entity	Name of locale voting on ballot measure	Center for Transportation Excellence Past Elections Resource
4	Type of Geographic Entity	State, City, County, Transit District, Other	Center for Transportation Excellence Past Elections Resource
5	Ballot outcome	Win, Loss	Center for Transportation Excellence Past Elections Resource
6	Approval %	Percentage voting yes	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database
7	Disapproval %	Percentage voting no	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database
8	Ballot history	Indicates whether this measure is an extension/renewal of existing tax or is new.	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
9	Tax increase	Indicates whether this measure represents an increase in tax rate	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans

	Field	Description	Source(s)
10	Tax history	Indicates whether a LOTT ballot measure with transit failed within the past 5 years.	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
11	Percentage of Funding for Transit	Indicates whether measure funding is entirely dedicated to transit	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
12	Transit Modes Funded	Bus, fixed guideway, both, or other (e.g., paratransit)	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
13	Transit Funding use	Capital, Operations and Maintenance Current system, or expansion of system	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
14	Year 1 Revenue	Amount of revenue forecast for year 1 of measure	Center for Transportation Excellence Past Elections Resource Website LexisNexis Academic News Database Ballot measure website and/or expenditure plans
15	Tax Duration	Number of years	Center for Transportation Excellence Past Elections Resource LexisNexis Academic News Database Ballot measure website and/or expenditure plans
16	Population Density	Persons per square mile	United States Census Bureau- 2010 Census
17	Median Household Income	Measure of income of geographic entity	United States Census Bureau – American Community Survey

	Field	Description	Source(s)
18	Race	Measure of percentage of the population	United States Census Bureau- 2010 Census
19	Hispanic Origin	Measure of percentage of the population	United States Census Bureau- 2010 Census
20	State fuel tax restriction for highway only	Yes/no	National Congress of State Legislatures

The information sources, process, and assumptions used to develop the dataset are described in more detail below.

Ballot Measure Information (Rows 1-15)

The main source used for this research was the CFTE, which maintains information on specific transit initiatives by year. The primary limitation of this source is that it does not represent the population of all transportation ballot measures, only those that include a transit component. For those measures with a transit component, CFTE stated that it believes the list to be comprehensive. As a result of this limitation, the analysis and research focused on questions related to transit investment and trends, but did not include analysis comparing referenda with and without transit funding. Another potential limitation on the comprehensiveness of the dataset is that these data were only available for measures starting in 2000. If a 30-year ballot measure passed in 1999 it would not show up in the dataset and would not be represented in summary statistics or analysis based on the CFTE data.

The focus of this research was on binding broad-based local (defined as county and city and transit districts with taxing authority) dedicated transportation

taxes. Because of the way the data were presented, it was sometimes difficult to determine whether ballot measures were put to voters by a transit district or county, so this characterization was influenced by CFTEs reporting of the ballot measures. Where it seemed that multi-jurisdictional measures would be implemented in each voting county independently, they were separated, and where success seemed to depend on a percentage across all counties, they were kept together as one measure.

CFTE's data contains statewide measures, bond measures, anti-tolling measures, advisory and non-binding measures, and user fees (gas taxes, car-tab fees, and vehicle fees). Because these measures are not broad-based dedicated transportation taxes, they were excluded from the dataset. After removal of these measures, the resulting number of ballot measures from 2000-2011 in the dataset was 274.

For all 274 ballot measures in the dataset, CFTE provided the state, year, type of tax or finance measure, name of the geographic entity, and election outcome (win or loss). As a first step, the description fields were parsed for data items 6 through 10. If these data were not available in the description field, the missing information was gathered through searches of individual transit referenda websites and expenditure plans, as well as local news coverage using LexisNexis Academic (Lexis Nexis Academic n.d.). For a small number of ballot measures, particularly city-level measures from the early 2000s, certain information was not available. One of the elements least likely to be available was information on recent failures (defined for this research as a failure within the past five years). If

this information was not recorded anywhere, the LOTT dataset itself became the source of this information. A limitation of this approach is that for ballot measures in the dataset from prior to 2005, data from prior to 2000 was unavailable. For example, a city with a ballot measure election in 2002 may have had an unsuccessful LOTT measure in 1999, but that information was not always captured by CFTE. In these cases, unless a failure appeared in the dataset, the field was recorded as unknown and excluded from the analysis.

Collecting detailed information on all 274 ballot measures would require a level of effort beyond the scope of this research. Instead, I selected a subset of the measures to collect additional information and conduct a more in-depth analysis that included county and transit district sales tax measures. Data items 13-15 were collected for the subset of county and transit district sales taxes.

All of these transportation ballot measures were voted on during elections, suggesting that more information on the expenditure plan was available at that time to the voting public. An example of one of these plans is the expenditure plan for Measure R in Los Angeles, which includes the anticipated revenue forecast, project list, estimated cost, other funding, year of fund availability, and expected completion (Los Angeles Metro 2008).

Transit expenditure plans and ballot language, however, were not available online for all of the county sales tax measures. If necessary, the missing information was gathered from local news coverage using LexisNexis Academic. For the variable funding in year one, information was often presented in that way, but not always. When only total expected revenue over the course of the ballot

measure was available, I divided that over the duration of the tax. This may result in a slightly different number than revenue in year one because of changing underlying revenue forecasting assumptions, but should at least provide a good approximation.

One limitation worth noting was the difficulty in distinguishing whether a renewal was the result of a tax reaching the end of its duration, or because additional revenue was needed due to shortfalls in forecasted revenue from the prior tax. This distinction could influence whether or not a ballot measure was successful, but is not captured in the data analysis.

Demographic and Socioeconomic Information (Rows 16-19)

Demographic and socioeconomic data from the U.S. Census Bureau were used to provide context to the counties and municipalities that voted on the LOTT ballot measures. The variables extracted from the 2010 U.S. Census and matched to ballot referenda were race, Hispanic origin, and population density (U.S. Census Bureau 2012). An acknowledged limitation of this approach is that there may have been demographic or socioeconomic changes between the time of the ballot measure and the 2010 data. This may be less of an issue with household median income data, as it is based on the 2006-2010 American Community Survey (U.S. Census Bureau 2012). These data were merged with the ballot measure data using the Federal Information Processing Standards (FIPS) place codes as an identifier.

In some cases, multiple counties voted on the same LOTT ballot measure as part of a multi-jurisdictional regional effort or transit district with taxation authority. For these cases, the demographic and income measures represent an average across all of the jurisdictions involved. For example, seven counties voted on the FasTracks measure from the Regional Transportation District in the Denver metropolitan area.

State Fuel Tax Restrictions (Row 20)

To conduct an analysis on the relationship between the transportation funding restrictions described in Chapter 2, which may help suggest what constraints or pressures a state is facing for transit finance, information was gathered using a recent report, *Transportation Governance and Finance: A 50-State Review of State Legislatures and Departments of Transportation* (Rall, et al. 2011). The information extracted from this report was whether or not the state had statutory or constitutional prohibition on fuel tax funding. The information is also presented in the map in Figure 1 in Chapter 2.

Analysis Methodology

This section presents the methods used to perform the three components of the analysis: understanding recent trends in LOTTs; examining the relationship between these taxes, the people and places voting for them, and their outcome; and understanding how LOTTs contribute to transit investment. The analysis of the dataset above consisted of three components: a trend analysis summarizing and describing LOTT transit referenda, an election outcomes analysis, and a

transit investment analysis of successfully local option county sales tax measures with a transit component. The primary software program used to analyze these data was Stata Version 12 (College Station, TX).

LOTT Ballot Measure Trend Analysis

The first component of this research is an exploratory analysis of the dataset described above. The analysis consists of summarization and description of trends based on the available data described above. The data were examined and presented using summary statistics, tables, and graphics describing the prevalence, history, geographic distribution, and tax characteristics of LOTT ballot measures that occurred between 2000-2011. The trend analysis examined the 274 ballot measures in the dataset, summarizing the measures by geographic entity (city, county, or transit district) and by tax type (property tax or sales tax). Tables also present a summary of whether the ballot measures would increase the tax rate and whether they were extensions of existing transportation taxes. The ballot measures were also summarized by their distribution across the 12-year period and their distribution and frequency across the United States.

