

Essays in Transportation and Electoral Politics

Xavier Joshua Harmony

Dissertation submitted to the faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
In
Planning, Governance & Globalization

Ralph Buehler, Chair
Thomas Sanchez
Thomas Skuzinski
Matthew Dull

February 6, 2024
Arlington, Virginia

Keywords: Transportation Policy; Electoral Politics; Distributive Politics; Saliency; Public
Transportation

© 2024 by Xavier Joshua Harmony

Essays in Transportation and Electoral Politics

Xavier Joshua Harmony

ACADEMIC ABSTRACT

Abstract 1 – The Importance of Transportation Policies in Local Elections

Building and maintaining transportation systems is one of the most important functions of local government. It is a subject that concerns local residents, jurisdictions spend a lot of money on, and local politicians use to their political advantage. This study helps us understand how transportation issues feature in local elections. Through evaluating a dataset of 542 candidates from 219 local election races from 2022, this study explores which candidates for local office are more likely to have transportation policies, what kind of content is included in these policies, and what are the factors that make including different transportation content more or less likely. The analysis primarily uses website campaign content and a mix of qualitative and quantitative methods to answer these questions. I find a variety of factors affect the inclusion of transportation issues at the local level such as variations in governance, partisanship, and regional characteristics like a jurisdiction's size and transportation behavior. It was also evident that defining transportation issues was more common than proposing transportation policy solutions. Overall, this research provides more insight into how transportation policies are included in local elections.

Abstract 2 – Saliency of Transportation Policies in State Legislative Elections: The Case of Virginia

Transportation systems are expensive and directly impact important issues like climate change, equity, and quality of life. However, it is not clear how important transportation policies are in state-level elections. Using the Virginia 2021 state legislative election, this research uses candidate website data, Twitter data, and data about Virginia House of Delegates districts to answer three questions: which candidates are more likely to have transportation policies, what issues or transportation modes are included, and what factors make candidates more or less likely to focus on certain issues. Using descriptive statistics, and regression methods, this research found transportation issues varied by political party with top overall issues including transportation funding as well as expanding or improving transportation systems. Public transportation was the top non-car mode. Candidates were more likely to include transportation issues if district households had higher car ownership or a lower percentage of single occupancy vehicle commuters. Finally, differences in transportation issues could be partly explained by political party, incumbency, population density, and transportation habits. These results will be helpful for understanding how state government transportation agendas change, can better inform transportation advocacy efforts, and could help transportation professionals better understand the impact of their work.

Abstract 3 – Does Voting Affect the Provision of Bus Service?

Inequalities in the distribution of bus services are important to understand. This chapter adds to previous literature by exploring why inequalities exist. Specifically, does voting for elected officials affect inequalities in the delivery of bus services? This study explores this question using a quantitative approach as part of a quasi-experimental research design focusing on GoRaleigh in North Carolina and the Milwaukee County Transit System in Wisconsin. The analysis provides evidence of a relationship between voting behavior and bus service. This finding is observed across cities and elections with the relationships holding even when controlling for factors associated with a bureaucratic explanation for changing bus service, like changes to population or jobs. However, the strength of the relationship can change between elections, the type of elected official, and cities. Overall, this work provides more evidence of the politics behind transit service planning, especially the political influences of voting behavior in representative democracies.

GENERAL AUDIENCE ABSTRACT

Abstract 1 – The Importance of Transportation Policies in Local Elections

This study helps us understand how transportation issues feature in local elections. Specifically, this study explores which candidates for local office are more likely to have transportation policies, what kind of content is included in these policies, and what are the factors that make including different transportation content more or less likely. I find a variety of factors affect the inclusion of transportation issues at the local level such as variations in local control, partisanship, and regional characteristics like a jurisdiction's size and transportation behavior. Overall, this research provides more insight into how transportation policies are included in local elections.

Abstract 2 – Saliency of Transportation Policies in State Legislative Elections: The Case of Virginia

While transportation systems affect many important issues, it is not clear how important transportation policies are in state-level elections. Using 2021 Virginia state elections, this research answers three questions: which candidates are more likely to have transportation policies, what issues or transportation modes are included, and what factors make candidates more or less likely to focus on certain issues. This study found top issues included transportation funding as well as expanding or improving transportation systems while public transportation was found to be the top non-car mode. Candidates were more likely to have transportation policies if their districts had higher car ownership rates or a lower percentage of people commuting using a car. Finally, differences in transportation issues could be partly explained by political party, incumbency, population density, and transportation habits. These results could be helpful for understanding state government transportation agendas, can better inform transportation advocacy efforts, and could help transportation professionals better understand the impact of their work.

Abstract 3 – Does Voting Affect the Provision of Bus Service?

Does voting for elected officials affect the delivery of bus services? This study explores this question by focusing on two transit systems: GoRaleigh in North Carolina and the Milwaukee County Transit System in Wisconsin. The study demonstrates voting behavior has a relationship to changes in bus service. This finding is seen in both cities and multiple elections with the impacts still observable even when considering other factors like changes to population or jobs. However, the size of the voting impact can be different between elections, the type of elected official, and cities. Overall, this work provides more evidence of the politics behind transit service planning.

For my mum, Rachel Harmony. My biggest supporter.

*For my daughter, Prudence Harmony Dorsey. My first PHD.
Like Grandma Rachel supported me, I will support you in all you choose to do in life.*

Acknowledgements

First and foremost, I want to thank my wife and partner, Ashley Dorsey, for being by my side throughout my PhD journey. Over the last five years, we've become parents, bought a home, endured a pandemic, and dealt with all life has thrown at us. It hasn't always been easy doing all of this while I complete my doctorate studies, and sometimes you took on more than your fair share around the home, but I appreciate you and couldn't have done this without you.

I also want to thank my daughter, Prudence. Although I haven't been able to hang out with you quite as much as I would have liked, you have made this whole PhD journey so much easier. You provided me with motivation to get work done, you sat at my desk with me to "help" me do my work, and you let me share my interest in buses and trains with you.

Thank you, also, to my mum. I wouldn't be where I am or who I am today without you. You have read every paper I have written and now know far more about transportation than you probably ever wanted to know. Thank you for supporting me.

My dissertation also wouldn't be what it is without my PhD committee. First, thank you to my chair and advisor Ralph Buehler. Your ability to turnaround useful and constructive feedback makes me the envy of many PhD students. I very much appreciate your thoughtful and timely responses. Second, thank you to Thomas Skuzinski, my first advisor. I knew I wanted my research to be interdisciplinary from the beginning and it's hard to have a better example of an interdisciplinary researcher than someone who changes disciplines part way through my PhD journey. Third, thank you to Thomas Sanchez. Your class on advanced quantitative methods in urban planning was probably one of the most useful for my entire PhD journey and made my work so much easier. Finally, thank you to Matt Dull. You extended my thinking by asking good questions and introducing me to new and interesting literature. (I particularly found "Politics in

Time: History, Institutions, and Social Analysis” by Pierson, a book you recommended early in my PhD journey, to be a great contribution to my thinking and approach. I also really enjoyed your public policy design class.)

I also want to acknowledge some people who came before me in this PhD program. They offered me advice, feedback, and friendship. Thank you, Marc Fialkoff and Denis Teoman.

Finally, I would like to thank my colleagues who supported me in my full-time job as I completed my PhD part-time. Special thanks to Sophie Spiliotopoulos who helped me figure out a couple of GIS and R problems.

Table of Contents

Academic Abstract	ii
General Audience Abstract	iv
Acknowledgements	vi
List of Figures	x
List of Tables	xi
Chapter 1 – Introduction	1
1.0 Dissertation Design	4
2.0 Research Contributions.....	7
2.1 Transportation Practitioners	7
2.2 Academia	8
Chapter 2 – The Importance of Transportation Policies in Local Elections	11
1.0 Introduction	11
2.0 Literature Review	12
3.0 Research Design	14
3.1 Sample Selection.....	15
3.2 Data.....	17
3.3 Methodology	23
4.0 Results and Discussion	23
4.1 Regression Models.....	24
4.2 Descriptive Evaluation	28
5.0 Conclusion.....	37
Chapter 3 – Saliency of Transportation Policies in State Legislative Elections: The Case of Virginia	40
1.0 Introduction	40
1.1 Virginia State Legislature	41
2.0 The Importance of Transportation Issues in Elections.....	43
3.0 Methodology and Data	45
3.1 Methods.....	46
3.2 Data.....	47
4.0 Results.....	52
4.1 Descriptive Results for Candidate Websites.....	52
4.2 Logistic and Ordinal Logistic Models	56

4.3	Descriptive Results for Tweets	60
5.0	Discussion.....	61
5.1	Transportation Factors	63
5.2	Political Factors.....	64
6.0	Conclusion.....	66
Chapter 4 – Does Voting Affect the Provision of Bus Service?		69
1.0	Introduction	69
2.0	Literature Review	71
3.0	Research Design	74
3.1	Case Selection	74
3.2	Methodology	79
3.3	Data.....	81
4.0	Results.....	84
5.0	Discussion.....	92
6.0	Conclusion.....	95
Chapter 5 – Conclusion		98
References		104
Appendix A: Chapter 2 Model Variable Summary Statistics.....		113
Appendix B: Chapter 3 Model Variable Summary Statistics.....		114

List of Figures

<i>Figure 1-1: A Political system (Easton 1957)</i>	4
<i>Figure 1-2: Dissertation design</i>	5
<i>Figure 2-1: Example of variation in local government form</i>	16
<i>Figure 2-2: Cities and counties represented in data</i>	17
<i>Figure 2-3: Transportation modes by jurisdiction for local political candidates (n=187)</i>	33
<i>Figure 2-4: Transportation policy solutions by partisan affiliation for local political candidates (n=183) ...</i>	37
<i>Figure 3-1: Transportation issues/themes in transportation policies of state legislative candidates</i>	54
<i>Figure 3-2: Non-ICE transportation modes in transportation policies of state legislative candidates</i>	54
<i>Figure 3-3: Transportation policy saliency and candidate success</i>	55
<i>Figure 3-4: Transportation tweets by month from November 2, 2020, to November 2, 2021</i>	60
<i>Figure 4-1: GoRaleigh and MCTS bus networks</i>	77

List of Tables

<i>Table 1-1: How this dissertation helps address research gaps in transportation policy (based on Marsden and Reardon 2017)</i>	9
<i>Table 2-1: Sum of 2022 selected local election candidates</i>	16
<i>Table 2-2: Data sources</i>	18
<i>Table 2-3: Local election candidate data availability</i>	18
<i>Table 2-4: Logistic regression odds ratios for transportation policy inclusion on candidate websites</i>	25
<i>Table 2-5: Relative differences in candidates who include a specific transportation theme in their website policy</i>	30
<i>Table 2-6: Crosstabulations for transportation modes and issue frames in policy excerpts (n=511)</i>	34
<i>Table 3-1: Election candidates and data availability</i>	46
<i>Table 3-2: Data sources</i>	48
<i>Table 3-3: Transportation themes crosstab indicating frequency of shared topic mentions</i>	53
<i>Table 3-4: Transportation policy framing</i>	55
<i>Table 3-5: Logistic regressions of transportation policy and ordinal logistic regression of policy salience</i> ..	57
<i>Table 3-6: Logit model relative risk ratios for transportation policy themes and modes</i>	59
<i>Table 4-1: Case summary statistics</i>	76
<i>Table 4-2: Evaluation scenarios</i>	81
<i>Table 4-3: Pearson correlation coefficients between voting turnout and historically marginalized populations percentages in voting precincts</i>	84
<i>Table 4-4: Welch's t-tests for bus service</i>	85
<i>Table 4-5: Linear regressions from pooled Raleigh and Milwaukee stop and TSI data</i>	86
<i>Table 4-6: Bus service summary statistics in voting precincts</i>	88
<i>Table 4-7: Measure of spatial autocorrelation (Moran's I)</i>	89
<i>Table 4-8: Coefficients and statistical significance of voting variables</i>	91
<i>Table 5-1: Summary statistics</i>	113
<i>Table 5-2: Summary statistics (all data)</i>	114
<i>Table 5-3: Summary statistics (transportation policies)</i>	114

Chapter 1 – Introduction

Imagine a situation where you are planning intercity rail for one of the largest developed countries on the planet. An elected official has asked your organization if they can have an additional daily roundtrip serve their district, a train that would operate early enough to act as a commuter service for this official's predominantly car-oriented constituents. The track is already built so the focus is more on whether trains are available for more service and if the cost of the additional service is acceptable. You set up your train service spreadsheet and model the costs only to find the public subsidy for this one train roundtrip would cost more than anticipated, much more than a typical new roundtrip. You discover this is because of the additional costs incurred from starting earlier in the day than the other trains in the region. This might be bad news for the elected official. You present them with the analysis, and, to your surprise, they are fine with it. The cost, as substantial as it is, is worth it for the elected official to be able to point at the new service and say, "Look at what I have brought to our region!" From a service planning and cost perspective, this decision does not make sense. Politically, it does. This scenario is not a fantasy, it is from my lived experience as a transportation planning professional.

Increasing political influences on transportation have shifted the focus of transportation planning from those with the most need to those with more political power (Garrett and Taylor 1999; Taylor and Morris 2015). While this claim is anecdotally supported by many practicing transportation planners, myself included, transportation policy and planning research suffers from a techno-rational bias that masks the political sausage-making that crafts transportation outcomes (Marsden and Reardon 2017; Reynolds and Currie 2021). While this is no surprise given the institutional and funding biases behind transportation research (Lowe 2021), it does not reflect the realities of transportation planning practice. Thus, the purpose of this dissertation is to

turn the focus back on politics. How does politics affect transportation decision-making? What contextual political, institutional, or geographic factors affect these decisions? How does it affect the work of transportation planners? This dissertation will help to answer these questions.

There are several reasons why better understanding the politics of transportation can improve transportation planning. First, studying politics can help us understand why things are the way they are; transportation planning reflects the government programs and political moods of the time (Altshuler 1979). Thus, studying transportation politics can help us better understand how planning decisions came to be. Second, transportation planners can be more effective in their jobs when they understand how politics can shape or influence their work. For example, part of a planner's role is communicating information to decision-makers like elected officials. Planners need to know how this information will be used, and what information will be most important (Forester 1982; Meyer and Miller 2001). Finally, the transportation planning process is as much political as it is technical (Meyer and Miller 2001; Wachs 1995); political influence is transportation decision-making reality.

I also acknowledge the study of politics is broad with many sub-disciplines. Consequently, I am choosing to specifically focus on electoral politics. There are two main reasons for this. First, as former New York City transportation commissioner Janette Sadik-Khan wrote with Solomonow (2016): "like all politics, all transportation is local." Both transportation decision-making and local politics are close to voters. As Clark and Krebs (2012) argue, the close relationship between citizens and local political institutions makes electoral politics particularly important. They write that the electoral dimension of urban politics "determine[s] the control of local councils and local public policy." Krumholz (1982), for example, has demonstrated how much transportation policy priorities can change between elections. Thus, electoral politics are especially relevant for transportation, a discipline closely tied to the local level.

The second principal reason for concentrating on electoral politics is based on the premise that transportation planning decision-making is fundamentally a resource distribution problem: who gets what, when, and how (Davidoff 1965; Lasswell 1936). Carpintero and Siemiatycki (2016) made this connection in their paper on light rail projects, writing: “in democratic countries, the political arena is the place where difficult decisions about the allocation of scarce public resources are ideally made.” The focus on resource distribution means transportation is subject to distributive politics, “the decisions about allocations of government goods and services to identifiable localities or groups” (Golden and Min 2013).

There are two broad theories under distributive politics that connect the discipline to electoral politics. First, there are theories of democratic accountability, a rational choice approach to decision-making (Auerbach 2012) where politicians use the allocation process to target specific groups with goods or services to increase their chances of reelection (Golden and Min 2013). Transportation is often used by politicians to increase their chances for reelection. For example, accountability theories help explain the distribution of roads (Harding 2014) or transit (Luca and Rodríguez-Pose 2019) and even changes to traffic enforcement closer to elections (Bertoli and Grembi 2021; Bracco 2018). Scholars often refer to public goods or services that are used to benefit a specific constituency, like roads or transit service, as pork (Golden and Min 2013; Milesi-Ferretti, Perotti, and Rostagno 2002). The other focus of distributive politics theories can be grouped under policy responsiveness. These theories focus on the redistributive consequences of government allocations (Golden and Min 2013). In transportation, policy responsiveness research has demonstrated areas with improving political representation can increase transportation investment (Ejdemyr et al. 2015) and has revealed the effects of road maintenance responsiveness on election outcomes (Gorgulu, Sharafutdinova, and Steinbuks 2020). Overall, while both types of theories differ, accountability theories asks how distributions of services

benefit politicians and policy responsiveness theories focus on how allocations reflect voter interests (Golden and Min 2013), they can both be directly connected to electoral politics.

The remaining sections in this chapter describe how I will design my dissertation around transportation and electoral politics as well as what contributions my dissertation will make for transportation practitioners and researchers.

1.0 Dissertation Design

Easton (1957) provided a conceptualized of the political process that is useful for designing this dissertation. He described the political process as a system that transforms demands and support (inputs) into decisions and policies (outputs), as shown in Figure 1-1.