Election Outcomes Analysis

In order to build on the existing literature and understand LOTT transit ballot measures in greater detail, statistical analyses are conducted to test the relationship between election outcome and (1) characteristics of LOTT ballot measures, (2) the state transit funding context, and (3) demographic and socioeconomic characteristics of the population of cities and counties voting. As the dataset includes only ballot measures with a transit component, a limitation of

these tests is that results will only be applicable to those measures, and not the universal set of all LOTT ballot measures. As this research is intended to examine the LOTTs in the context of transit funding, this should not be a major limitation.

A series of chi-square tests of independence were performed to examine the relationships described above. In all cases, the null hypothesis tested was that the success or failure of a LOTT ballot measures was independent of the tax or state characteristic being tested. These hypotheses included:

1. Election outcome is independent of whether or not the LOTT ballot measure increased tax rates
2. Election outcome is independent of whether or not the LOTT ballot measure was an extension of an existing dedicated tax
3. Election outcome is independent of whether or not a LOTT ballot measure had failed in the same locality within the past five years
4. Election outcome is independent of whether or not the LOTT ballot measure is both new and represents an increase in tax rate
5. Election outcome is independent of whether or not the state within which the LOTT ballot measure occurred prohibited the use of fuel tax revenue for public transportation

The chi-square tests were conducted on the dataset of all LOTT transit ballot measures, as well as subcategories of the data such as property taxes only, sales taxes only, cities, and counties. The results of these tests are presented in Chapter 4.

In addition to examining the relationship between tax characteristics, another area of analysis was to examine LOTT ballot measures and the characteristics of places where these measures are successful. Because much of the data in this analysis is categorical and not normally distributed, nonparametric

inference tools, those that do not require the underlying population distribution to be normal, were necessary; rather than t-tests, the Mann-Whitney test (also known as the Wilcoxon rank sum test or the Mann-Whitney-Wilcoxon test) were used (Johnson and Bhattacharyya 2006). The Mann-Whitney test tests the null hypothesis that two groups or samples of unmatched data are from populations with the same distribution/median values.

The null hypothesis being tested in each was that there was no significant difference in the underlying distribution of the independent variable of interest in places with successful and unsuccessful transit ballot measures. For the variable population density, the Mann-Whitney tests were performed on the dataset of all LOTT transit ballot measures, as well as subcategories of the data such as property taxes only, sales taxes only, cities, and counties. It is possible that population density may be higher in places voting to approve LOTT transit ballot measures because these denser communities are more transit-oriented. It also could be that places that are less dense have a greater need of revenue because the farebox recovery ratio (fraction of operating expenses met by fares) is lower in lower-density areas with lower transit ridership. For the demographic variables median household income, and percentage of population by race (white, black, and Hispanic), were performed on the subset of county sales tax measures.

Mann-Whitney tests were also performed to test the null hypotheses that there were no significant difference in the underlying distribution of the percentage of approval for each ballot measure between (1) LOTT ballot measures that increased tax rates and those that did not, and (2) LOTT ballot

measures that were an extension or renewal (increase in rate or not) of existing LOTTs.

Local County Sales Tax Transit Investment Analysis

The third section of analysis (Transit Investment), seeks to expand the scope and level of detail of transit funding measure analysis using a subset of the data described above, successful county sales tax measures. Chapter 2 reviewed available information on LOTT ballot measures with a transit component. This literature primarily focuses on the popularity and appeal of LOTTs, as well as their potential planning implications. Very little literature has explored how the revenue raised by the ballot measures was distributed. However, a full analysis of the distribution of transit funds was not possible due to the previously discussed limitation that no data source exists containing all transportation ballot measures, including those without a transit component. What was possible given available data was to learn more about the variation in transit investment across those LOTT ballot measures with a transit component with respect to modal distribution of investment and planned use of the funds.

Because of limited data availability and time constraints, this part of the research used a subset of the data – the 49 successful local county sales tax measures with a transit component. Because of limited data availability, this analysis was descriptive and exploratory in nature and did not include statistical analysis. The data were examined and presented using summary statistics, tables, and graphics to describe and examine the variation in successful local option county sales tax measures that occurred between 2000-2011. Areas summarized

include: distribution of funds between transit and non-transit modes of transportation, investment by transit mode, whether the funds were intended for capital improvements or O&M, and whether the funds were intended for existing transit system preservation and improvement or system expansion.

To address these issues, each ballot measure was coded based on information in the CFTE description, the project expenditure plan and website, and if necessary, local news coverage found through the LexisNexis Academic database. For each of the subset of ballot measures, information was gathered on the percentage of funds from that measure dedicated to transit. Each ballot measure was also coded for the presence of each of the transit modes:

- Heavy rail (subway/metro)
- Light rail
- Commuter rail
- Buses
- Bus rapid transit

Each measure was also coded for the planned use of the funds and was classified either as capital improvements, O&M, or both. Another set of classification for each measure was preservation and improvement of existing lines, routes, and facilities of a transit system, new lines or services to expand a transit system, or both. Rows 11-15 of Table 3 present the information collected and used for the local county sales tax transit investment analysis. A limitation of this analysis is that the classification for the purposes of this research of what

constitutes the primary use of transit funds was based on judgment of available information and not a specific threshold or exact criteria.

Some challenges arose when collecting information for this part of the research. Approximating transit funding was difficult because for some measures, only the amount of revenue anticipated in year one of the measure was provided, while for others, only the 20 or 30 year total of funds was available. A rough proxy measure based on the percent transit and amount of revenue in year one was used to at least provide a sense of the magnitude of the funding dedicated to transit.

Chapter 4 presents the results of the analysis using the methodology described in this chapter. Discussion and analysis of the results, their policy implications, and areas for future research based on those results are included in Chapter 5.

Chapter 4: Results

This section presents the results of the analysis on the datasets described in Chapter 2, which serves to further the research objectives of understanding recent trends in LOTTs, what these trends suggest about public interest in transit and limitations in the current transportation funding system, and how LOTTs contribute to transit investment.

This first part of this section (Trend Analysis) presents the results of descriptive analysis and summarization of LOTT transit referenda. Chapter 2 provided an overview of LOTTs and describes the history and extent of transportation ballot measures in the United States and reviews the literature on their success and appeal. This section expands on that existing information through trend analysis of LOTT prevalence, history, characteristics, and election outcomes using the dataset of all transit tax referenda that occurred from 2000-2011. It is important to note that the measures below are not representative of all ballot measures that occurred during those years; rather, the dataset includes only referenda tracked by the Center for Transportation Excellence, which all have dedicated funding for transit or the potential use for transit funding.

Following this overview, in the Election Outcome section, are the results of a series of statistical tests on the relationship between LOTT ballot referenda outcomes and the characteristics of recent transit referenda and the people and places. Some of these tests were conducted on the dataset of all LOTTs. Due to data constraints of this research described in the methodology section, others were

conducted only on the subset of the data comprised of county and transit district sales taxes.

The third section (Transit Investment) seeks to expand the scope and level of detail of transit funding measure analysis using the subset of the data, successful county sales tax measures. The results presented include transit funding levels, investment by transit mode, and categories of funding use.

LOTT Ballot Measure Trend Analysis

Between 2000 and 2011, cities, counties, and transit districts presented voters with 274 ballot measures with a transit component for sales or property taxes. Table 4 presents the breakdown of these measures by tax type and geographic entity.