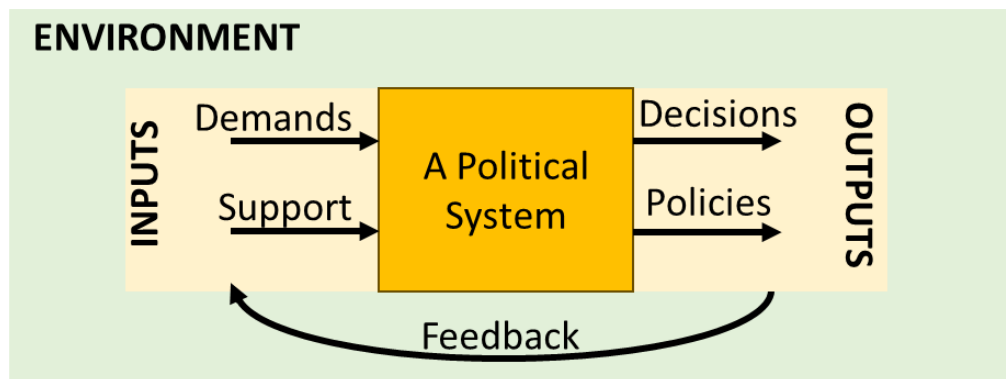


Figure 1-1: A Political system (Easton 1957)

Building off Easton's conceptualization, this dissertation evaluates the inputs and outputs of transportation within the context of the electoral political processes. This is achieved through two broad research questions:

Research Question 1: How important are transportation issues in elections?

Research Question 2: Does voting for elected officials affect the amount of bus service delivered?

These two questions, while both relating to electoral politics, sit on either side of elections. My first research question focuses on electoral process inputs. The question directly addresses political agenda setting and transportation saliency within the context of electoral

priorities, specifically noting what geographic, political, or other factors may influence demand or support for different transportation modes or topics. Conversely, the second research question focuses more on outputs, what happens after an election. Specifically, the focus is on electoral responsiveness, “how outcomes affect equity and inequality” (Golden and Min 2013, 74). These research questions build off gaps in existing research and form the basis of a three-paper dissertation. Figure 1-2 shows the relationship between existing research, my research questions, and my papers.

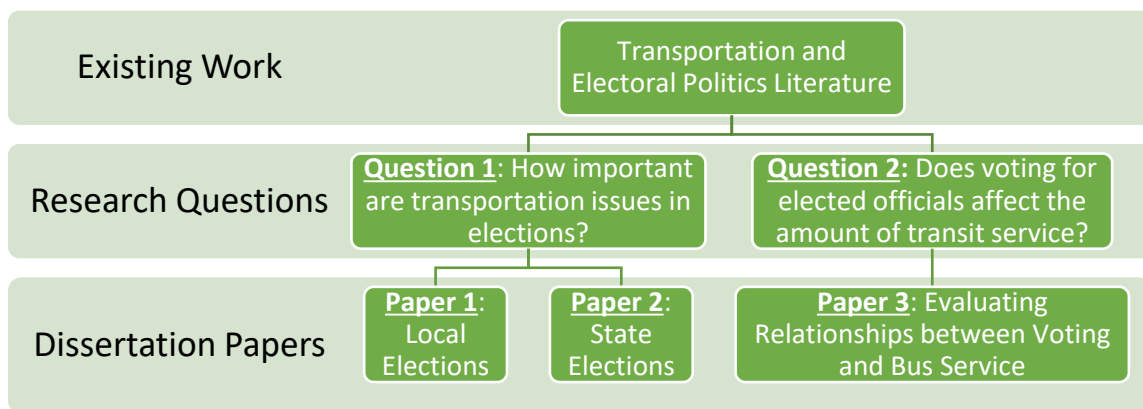


Figure 1-2: Dissertation design

As transportation policy involves “multiple levels and layers of officials” (Agranoff and Radin 2015), I am approaching the first research question at two different levels of government. First, as mentioned earlier, both politics and transportation are predominantly local (Sadik-Khan and Solomonow 2016). Higher levels of government can be seen as being “out of touch,” detached from urban and local issues, leaving municipal government as a better platform for developing plans for transportation policy (Hatzopoulou and Miller 2009). Thus, I begin answering my first research question at the local level in **Chapter 2**. However, although transportation is often considered a local issue, political factors might be less influential at the local level because of the shared authority with federal and state government actors (Gerber and Hopkins 2011; Wright 1988). As Burns and Gamm (1997) argue, understanding local politics “requires the systematic study of state legislative politics.” Consequently, in **Chapter 3** I continue answering the first

research question at the state level. This focus is further justified because elected officials and their appointees make up the majority of transit board members in the US (Fischer, Ray, and King 2021; SIMON & SIMON Research and Associates 2002). Thus, to improve our understanding of how elections can shape transportation policy priorities I will focus these two chapters, one at the local level and one at the state level, on the following research questions:

- Which candidates are more likely to have transportation policies?
- What kind of transportation issues are covered within transportation policies?
- What factors make candidates more likely to focus on certain issues?

In **Chapter 4**, the second research question asks how electoral politics may affect transportation decision-making. While some research argues transit funds are spread roughly geographically, there is an argument that differences in level of service can come down who does and does not vote: “transit dependents do not represent a strong constituency for improved bus service since fewer poor and minority persons are registered to vote” (Garrett and Taylor 1999). When infrastructure benefits are concentrated, like in a specific city ward, and costs are diffused, as is often the case with transit funding, politicians may be incentivized to make politically driven decisions (Krol 2018). Drawing from previous research on urban service delivery, this chapter explores what relationships, if any, can be empirically demonstrated between elections and transit service.

After exploring inputs and outputs for transportation electoral politics processes, the dissertation concludes in **Chapter 5**. The conclusion reties the three papers in Chapters 2 through 4 before highlighting additional gaps and future potential research avenues that should be explored.

2.0 Research Contributions

This dissertation will be useful for both practicing planners, who would benefit from a better understanding of how politics affects their work, as well as academics. This section provides an overview of how this dissertation could further both transportation practice as well as transportation research.

2.1 Transportation Practitioners

Understanding how politics intersects with transportation policy is critical to understanding how transportation decisions are made. As Wachs (1995, 285) put it:

Consensus, power, money, and political salience are far more likely to be the determinants of transportation policies than are analytical methods or theoretical arguments, and it is important that students of transportation acknowledge the inherently political nature of policy making.

Consequently, for transportation practitioners this dissertation work is important because it can help illuminate how political power or salience might shape transit policies or decision-making. Through evaluating political inputs and outputs, practitioners can better understand how different projects are selected and prioritized.

Some transportation policy topics are arguably more salient than others. Understanding how empirically valid these claims are is important because, as Wachs (1995, 274) argues, “political salience, rather than technical objectivity, determines the estimates of future travel demand and cost produced by consultants.” Thus, better understanding how politically important transportation issues are could help us better understand how transportation systems are shaped. What modes are prioritized? What metrics are used for evaluating transportation projects? What assumptions are made and how do these assumptions influence transportation models? For example, if traffic and congestion are identified as a salient issue, as suggested by Manville (2019), then elected officials might influence government infrastructure selection

processes to mitigate this issue. Decision-makers may decide the “best” transportation projects are those that reduce car travel time or increase car travel reliability. As spatially prioritizing other modes, like buses with bus lanes and bicycles with bike lanes, can often involve removing car lanes, cars might be negatively affected even if overall system capacity and efficiency improves. Focusing more on traffic and congestion might therefore incentivize projects that benefit cars more than other transportation modes.

While many practicing planners are aware of the influence of politics in transportation decision-making, it is more difficult to ascertain what mechanisms drive the politics. While some linkages are more intuitive to planners, like the influence of certain interest groups, the connection between voters and transportation outcomes is arguably not as clear. Understanding potential magnitudes of service change could directly influence how planners provide services, when they make changes, and even how they design their outreach processes with the public and elected officials.

2.2 Academia

The benefits of this research are not limited to practical lessons for practicing transportation professionals, this work also has some important scholarly contributions for transportation policy and urban politics. Marsden and Reardon (2017) describe some of the current research gaps in transportation policy literature, as summarized in Table 1-1. As the table demonstrates, my research will help address several of these gaps.

First, better understanding what factors make candidates focus on certain issues provides insight into some of the context of policy creation as well as why certain policies may be pursued. Evaluating transportation content from local and state elections can also help us understand how different transportation issues are framed. Second, exploring the relationship between voting and the supply of bus service can illuminate power dynamics around voting. The differences in the voting-bus relationship over time, between different types of elected officials, and in different

cities also helps us better understand the stability of the relationship, the influence of institutions and governance dynamics, as well as more of the context of policy implementation.

Table 1-1: How this dissertation helps address research gaps in transportation policy (based on Marsden and Reardon 2017)

Transportation Policy Research Gaps	1. Transportation Policy Saliency in Local Elections	2. Transportation Policy Saliency in State Elections	3. Voting and Bus Service
Need to consider not only how but why polices are chosen	●	●	
How and why particular policies are framed	●	●	
How stable are these policy logics over time?			◐
Role of 'political risk' in the creation of policy			
Power dynamics at play within a policy arena			●
Map decision-making systems and structures of power			
How and why do institutions matter in different contexts?			◐
Need to more fully appreciate governance dynamics			◐
Context of policy creation/ evaluation/ implementation	●	●	◐

Note: A full black circle ● indicates the paper directly addresses a research gap while a half-filled circle ◐ indicates the paper only partially contributes to meeting a research gap.

As mentioned earlier, Clark and Krebs (2012) argue electoral politics has a close relationship to urban politics. However, the authors go on to say that “elections and their outcomes have been overlooked in urban politics.” The research in this dissertation addresses some of the research needs described by Clark and Krebs. First, the authors highlight the importance of understanding what is being communicated between elected officials and voters. Specifically, focusing on subjects like campaign messaging can help scholars better understand elections and policy responsiveness. Chapters 2 and 3 address these types of gaps. A second area emphasized by Clark and Krebs (2012) is “the responsiveness to whom or to what interests.” How

responsive are elected officials to the mobility needs of residents and how does this translate to transportation outcomes? Chapter 5 helps answer these questions by exploring relationships between the need for transit in cities, votes for elected officials, and transit service outcomes.

While this dissertation can help fill some of the gaps in transportation policy and urban politics, one dissertation cannot do so comprehensively. Consequently, Chapter 6 concludes with some of the areas of future research, as well as new questions or research avenues illuminated by the work in Chapters 2 through 5. Overall, this helps connect my dissertation to my future work as a scholar of transportation policy and politics.

Chapter 2 – The Importance of Transportation Policies in Local Elections

1.0 Introduction

Building and maintaining transportation systems is both one of the most important functions of local government and an issue at the forefront of many city residents' concerns. For example, as of June 6, 2023, San Francisco's 311 database (City of San Francisco 2023), a record of resident municipal issues and concerns covering the last 15 years, categorized more than 60% of the 6.2 million public complaints as related to transportation. The categories ranged from street cleaning to transit service to parking enforcement. Transportation also constitutes a significant source of local government expenditure. According to 2020 local government financial data (US Census Bureau 2020), local transportation expenditures, including roads, parking facilities, and transit, totaled \$151 billion, about 7% of all local government spending. This is more than other expenditures that tend to draw more attention or scrutiny including police (\$112 billion), welfare (\$63 billion), and housing (\$50 billion).

Although transportation is clearly important to local government, it is less clear how local elected officials prioritize transportation issues. Former New York City transportation commissioner Janette Sadik-Khan tied both together when she and Solomonow (2016) wrote: "like all politics, all transportation is local." This statement is supported by the many examples of local politicians using transportation to their advantage. For example, local politicians have changed transportation policy priorities to suit their political preferences (Walks 2015), prioritized road maintenance based on political support (Burnett and Kogan 2017), and changed the level of traffic enforcement to improve their chances of reelection (Bertoli and Grembi 2021; Bracco 2018). Although the degree of influence varies, local politicians have an influential role in the local transportation planning process, setting policy directions, approving budgets and plans, and setting policy direction (Han, Laurian, and Dewald 2021). Clearly the role of local politicians

in transportation policy making and implementation is significant, however, the politics of transportation policy and agenda setting is underemphasized in transportation research (Kębłowski and Bassens 2018; Marsden and Reardon 2017). This bias understates how politics may affect transportation outcomes and underemphasizes the arguably greater role of “consensus, power, money, and political salience” (Wachs 1995, 285). As Kębłowski et al. (2019) put it: “transport planning derives from rather than shapes changing political agendas.” This bias is particularly notable because urban politics research argues candidate issue positions have a strong, causal influence on voter support (Oliver and Ha 2007; Sances 2018). However, urban politics research, too, has been limited here. In their theoretical work on political systems, Easton (1957) described the political process as a system that transforms inputs (demands and support) into outputs (decisions and policies). Elmelund-Præstekær and Hopmann (2013) argue urban politics literature has focused on the outputs rather than the inputs. The examples of local politicians using transportation to their advantage cited earlier are a good illustration. Understanding how local policy agendas are formed, including some of the inputs involved, could provide new insight into the subsequent transportation decisions of local elected officials. Thus, this research purports to help fill some important gaps. Specifically, this work will help address the following research questions:

- Which candidates for local office are more likely to have transportation policies?
- What transportation issues do candidates for local office include in their transportation policies?
- What factors make candidates for local office more likely to focus on certain transportation issues?

Through answering these questions, we can get better insight into how transportation policies and agendas are developed in local government.

2.0 Literature Review

Salience is a useful frame for understanding the importance of an electoral issue. Gormley defines salience as an issue “that affects a large number of people in a significant way; [...] saliency is low unless the scope

of conflict is broad and the intensity of conflict is high” (1986, 598). As transportation affects most people in some way every day, the potential scope of conflict is quite broad. However, assumptions about transportation salience are mixed. For example, Gormley stated transportation is a low salience issue, agreeing with other research that has explicitly called transportation issues “low-salience” (Nall, Agrawal, and Nixon 2016) or “pedestrian” (Oliver and Ha 2007). As Oliver and Ha write “it is unclear how well citizens can recognize candidate positions” on these issues. However, others have assumed transportation is more salient. Assumptions on political salience have generally focused on specific modes or issues including public transportation (Wachs 1985), congestion (Manville 2019), and road maintenance (Burnett and Kogan 2017; Gorgulu, Sharafutdinova, and Steinbuks 2020). The diversity of issues underscores the importance of understanding salience through the lens of candidate political statements, a politician’s public positions on transportation where different transportation issues may be described.

Previous research has demonstrated that politicians incorporate voter issue priorities when developing election platform materials like manifestos (Spoon and Klüver 2014). Existing transportation research focusing on candidate political statements has used election manifestos, website content, and social media to better understand how political candidates set their transportation agendas. This work has covered different levels of government and countries. For example, both Chaney (2014) and Meerkerk et al. (2015) used election manifestos to look at transportation policies of electoral candidates at the federal/national level. The former considered rail discourse in the United Kingdom while the latter considered road pricing in the Netherlands. Harmony (2023) used candidate websites and social media to evaluate transportation policies at the subnational state level in the United States (US). Finally, Han et al. (2021) compared social media to city plans in their analysis of candidate transportation views in a local election in Canada. This last paper is most relevant to this study.

Han et al. (2021) used content analysis methods to assess social media communications of political candidates in the 2017 Calgary municipal election. Although the paper’s subject matter was

broad, considering all planning issues, transportation issues were a major component. Overall, transit was identified as an important issue for all candidates. However, the authors identified differences in priorities between the at-large mayor and ward council members. While the mayor focused on “broad municipal issues,” like a major light rail transit project, ward councilors focused more on issues that were more relevant to their districts, like prioritized bus service, a topic the mayor didn’t even mention. Other non-transit transportation topics mentioned included parking, traffic, and pedestrians (mentioned by councilors only) but none of these other topics were highly ranked. Finally, few differences were found between elected and nonelected political candidates.

Although Han et al. (2021) made some significant contributions on this topic, there are still opportunities to further work on this subject. First, there are over 20,000 municipalities and counties in the US alone. While focusing on one locality allows for a deeper analysis of a single region’s election issues, as Han et al. demonstrated, the approach is less useful for determining issues that are prevalent across jurisdictions (Wolman 2012). The question of transferability is particularly important when considering the variation in local government. Calgary, Canada, for example, is a city with a council-manager government structure. How transferable are the results from this city to other council-manager cities? Or to mayor-council cities? Or to counties? Further, the local factors that affect the importance of issues may change when looking at more than one locality. Consequently, to better understand the general importance of transportation issues in local elections, a wider sample of local elections should be used. This chapter takes this approach.

3.0 Research Design

One of the goals of this research is to better understand how different factors might make candidates more or less likely to include transportation issues. While case study research designs are popular in political science because they enable the inclusion of context, which is useful for explaining decisions, including a larger number of decisions makes case studies time and cost prohibitive. A large number of

observations can give multiple advantages that are more difficult to demonstrate with a case study approach (Gerring 2004). For example, an analysis can incorporate greater variance, meaning we can better understand how the range of different independent variables may affect the dependent variable. As local elections typically do not include enough candidates to perform reliable statistical analyses, I use a pooled sample of local candidates. The pooled data both allow me to have a sample large enough for statistical analysis but also allows for more data variance. Thus, while the limitations of my research design will not enable me to demonstrate causation, through my carefully chosen explanatory and contextual variables, I can establish correlations and potential relationships between variables with more confidence.