Table 4: Number of LOTTs Measures by Type and Political Unit

Tax Type	Type of Jurisdiction	Number of Ballot Measures (2000-2011)	Percentage
Property Taxes	City	62	22.6%
	County	61	22.3%
	Transit District	3	1%
Sales Tax	City	66	24.1%
	County	78	28.5%
	Transit District	4	1.5%
Total		274	100%

Source: Center for Transportation Excellence 2012

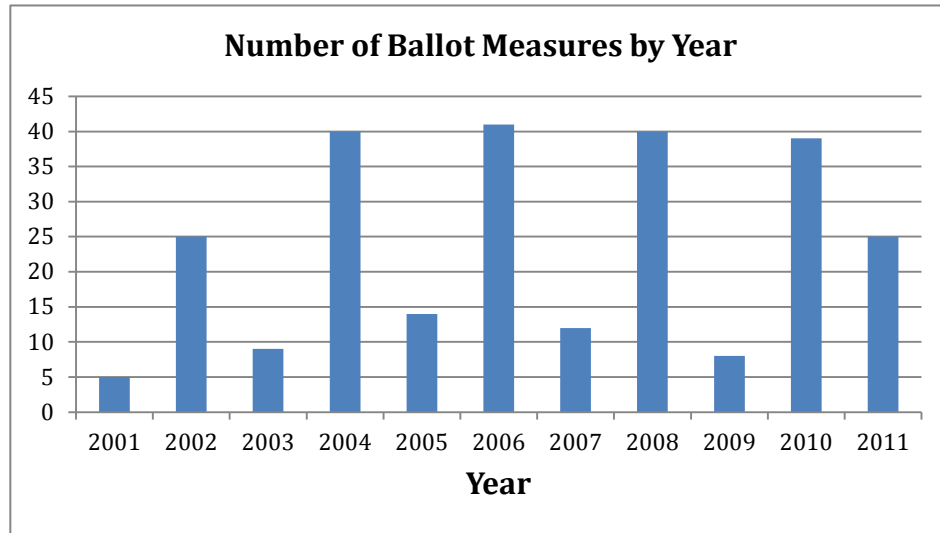
Just under half of the LOTT ballot measures are property taxes, which are levied based on the value of property and are often expressed in mills, defined as dollars per thousand dollars of value). For each of these measures, information on whether or not the ballot measure represented an increase in tax rate was collected as part of the data gathering effort. Due to limited reporting of the amount of the change in tax rate in the CFTE data and local media coverage, that information

was not collected to be included in this research. For measures in which CFTE did report the information, most sought increases of one mill or less and several were in the range of one mill to three mills. The information available also did not generally describe how the proposed millage compared to the existing tax rate.

As with the property taxes, information on sales tax rates was available in the source data from CFTE. With sales taxes, approximately half of the measures for which a tax rate amount was included in the description were half-cent increases or extensions. The other measures were primarily new taxes or extensions between two-tenths and one-half cent, as well as several one-cent sales taxes.

Figure 2 shows the number of LOTT ballot measures in the dataset by year. From the chart, it is clear that the measures have not been distributed evenly over the 12-year period. Almost three-quarters of the measures took place in election years, though 2011 saw a greater number of measures than past non-election years, possibly in part because of local government funding shortfalls.

Figure 2: Number of Local Option Transportation Tax Ballot Measures by Year



The additional data collected allowed a further breakdown of the taxes by whether they were measures for a tax increase or not, as well as whether the measure was an extension of an existing transit tax or not. These classifications were made based on information available in the CFTE ballot measure description, as well as local news coverage of the referenda. Information could not be located for all ballot measures. Also, information on any corresponding reductions elsewhere in the tax structure was not readily available.

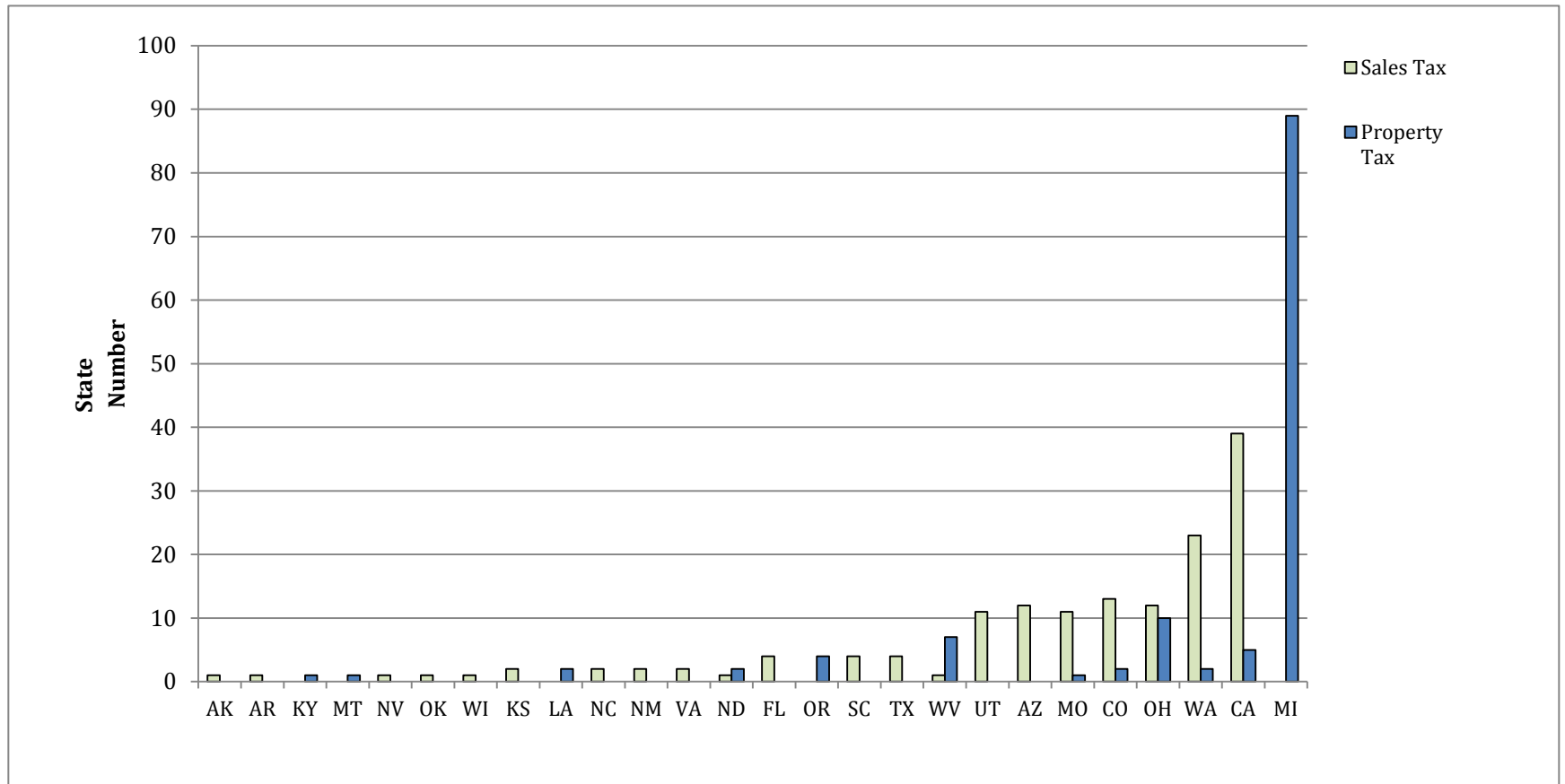
Table 5 presents these results. Just over two-thirds of these ballot measures proposed would result in a tax increase. Approximately half extended an existing transportation tax either at its current rate or at a higher rate. One measure proposed was a first time dedicated tax for transportation, but was proposed in such a way that it would keep the net tax rate the same.

Table 5: Characteristics of Local Option Transportation Tax Ballot Measures

Tax Increase Status	Extension Status	Number	Percent
No Tax Increase	New	1	0.3%
	Extension	79	28.9%
	Total	80	29.2%
Tax Increase	New	135	49.3%
	Extension	50	18.2%
	Total	185	67.5%
Data unavailable		9	3.3%
Totals		274	100%

Between 2000 and 2011, 26 states voted on sales or property tax LOTT ballot measures. As noted in Chapter 2, not all states permit local sales taxes or the dedication of revenue for a particular use. Even within those states that have the appropriate authorizations in place, there is variation in the use of voter-approved LOTTs sales and property taxes. While some of the variation can be explained by what state and local authorities permit, some also is based on local characteristics and differences. Figure 3 (below) shows the breakdown of taxes by state and type of tax. Michigan had the most ballot measures, all of which were property taxes. California had the second highest number with 44 measures, most of which were sales tax measures. Only eight states had more than 10 ballot measures.