3.1 Sample Selection

A sampling strategy for local election candidates is complicated. First, as already mentioned, a pooled sample of candidates from multiple elections is preferable for my research design. Second, locality governance varies in the US (DeSantis and Renner 2002). Figure 2-1 shows some of this variation. Third, due to complexities around intergovernmental relations, especially considering factors like Dillon's rule (A. Clark and Krebs 2012), the influence of state governments on localities varies by state. Thus, a suitable sampling strategy for this analysis needs to identify candidates from multiple elections, accounting for different governance types, and minimizing state variation to minimize cross-state differences. Given these constraints, a purposive sampling strategy was appropriate. While this kind of strategy does not allow for generalization, it does allow for exploration between variables (Rich et al. 2018, 133), a research goal. Using Ballotpedia to identify local elections in 2022, I used a purposive sampling strategy to identify potential elections and candidates. Table 2-1 summarizes the resulting selection of candidates. As the table shows, I identified 542 candidates in local elections in eight states and the District of Columbia. The sample includes all general election candidates from 219 elections, averaging 2.5 candidates per election. The elections took place in 59 local jurisdictions, summarized in Figure 2-2.

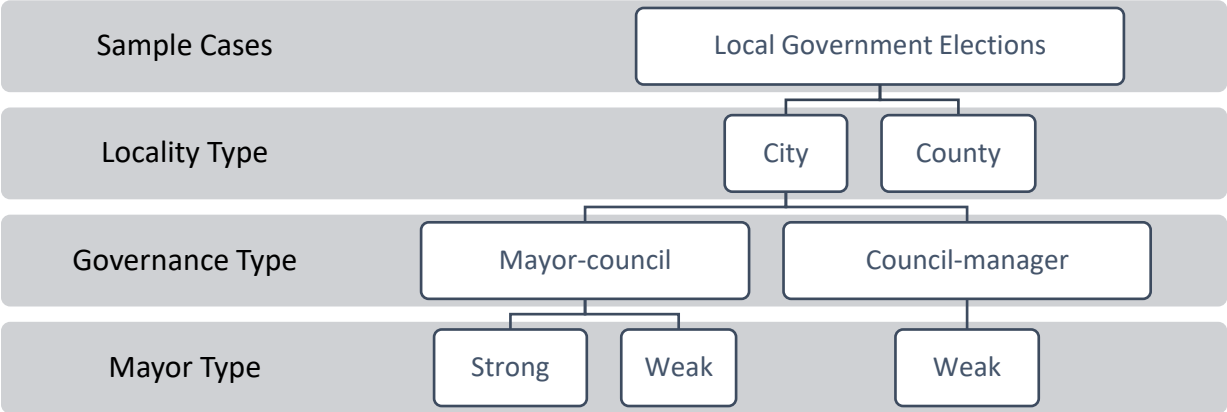


Figure 2-1: Example of variation in local government form

Table 2-1: Sum of 2022 selected local election candidates

Election Type	State	City		County
		Council-manager	Mayor-council	
City council or Commissioners (or equivalent)	California	75	27	28
	District of Columbia	-	19	-
	Kentucky	6	53	-
	North Carolina	24	-	38
	Nevada	10	-	-
	Ohio	-	-	17
	Rhode Island	-	21	-
	Texas	80	-	30
	West Virginia	-	39	-
<i>Sub-Total</i>		195	159	113
Mayor	California	31	2	-
	District of Columbia	-	4	-
	Kentucky	-	11	-
	Nevada	3	-	-
	North Carolina	2	-	-
	Ohio	-	-	-
	Rhode Island	-	1	-
	Texas	19	-	-
	West Virginia	-	2	-
<i>Sub-Total</i>		55	20	-
Total		429		113
Grand Total		542		



Figure 2-2: Cities and counties represented in data

3.2 Data

This research relied on website data as well as a variety of contextual and explanatory data. The following sections describe these data in more detail. Data are summarized in Table 2-2 with summary statistics in Appendix A.

Campaign website content for each candidate was scraped to help answer my research questions. Although candidates often present campaign platforms in a variety of media, Sulkin et al. (2007) found that candidate websites tend to give more attention to issues like infrastructure than other media like television advertisements. This makes websites suitable for assessing transportation issues. Previous research has also found that websites can be used for targeting undecided voters, soliciting donations, and recruiting volunteers (Gibson 2012; Herrick 2016), underscoring their utility for highlighting potentially important issues. Candidate campaign websites were identified using a mix of Ballotpedia and Google. For each candidate’s website I first established whether a candidate has a transportation platform before coding the transportation issues, themes, and modes. An evaluation of candidate websites

indicated almost 75% of candidates in my sample had websites while approximately half of these websites included a transportation platform. Table 2-3 summarizes these data.

Table 2-2: Data sources

Category	Variable	Definition	Data Source
Dependent variables	Transportation policy	1 if candidate mentioned transportation, 0 if not	Candidate websites (November 2022)
	Transportation issues and modes	1 if candidate mentioned issue or mode, 0 if not	Candidate websites (November 2022)
Explanatory variables	Election Type	1 for mayoral election, 0 otherwise	Respective jurisdiction electoral department websites
	Nonpartisan Election	1 for Nonpartisan , 0 otherwise	Respective jurisdiction electoral department websites
	Political Party	1 for Democrat, 0 otherwise	Respective jurisdiction electoral department websites
	Incumbent	1 for Incumbent candidate, 0 otherwise	Respective jurisdiction electoral department websites
	Contested	1 for elections with more than one candidate, 0 otherwise	Respective jurisdiction electoral department websites
	At-large status	1 for at-large candidate, 0 otherwise	Respective jurisdiction electoral department websites
	Previous Election Win Margin (%)	Percent difference between Highest and second highest votes from most recent previous general election	Respective jurisdiction electoral department websites
	City Governance	1 for Mayor-council, 0 for Council-manager	Ballotpedia
	Mayor Type	1 for strong mayor, 0 for weak mayor	Ballotpedia
	Jurisdiction Population (log)	Log of population for jurisdiction to which candidate's district belongs	2017-2021 ACS 5-year Estimates @ Block Group
	District Population Density (log)^	Log of residents per square mile in candidate district	2017-2021 ACS 5-year Estimates @ Block Group, respective jurisdiction electoral boundaries
	Household Ownership (%)^	Estimated percent of residents who live in owner-occupied housing	2017-2021 ACS 5-year Estimates @ Block Group, respective jurisdiction electoral boundaries
	Commute Drive Alone (%)^	Estimated percent of commuters who commute by driving alone in candidate district	2017-2021 ACS 5-year Estimates @ Block Group, respective jurisdiction electoral boundaries

^Data provided at Census Block Group level were transformed to electoral districts using areal weighting

Table 2-3: Local election candidate data availability

Election Type		Total	Council-manager	Mayor-council	County
Mayor	<i>Candidates</i>	75	55	20	-
	<i>Candidates with websites</i>	76%	76%	75%	-
	<i>Candidate's website includes transportation policy</i>	53%	57%	40%	-
City Council or Equivalent	<i>Candidates</i>	467	195	159	113
	<i>Candidates with websites</i>	75%	78%	66%	82%
	<i>Candidate's website includes transportation policy</i>	45%	53%	42%	35%

As the table shows, while my purposive sampling strategy ensured a mix of candidates were included in this study, they are not equally represented in the data. Local government type also already plays a role. More candidates for county office have a website than city candidates but fewer county candidates have a transportation platform. Further, while a similar proportion of mayoral candidates in council-manager and mayor-council government structures had websites, more candidates for mayors under council-manager systems had transportation platforms. Finally, candidates for city council in council-manager systems were both more likely to have websites and more likely to have transportation platforms than those under a mayor-council form of government.

A variety of contextual factors could potentially influence whether a candidate includes a transportation platform on their website and what transportation issues or modes they prioritize. These variables are summarized below.

Political Variables

There is some evidence suggesting partisanship affects transportation spending and preferences (Gerber and Hopkins 2011; Jensen et al. 2021; Klein et al. 2022; Nall, Agrawal, and Nixon 2016), justifying the inclusion of a candidate's political party affiliation. However, more than three-quarters of municipal elections are nonpartisan (Wood 2002), potentially reducing the efficacy of this variable. As partisanship is arguably less important in local elections, Oliver and Ha (2007) suggested "voters are more likely to base their decisions on the candidate's stances on specific issues." Thus, in nonpartisan elections it is possible transportation issues are even more important as voters would not have the partisan cues that come with affiliation with one of the major national political parties. This previous research suggests including political party identifiers as well as whether an election is nonpartisan are important variables.

Oliver and Ha (2007) also highlighted incumbency as an important factor. Incumbents tend to have an advantage in local elections (Trounstine 2013), but if a new candidate "can link themselves to salient issues" (Oliver and Ha 2007, 403) they may be more competitive. If transportation issues are

important to a community, the inclusion of the issues by a non-incumbent may be advantageous. Consequently, candidate incumbency status was included as a variable.

Political history could also explain differences in voting issues. For example, competitive elections can affect issues that appear on candidate websites (Herrick 2016). Thus, the win margin of the previous general election for each race was included to indicate historical competitiveness. Finally, candidates may choose different campaign strategies if there is more than one candidate in the current election. Consequently, the last political variable indicates whether the candidate is in a contested election or not.

Governance and Institutional Variables

The research design for this study explicitly accounts for variations in local government governance. Consequently, these variations were also included as variables. First, although previous research has demonstrated institutional variables affect local governments policy preferences, these preferences are different for cities and counties. Farmer (2011), for example, highlighted the institutional factors that affect redistributive services are different for counties and cities. In addition, cities and counties may also have different transportation responsibilities. For example, in Virginia, a road may be owned and maintained by a city but becomes the responsibility of the state once it crosses the city boundary into the county. Thus, cities and counties need to be differentiated.

However, cities also have some variation in governance structure. Although there are a variety of ways to classify city government structure (DeSantis and Renner 2002), the two major forms are mayor-council and council-manager. The mayor-council form of government is older and is still prevalent in many major cities (Wollmann and Thurmaier 2012). Council-manager systems are newer, created in the twentieth century as part of a reform movement for local government. Council-manager systems were created to bring “business-like” practices to city management (Wollmann and Thurmaier 2012). In a mayor-council system, city operations are managed by an elected chief executive, the mayor, with a legislature typically elected by district or ward (though can also be elected at-large or be mixed).

Conversely, in a council-manager system, council members are often elected at-large, and they select a non-elected city manager to manage city operations. These two different forms of governance may produce different policy results. First, there is a difference in policy focuses and solutions. For example, the managerial focus of council-manager systems puts more value on efficiency (Wollmann and Thurmaier 2012) with council-manager systems also more likely to engage in policy innovation (K. L. Nelson and Svava 2012). Second, Hajnal and Lewis find (2003) when city operations are managed by an elected official, like a mayor, instead of an unelected person, like a city manager, voter turnout is higher. This may increase attention to candidates, influencing candidate platforms. While some have argued the city governance type perhaps doesn't make a difference in city policymaking (Reese, Li, and Remer 2020), previous research has found differences in transportation policy. For example, Nuun (1996) demonstrated cities with council-manager governance allocate more financial resources to highways and roads compared to mayor-council cities while Duncan and Christensen (2013) found mayor-council forms of government are more likely to include parking at light rail stations. Thus, city governance type was included as a variable.

Mayoral power is another key differentiator between mayor-council and council-manager systems. A mayor-council city can have either a strong mayor, where the mayor has veto power over the city council, or a weak mayor, where the mayor has equal power to a council member. Council-manager systems, on the other hand, typically have weak mayors. While mayoral strength is correlated with the type of city governance, previous research suggests a mayor's power may play a distinct role in transportation outcomes. For example, a weak mayor means that municipal power is fragmented, resulting in a mayor having less power and influence over functions like a city's transportation (Schragger 2005). Nuun (1996) also argued that "strong mayors are expected to use policies for political purposes" and thus may have a transportation platform that is more responsive to constituent needs. Consequently, mayor type was also included as a variable.

In addition to these factors, Mladenka (1981) indicated at-large politicians might be less sensitive to the needs of constituents than ward candidates. For example, at-large candidates focus on citywide and substantive issues like spending, taxation, economic development, and traffic congestion while ward candidates concentrate more on inequalities across districts or geographically specific projects or transit lines (Han, Laurian, and Dewald 2021). Consequently, a variable that indicates city-wide candidates versus ward or district candidates may be useful for understanding differences in transportation policies.

Geographic and Transportation Variables

Elmelund-Præstekær and Hopmann (2013) stated “the assumption that geographical factors are important to local campaign agendas makes sense in virtually every country.” This would intuitively be even more true for transportation issues. Geographical factors are represented in a variety of ways in this study. First, previous research has suggested issues are more important when a candidate is closer to the policy focus. For example, Yusuf et al. (2014) found coastal proximity to be factor for legislators developing policy on sea level rise while Melia (2020) found “past decisions and material conditions (such as infrastructure, levels of traffic and congestion and relative prices) can directly or indirectly influence the decisions of transport planners and politicians with responsibility for transport policy.” I operationalized proximity to transportation issues in two ways¹. First, I estimated single occupancy vehicle (SOV) commuter mode share as an indicator of transportation multimodality. Walks (2015) has previously shown mode share is useful for identifying politicians with stronger views on transportation policy. Second, local campaign agendas in denser areas have previously been found to have significant differences to campaign agendas in rural areas (Elmelund-Præstekær and Hopmann 2013). Consequently, average population density was also calculated for each political district.

¹ Average cars per household was also considered but it was highly correlated with mode share and moderately correlated with home ownership so was ultimately not included.

In addition to transportation variables, I calculated average homeownership rates for localities. Oliver and Ha (2007) found that increased homeownership might predict an increase in voter turnout and engagement in local affairs. This gives them a disproportionate ability to “shape the local political agenda, putting concerns of homeowners and long-term residents to the forefront of any electoral contest.” Consequently, elected officials might include policies that appeal to homeowners, justifying the inclusion of a locality’s average homeownership rate.

3.3 Methodology

The scraped website content was reviewed to identify transportation platforms as well as any themes or transportation modes mentioned. This was achieved by first breaking transportation platforms down into excerpts, policy fragments that focus on a specific phenomenon. I then used an inductive coding process where “detailed readings of raw data [are used] to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher” (Thomas 2006). As opposed to a deductive coding process where categories are developed before coding, this process develops themes through the coding progress, reducing potential biases (Chaney 2014). Although this kind of content coding practice can be subjective, with codes potentially differing between different researchers, it allows for qualitative data to be evaluated using quantitative methods.

I evaluated the resulting data in two principal ways. First, I used binomial logistic regression to evaluate which candidates were more or less likely to include transportation policies on their websites. Second, I used a combination of descriptive statistics and qualitative textual analysis to describe patterns and trends for transportation policy content in local elections.

4.0 Results and Discussion

As previously mentioned, in my sample approximately 75% of candidates for local office had campaign websites. Of those, 319 candidates included a list of campaign issues on their website with 187 having

some form of transportation platform². When transportation policies were included on a candidate's website, they were generally not the first policy topic mentioned. Only 15 of the 319 (4.7%) candidates with a policy platform had transportation or infrastructure listed as the first issue³.

The 187 transportation platforms were coded to identify themes. This process produced 68 unique codes ranging from universal basic mobility, with one mention, to cars and/or roads, mentioned by 126 candidates. Transportation platforms averaged 7.7 different codes with one candidate including 41 different themes in their platform. Section 4.1 uses binomial logistic regression modeling to determine what factors were correlated with the inclusion of transportation platforms. Section 4.2 then analyses the content using a mix of qualitative and quantitative methods.

4.1 Regression Models

Binomial logistic models were developed with my dependent variable defined as a simple yes or no for whether a transportation platform was included on a candidate's website or not. Table 2-4 shows the results. As the table shows, five different models were developed. The first considers all candidates for local office in my sample while the remaining four models break the sample down by different jurisdiction types. Cities were broken down into small and big cities because of the range in city sizes. Bigger cities also had more electoral candidates than smaller cities meaning there was a risk candidates from bigger cities might mask potential insights from small city candidates. For the purposes of this analysis, big cities were defined by population density under the assumption that older, denser cities may operate differently to smaller, less dense cities. A big city was defined as having an average city density of 7,500 or more people per square mile⁴.

² 134 candidates had their transportation platform under a transportation or infrastructure label while 53 included a transportation platform under a different label (almost half of which had transportation under an environment heading).

³ The two most important issues were housing/homelessness (25.7% of candidates mentioned these issues first) or policing and public safety (23.8% of candidates mentioned these issues first).

⁴ This density threshold was also greater than all counties included in the dataset.