Figure 3: Number and Type of LOTT Ballot Measures by State



In addition to analysis of the dataset of all local option sales and property tax ballot measures, this effort also included more in-depth analysis of a subset of the ballot measures – county sales taxes. Table 6 presents the number of successful and unsuccessful county sales tax measures by state. Nevada is the only state of the 12 below in which a county transit sales tax has been attempted, but has never succeeded.

Table 6: Local County Sales Tax Measures by State

State	Total	Win	Loss
AZ	1	1	0
CA	36	18	18
CO	4	3	1
FL	4	1	3
MO	1	1	0
NC	1	1	0
NM	2	2	0
NV	1	0	1
OH	10	4	6
SC	3	1	2
UT	10	9	1
WA	11	8	3
Totals	84	49	35

Election Outcomes Analysis

While literature exists that examines the appeal and success of LOTTs, no existing study reviewed performed statistical analysis of these factors on all LOTT measures nationwide. Table 7 shows the breakdown of wins and losses for all LOTT ballot measures in the dataset. This section presents the results of statistical analyses on the relationship between election outcome and (1) characteristics of LOTT ballot measures, (2) the state transit funding context, and

(3) demographic and socioeconomic characteristics of the population of cities and counties voting.

Table 7: LOTT Ballot Measure Outcomes

Outcome	Number of Ballot Measures	Percent
Win	82	30%
Loss	192	70%
Totals	274	100%

One of the objectives of this research was to understand more about trends in these elections using available data for all LOTTs between 2000 and 2011. The data collected allowed this figure to be broken down further by tax characteristics and chi-square tests of independence were performed to examine the relationship between LOTT ballot measure characteristics and election outcomes. The results of these tests are presented in Table 8.

Table 8: Election Outcome Chi-Square Test Results

	Election Outcome		Total	Trend
	Loss	Win		
Tax Increase Status (All LOTTs)				More likely to pass if no increase in tax rate (p<0.01)
No increase	5	75	80	
Increase	77	114	191	
<i>Total</i>	82	189	271	
Tax Increase Status (Property Taxes)				More likely to pass if no increase in tax rate (p<0.01)
No increase	3	50	53	
Increase	21	50	71	
<i>Total</i>	24	100	124	
Tax Increase Status (Sales Taxes)				More likely to pass if no increase in tax rate (p<0.01)
No increase	2	25	27	
Increase	56	64	120	
<i>Total</i>	58	89	147	
Tax Extension Status				More likely to pass if ballot measure extends existing tax (p<0.01)
No extension	63	74	137	
Extension	17	113	130	
<i>Total</i>	80	187	267	

	Election Outcome		Total	Trend
	Loss	Win		
Recent Failure Status				More likely to pass if ballot measure has not failed in past 5 years (p<0.10)
No recent failure	39	116	155	
Recent failure	16	26	42	
<i>Total</i>	55	142	197	
Tax LOTT that increases tax rate but is not an extension				Less likely to pass if ballot measure increases tax rate and is not an extension (p<0.01)
No increase and/or extension	5	74	79	
Tax increase and no extension	63	72	135	
<i>Total</i>	68	146	214	
State fuel tax restriction (all LOTT measures)				No statistically significant relationship
No restriction	42	111	153	
Restriction	40	81	121	
<i>Total</i>	82	192	274	
State fuel tax restriction (Sales Taxes only)				More likely to pass in state with fuel tax restrictions (p<0.05)
No restriction	28	29	57	
Restriction	30	61	91	
<i>Total</i>	58	90	148	
State fuel tax restriction (Property Taxes Only)				More likely to pass in state with fuel tax restrictions (p<0.05)
No restriction	14	82	96	
Restriction	10	20	30	
<i>Total</i>	24	102	126	

One of the election outcome hypotheses was that LOTT measures that would result in an increase from existing tax rates would be less likely to succeed than those that were extensions of existing tax rates. For the whole population of LOTTs ballot measures, 93.75% of non-increases passed, while 60% of those that represented a tax increase were successful. For the subset of sales taxes, only 53% of increases were successful. All of these differences were statistically significant at the 5% level.

Another hypothesis was that measures occurring where a dedicated tax already existed would be more likely to succeed than measures that would result in the establishment of a new LOTT, for both tax increases and non-increases. For

all LOTTs in the dataset, 86% of tax extensions were successful, while 54% of non-extension ballot measures passed. Another test performed examined the relationship between the difference in success between a new dedicated tax (non-extension) representing an increase, and other measures. Fifty-three percent of those measures that were not extensions and would increase the tax rate were successful compared with 93.7% of referenda that were not an increase and/or extension. All of these measures were statistically significant at the 5% level.

In some cases, if a LOTT measure fails, the same or similar measure may be brought before voters again. A chi-square test was performed to examine the relationship between recent failures (defined as the presence of an unsuccessful vote in the five years preceding an election) and election outcome. Seventy-five percent of those measures without recent failures passed, compared with 62% that were preceded by unsuccessful measures. This relationship was marginally statistically significant, with a p-value of 0.097.

As discussed in Chapter 2, some states statutorily or constitutionally prohibit the use of fuel taxes for public transportation expenditures. There was no statistically significant difference in election outcome in measures in states with and without fuel tax restrictions when tested for all 274 measures. Once the data were separated out into subsets of tax type, relationships were revealed that were otherwise not clear in the whole dataset. For both sales and property taxes, there was a statistically significant difference in election outcome between states with fuel tax restrictions and states without fuel tax restrictions at the 5% level. Ballot measures were more likely to pass in states with restrictions prohibiting fuel tax

revenue to be spent on transit. For the population of all LOTT ballot measures, the relationship was not statistically significant.

In addition to examining the relationship between tax characteristics, another area of analysis was to examine LOTT ballot measures and the characteristics of places where these measures are successful. To this end, the relationships between certain demographic variables and LOTT ballot measure election outcomes were compared using the Wilcoxon-Mann-Whitney two-sample rank-sum test.

Table 9: Wilcoxon-Mann-Whitney Two-Sample Test Results

Variable and subset of LOTTs	Election Outcome		Probability
	Loss (Mean of variable)	Win (Mean of variable)	
(1) Average population density (all LOTTs)	1,470 (n=77)	1,639 (n=181)	0.95
(2) Average population density (Property Taxes)	2,138 (n=21)	1,592 (n=92)	0.11
(3) Average population density (Sales Taxes)	1,219 (n=56)	1,688 (n=89)	0.25
(4) Average population density (County Sales Taxes)	660 pop/sq. mile (n=35)	1,133 pop/sq. mile (n=49)	0.37
(5) Median household income (county sales taxes)	\$62,226 (n=35)	\$56,670 (n=47)	0.03
(6) Percent white (county sales taxes)	70.4% (n=35)	71.3% (n=47)	0.72
(7) Percent black (county sales taxes)	5.2% (n=35)	9.8% (n=47)	0.04
(8) Percent Hispanic (county sales taxes)	24.1% (n=35)	20.3% (n=47)	0.16

For tests 1-4 presented in Table 9, the null hypothesis being tested in each was that there was no significant difference in the distribution of population density between successful and unsuccessful LOTT ballot measures. These tests did not show any statistically significant difference in population density by election outcome. Additional tests were conducted for subsets of the data, broken down by geography, as well as into each possible combination of geography and tax type. None of these tests were statistically significant.

Additional demographic variables were available to test the subset of data on county sales taxes. The results of tests 5 and 7 were statistically significant, indicating lower median household income in places with successful LOTT ballot measures, and lower percentage of the population identifying as black in places with successful LOTT ballot measures. No statistically significant relationship existed for percent white or percent Hispanic.

Figure 4: Average Approval Margin by Year for Successful LOTT Ballot Measures

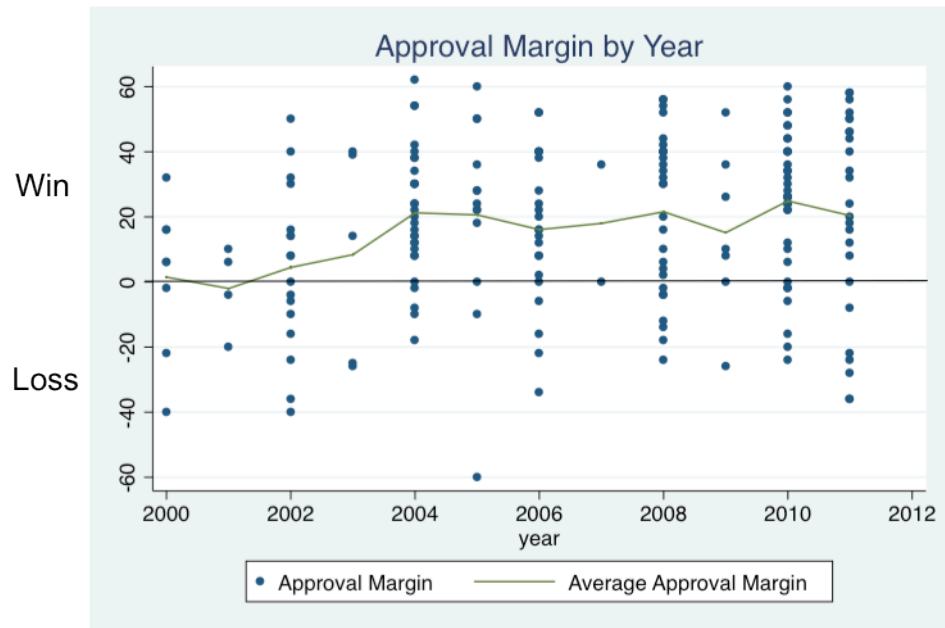


Figure 4 (above) displays the approval margin for each LOTT ballot measure for each election where data were available. A positive approval margin indicates a win, while an approval margin of less than zero signifies a loss. The line shows the average approval margin across all ballot measures for each year.

The prior set of test results presented examined the binary outcome variable for a ballot measure win or loss. A second series of Mann-Whitney two-sample tests were conducted using the actual percentage of voters approving the measure (Table 10), testing the hypothesis that there was no significant difference in the distribution of the percentage of approval votes between ballot measures that increase and do not increase taxes. Table 11 shows the results of the test of the hypothesis that there was no significant difference in the percentage of

approval votes between ballot measures that were extensions of existing taxes and those that were not. In both cases, the differences were statistically significant, which is consistent with the results of the chi-square test described in Table 8.

Table 10: LOTT Approval Percentage by Tax Increase Status

Variable	No Increase (n=74)	Tax Increase (n=167)	Probability
Approval	68.29%	56.05%	0.000

Table 11: LOTT Approval Percentage by Tax Extension Status

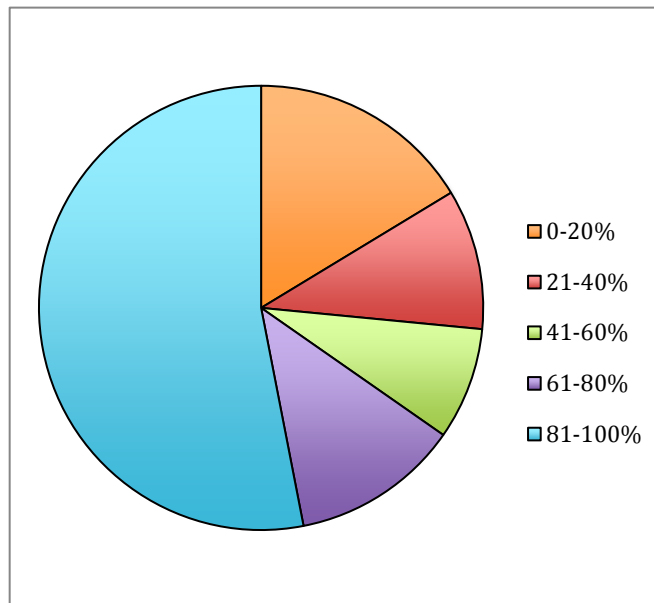
Variable	No Extension (n=123)	Tax Extension (n=116)	Probability
Approval	54.47%	65.4%	0.000

Local County Sales Tax Transit Investment Analysis

Another objective of this research was to gain a more in-depth understanding of how revenue from these LOTT ballot measures with a transit component fit into the transit funding environment. Very little literature has explored how the revenue raised by the ballot measures was distributed. However, a full analysis of the distribution of transit funds was not possible due to the unavailability of a data source all transportation ballot measures, including those without a transit component. What was possible given available data was to learn more about the variation in transit investment across those LOTT ballot measures with a transit component with respect to modal distribution of investment and planned use of the funds.

Chapter 2 provided an overview of how public transportation is funded and why LOTT ballot measures are a popular mechanism for raising revenue for transit. To date, very few studies have compiled information on the amount of transit funding or types of transit paid for by LOTTs. This section expands on that literature through an analysis of the variation in transit funding levels, transit mode split, and funding uses within the subset of all U.S. county sales tax ballot measures that were successful.

Figure 5: Percentage of Local Option County Sales Tax Revenue with a Transit Component to be Dedicated to Transit

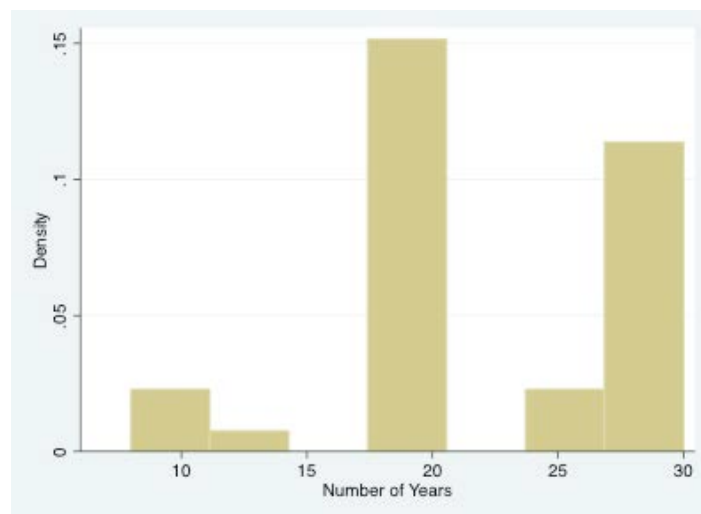


LOTT ballot measures with a transit component vary in the amount of funding dedicated to transit. An in-depth accounting of all funding across all ballot measures was not feasible within this analysis and the information readily available, but some analysis was possible. Some measures are fully dedicated to transit, while others are multimodal with funds dedicated to transit, roads and

highways, and bicycle and pedestrian improvements. Figure 5 shows the breakdown of the percentage of each of 49 of the successful county sales tax dedicated to transit. Over half of the measures dedicated 81-100 percent of their revenue to transit, while only 16 percent dedicated less than 20% of the funding to transit. Thirty percent dedicated between 21 and 80 percent of the sales tax revenue to transit.

Another area of variation examined was the duration of these county sales tax measures. The county sales tax measures that passed varied in the duration over which the sales tax was to be levied. Figure 6 shows a histogram the duration of twenty-five of these county sales tax measures. Not included in this histogram are six measures which had open-ended durations, and eighteen for which duration information was not available.