Table 2-4: Logistic regression odds ratios for transportation policy inclusion on candidate websites

	(1) <i>All</i>	(2) <i>Counties</i>	(3) <i>Cities</i>	(4) <i>Big Cities</i>	(5) <i>Small Cities</i>
Jurisdiction Population (log)	1.816*** (0.144)	1.1800 (0.468)	1.927*** (0.169)	3.832*** (0.465)	1.695*** (0.193)
District Population Density (log)	0.798 (0.156)	1.175 (0.400)	0.849 (0.194)	0.078*** (0.985)	1.2000 (0.255)
Commute Drive Alone (%)	0.982* (0.010)	0.831*** (0.067)	0.987 (0.011)	0.955** (0.023)	0.953** (0.024)
Household Ownership (%)	0.989 (0.010)	1.099*** (0.035)	0.980* (0.011)	0.983 (0.027)	0.986 (0.014)
Previous Election Win Margin (%)	1.000 (0.003)	0.995 (0.006)	1.001 (0.004)	0.989 (0.012)	1.003 (0.005)
City Election	2.001* (0.367)				
Nonpartisan Election	3.533*** (0.330)	6.964** (0.910)	3.633*** (0.487)	4.561* (0.869)	2.534 (0.640)
Democrat Candidate	3.100*** (0.389)	3.121* (0.649)	4.515*** (0.580)	12.100** (1.201)	1.956 (0.761)
At-Large Candidate	1.083 (0.235)		1.147 (0.257)	0.513 (0.585)	1.525 (0.314)
Incumbent	0.528*** (0.245)	0.187*** (0.633)	0.714 (0.282)	0.543 (0.709)	0.740 (0.331)
Contested Election	0.816 (0.258)	0.061*** (0.765)	1.365 (0.315)	0.237 (1.167)	1.157 (0.376)
Strong Mayor			0.539** (0.306)	0.118** (0.953)	0.803 (0.408)
Constant	0.002** (2.683)	146.070 (8.955)	0.001** (3.183)	46,346.32 (11.510)	0.004 (3.724)
Observations	542	113	429	102	327
Log Likelihood	-315.945	-181.816	-244.876	-51.368	-181.881
Akaike Inf. Crit.	655.89	389.633	513.752	126.735	387.762
Pseudo R ²	0.10	0.27	0.13	0.24	0.15

Note:

*p<0.1; **p<0.05; ***p<0.01

Pearson coefficients were used to identify variables that were correlated with each other. City governance was highly correlated with nonpartisan elections. As council-manager elections are always non-partisan (Wollmann and Thurmaier 2012), all council-manager candidates were nonpartisan while mayor-council candidates had both nonpartisan and partisan elections. Unsurprisingly, mayor-council forms of government were very highly positively correlated with strong mayors. Also unsurprisingly,

mayoral elections had a moderate to strong positive correlation with at-large candidates. These correlations had some implications for the regression models. As city governance was correlated with two different variables, it was left out of the models so both partisanship and mayor type could be included. In addition, the distinction between mayoral and council elections was excluded in favor of at-large status. However, at-large status was left out of the second model due to the small number of at-large candidates.

As the models in Table 2-4 show, there are some surprising results. First, candidates from jurisdictions with larger populations were associated with an increased likelihood for candidates having transportation platforms, a trend primarily driven by cities. The models show transportation issues appear to have less of an association with candidates from small jurisdictions. However, what is more surprising is that when controlling for other factors density does not appear to have much association with the presence of transportation issues. It is only statistically significant for big cities and, even then, the coefficient is the opposite of what was expected. Increases in population density were associated with a lower likelihood of having a transportation platform. This finding may highlight the responsiveness of local politicians to the suburban areas of big cities. Suburbs are more likely to be car dependent than denser areas (Newman 1996) resulting in traffic problems (Cervero 1991) without many alternative mobility options like transit (Schimek 1997). As suburban voters have “very high levels of interest and involvement in local affairs” (Oliver and Ha 2007), political candidates may be drawn to issues that are more salient to this group, like transportation concerns.

Although the coefficients for density did not conform to initial expectations, drive alone commuting does. While the strength of the relationship varied by jurisdiction type, overall, increases in driving for commuting were correlated with a decrease in the likelihood of a candidate having a transportation platform. That is, the more transportation diversity, the more likely a candidate includes a transportation platform on their website. As people are more likely to use other modes when driving is less appealing, this variable may be reflecting concerns like traffic congestion, a transportation issue

Manville (2019) suggested is more salient, or just that other modes, like transit, are more salient, as suggested by Wachs (1985).

Household ownership was not strongly associated with transportation platforms in jurisdictions other than counties. However, for county candidates, it was strongly associated with an increase in the likelihood of having a transportation platform. Homeowners are overrepresented in local elections with this population having more resources and arguably greater stakes in their community, especially in lower density areas like suburbs (Oliver and Ha 2007). Thus, candidates for local office in counties may use transportation issues to try and appeal to this more active voting group. As homeownership is correlated with wealth, this may result in equity concerns as mobility needs of lower-income residents are less visible.

Political variables had more mixed results. While historic district competitiveness, operationalized through the previous election win margin, was not correlated with candidate transportation platforms, contested elections do have an association. More specifically, in counties, electoral competition was associated with a reduced likelihood a candidate might have a transportation platform. This may be because other issues may be better for differentiating candidates in county races. The incumbency results were also surprising as incumbency status was associated with a decrease in the probability of having a transportation platform, especially in counties. Although incumbents are more likely to hear about transportation issues from constituents, the incumbency advantage in local elections (Oliver and Ha 2007; Trounstein 2013) may mean incumbent candidates do not put as many resources into developing policies. Conversely, disadvantaged non-incumbents have a greater need to link themselves to issues voters may care more about (Oliver and Ha 2007), like transportation.

The statistical significance of party affiliation was in line with expectations. Both nonpartisan candidates and Democrat candidates were correlated with an increased likelihood of candidates having transportation platforms on their websites. There are two potential explanations for this. First, due to the lack of partisan clues, voters in nonpartisan elections were more likely to vote based on where a candidate

stands on certain issues (Oliver and Ha 2007). Thus, candidates may highlight transportation issues to appeal to voters in these contests. Second, people who lean liberal are more willing to support changing the transportation status quo with transportation reforms (Klein et al. 2022). Thus, it is not surprising liberal candidates are more likely to have transportation platforms.

Finally, cities, especially big cities, with strong mayors were associated with a decrease in the likelihood of having transportation platforms. In reviewing the data, this correlation reflects trends for both candidates for mayor and for city council. These results were not expected given previous scholarship suggested strong mayors may use policies for political purposes (Nuun 1996). However, as cities with strong mayors spend substantially less on infrastructure than cities with weak mayors (Nuun 1996), these results may indicate transportation is not a high political priority in strong mayor cities.

4.2 Descriptive Evaluation

Once identified, transportation themes were sorted into three broad categories:

- **Transportation mode:** the mode(s) of transportation mentioned
- **Transportation issue framing:** the concern, problem, or opportunity the candidate is focusing on
- **Transportation issue solution:** the proposed solution or answer to the problem; agenda-setting

While these three categories are connected, this section uses these broad classifications to give some structure to descriptive results. However, there are also broader trends that cut across these categories.

Table 2-5 shows the percent differences in the proportion of candidates who mentioned a specific transportation theme. Only themes with a sufficient sample size to perform at least one chi-squared evaluation were included, 27 out of the 68 total themes. The descriptive trends from the chi-squared evaluations are described below.

First, there are some large, statistically significant differences between candidates standing for office in cities and those in counties. Most glaring was the difference in the inclusion of active transportation. 36% more city candidates included platforms mentioning bicycling or pedestrians with

22% more city candidates mentioning bicycle infrastructure. Some of these differences may be due to differences in responsibilities between the two types of jurisdictions. Cities are generally denser than counties, providing an environment that is more accommodating for cyclists and pedestrians. City candidates were also more likely to mention maintenance or repair needs. This may also be because of density. Denser areas may see higher use of roads and sidewalks, meaning they are more often in need of maintenance repair than the average road or sidewalk in a county. Finally, transportation safety was more of a concern for cities than for counties. While rural roads have a higher fatal crash density than urban roads (Zwerling et al. 2005), car fatalities have been relatively flat over the past decade while pedestrian and bicyclist fatalities have been trending upward (USDOT Bureau of Transportation Statistics 2022). Thus, the focus cities have on safety is possibly driven by the focus cities have on active transportation modes.

Differences in incumbency status only had two statistically significant differences in transportation themes. First, 14% fewer incumbents than non-incumbents covered issues relating to fairness or equity. This might be explained by the different approaches to campaign messaging. Fairness and equity are generally mentioned when there is a need for more fairness or equity, a critique of current practice. As Han et al. (2021) noted, non-incumbents were more likely to use negative campaign messaging than incumbents. Thus, the willingness to critique may be a result of more negative campaign messaging. Second, incumbents were more likely to focus on funding or investment as policy solutions. This may reflect the experience of incumbents. Experience as an elected official may reveal that novel or innovative transportation policy solutions still need funding for implementation.

At-large status provided some unanticipated results. The differences between at-large and ward politicians described by Han et al. (2021) led to an expectation that there may be differences in themes included in transportation policies. However, differences between at-large and ward candidates were small and not statistically significant.

Table 2-5: Relative differences in candidates who include a specific transportation theme in their website policy

Variable	Jurisdiction Type (City relative to County)	Incumbency (Incumbent relative to not)	At-Large Status (at-Large relative to not)	Partisanship			City Governance (Mayor-council relative to Council-manager)	Mayor Type (Strong Mayor relative to Weak Mayor)
				(Nonpartisan relative to Democrat)	(Nonpartisan relative to Republican)	(Democrat relative to Republican)		
Observations	187	187	187	183~	183~	183~	154	154
Transportation Mode								
Bicycling	35.9%***	-5.0%	-4.4%	20.3%***	37.6%***	17.2%***	10.4%	12.9%
Cars or Roads	4.5%	-9.1%	-3.7%	12.9%	-8.8%	-21.8%	2.7%	4.2%
Infrastructure	-7.1%	-6.5%	-8.6%	-5.2%**	-40.8%**	-35.5%**	11.4%	8.3%
Pedestrians	33.3%***	-10.0%	-5.9%	12.2%*	27.9%*	15.6%*	18.6%**	17.0%**
Rail	0.4%	-5.0%	0.2%	-	-	-	-5.3%	-7.3%
Transit	13.6%	-2.3%	-3.4%	1.4%*	34.3%*	32.9%*	8.9%	7.1%
Transportation Policy Framing								
Accessibility	6.1%	7.1%	6.1%	1.2%	10.7%	9.5%	14.5%**	14.1%**
Affordability or Cost	-0.2%	-12%	-6.1%	-2.8%	24.8%	27.6%	0.0%	-3.4%
Clean	-	-	-	-	-	-	-	-
Connectivity	-	-	1.2%	-	-	-	4.5%	2.4%
Economy or Business	-	-0.2%	4.4%	-	-	-	2.5%	0.6%
Efficiency	-	-	4.2%	-	-	-	7.3%	5.5%
Environment	14.9%*	-9.4%	6.6%	3.0%**	34.0%**	31.0%**	10.2%	13.5%*
Fairness or Equity	9.7%	-14%**	-2.0%	-	-	-	7.7%	4.6%
Jobs	-	-	2.2%	-	-	-	-	-3.8%
Maintenance or Repair Needs	17.7%**	-1.3%	-4.4%	16.7%	7.4%	-9.3%	6.1%	10.1%
Mode Shift or Reduce Car Use	-	-0.8%	-1.7%	-	-	-	4.6%	2.0%
Parking	-	-	-	-	-	-	5.3%	3.6%
Reliability	-	-	-	-	-	-	-	7.5%
Safety	19.7%**	-10.9%	-11%	9.4%	25%	15.6%	16.4%*	15.6%*
Traffic or Congestion	14.5%*	-5.0%	4.7%	16.6%	3.9%	-12.7%	8%	3.8%
Transportation Policy Solution								
Bicycle Infrastructure	22.1%***	-4.8%	-6.1%	14.4%**	21.3%**	6.9%**	11.7%	13.7%**
Build or Expand	-1.9%	-9.8%	4.2%	-	-	-	5.6%	3.0%
Bus Priority Infrastructure	-	-	2.2%	-	-	-	2.5%	3.4%
Community Engagement	-	-	-	-	-	-	-	10.3%**
Cross Government Coordination	-	-	2.2%	-	-	-	2.4%	0.8%
Development, Housing or Land Use	-	-	5.9%	-	-	-	-0.4%	0.4%
Electric Vehicles	-	-	4.9%	-	-	-	7.3%	5.5%
Fares	-	-	-	-	-	-	-	4.6%
Fund or Invest	-9.7%	17.9%**	1.5%	-6.9%**	-37.4%**	-30.5%**	10.9%	6.7%
Pedestrian Infrastructure	-	-	-	-	-	-	4.4%	5.5%

*p<0.1; **p<0.05; ***p<0.01; ~ Includes all Nonpartisan, Democrat, and Republican observations

Political affiliation had statistically significant differences for several themes, suggesting correlations between partisanship and platform content. This aligns with research that demonstrates partisanship has been increasingly proven to be an important focus in local elections (Sances 2018; Warshaw 2019). Cycling and environmental issues were more likely to be included by nonpartisan and Democrat candidates while Republican candidates were more likely to label transportation issues under the more general term “infrastructure” and were more likely to focus on funding or investment. A noteworthy finding is that nonpartisan candidates and Democrats both had similar statistically significant differences to Republicans. This suggests Democrat and nonpartisan candidates may share similar transportation policy preferences. One explanation could be that nonpartisan elections allow candidates to focus on issues and urban issues may align more with Democrat politics, a consequence of the increasing urbanization of Democrat voters (Damore, Lang, and Danielson 2020; Parker et al. 2018). However, there were still differences between these two groups. Because nonpartisan elections allow candidates to focus more on issues while partisan candidates align more with national party preferences (Warshaw 2019), the differences between nonpartisan and Democrat candidates may represent the transportation issues that are more important to cities and less salient in party politics. Bicycling, for example, is an issue that may not be important for Democrat politics but is increasingly important for cities, as demonstrated through the increase in US cycling infrastructure (Freemark et al. 2022).

Some have argued that theoretical local government structure does not result in empirical differences in local government spending (Reese, Li, and Remer 2020). This might partly explain why there are not many statistically significant differences between mayor-council and council-manager cities. Further, the two themes that are statistically different, pedestrians and accessibility, have similar differences and statistical significance when considering mayor types. As mayor type is a major factor in city government types, the observed differences may reflect differences in mayor type, not governance type. As mentioned previously, the correlation between the two makes the results difficult to disentangle.

Although candidates from strong mayor cities share some similarities with candidates from mayor-council cities, there are still some differences. First, there is statistically significant support for strong mayors focusing more on community engagement. As a “mayor’s electoral strength still rests in the ability to respond to political constituencies” (Nuun 1996, 95), these results may be demonstrating the stronger role of politics. Being seen responding to constituent concerns, putting their face in the forefront of resolving important issues, is as important as actually solving the issue. The significance of bicycle infrastructure could be an example of automobility politics. Wilson and Mitra (2020) argue a strong political champion is needed for implementation when non-car infrastructure engages in a political battle for road space. Thus, these results suggest strong mayor cities where a mayor has “stronger executive authority over many municipal functions” (Wilson and Mitra 2020) could be seeing the stronger political leadership needed for policies like installing bike lanes.

4.2.1 Transportation Modes

Twelve different transportation modes (plus the broader term “infrastructure”) were mentioned in transportation platforms, however, only four modes were mentioned by more than 30% of candidates. About two-thirds of candidates mentioned cars or roads, almost half mentioned transit, and about two-fifths mentioned bicycling and pedestrians. There was also an emphasis on people transportation; only four candidates explicitly mentioned freight.

Interestingly, modal policy priorities don’t align with mode share. According to the latest US National Household Travel Survey data (Wang and Renne 2023), cars are the predominant mode used for daily travel (82.6% of trips) with walking (10.5% of trips), transit (2.9% of trips), and bicycling (1.0% of trips) all much smaller proportions. As Figure 2-3 shows, all non-car modes are overrepresented in transportation platforms, but especially so in cities and especially so for transit. This is somewhat in line with other research that has demonstrated that political support for transit is higher than transit use (Manville and Cummins 2015; Taylor and Morris 2015). While this previous research has focused on direct democracy, the findings here suggest disproportionate political support for non-car modes may also be a

feature of representative politics. Another explanation is normative: what modes *should* cities be focusing on? Some candidates were explicit about their normative views of transportation modes, writing they: “Support all areas of public transit and increased incentives for use of shared transit, car/van pools and micro-mobility to reduce the number of cars on city streets.” The next section goes deeper into how transportation modes are connected to the different goals and values of local political candidates through issue framing.

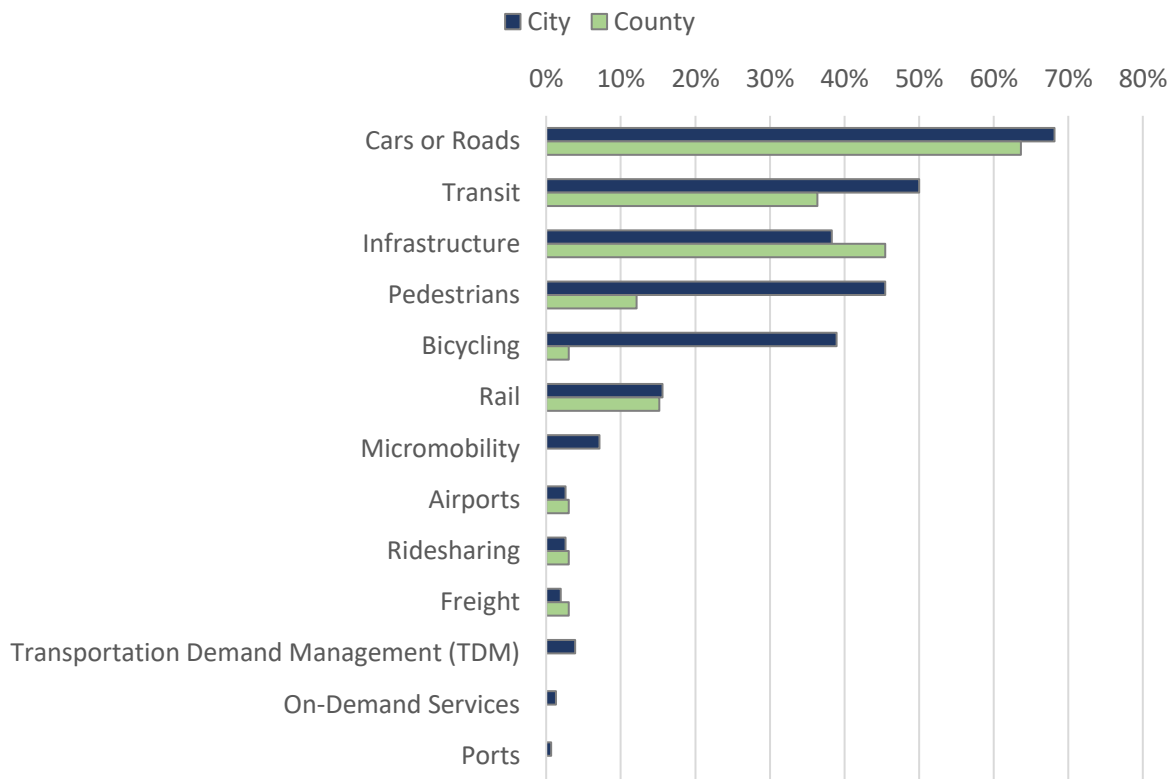


Figure 2-3: Transportation modes by jurisdiction for local political candidates (n=187)

4.2.2 Issue Framing

Issue framing is critical because it influences how a problem is perceived and defined (Meyer and Miller 2001). In my sample, candidates for local office used 28 different frames for their transportation platforms. However, different transportation modes were associated with different issue framing. To better understand how mode varied with framing, I created a crosstabulation of transportation platform excerpts to see where transportation modes and issues interact. Table 2-6 shows the result.

Table 2-6: Crosstabulations for transportation modes and issue frames in policy excerpts (n=511)

Frame \ Mode	Airports	Cars or Roads	Bicycling	Infra-structure	Freight	Micro-mobility	On-demand services	Ports	Rail	Ride-sharing	Pedes-trians	TDM	Transit
Accessibility	0	7	13	6	0	0	0	0	3	0	14	0	26
Accountability or Audit	0	3	2	2	0	0	0	0	0	0	3	0	2
Disability	0	3	6	1	0	1	2	0	2	0	7	0	3
Aesthetics or Beauty	0	4	1	3	0	0	0	0	0	0	3	0	1
Affordability or Cost	0	17	9	10	0	0	0	0	5	1	10	0	31
Clean	0	10	0	4	0	0	0	0	0	0	4	0	3
Commute or Travel Length	0	1	2	1	0	1	0	0	0	0	1	0	2
Connectivity	2	6	11	5	1	0	0	0	9	1	10	0	16
Construction	0	5	1	2	0	0	0	0	0	0	1	0	3
Economy or Business	2	13	3	10	0	0	0	0	2	0	5	0	8
Education	0	2	4	2	0	0	0	0	1	0	4	0	7
Efficiency	0	11	8	5	0	1	1	0	1	0	5	1	10
Environment	0	24	21	23	4	2	0	0	7	1	23	2	51
Fairness or Equity	0	11	9	10	0	0	0	0	5	0	10	0	26
Freedom of Choice	0	6	5	5	0	0	0	0	3	0	5	0	8
Jobs	0	7	5	8	1	0	0	1	2	1	3	0	15
Maintenance or Repair Needs	0	48	6	22	0	0	0	0	0	0	19	0	6
Mode Shift or Reducing Car Use	0	14	17	4	0	2	0	0	3	1	14	2	19
Parking	0	7	3	0	0	0	0	0	0	0	4	0	8
Policing and Enforcement	0	5	2	1	0	0	0	0	1	0	1	0	1
Public Health	0	7	6	1	1	0	0	0	4	0	7	0	7
Quality of Life	0	6	3	4	0	0	0	0	3	1	3	0	5
Reduce Oil Dependence	0	0	2	3	0	0	0	0	1	0	1	0	3
Reliability	0	2	2	3	0	0	1	0	1	1	1	0	15
Resiliency	0	0	0	2	0	0	0	0	0	0	0	0	0
Safety	0	55	54	20	1	3	2	0	10	0	54	1	40
Traffic or Congestion	0	29	8	9	2	1	1	0	2	0	11	4	15

Overall, safety, the environment, and maintenance were the top frames used by candidates. However, their use changed by mode. For example, while cars, bicycling, and pedestrians were all frequently associated with safety, environmental framing focused more heavily on transit. Maintenance generally focused on roads, sidewalks, and infrastructure.

Interactions between modes and frames illuminate different policy narratives. For example, bicycling was associated with connectivity much more than cars, partly because of issues with gaps in bicycle networks, a common problem in cities. As one candidate put it, they want to “Complete the protected, connected bike network.” As another example, affordability or cost was associated more with transit than any other mode. This may reflect the perception of transit as a social service (“We need transit to be accessible and affordable for everybody – especially the disabled, seniors, and low income”) but also the fare-free policy trend (“[Candidate] will also make sure that no [resident] ever has to pay to ride a bus or [...] train again saving working families thousands of dollars every year”). These policy narratives reveal and reflect a candidate’s values. In doing so, they provide a basis for comparing and prioritizing different modes and transportation problems. As one candidate wrote: “Can we make our bike lanes and pedestrian crossing safer? Absolutely, but there is no legitimate reason that it must be at the expense of efficient traffic flow.” In this case, the framing of efficient traffic flow for cars was used to deprioritize pedestrian and cyclist safety.

4.2.3 Agenda Setting and Policy Solutions

Once transportation issues had been identified, local political candidates could set their political agenda by proposing solutions to the problems they identified. However, not all candidates in my sample took this step. One-third of candidates highlighted modes and presented policy frames or issues without proposing a solution or action. The remaining candidates with transportation platforms provided 28 different policy solutions. No single solution was shared by more than 30% of candidates. Funding or investment was the most popular solution, mentioned by 28% of

candidates, while bicycle infrastructure (18%), building or expanding transportation (17%), and development, housing, and land use (13%) were the next most popular.

The mix of policy solutions was a clear differentiator between some candidates. Figure 2-4 shows an especially salient example. While nonpartisan candidates had the most variation in policy solutions, Democrat candidates had much less variety. Republican candidates had the least variety with only five types of policy solutions offered. This may suggest transportation policy diffusion is more constrained among Republicans in local politics. While the lack of policy solution diversity was most salient with candidate party affiliation (or lack thereof), it is also evident among other candidate labels. Incumbents offered an average of 32% fewer policy solutions than non-incumbents and county candidates offered 57% fewer policy solutions than city candidates on average.

Overall, agenda setting and policy solutions were the most underdeveloped of candidate transportation campaign platforms. This may be because candidates did not want to be held accountable to an unworkable solution, may have considered identifying the problem was enough to satisfy constituents, or perhaps just did not have the knowledge or resources to know what potential solutions could be tried. This last point may highlight a gap between politics and transportation practitioners.

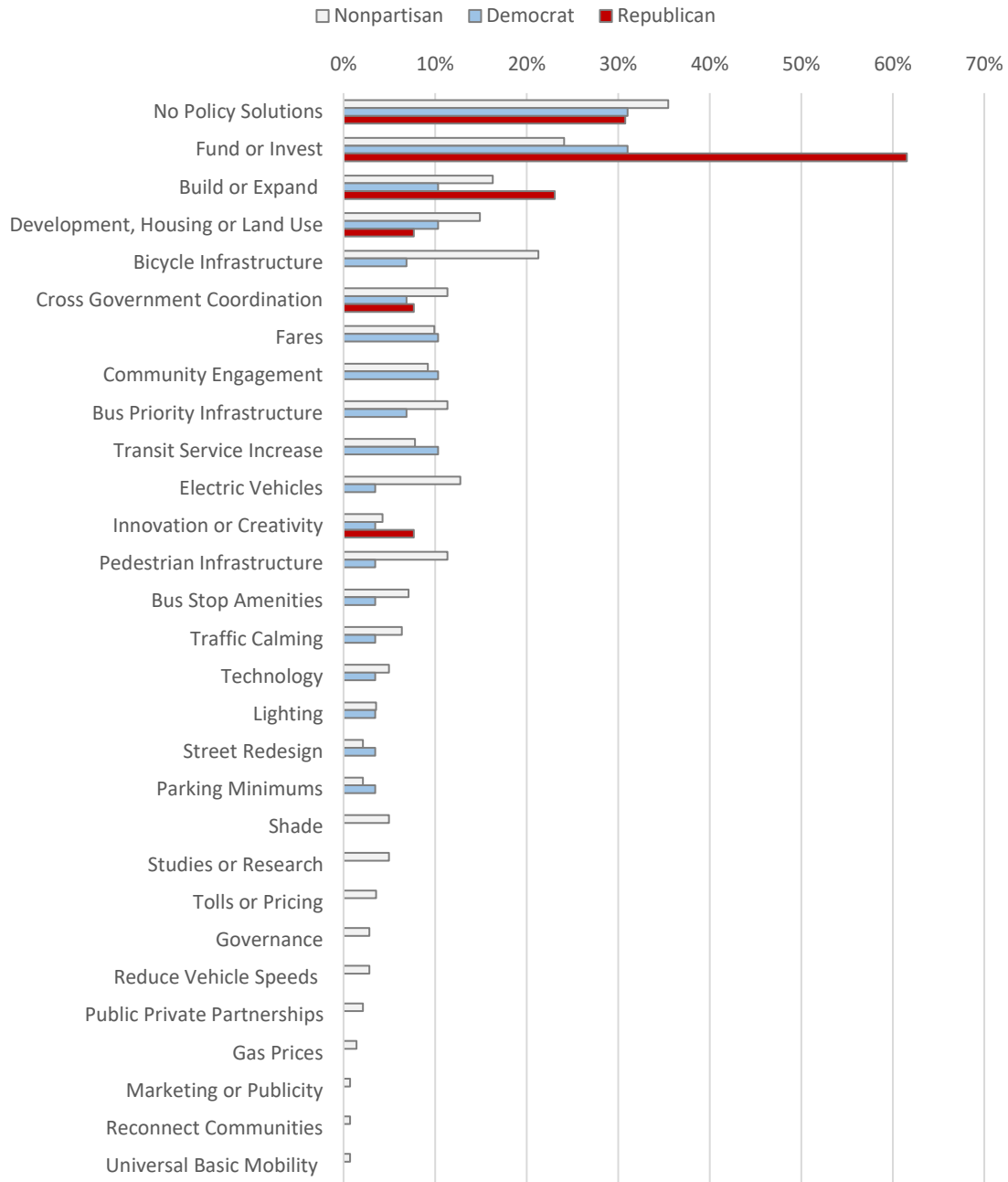


Figure 2-4: Transportation policy solutions by partisan affiliation for local political candidates (n=183)

5.0 Conclusion

This chapter develops and analyzes new data connecting politics and transportation at the local level. The evaluation presented here has provided insight into which candidates for local office are more likely to include transportation in their political platforms as well as what kinds of

transportation topics get included. A variety of factors affect the inclusion of transportation platforms at the local level including variations in governance, partisanship, and regional characteristics like a jurisdiction's size and the population's transportation behavior. Importantly, these factors are not consistent across jurisdictions, underlining the importance of recognizing different types of jurisdictions prioritize transportation for different reasons.

Through an evaluation of transportation platform content, I organized the most important themes into three categories: transportation modes, issue frames, and policy solutions. The most mentioned modes included cars, pedestrians, transit, and bicycling; the most frequent issues were safety, the environment, and maintenance; and, the most popular solutions were funding and investment, bicycle infrastructure, building or expanding transportation systems, and development, housing, and land use. There is also evidently a big step between defining a problem and offering a solution to that problem, a step many candidates did not take. Agenda setting is understudied in transportation (Marsden and Reardon 2017), but this may partly be because it is a smaller, more insignificant part of political campaigning at the local level.

Although this work expands our understanding of transportation policy development in a few ways, there are some limitations to the findings. First, the statistical correlations described in this chapter do not necessarily reflect causation. More would need to be done to demonstrate how contextual factors causally affect transportation policy development in local elections. Second, the census data used in this analysis was transformed to political districts using spatial averaging, meaning there may be ecological inference impacts. Third, there may be local situational factors that affect the inclusion of different transportation platforms that aren't captured in this analysis. This underlines the importance of complementing studies with a larger number of cases, like this one, with more detailed case study work like Han et al. (2021).

Finally, there are also opportunities to expand on this work. First, while a variety of local election contests were captured in this evaluation, there is still much more variation in local politics to explore. As Han et al. (2021) wrote “Salient municipal issues vary over time, space, and social groups.” Consequently, changes in geography, changes in time, or even changes in federal politics may shift how transportation policies are included in local elections. Second, while this chapter provides insight into how transportation is considered in local elections, more needs to be done to see how well transportation campaign positions translate to adopted transportation policies. As mentioned earlier, Easton’s (1957) conceptualization of the political process is a system that transforms inputs into outputs. This study has focused on the inputs, but future work is needed to help connect these inputs to outputs, transportation decisions and policies. An important next step for this work would be more case-level research that could track how inputs that affect policy platforms may or may not translate to political outcomes.

Chapter 3 – Saliency of Transportation Policies in State Legislative Elections: The Case of Virginia

1.0 Introduction

How important are transportation issues to political candidates? Transportation systems are expensive⁵ and directly impact important issues like climate change, equity, and quality of life. However, it is not clear how salient transportation policies are in elections. Do candidates prioritize transportation or do candidates not care if voters know their position on these issues? Are there situations where candidates do care and situations when they do not? This research will attempt to address these open questions.

Specifically, I will answer the following research questions:

- Which state legislative candidates are more likely to have transportation policies?
- What kind of transportation issues are covered within transportation policies?
- What factors make candidates more likely to focus on certain issues?

Understanding the saliency of transportation policy priorities at the state legislative level is important for a few reasons. First, agenda setting in transportation in policy is generally understudied (Marsden and Reardon 2017). This gap in transportation policy has contributed to a bias in favor of the technical-rational theory of policy where politics is treated exogenously (Marsden and Reardon 2017). This does not reflect the much more complicated reality of transportation decision-making where politics is heavily entrenched in policy sausage-making. As Wachs (Wachs 1995, 285) wrote:

Consensus, power, money, and political salience are far more likely to be the determinants of transportation policies than are analytical methods or theoretical arguments, and it is important that students of transportation acknowledge the inherently political nature of policy making.

⁵ At almost \$10 billion transportation was the third largest line item in the Virginia 2021-2022 budget

Hence, studying transportation policies in political campaigns could further our understanding around how transportation policy decisions are made. Second, although transportation is often considered a local issue, political factors might be less influential at the local level because of the shared authority with federal and state government actors (Agranoff and Radin 2015; Wright 1988), with state influence only getting stronger over time (Bowman and Kearney 2012). Funding mechanisms in particular may result in transportation issues somewhat being taken out of the hands of local government control. A reliance on grants or other forms of funding from other levels of government can reduce or constrain a local government's ability to control transportation spending (Peterson 1981, 214). For example, states that provide more funds for transportation and infrastructure have more say in where these funds are allocated (Richardson Jr, Gough, and Puentes 2003). As the Urban Institute (2022) has highlighted, states in the US spend a greater share of their budgets on transportation than local governments. Burns and Gamm (1997) also argue that understanding local politics "requires the systematic study of state legislative politics." Consequently, studying state level transportation policy agendas could help explain local transportation actions. Third, research focusing on transportation policies at the state level complements recent existing state legislative campaign and policy content that has considered physical characteristics of political districts (Herrick 2016; Yusuf, st. Burton III, and Ash 2014) as well as other work focusing on transportation issues at the national level (Chaney 2014). Finally, issue salience can help shape the contours of politics (Gormley, 1986). Thus, an improved understanding of issue salience can improve our understanding of the actors who get involved, their incentives, tactics used, and the choice of criteria employed.

1.1 Virginia State Legislature

Following other state legislative research (Yusuf, st. Burton III, and Ash 2014), I chose to focus this research on state, Virginia, to control for external factors that may vary between states. As I am only using one state, I chose a state that represents a common case with circumstances and conditions that would be common across other states (Yin 2018).

Established in 1619, the Virginia General Assembly is the oldest legislative body in the United States (US). The legislature is bicameral, consisting of both a House of Delegates with 100 members and a Senate with 40 members. Members of the House of Delegates are elected for two year terms while members of the Senate are elected for four years terms. Although legislators only meet for a short period, 60 days in even-numbered years and 45 days in odd-numbered years, the National Conference of State Legislatures (NCSL) considers Virginia to have a hybrid legislature (National Conference of State Legislatures 2021). This means that the role of legislator is more than two-thirds of a full-time job with pay low enough to require additional sources of income.

Virginia was selected as the case for this research for three principal reasons. First, Virginia is a diverse state with variation in politics, demographics, and transportation (Mondschein and Parkany 2017). For example, Virginia's status as a political swing state and mix of urban and rural areas means there are large enough variations in partisan influence and transportation context to observe in statewide trends and analyses. Second, in recent years transportation policy has become increasingly important at the state level with significant increases in rail investment, public transportation, toll roads, bridges, and other infrastructure (Lazo 2021). Third, Virginia is representative of other states in several ways. According to 2020 Census data, although Virginia is becoming increasingly urban, its urban population is still relatively average for the US with population density comparable to the rest of the country. In addition, Virginia shares its hybrid legislature status, as defined by NCSL, with a further 25 states. One metric where Virginia is below average is the Squire Index. This index is a measure of legislative professionalism that uses information like salaries and staff resources to assess a legislator's capacity for generating and digesting information in policymaking (Squire 2017). Virginia's 2015 rank was 32nd, its lowest rank since the index was introduced over 40 years ago. This means understanding a candidate's agenda is even more important as their policy positions are less likely to change once elected.