Figure 6: Histogram of the Duration of Successful County Sales Tax Measures

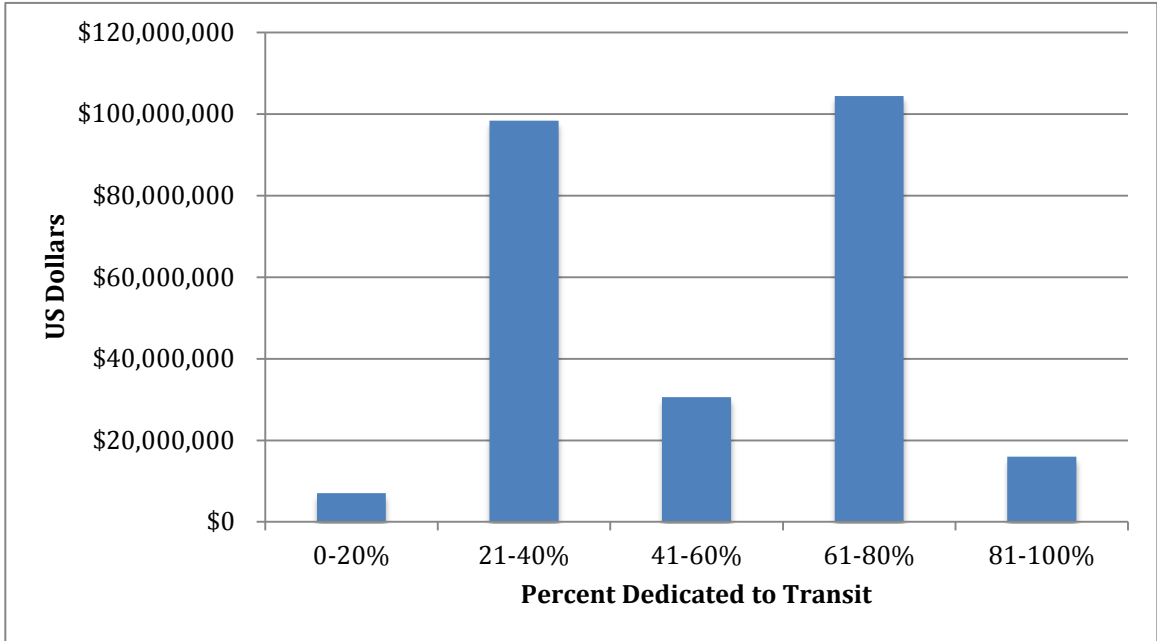


The successful local county sales tax measures with a transit component also varied in the levels of anticipated revenue. The sum of the total year one

funding across all successful county sales tax measures was approximately \$7.5 billion. The amount of that dedicated to transit is approximately \$4.6 billion (61%). This is an imperfect, rough approximation of the amount of transit funding versus non-transit funding in the measures that passed. The approximation is very rough because year one varies across measures, the revenue projections are not flat across the lifespan of measures, and the amounts are not adjusted for inflation. This figure is consistent with the literature that transit is a significant component of these measures, although it does not account for highway only measures.

Figure 7 provides a rough approximation of the level of funding dedicated to transit for 49 of the ballot measures by each of the quintiles presented in Figure 5. The measure was calculated as the median value of year one funding dedicated to transit by quintile. The measures with the least and the most funding dedicated to transit tend to be lower in value than those dedicating between 21% and 80%. The median value of those dedicating between 61% and 80% of funding is the highest.

Figure 7: Median Revenue to be Dedicated to Transit from Successful County Sales Tax Measure with a Transit Component by Quintile

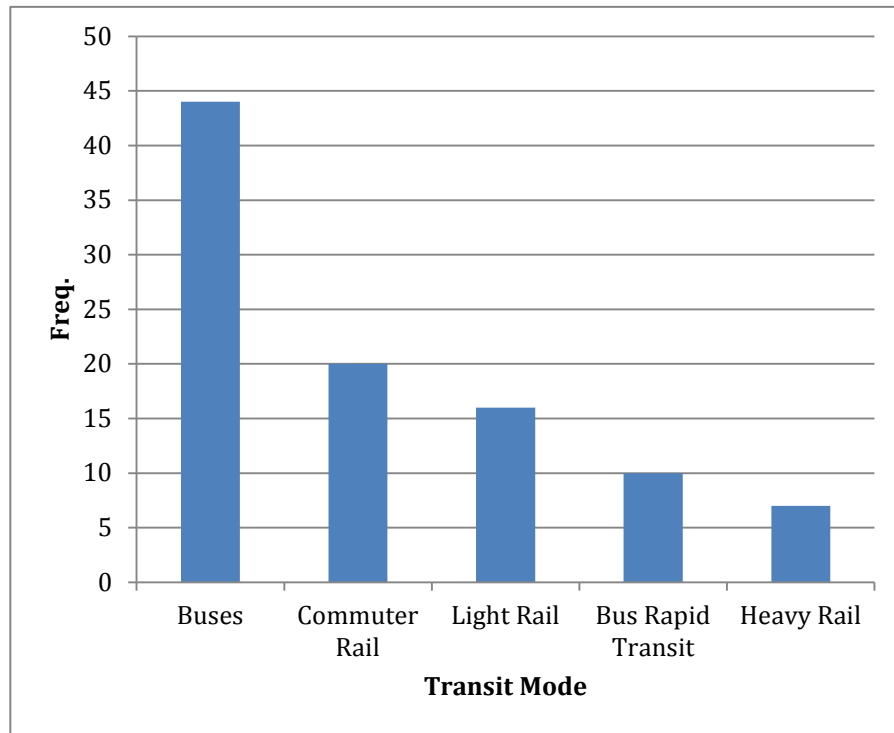


The successful county sales tax measures dedicated funding to the different types of transit, buses, commuter rail, light rail, heavy rail (subways), and bus rapid transit (BRT).

Figure 8 shows the amount of measures including funding for each transit mode. Out of the 49 measures for which modal information was available, 44 included buses, 20 included commuter rail, and 16 included light rail.² No analysis was conducted on how many of these went to the same transit system, but this would be an interesting area of future research.

² Paratransit services were included in the bus category.

Figure 8: Frequency of Transit Modes in Successful County Sales Tax Expenditure Plan



As discussed in the background section, past studies have observed that these expenditure plans are more likely to include large capital projects, especially high-profile projects, such as a light rail line or a major improvement to a highway. A number of these studies were written prior to 2003, so to examine more recent trends, one of the data elements collected was whether the measures that passed were primarily capital investment focused or operations focused. This determination was based on a reading of the expenditure plan and description of the ballot measure, not a set of specific criteria, so the breakdown of the 49 measures included in Figure 9 is a rough estimate. Nearly half of the measures seemed primarily focused on operations and maintenance rather than capital.

Anecdotally, based on the review of expenditure plans, it seems that smaller, bus-only transit agencies were especially focused on operations costs.

Figure 9: Distribution of Planned Use of Revenue from Successful Local County Sales Tax Measures Between Capital Improvements and Operations and Maintenance

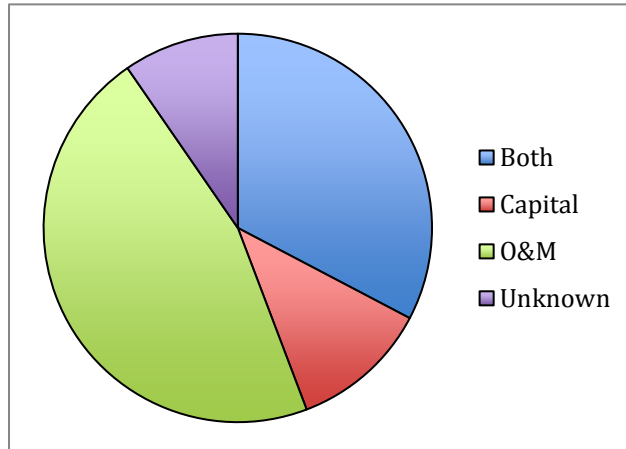
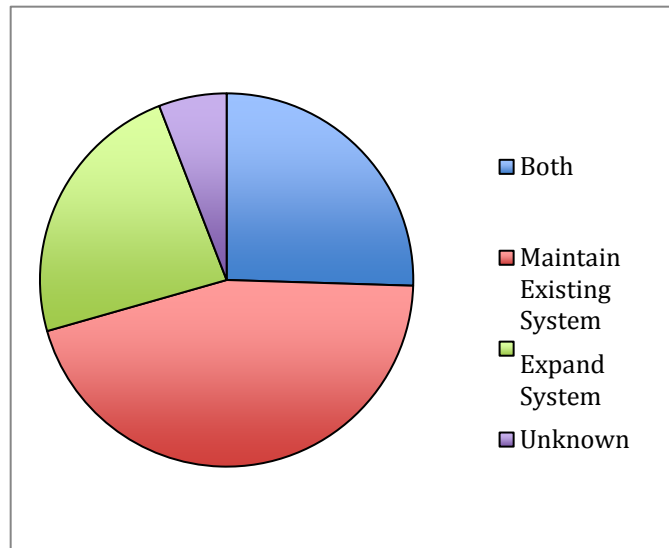


Figure 10: Distribution of Planned Use of Revenue from Successful Local County Sales Tax Measures Between System Maintenance and System Expansion



Often, large capital projects are extensions of transit systems, such as an extension of a commuter rail line or a new bus rapid transit system. In transit funding, a tension exists between improving and maintaining the existing system

and expanding service to new places. The county sales tax measures were categorized according to a system maintenance or system expansion focus. Again, this determination was based on a reading of the expenditure plan and description of the ballot measure, not a specific set of criteria, so the breakdown presented in Figure 10 represents a rough estimate. Nearly half of the measures were primarily focused on maintaining or improving the existing system. In reviewing the expenditure plan descriptions, several of the measures focused primarily on warding off massive cuts in service. For the short-term property taxes, that objective seemed even more common.

This section examined trends in LOTT ballot measures, election outcomes, and transit investment. The next chapter describes how these results connect together, potential policy implications, and areas for further research.

Chapter 5: Policy Considerations and Areas for Future Research

This research sought to add to the existing literature on LOTTs by summarizing and describing trends in LOTTs from 2000 to 2011, analyzing the relationship between these taxes, the people and places voting for them, and their outcome, and finally, by analyzing how LOTTs contribute to investment in public transportation. The ability to generalize these results is limited, as they are based on a dataset that only includes LOTT ballot measures with a transit component. In some cases, the analysis relied on a subset of that dataset. An analysis of all LOTT ballot measures, including those that dedicated funding only to highways would provide more insight into the amount of transit funding that comes from LOTTs compared with total LOTT funding. Still, the analysis on the limited dataset provides some interesting insights into the broader transit funding context and highlights a number of areas where additional research would create a greater understanding of the relationship between LOTTs and transit in the United States.

LOTT Ballot Measure Trend Analysis

The results show that between 2000 and 2011, cities, counties, and transit districts voted on 274 ballot measures. The consistency and high number of these measures demonstrates that LOTTs have increased in popularity since their start in the 1980s, and have become a fixture of transit funding. The breakdown of tax type was approximately half sales tax measures and half property tax measures. Thirty-three states allowed local jurisdictions to have these, but only 26 voted on

them between 2000 and 2011 and all but one of the 26 had a jurisdiction in which the measure was successful between 2000 and 2011.³

One interesting finding was the geographic distribution of LOTT ballot measures with a transit component. Michigan, the state with the most LOTT ballot measures (89 measures) had more than twice as many as the state with the second most number, California (44). All of the ballot measures in Michigan were property taxes, which tend to be shorter term (1 to 5 years) and so 129 of the measures in the dataset from 2000 and 2011 were votes for extensions or renewals within the same jurisdiction. Following Michigan, the five states with the highest number of ballot measures were California, Washington, Ohio, Colorado, and Missouri, all of which are in the Midwestern or Western United States. These states had both sales and property tax ballot measures. Of the remaining states, the majority had either sales or property taxes but not both. In most states outside of Michigan, local transportation sales taxes were the dominant type of LOTT. This may be due to their broad-based incremental nature, which means the tax is a small amount spread out over a large number of transactions. A property tax on the other hand, is generally billed in one or two large sums. A further limitation of property taxes is that a number of states constrain the amount of increase that can occur annually in the tax levy or assessment.

The majority of the votes on LOTT ballot measures with a transit component took place during election years. Only 73 out of the 274 ballot measures (26.6%) took place during non-election years. This may be due to localities restricting

³ It is not possible to assert only 26 states have them, because there is the possibility that a jurisdiction in one of the other 7 states that authorize LOTTs has one that was not put to a public vote, or was a long-term tax passed prior to 2000.

voting to election years due to the expensive of voting. One interesting finding, however, is that in 2011, the number of LOTT ballot measures was much higher, 25 measures, than in any past non-election year. This upswing could be a result of the economic recession and the pressure it has placed on local government budgets.

An interesting trend to follow in upcoming years is whether LOTT ballot measures with a transit component continue only in states where they already exist, or additional states will use or implement this tool in the face of continuing transportation funding shortfalls and uncertainty in the future of federal transportation funding.

The goal of this trend analysis was to help further understand what is happening with LOTT transportation ballot measures. An acknowledged limitation is that because of data availability, only those LOTT measures with a transit component are included in the analysis. The absence of measures that fund only highway projects limits the ability to examine how LOTTs fit into the broader context of transportation funding for all modes of transportation, and how transit funding fits into that picture. Additionally, not all states authorize city or county level sales taxes, so the analysis is limited to that subset, which may be systematically different in some way. For example, those other states may have a dedicated sales tax for transit at the state level that helps offset the costs of the transit system.

Election Outcomes Analysis

The statistic commonly cited to demonstrate the success of LOTT ballot measures with a transit component is the approval rate (Center for Transportation Excellence 2006). The subset of CFTE records showed that 70% of the 274 sales or property tax measures analyzed were successful. The results of this research provide a more detailed picture than the percentage of wins.

One of the major findings is that there exists a statistically significant preference for the status quo. LOTT ballot measures were more likely to pass if there was no increase in tax rate, or if it extended or increased an existing tax. For completely new (i.e., a tax rate increase, but not an extension) LOTT ballot measures with a transit component, the success rate was only 53%. Of ballot measures that were extensions, 86% were successful. The percentage of voters voting for the measure to pass was also statistically significantly higher for taxes that were not increases and also for taxes that were extensions of existing dedicated transportation taxes.

The policy implication of this finding is that passing the first tax measure is the primary hurdle. Once a locality successfully passes one of these LOTT ballot measures, it is more likely to remain in existence. This suggests that even places that currently only dedicate funding to roads through local dedicated tax measures may have an easier time incorporating transit into a future expenditure plan than those introducing a completely new transportation tax with a transit component.

Another implication of these findings is that although these are still popular financing mechanisms, they may not be quite as popular as the 70% success rate suggests -- fewer new taxes are passing, and many of the passing measures are happening in places that have already adjusted to and accepted this method of funding. Separating the taxes based on these characteristics creates a clearer picture of what new transit taxes are coming into existing and the likelihood of a new ballot measure achieving success.

Another of the tests was performed to examine the relationship between LOTT transit ballot measures and state restrictions on fuel tax expenditure for transit. It could be possible that states with these restrictions could be less transit-oriented and less likely to pass them. Alternatively, states with gas tax spending restrictions may be more likely to seek creative ways to fund transit and put transit funding ballot measures to voters, and have greater success with voters who see a greater need for the revenue. The results show that for sales taxes and property taxes individually, the ballot measures were more likely to pass in states with restrictions prohibiting fuel tax spending on transit.

One of the demographic variables tested for a relationship to LOTT transit ballot measure outcome was population density. No statistically significant relationship or strong trend in either direction was detected in this research, for all LOTT ballot measures in the sample, or for subsets of sales, property, city, or county taxes. This could be due to the small sample size or to a much more complex relationship between density and LOTTs than could be captured in this analysis.

Household income, race, and ethnicity variables were gathered and tested only for county-level sales tax ballot measures. The research found a statistically significant relationship between median household income and election outcome, as well as percentage of the population identifying as black and election outcome. County sales tax transit ballot measures were more likely to succeed in counties with a lower median household income. The average median income was \$62,226 for unsuccessful ballot measures compared with \$56,570 for successful ballot measures. Lower-income communities may be more reliant on public transportation, but it is still, it is interesting that those places are more likely to vote to start or continue taxing themselves as additional taxes could have a greater negative impact on the percentage of income paid in taxes. The other statistically significant relationship was that county sales tax measures were more likely to succeed in counties with a higher percentage identifying as black. The average percentage of the population identifying as black was 9.8% for successful ballot measures compared with 5.2% for unsuccessful ballot measures.