2.0 The Importance of Transportation Issues in Elections

Gormley wrote “a highly salient issue is one that affects a large number of people in a significant way; [...] saliency is low unless the scope of conflict is broad and the intensity of conflict is high” (1986, 598). It is important to better understand transportation salience as it directly affects how issues are treated in the policymaking process. If issues have high salience, they attract more attention from politicians, more focus from citizen’s groups, and more attention from journalists (Gormley, 1986). Conversely, issues with low salience could be subject to influence by more systematized factors like ideology, geography, and institutional barriers (Yusuf, st. Burton III, and Ash 2014). There is also a risk of affected industries and actors exploiting the process (Gormley, 1986). Finally, if transportation issues are less salient, the views and policies of elected representatives may have a greater influence on the way the public perceives or understands said issues (Griffin and Newman 2013).

Using the earlier definition of salience, it is understandable how a subject like transportation might be considered a salient issue, at least for some people. Many people complain about being stuck in traffic, for example. Some researchers agree with this assessment. Manville (2019) wrote about the high salience of congestion, specifically for urban residents; Wachs (1985) wrote that public transportation has long been a politically salient issue; and Gorgulu et al. (2020) stated that road quality is a “publicly salient policy sphere.” However, although Gormley provided the earlier definition of salience, they classified transportation as a low salience, predominantly state-level issue. They argue that, while transportation affects the economy, it has an indirect impact on “ordinary citizens.” Again, some researchers agree. When evaluating how partisanship affects transportation policy attitudes, Nall et al. (2016) wrote:

... transportation is a low-salience issue that receives relatively little attention from the public. Americans have little knowledge of existing gasoline taxes, or how such taxes are distributed among transportation programs.

The authors suggested the low salience of transportation policy could partly explain the small differences they found in policy preferences. The theory that transportation policies have low salience is also supported by comments by Oliver and Ha (2007) who wrote that voters are underinformed on national issues and thus may be even more underinformed on subnational issues. The authors go on to classify transportation policies, like road maintenance, as “pedestrian” or unexciting stating “it is unclear how well citizens can recognize candidate positions” on these issues. Considering the literature, it is clear there is no consensus on the saliency of transportation policies.

Previous transportation research has used election manifestos, a published document that summarizes plans, policies, and views of a political party or group, as one way to understand the importance or salience of transportation issues in elections. For example, Chaney (2014) explored changes in rail discourse in Westminster, Scottish, Welsh, and Northern Irish election manifestos from 1945 to 2011, finding rail salience has been increasing over time. van Meerkerk et al. (2015) concluded road pricing was important to Dutch election politics because the topic was included in a majority of election manifestos from political parties in the Netherlands. However, both studies focused on politics at a national/federal level. More recently, social media has been leveraged to better understand transportation in the context of election campaigns. Han et al. (2021) used text analysis to evaluate how election candidates mentioned planning topics, including transportation, on Twitter and Facebook during the 2017 Calgary election in Canada, a municipal level election. The authors found public transportation was a focus of most candidates for mayor and city council.

Although there has been some work considering transportation salience in elections, there are still gaps to be addressed. First, as salient issues vary over geography and between communities (Han, Laurian, and Dewald 2021), different geographies and political scales may produce different results. Thus, state-level elections in the US may produce different results to existing literature that has focused on national or local elections in other countries. Second, previous work has either used political manifestos

from political parties, which do not reveal differences between candidates within parties, or social media, which may not be as representative due to variations in who uses social media and how social media is used by candidates (Han, Laurian, and Dewald 2021). As I will establish in the next section, candidate websites help overcome some of these limitations. Finally, as I have demonstrated, research covering transportation topics has speculated about transportation salience without much consensus. More work focusing on what transportation topics are important and why salience might vary could provide some clarity to both politicians and academics.

3.0 Methodology and Data

Although Virginia has a bicameral legislature, this analysis specifically focuses on the 2021 House of Delegates election (the state senate was not up for reelection in 2021). This election included 201 candidates for the 100 seats available. Candidate websites were the primary data source used for evaluating transportation policy saliency. While websites include similar content to other political communications, like television advertisements, they typically include more issues, and the focus of issues is different. Sulkin et al. (2007) specifically found that infrastructure was one of the issue areas that received significantly more agenda attention on a candidate's website than in their paid advertisements. Hence, websites are particularly suitable for evaluating the saliency of transportation issues. Previous research has also suggested candidate websites are used to appeal to undecided voters, recruit volunteers, and seek donations (Gibson 2012; Herrick 2016); thus, they are a good source for issues that are particularly salient for candidates. Finally, websites make it more manageable to evaluate many campaign issues simultaneously (Herrick 2016).

To supplement website information, candidate tweets were scraped from Twitter. While websites can provide a lot of policy detail, they do not indicate how the importance of an issue may increase or decrease over time. Twitter data, while less substantive, can demonstrate how the importance of an issue may fluctuate over time (Han and Laurian 2022).

As there is a risk of bias against some candidates who may not have websites or Twitter, I checked the representativeness of the data sources for the candidates. Table 3-1 summarizes the results. As the table shows, almost all candidates had a campaign website, demonstrating the validity of the medium as a source of candidate content, while most candidates also had a Twitter handle they used for the election. A significant portion of candidates had some form of transportation policy on their website with a smaller portion mentioning transportation related issues on Twitter. As there was a small number of Libertarian and independent candidates, they were excluded from some of the statistical analyses.

Table 3-1: Election candidates and data availability

	<i>Total</i>	<i>Democratic</i>	<i>Republican</i>	<i>Libertarian</i>	<i>Independent</i>
<i>Candidates</i>	201	93	98	5	5
<i>Candidates with websites</i>	98%	98%	98%	100%	100%
<i>Candidate's website includes a transportation policy</i>	33%	40%	29%	0%	20%
<i>Candidates with Twitter</i>	86%	96%	80%	100%	20%
<i>Candidate tweeted about transportation</i>	27%	35%	21%	0%	0%

3.1 Methods

Three different methods were used to evaluate the website and Twitter data. First, descriptive statistics and basic univariate and bivariate statistical testing were used to identify potential trends and patterns in the coded website data. Second, I developed binomial logistic and ordinal logistic regression models of policies from candidate websites. The purpose of the modeling was to determine which candidates were more likely to have transportation policies and identify any factors that might make a candidate more or less likely to have a transportation policy. There were three primary strategies for these regression models. First, to evaluate whether a candidate has a transportation policy, I used a binomial logistic model with a simple yes/no for the presence of a transportation policy. Second, to determine how important a transportation policy is to a candidate, I developed a three-level measure for the degree of saliency before using an ordered logistic regression to evaluate the results. Finally, as the literature suggests specific issues or transportation modes might be more salient, I developed binomial logistic models for a variety of different issues and modes to see how different factors affect different issues. For the third analysis I

descriptively evaluated tweets over time. Tweets were plotted by month over time with basic statistical tests used to identify trends and patterns. Other research (Han and Laurian 2022) has employed a similar strategy to observe trends and patterns in tweet content over time. Like Han and Laurian, my analysis includes a normalization of transportation tweets by dividing the number of on-topic tweets by all tweets over the study period.

3.2 Data

This research uses three types of data: candidate website data, explanatory variable data, and data from Twitter. The data are summarized in Table 3-2 and described in more detail in the sections below. Summary statistics are included in Appendix B.

3.2.1 Website Data

Candidate websites were individually reviewed to identify three types of information. First, I determined whether the candidate had a transportation policy and where the policy was located on the website. Second, I measured the extensiveness of the transportation policy, both qualitatively and by word count. Finally, to identify policy themes and any included transportation modes, I coded the website content using an inductive coding process (Boyatzis 1998). Inductive coding “primarily use[s] detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher” (Thomas 2006). This kind of process is “driven by the data” (Chaney 2014) rather than driven by preconceived categories. While arguably subjective, this method can quantify themes and patterns in qualitative data.

Previous research has described different ways for measuring the importance of an issue on a candidate’s website. For example, Sulkin et al. (2007) used a four-point scale based on the amount of text dedicated to an issue. The value for an issue was their score divided by the sum of all issue scores on the website. Conversely, Herrick (2016) used a three-point scale based on the length of a discussion and the

placement on the candidate’s website. Building especially off the work by Herrick, I developed a three-point scale that estimates the degree of saliency.

Table 3-2: Data sources

<i>Category</i>	<i>Variable</i>	<i>Definition</i>	<i>Data Source</i>
<i>Dependent variables</i>	Transportation policy	1 if candidate mentioned transportation, 0 if not	Candidate websites (November 2021)
	Degree of saliency	2 if transportation had high saliency, 1 if transportation was mentioned but not highly salient, and 0 if transportation was not mentioned	Candidate websites (November 2021)
	Transportation issues and modes	1 if candidate mentioned issue or mode, 0 if not	Candidate websites (November 2021)
<i>Explanatory variables</i>	Democrat	1 for Democrat, 0 otherwise	Virginia Department of Elections
	Incumbent	1 for Incumbent, 0 otherwise	Virginia Department of Elections
	Average Voter Turnout (%)^	Votes in 2019 election divided by estimated count of US Citizens 18 years or older	Virginia Department of Elections, 2017-2021 ACS 5-year Estimates @ Block Group, VirginiaRoads.org
	Average Win Margin (%)	Measure of district competitiveness. Average percent difference between Democrat and Republican votes in 2017 and 2019 elections	Virginia Department of Elections
	Roads per Square Mile (log)	Log of road miles from Virginia Road Centerlines (2022) per square mile in candidate district	Virginia Geographic Information Network, VirginiaRoads.org
	Rail per Square Mile (log)	Log of rail miles from rail network (2022) per square mile in candidate district	Virginia Geographic Information Network, VirginiaRoads.org
	Transit Routes per Square Mile (log)	Log of transit route miles from all Virginia transit agencies (2022) per square mile in candidate district	virginia-gtfs.com, VirginiaRoads.org
	Population Density (log)^	Log of residents per square mile in candidate district	2017-2021 ACS 5-year Estimates @ Block Group, VirginiaRoads.org
	Commute Drive Alone (%)^	Estimated percent of commuters who commute by driving alone in candidate district	2017-2021 ACS 5-year Estimates @ Block Group, VirginiaRoads.org
	Average Cars per Household^	Estimated number of cars owned in candidate district divided by households in a candidate district	2017-2021 ACS 5-year Estimates @ Block Group, VirginiaRoads.org
<i>Tweets</i>	Tweets	Candidate tweets	Twitter (November 2020 to November 2021)

[^]Data provided at Census Block Group level were transformed to electoral districts using areal weighting

If a candidate’s transportation policy is either equal to or greater than the 75th percentile for word count, either equal to or greater than the 75th percentile for the number of transportation issues,

or listed in the first 50% of policies on a website, it is classified as highly salient and coded as 2. If a candidate has a transportation policy but does not meet the highly salient criteria, it is coded as 1. Candidates without transportation policies are coded as 0.

$$\text{Degree of saliency} = \begin{cases} 2, & \text{if } w_j > 75\% \text{ile } w \text{ OR } t_j > 75\% \text{ile } t \text{ OR } i_j > 50\% \text{ile } i \\ 1, & \text{if there is a transportation policy but does not meet criteria for 2} \\ 0, & \text{if there is no transportation policy} \end{cases}$$

Where w is number of words included in a platform, t is number of transportation issues included in a candidate's website, i is the total number of issues on a candidate's website, and j is a specific candidate.

3.2.2 Explanatory Variables

There are two main types of explanatory variables: political variables and district characteristics. Each category is explained and justified below.

Political Variables

Existing work evaluating partisanship and transportation suggests a candidate's political affiliation might influence both their inclusion of transportation policy and the types of issues they prioritize. For example, there is some evidence Democrats are more likely to spend more on transportation than Republicans (Gerber and Hopkins 2011) and some evidence that political party can explain preferences over different types of transportation issues (Hannay and Wachs 2007; Jensen et al. 2021; Klein et al. 2022; Nall, Agrawal, and Nixon 2016). Research has also shown that re-election incentivizes state legislators to bring more discretionary pork, including highway and transit dollars, back to their district (Aidt and Shvets 2012). Consequently, an incumbent candidate might increase the saliency of transportation policies to signal their intent of bringing increased transportation dollars to their district. Political competitiveness in a district may also play a role. Previous work has found close elections can affect issues found on candidate websites (Herrick 2016) while electoral competition has historically been considered an important part of state politics literature (Holbrook and Dunk 1993). Thus, the inclusion of the previous margin of victory in a district might give some insight into political competitiveness (Holbrook and Dunk 1993). As previous

political results might be more about specific candidates than political parties (Besley and Case 2003), the average result from the previous two elections are included. Finally, as those who are more likely to vote have greater voting power (Griffin and Newman 2013), I included the estimated voter turnout percentage.

District Characteristics

Previous research has indicated geographic factors could contribute to issue salience. For example, Yusuf et al. (2014) found that there is increased saliency of sea level rise when state legislators are located closer to coastal areas. The hypothesis being that the closer a candidate is to the subject of a policy concern, the more likely they are to focus on the policy. Melia (2020) supports this when they described how “past decisions and material conditions,” like traffic or congestion, influence a politician’s transportation policy decisions. Exposure to local issues, like traffic and infrastructure needs, is one of the reasons jurisdictions justify requiring candidates live in their districts (Burnett and Kogan 2014). I accounted for transportation issue proximity through two methods: transportation behavior and transportation infrastructure. I define transportation behavior as transportation attributes for people drawn from census data. I estimated average population density under the assumption that denser areas have more transportation issues. I also estimated single occupancy vehicle (SOV) mode share, under the assumption that a lower SOV mode share might indicate a community may have broader transportation concerns. This variable operationalization has been demonstrated to be a good predictor for votes for politicians with stronger transportation policy views (Walks 2015). Previous research has also suggested car ownership is an important part of the context of policy development, especially for sustainable travel (Nolan 2010). Existing literature suggests average household car ownership is different to the other variables mentioned as it is only modestly correlated with density (Schimek 1997) while providing information that combines socioeconomic status and life status with proximity to alternative transportation modes (Nolan 2010; Schimek 1997; Whelan 2007). For transportation infrastructure, I calculated the density of roads, bicycle facilities, transit routes, and rail lines for each political district.

In addition to these district characteristics, I considered two additional variables that were not included in my final models. First, I considered the percentage of homes that were owner-occupied. Previous research has found that homeowners are more likely to be engaged in local affairs and more likely to vote (Oliver and Ha 2007); thus, they may have disproportionate ability to “shape the local political agenda, putting concerns of homeowners and long-term residents to the forefront of any electoral contest” (Oliver and Ha 2007, 399). However, I found the variable was highly correlated with vehicle ownership. As vehicle ownership relates more closely to transportation policy, I chose to exclude my homeownership variable. I also considered a Northern Virginia variable under the assumption Virginia may have some cultural differences that are not captured by other district variables. However, I found the variable to be highly correlated with population density and mode share with the Northern Virginia variable greatly reducing the statistical significance of these variables in all my models. This suggested that the differences between Northern Virginia and the rest of Virginia could be explained by geographic factors rather than cultural, at least when it comes to transportation policy. Consequently, this variable was not included in any models.

3.2.3 *Twitter*

Tweets were obtained using the ‘rtweet’ package for R studio on November 6, 2021. This package pulls the last 100 tweets of each candidate providing a dataset of 14,593 tweets. Filters were applied to remove any tweets made before November 2, 2020 or after November 2, 2021, giving one year before the election and removing approximately 20% of the tweets. Next, tweets were filtered for any transportation-related key words⁶, giving a list of 395 tweets. Finally, tweets were manually inspected to identify and remove false positives (e.g., **busy**, campaign **trail**, **support**), resulting in a final list of 111 transportation-related tweets.

⁶ 19 keywords were used including: road, DOT, truck, bicycle, traffic, highway, port, congestion, rail, vehicle, bus, VRE, Amtrak, train, transit, toll, bike, transport, infra

4.0 Results

4.1 Descriptive Results for Candidate Websites

Transportation was typically not one of the first issues candidates highlighted on their websites. Of the 164 websites containing campaign issues, the most prioritized issues included education (27.4% of websites), jobs and the economy (12.2% of websites) and healthcare (11.0% of websites). However, transportation issues were still important with 25% of all candidates including a transportation issue category on their website and a further 7% of candidates including transportation under another heading, predominantly under “environment” or “economy.”

Ten different transportation issues and five different modes of transportation (other than internal combustion engine, ICE, cars) were identified through the content analysis of candidate websites. Table 3-3 crosstabs the issues and modes together to see which transportation issues and modes were associated with each other. As the table shows, funding, traffic/congestion, and improving or expanding were all frequently mentioned issues but were also frequently mentioned together. The table also shows public transportation was also often mentioned with congestion/traffic issues.

Figure 3-1 shows the transportation issues by candidate’s political affiliation while Figure 3-2 shows the transportation modes. Although Republicans and Democrats each had an average of approximately 7.2 issues in their transportation policies with no statistically significant difference between them (one-tailed t-Test $p=0.46$), the types of issues included were statistically different at the 5% level ($\chi^2=17.4$, $df=9$, $p=0.04$). As Figure 3-1 shows, Democrats tended to include more issues relating to social equity, the environment, and maintenance, while Republicans focused more on issues like tolls. Conversely, there was no statistically significant difference for transportation modes⁷ ($\chi^2=2.0$, $df=3$, $p=0.57$). While Democrat candidates were more likely to include non-car transportation modes, both

⁷ Electric vehicles were excluded due to zero value for Republicans

Republicans and Democrats were most likely to mention public transportation first, followed by rail, bicycling, and pedestrians. Only Democrats mentioned electric cars.

Table 3-3: Transportation themes crosstab indicating frequency of shared topic mentions

	Funding and Investment	Jobs and Economy	Congestion/Traffic	Improve, Expand, Widen	Maintenance, Repairs	Safety	Geographic Equity	Socially Equitable and Affordable	Sustainability and Environment	Tolls	Public Transportation	Electric Cars	Rail	Bike	Pedestrians
Funding and Investment	33	13	21	23	12	14	8	4	5	4	17	1	11	10	8
Jobs and Economy	13	17	8	12	6	9	5	1	2	3	7	0	5	6	3
Congestion/Traffic	21	8	32	23	9	11	8	2	4	6	18	0	10	9	8
Improve, Expand, Widen	23	12	23	34	11	12	7	3	6	5	20	1	11	10	7
Maintenance, Repairs	12	6	9	11	15	6	3	1	4	2	9	1	7	6	3
Safety	14	9	11	12	6	19	5	1	2	3	9	0	6	7	6
Geographic Equity	8	5	8	7	3	5	8	0	1	4	7	0	4	5	4
Socially Equitable and Affordable	4	1	2	3	1	1	0	8	6	0	5	3	2	2	2
Sustainability and Environment	5	2	4	6	4	2	1	6	15	1	9	3	3	4	4
Tolls	4	3	6	5	2	3	4	0	1	9	4	0	2	3	2
Public Transportation	17	7	18	20	9	9	7	5	9	4	28	1	11	10	8
Electric Cars	1	0	0	1	1	0	0	3	3	0	1	3	1	0	0
Rail	11	5	10	11	7	6	4	2	3	2	11	1	14	6	4
Bike	10	6	9	10	6	7	5	2	4	3	10	0	6	12	9
Pedestrians	8	3	8	7	3	6	4	2	4	2	8	0	4	9	10

Only small differences were observed when incumbency was considered. For example, incumbents prioritized funding and investment and congestion/traffic while non-incumbents focused on expanding or widening transportation infrastructure and services. However, there was no statistical difference between transportation issues included on incumbent websites and non-incumbent websites ($\chi^2=3.1$, $df=9$, $p=0.96$). There was also no statistical difference for the inclusion of transportation modes by incumbents and non-incumbents ($\chi^2=2.5$, $df=4$, $p=0.65$). Although both groups focused on the same transportation modes, there was a difference in the magnitude of mentions. For example, both incumbents and non-incumbents mentioned public transportation the most. However, more incumbents

(75%) mentioned public transportation than non-incumbents (45%). This trend was even more stark for rail, the second most cited mode, mentioned by 50% of incumbents and 13% of non-incumbents.

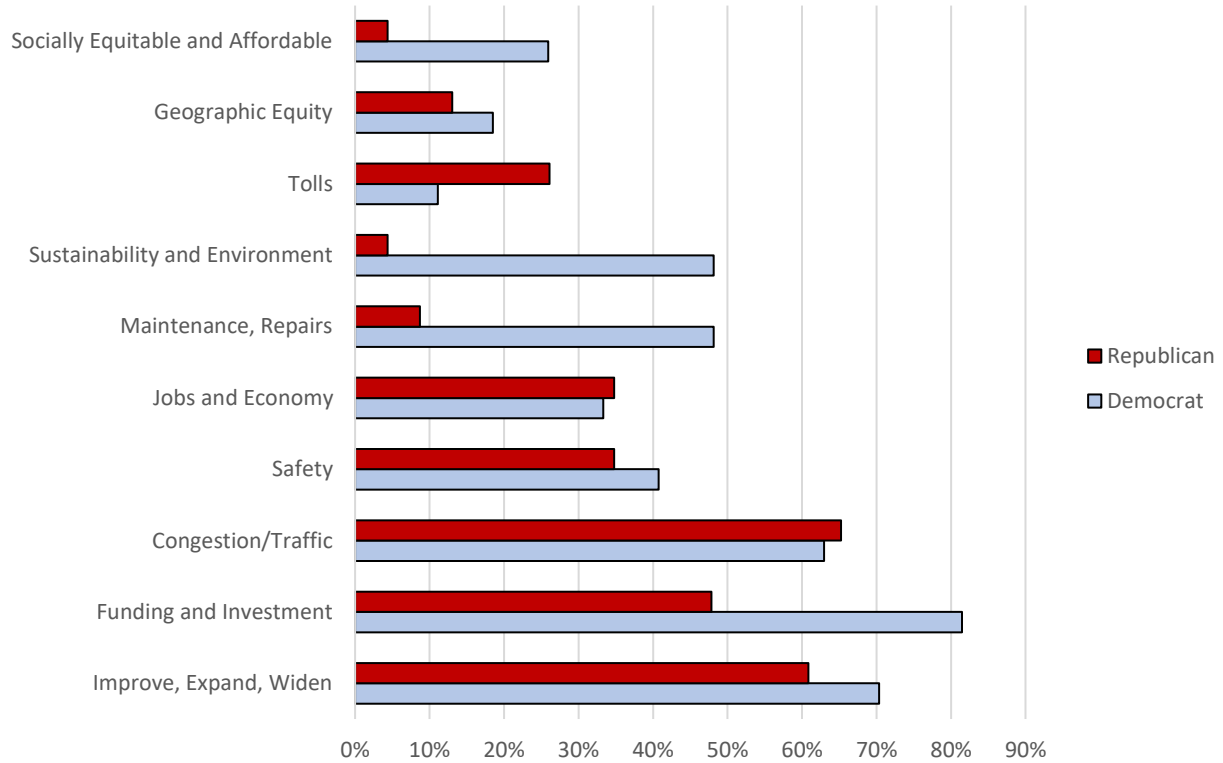


Figure 3-1: Transportation issues/themes in transportation policies of state legislative candidates

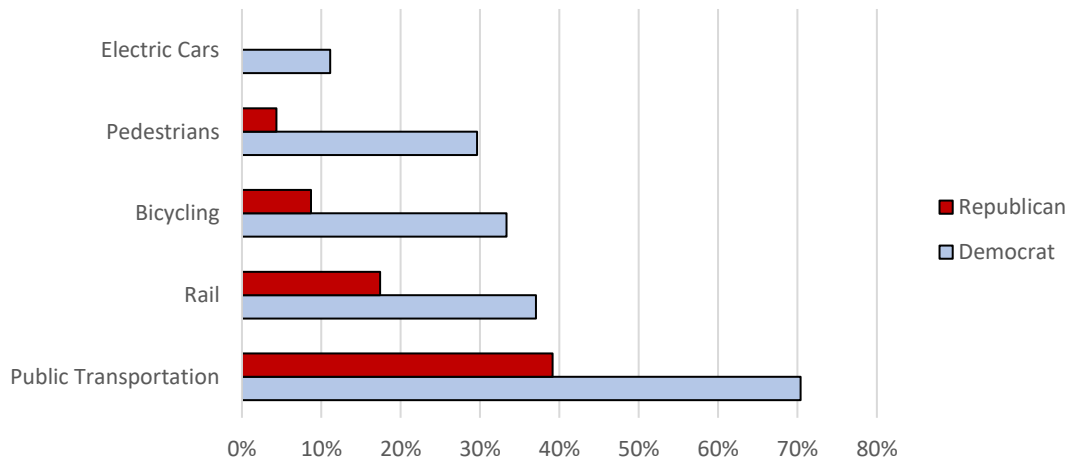


Figure 3-2: Non-ICE transportation modes in transportation policies of state legislative candidates

Political candidates can also communicate their issues indirectly using strategic framing. For example, how a candidate titles their issue platform could provide insight into the candidate’s position on the issue (Xenos and Foot 2005). Consequently, transportation policies were categorized based on the policy platform heading used on the candidate website. Four categories were developed with the results shown in Table 3-4. Although there are some observable differences between Democrats and Republicans, Republicans being more likely to focus on issue specific policies for example, the differences were not statistically significant (Fisher’s Exact Test $p=0.17$).

Table 3-4: Transportation policy framing

Issue Naming	Democratic	Republican
Transportation	59%	63%
Infrastructure	37%	17%
Roads/Cars	4%	13%
Other (e.g., tolls, electric scooters)	0%	8%

Another descriptive statistic compared the importance of transportation issues with candidate success in the 2021 election. The results are shown in Figure 3-3. As the figure shows, there appears to be no relationship between Republican candidate success and transportation policies. However, there is a correlation between Democrat candidate success and transportation policy salience. The more emphasis Democratic politicians placed on transportation issues, the more likely they tended to be to win their election.

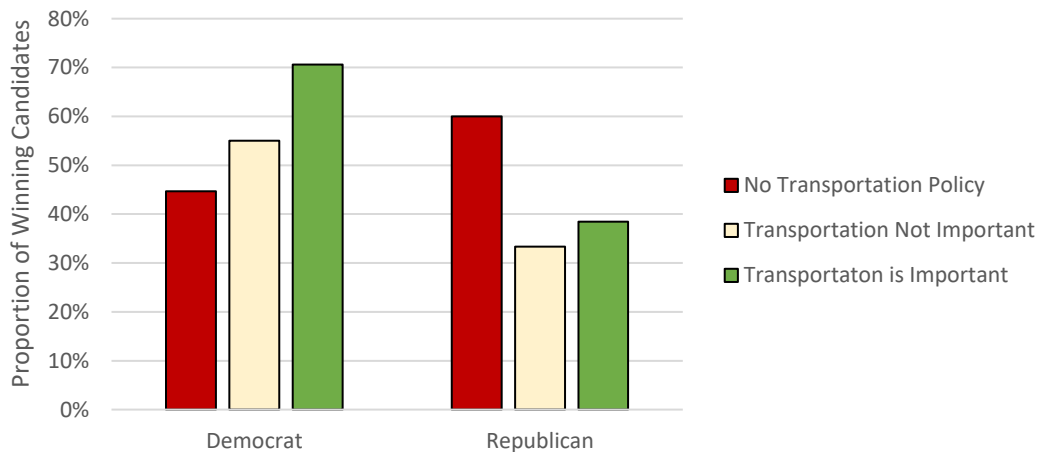


Figure 3-3: Transportation policy saliency and candidate success

4.2 Logistic and Ordinal Logistic Models

As described earlier, I developed a logistic model to test what factors contributed to the likelihood of having a transportation policy and an ordinal logistic regression to test the degree of saliency. For the logistic model, I initially employed two modeling strategies that use different operationalizations of geographic variables. The first used the concentration of transportation infrastructure⁸. The second variation of the models used population density instead, a geographic descriptor that was highly correlated with transportation infrastructure. As population density and road mile density were highly correlated, they could not be used in the same model. The results⁹ are shown in Table 2-5. As the table shows, a district's transportation behavior characteristics were the best predictors for determining if a candidate has a transportation policy or not. An increase in average household car ownership in a candidate's district makes it much more likely the candidate will have a transportation policy while an increase in the percentage of people who commute by car slightly reduces the probability a candidate has a transportation policy. While not statistically significant, it is worth noting that a candidate identifying as a Democrat approaches statistical significance, also with a positive relationship. These relationships held for both the model testing transportation infrastructure and population density. Interestingly, none of the transportation infrastructure variables approached statistical significance.

For the ordinal logistic regression and the transportation issue regressions that will be discussed next, only the population density strategy was used. This is because, when tested, the inclusion of transportation infrastructure variables resulted in VIF greater than 5.0 in some cases in these models. Both transportation infrastructure and transportation behavior variables were affected. As Table 2-5 demonstrated, the transportation behavior variables are more useful for understanding transportation salience. Thus, transportation infrastructure variables were not included in subsequent models to ensure

⁸ Although bicycle facility data was also available, it was highly correlated with road mile density so was not included in the models.

⁹ Variance inflation factors (VIF) were estimated for all variables to check for multicollinearity. All final models had VIF values less than 5.0, indicating no variables were highly correlated.

the transportation behavior variables could be used. The transportation infrastructure variables were tested for all models and were not statistically significant nor affected the statistical significance of other variables in any case where the alternative population density variable was not also statistically significant. Consequently, the exclusion of these variables does not appear to affect the model outcomes.

Table 3-5: Logistic regressions of transportation policy and ordinal logistic regression of policy salience

	Logistic Regression		Ordinal Logistic Regression	
	Model 1 Odds Ratios	Model 2 Odds Ratios	Model 3 Estimates	Model 3 Odds Ratios
Democrat	1.745* (0.332)	1.746* (0.332)	0.494 0.322	1.639 (0.322)
Incumbent	0.742 (0.337)	0.733 (0.336)	-0.201 0.324	0.818 (0.324)
Average Win Margin (%)	0.998 (0.007)	1.000 (0.007)	-0.003 0.007	0.997 (0.007)
Average Voter Turnout (%)	0.953 (0.036)	0.963 (0.034)	-0.037 0.032	0.964 (0.032)
Average Cars per Household	18.791*** (1.090)	22.490*** (1.019)	3.333*** 0.977	28.025*** (0.977)
Commute Drive Alone (%)	0.906*** (0.030)	0.913*** (0.030)	-0.103*** 0.029	0.902*** (0.029)
Population Density (log)	-	1.084 (0.152)	0.102 0.146	1.107 (0.146)
Roads per Square Mile (log)	1.273 (0.333)	-	-	-
Transit Routes per Square Mile (log)	0.935 (0.103)	-	-	-
Rail per Square Mile (log)	0.995 (0.060)	-	-	-
Constant	7.562 (3.531)	1.691 (3.798)	1.691 (3.798)	1.691 (3.798)
<i>Intercepts</i>				
No Policy Policy	-	-	(0.976) 3.675	-
Policy Important Policy	-	-	0.184 3.674	-
Observations	191	191	191	
Log Likelihood	-110.303	-110.478		
Akaike Inf. Crit.	240.606	236.956		
Accuracy	0.69	0.68	0.65	
Pseudo R ²	0.10	0.10		

Note:

*p<0.1; **p<0.05; ***p<0.01

In addition to looking at whether a candidate has a policy or not, I used logistic models to determine what factors might contribute to a candidate including certain transportation issues or modes. These models focused on two different modes of transportation and seven transportation issue themes. The results of these models are shown in Table 3-6. The results show that several different factors influence the types of issues or modes included in candidate transportation policies. First, transportation characteristics still play a role but only for some issues. Specifically, increased car ownership and decreased commuting by driving alone make it more likely candidates will include issues focusing on congestion/traffic or sustainable transportation. Commute mode share also approaches statistical significance for public transportation and safety. Population density also appears to play a role in issue selection, especially for sustainable transportation and safety. It is worth noting that the relationship between the two issues is opposite. Increasing population density increases the probability of a sustainable transportation issue being mentioned but decreases the probability of a safety issue being mentioned.

Model estimates suggest political factors also play a role in issue attention. If a candidate is a Democrat, they are significantly more likely to include sustainable transportation issues or issues focusing on repairing and maintaining existing transportation systems. The former relationship is independent of the district's population density, even though density has been increasingly correlated with political party in the US (Nall 2015), including Virginia (Hertz, Pyle, and Schaffner 2021). If a candidate is an incumbent, they are more likely to focus on congestion/traffic and trains. Incumbency also approaches statistical significance for safety and funding/investment. Although a district's average win margin, a stand-in for district competitiveness, was not statistically significant for any model, it approaches statistical significance for congestion/traffic, maintenance, and expanding or improving transportation systems.

Table 3-6: Logit model relative risk ratios for transportation policy themes and modes

<i>Dependent variable:</i>									
	Public Transport	Trains	Sustainable Transport [^]	Congestion or Traffic	Maintain or Repair	Safety	Expand or Widen	Fund or Invest	Jobs or Economy
Democrat	2.301 (0.770)	1.162 (0.811)	15.098*** (0.975)	0.35 (0.666)	9.761** (0.977)	0.710 (0.639)	9.761 (0.606)	1.458 (0.561)	0.674 (0.629)
Incumbent	1.350 (0.822)	4.927** (0.797)	0.912 (1.039)	4.933** (0.693)	0.750 (0.892)	3.143* (0.664)	0.750 (0.627)	2.896* (0.594)	2.199 (0.650)
Average Win Margin (%)	0.988 (0.015)	1.002 (0.014)	1.006 (0.015)	0.979* (0.013)	0.975* (0.014)	0.987 (0.012)	0.975* (0.012)	1.000 (0.011)	0.990 (0.012)
Average Voter Turnout (%)	1.021 (0.058)	0.931 (0.070)	1.006 (0.062)	0.900* (0.058)	0.895 (0.072)	0.953 (0.060)	0.895 (0.052)	0.989 (0.050)	0.945 (0.060)
Average Cars per Household	27.489 (2.152)	19.681 (2.209)	504.473** (2.722)	25.772* (1.877)	4.330 (2.086)	4.295 (1.932)	4.330 (1.633)	0.954 (1.598)	2.066 (1.867)
Commute Drive Alone (%)	0.876* (0.071)	0.932 (0.067)	0.865* (0.079)	0.876** (0.064)	0.911 (0.071)	0.890* (0.064)	0.911 (0.056)	0.935 (0.056)	0.963 (0.062)
Population Density (log)	1.841 (0.375)	1.270 (0.355)	2.561** (0.464)	1.347 (0.305)	1.067 (0.367)	0.540** (0.300)	1.067 (0.275)	0.759 (0.268)	0.677 (0.294)
Constant	0.057 (7.980)	0.102 (7.559)	<0.001 (9.599)	302.187 (6.904)	357.409 (7.538)	40,919.740 (6.677)	357.409 (6.202)	698.178 (6.199)	188.467 (6.884)
Observations	65	65	65	65	65	65	65	65	65
Log Likelihood	-29.971	-28.445	-25.576	-34.999	-28.314	-34.541	-39.408	-41.089	-34.812
Akaike Inf. Crit.	75.943	72.891	67.153	85.998	72.629	85.083	94.817	98.179	85.625
Pseudo R ²	0.33	0.16	0.43	0.22	0.19	0.12	0.13	0.09	0.07

Note: *p<0.1; **p<0.05; ***p<0.01

[^]Sustainable transport is a combination of sustainable modes of transportation (including public transportation, cycling, and walking) as well as mentions of environmentally focused transportation issues

Finally, no variables were statistically significant for issues focusing on jobs or the economy, public transportation, expanding or improving transportation systems, or funding and investment. However, the last three topics all had variables approaching statistical significance.