It is not possible to determine the causal relationship through this research, but possible explanations for the relationships described above may be that those communities who vote in favor of LOTT ballot measures with a transit component are more transit-dependent, differ in political orientation, benefit more directly from the transit services, or have some other characteristic that makes them value the transit services more highly than those communities voting against the measures. It would be interesting in the future to examine these election

outcomes with additional variables such as political orientation and vehicle ownership.

Local County Sales Tax Transit Investment Analysis

The third objective of this research was to gain a more in-depth understanding of how LOTT ballot measures with a transit component contribute to investment in transit in the United States. This research was limited to the subset of data that included all county sales tax measures that passed between 2000 and 2011.

The dataset included measures that dedicated at a minimum one percent of the funding to transit. Noteworthy was the fact that over half of these measures dedicated 100% of the funding to transit, while only 16% dedicated less than 20% of the funding to transit. One caveat is that this estimate could potentially be slightly biased towards measures with a higher percentage of transit, as they would be less likely to go undetected by CFTE's tracking system. The successful county sales tax measures also include a distribution of transit funding modes. Nearly all measures included buses, while fewer included fixed guideway modes such as commuter rail, light rail, and heavy rail. This is not surprising given that nearly all transit systems in the United States include buses, while fewer include the other modes. Another interesting finding, given the limited number of commuter rail systems in the United States, was that 18 measures out of the 49 successful county sales tax measures dedicated revenue to commuter rail. There are only 25 existing and several proposed commuter rail systems and nine of these are represented in the subset of data analyzed. Nine is a relatively high number

considering that a number of the commuter rail systems in the United States are in states that do not authorize LTSTs (New York, New Jersey, Illinois, Massachusetts, Connecticut).

Some measures had forecasted revenues of billions of dollars allocated to long-range 20-30 year expenditure plans, while others had shorter durations of 8-12 years. Observation of the CFTE data and other information sources during the dataset development phase seemed to suggest that in general, county sales tax measures often were of a larger scale in terms of funding and time horizon than the property taxes. The property tax measures often expired after one to five years.

This variation in the percentage of dedication to transit, the time horizon, and the distribution of the modes of transit demonstrates the flexibility of these measures and their ability to be tailored to the local transportation context. As discussed in Chapter 2, transportation funding at all levels of government is characterized by restrictions on what it can be spent on. The range of transit funding allocation across these measures demonstrates their flexibility, which may enable counties to better address its transportation needs. Funding with restrictions, on the other hand, could lead to projects that a locality knows will be able to successfully compete for purpose-constrained funds, rather than what may be the most pressing transit need. For example, a locality may know a commuter rail extension capital project could successfully make it through the New Starts process, but its highest priority need is additional funding for bus and paratransit operations. A recent example provided in The Transport Politic was a federal

grant to cover half the costs of a \$523 million dollar light rail expansion to Pittsburgh's North Shore, while Pittsburgh was unable to apply federal government funds to help support the same transit agency's operating deficit of \$64 million (Freemark 2012).

With enough foresight, the LOTT ballot measure funding can also serve as the local match for federal funding projects. The National Congress of State Legislatures found that if states do not use gas tax revenue for transit, it is often difficult for them to receive general funds for transit projects due to federal matching requirements (Sunden and Reed 2006). A potential takeaway from these results is that interest in these county sales tax measures and the range of transit funding percentages may be indicative of a greater need for flexibility in the use of transportation funds, instead of the highly constrained system that exists today.

The analysis of the intended category of use of transit funds also yielded interesting results. Although the literature notes that these are often focused on large capital expenditures and system expansion, a review of the expenditure plans and intended use of the funding suggested a change from that initial trend. While a number of large capital projects are included, there seems to be a greater balance between capital and operating expenditures, and between system preservation and expansion. An observation during the dataset development for LOTT ballot measures was that places that only had bus service and smaller transit agencies appeared to be particularly focused on operational cost, and a number were using LOTT property or sales taxes to prevent cuts in service. If this apparent shift in the data is reflective of the larger set of LOTTs, this shift towards

operations could be the result of the continuing shift away from federal transit operating support, increasing costs of operating transit services, and the pressures from funding shortfalls and increasing ridership described in prior sections. It could also help address the concern that the current transit funding system could result in the overcapitalization of transit networks.

Areas for Future Research

While this research sought to contribute to the understanding of the relationship between LOTTs and transit, as is often the case, one of the primary findings of this research is that many questions remain to be answered. This research identifies three areas of future research that would continue shed light on this complex issue.

- 1.) Develop of a dataset of all LOTT ballot measures, not just those with a transit component.*

As no single source of information is available on LOTT ballot measures that dedicate funding only to road and highway projects, it is not possible to get a sense of how the subset of transit measures used in this analysis fit into the broader transportation funding picture. A more comprehensive dataset would enable more analysis on funding distributions and trends, as well as cross-modal comparisons. For example, it could be used to research how LOTTs are affecting the modal share of investment across all modes of transportation. Another area of analysis that would be interesting and would fill in some of the gaps of the analysis would be to collect

information on which states have dedicated transportation taxes at the statewide level.

2.) Match LOTT ballot measures with additional information – National Transit Database and New Starts funding information.

While developing the dataset, one of the elements of data added to the county sales tax dataset was the TRIS ID, which would enable a merge with the National Transit Database (NTD). The NTD is the primary national source for information on transit systems in the United States. It contains information on types of transit services, operating and capital funding, operation and services, and assets. It would also interesting to connect the LOTT dataset to information about New Starts and other FTA or USDOT funding and grant programs to determine how LOTTs relate to these programs. For example, are LOTTs being used to complement federal transit funding by serving as a local match or as a substitute because federal funds are limited and highly competitive?

3.) Research LOTT project implementation

Finally, a third area of analysis that would be interesting to pursue would require long-term tracking of these LOTT ballot measures to determine whether the expenditure plans put to the voters are consistent with what actually got implemented. If variation exists, it would be useful to understand whether it was a reflection of shifting priorities, revenue forecasting accuracy, or some other issue. A further extension of this research would be to examine

how, if at all, the investment decisions made through LOTT expenditure plan development systematically differed from what would have come out of the traditional MPO transportation planning process, which would help answer the question of whether a revolution in transportation finance really is occurring.

Conclusion

For decades, user fees dominated transportation funding. These user fees are still the largest source of funding, however, other alternative mechanisms such as LOTTs, particularly local option transportation sales taxes, are now a fixture of transportation funding in many cities, counties, and transit districts across the country. These LOTTs are especially prevalent in the Western and Midwestern United States, and they are continuing to expand to new localities within and outside of these states.

The research revealed a strong preference for the status quo among those voting on these LOTT ballot measures. Once LOTTs are successfully adopted, they are significantly more likely to continue to be extended in future years. Many of the successful measures are now happening in places that have already adjusted and accepted this method of funding. The adoption of LOTT measures is also related to the characteristics of the locales in which they are voted on. LOTT ballot measure success was statistically significantly associated with state fuel tax use restrictions, median household income, and the percentage of the population identifying as black.

Finally, the magnitude and modal of the funding attached to these measures demonstrate that they are resulting in real investment in both bus and fixed guideway modes of transit. Also, counter to some of the earlier literature, the funds are being allocated to both capital and O&M, and for both transit system preservation and transit system expansion.

Answering Martin Wach's question about whether these are good or bad is difficult, and not possible with the information currently available. The need for answers remains, as the challenge of sufficiently and sustainably funding the U.S. transportation network continues. This research served as an early step in that direction, and the areas of future research proposed above would provide more information on how LOTT ballot measures fit into the broader transportation funding environment and enable voters, policymakers, and transportation agencies to make more informed decisions.

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