4.3 Descriptive Results for Tweets

Evaluating transportation tweets found that, although Democrat candidates were more likely to tweet about transportation, with 50% more candidates tweeting about transportation than Republicans, the number of tweets per candidate was not statistically differentiated by party (one-tailed t-Test $p=0.45$). Transportation tweets were plotted over time to see how the importance of transportation issues changed. Rolling averages and the calculation of transportation tweets per 1,000 total tweets were included to provide context for changes over time. The resulting plot is shown in Figure 3-4.

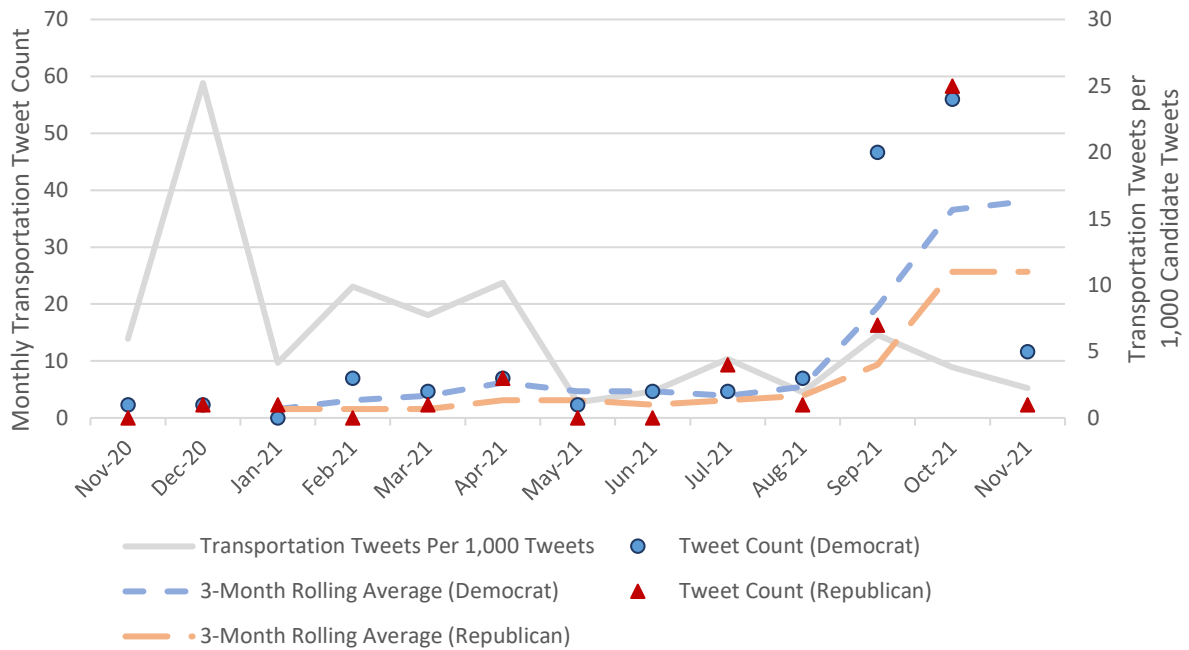


Figure 3-4: Transportation tweets by month from November 2, 2020, to November 2, 2021

As the figure shows, transportation issues were not tweeted extensively with transportation tweets constituting an even smaller proportion of overall tweets six months before the election. However, tweets about transportation started increasing significantly in September,

two months before the election, with Democrats tweeting more than Republicans. Republicans started also increasing transportation tweets in October however, as the number of transportation tweets as a proportion of total tweets is still low, this suggests all tweeting increased in the lead up to the election. As noted in the data section, 'rtweets' only pulls the latest 100 tweets. Thus, there is potential bias against candidates who tweet more often as fewer months of data may be recorded. The twitter data show the median candidate's earliest tweet occurred on August 15, 2021, while the average candidate's earliest tweet occurred on July 3, 2021. These results might explain some of the lower values before August, but they do not explain the large difference in September.

5.0 Discussion

Earlier, I demonstrated the literature is mixed on whether transportation policy is salient. Some researchers suggested transportation issues were salient while others suggested the opposite. As the descriptive results demonstrated, only a third of political candidates had some form of transportation policy. This suggests, in general, transportation was not the most important issue for Virginia legislative candidates in 2021. Further, only three candidates had transportation as their number one issue (first issue included on their list of issues) with just ten more candidates having transportation in their top two issues. On average, transportation was ranked in the bottom third of all issues. The Twitter results do not change the narrative. Although tweets about transportation increased closer to the election, they remained a small proportion of all candidate tweets. Overall, in this election transportation was not salient.

To an extent, different district characteristics and political variables help us understand why some issues might be considered more salient. For example, Manville (2019) stated congestion was a salient issue and the descriptive results support this. Congestion/traffic was the third most mentioned transportation issue. The logistic models help us understand why. A

reduction in drive alone commuting is correlated with increases in transportation policy presence and congestion issues. This possibly means commute mode share serves as an indicator for congestion. People may use other modes when driving is too laborious. Thus congestion, and transportation issues more generally, are salient when traffic and congestion are experienced. Incumbency also increases the likelihood a candidate has a policy on congestion or traffic. This may be because traffic is an issue many people complain about and incumbents hear about traffic issues from their constituents. As one candidate included on their website: “Requests for maintenance of our roads and reduction of traffic congestion are a large part of the calls from constituents that I receive.”

As another transportation salience example, Chaney (2014) discussed the increasing salience of rail in elections. Rail was the second most mention non-car mode in the 2021 Virginia state legislative election. The logistic model in Table 3-6 shows incumbency is also an important predictor for the inclusion of rail policies. Previous work has indicated trains tend to be more vocally supported than other public transportation options by people looking for alternatives to cars (Garrett and Taylor 1999). Thus, the statistical significance of incumbency for both trains and congestion might indicate a connection. One candidate made this connection explicitly: “[Candidate’s name] supports additional rail improvements that help take cars off our roads and enable families to spend more time with one another - not stuck in traffic.”

While modeled variables help explain congestion and rail salience, they are less useful for public transportation. Both Wachs (1985) and Han et al. (2021) stated public transportation is a salient issue and the descriptive results support that. Outside of SOVs, public transportation was the most mentioned mode. However, unlike congestion, the presence of public transportation was not well-explained by the models where only drive alone commuting approached statistical

significance. This may be an artifact of the relatively small sample size used in the transportation mode and issue models.

Finally, while Meerkerk et al. (2015) noted road pricing was important to Dutch elections, it was only included in less than 5% of candidate websites. This underlines the contextual importance of transportation salience; what is important in one election is not necessarily important in other elections. In the 2021 Virginia state legislative election, transportation's connection to safety and the economy were mentioned more than twice as often as tolls.

Overall, transportation salience aligns with the literature in some ways but not in others. While not all of the differences can be explained, the correlations found in the models can help us understand why some transportation policies and issues were included in candidate websites. The sections below discuss some of the variables and their relationships to transportation policy issues and modes.

5.1 Transportation Factors

Average car ownership is one of the most significant and influential factors for predicting transportation policy in the Virginia 2021 state legislative election. Car ownership research suggests increasing family size, higher incomes, and decreased access to public transportation have significant contributions to vehicle ownership (B. Clark, Chatterjee, and Melia 2016; Schimek 1997). Thus, the influence of car ownership might be driven by suburban areas that are often automobile dependent, places where families are more likely to live, and where incomes are relatively high (Forsyth 2012; Fry 2020). The significant congestion in suburbs (Cervero 1991) and lack of alternatives like public transportation (Schimek 1997) mean transportation issues likely plague many suburbanites. Considering suburbanites can have a strong electoral voice and are generally highly informed on local affairs (Oliver and Ha 2007) it is understandable that candidates might orient policy statements toward this group.

One of the early findings in my modeling process demonstrated that, while transportation behaviors significantly contribute to understanding transportation salience, transportation infrastructure does not. This may be emphasizing that transportation issues are people issues. That is, transportation issues become important when they affect voters. For example, the existence of a road does not appear to draw attention unless the road is congested with traffic.

There are some cases where physical geography does play a role, as the population density variable indicated. For example, sustainable transportation issues are correlated with increased population density. Conversely, the inclusion of safety issues is negatively correlated with population density. This may be because, while the total number of car crashes is higher in urban areas, more fatal crashes happen in rural areas, even after accounting for differences in miles traveled (Zwerling et al. 2005). Some candidates know this, as one candidate wrote: “A greater number of roadway fatalities occur within rural areas. [...] Rural transportation challenges must be overcome. [*Candidate’s name*] will prioritize funding for rural transportation safety needs [...].” Thus, the correlation between population density and safety issues suggests a shared understanding between politics and research when it comes to road safety.

5.2 Political Factors

The relationship between political party identity and transportation policy was somewhat mixed. While political party identity could help explain some differences in different issues, it did not help explain differences in transportation modes. The bipartisan inclusion of public transportation was particularly unexpected. While previous research has identified differences in how conservative and liberal ideology affects perceptions around public transportation (Klein et al. 2022; Nall, Agrawal, and Nixon 2016), candidates aligned with both Democrats and Republicans generally framed public transportation in the same, positive way (only one exception by a Republican candidate). Some of these findings could be attributed to differences in the importance of transportation to voters who support different political parties. As Figure 3-3 showed, the degree

of transportation salience was correlated with Democrat electoral success but not Republican electoral success. This might suggest transportation issues are more important to Democrat voters than Republican voters, or that transportation issues are more important in political districts where there is more support for Democrat politicians. As Table 3-6 indicates, political party does play a role for sustainable transportation themes and transportation maintenance. The former could be partly explained by the fact Democratic partisanship is a good predictor for environmental issues (Coan and Holman 2008). It is less clear why maintenance and repairs are more of a Democratic issue than a Republican issue.

Although incumbency was not as useful for understanding specific transportation issues or modes, it could help explain why some issues were included in candidate policies. For example, the importance of incumbency for trains and congestion highlights how familiarity with a district and concerns of constituents might shape candidate policy positions, counter to what Virginia's lower Squire Index might have indicated. However, it does reinforce the importance of requiring candidates to live in their districts (Burnett and Kogan 2014), closer to constituent concerns.

Finally, while district political competitiveness (represented by average win margin) did not reach statistical significance at the 5% level, it was statistically significant at the 10% level for congestion/traffic, maintenance/repairs, and expanding/widening transportation systems. In each case the relationship was the same. Larger win margins reduced the chance of each of these issues being mentioned. That is, the smaller the difference in previous political competitions, the more likely candidates mentioned concerns about traffic or fixing and improving transportation systems. This suggests there is a potential pork-barrel explanation to these findings, supporting the findings by Aidt and Schvets (2012). When districts are more competitive, candidates may be more willing to say they will bring "pork," promises to either resolve district concerns or build new

or better transportation systems. The level of statistical significance suggests there is more to this story but the consistency in the relationship lends some support to this idea.

6.0 Conclusion

The purpose of this research was to evaluate transportation saliency in a state legislative election. Although previous research has been mixed on the salience of transportation policies, especially regarding different transportation issues, overall, transportation was not salient in the Virginia 2021 state legislative election. However, some transportation themes were more salient than others. The results have shown the saliency of transportation is correlated with a variety of factors, both political and apolitical. Overall, average household car ownership was one of the strongest predictors of transportation issues followed by commuting mode share. Population density, political party identity, and candidate incumbency were all found to be useful for understanding why candidates included different transportation issues and modes in their transportation policy platforms.

This research has some implications for people working in transportation. First, these findings directly link the work of transportation planners and engineers to political outcomes. Previous research has already demonstrated how spatial policies like interstate development can lead to longer term changes in electoral outcomes (Nall 2015). This research continues this thread. Importantly, this work suggests it is not just the building of infrastructure but how transportation policies and systems affect peoples' lives. Second, this work highlights the communication tools of bureaucratic staff, like transportation planners, and how they can wield these tools in the political process (see Forester, 1982). Through a better understanding of how politicians shape transportation policies in legislative elections, transportation professionals can direct information to help highlight or suppress certain projects or policies. For example, knowing which issues may be more important in an election may provide an opportunity for a transportation professional to

offer a specific project as a solution. If an elected official then pushes this solution as part of their platform, it gives the project more political legitimacy.

This research also has implications for strategies employed by transportation interest groups. Venue shopping is a strategy used by policy actors to seek out policy arenas that are more favorable for achieving policy goals (Baumgartner and Jones 1993; Sapotichne and Smith 2012). As Sapotichne and Jones (2012) emphasize, this could mean actors redirect their focus from a subnational level to a higher level of government, or vice versa, in response to “unreceptive political environments.” For example, if a Democrat majority is elected the Virginia General Assembly, advocacy groups may refocus issues around sustainable transportation or transportation maintenance to a state level where, as Table 3-6 suggests, state legislators may be more receptive.

There are some limitations to this work. First, the spatial analyses use average values for political districts. This means ecological inference issues may affect some of the results. Second, the relatively small sample size, especially for the transportation theme models in Table 3-6, could also affect some of the results. Third, it is unknown how well political candidates are aware of some of the variables and characteristics mentioned in this research. Thus, the observed relationships may not fully represent why political candidates are including specific transportation themes or issues in their policies.

While this research was able to capture a breadth of decisions around the inclusion of transportation policies in a state election, the trade-off is lack of depth around each individual case. It is more difficult to understand specific district issues that may be in the news, affecting salience, for example. Thus, this research could be complemented by a case study approach and some more qualitative methods, like elite interviewing, that may further help us understand why certain transportation issues were included or considered important. In addition, this research

has demonstrated the context-specific features of politics and political districts likely shape and influence transportation policy inclusion. This research design could also be repeated in different geographies, at different political scales, and at different time periods to see what other factors may affect transportation salience. Finally, this research was cross-sectional and salience changes over time (Han, Laurian, and Dewald 2021). Consequently, a time-series research design could be useful for observing how different transportation policies change over time.

Acknowledgements

The author would like to thank attendees at the American Planning Association (APA) Virginia Chapter 2022 Annual Conference as well as attendees at the 51st Urban Affairs Association Conference for their insightful feedback.

Chapter 4 – Does Voting Affect the Provision of Bus Service?

1.0 Introduction

Measuring and evaluating inequalities in the distribution of transit services has been studied extensively, particularly over the last two decades (Garrett and Taylor 1999; Iseki 2016; Karner and Golub 2015; Liu, Rahman, and Karner 2023). However, literature focusing on why inequitable planning decisions are made is more limited. Both Wells (2009) and Miranda and Tunyavong (1994) have suggested bus service distribution, like decisions around bus routes, can be subject to political influence. Krol (2018) supports this, arguing that when infrastructure benefits are concentrated, like in a specific city ward, and costs are diffused, like with transit funding, there is an incentive for politicians to make infrastructure decisions driven by politics rather than other goals like efficiency. For example, a politician might use bus service as a form of political pork where public goods are allocated to increase political support (Golden and Min 2013). However, while politics may play a role in service distribution, the impacts may be regressive. Political influences may hurt equity goals because of institutional and funding issues that prioritize discretionary transit riders who tend to have more choices, a political landscape status quo that makes it more difficult to implement redistributive transit services, the ribbon cutting appeal of capital projects giving disproportionate emphasis to projects that tend to benefit wealthier or whiter transit users, or because of voting power differences between different groups (Garrett and Taylor 1999; Wachs 1985). This chapter attempts to empirically demonstrate the influences of politics on bus service by focusing on voting. Specifically, does voting for elected officials affect the delivery of bus service?

I have chosen to focus on voting because previous research has suggested a direct connection between voting and transit service. As Garrett and Taylor (1999) put it: transit funds are spread to voters on a “roughly geographical basis rather than in accordance with transit use or need.” However, previous work has tended to focus on direct democracy, where citizens vote directly for funding or policy (see Dixit

et al. 2010; King and Fischer 2016; Werbel and Haas 2002 for some examples), rather than representative democracy, where citizens vote for someone to represent them in policymaking. While direct democracy research is important, in democracies “citizens rarely vote on policy” (Levy, Meltsner, and Wildavsky 1974). Thus, considerations of voting influence in representative democracy are warranted. Focusing on voting is also justified because attention to voters could directly exacerbate bus service inequalities. There are two reasons for this. First, as low-income and non-white populations that disproportionately use the bus have less voting power (Bartels 1998; Garrett and Taylor 1999), politicians may not be as incentivized to make politically driven actions in their favor (Griffin and Newman 2013). As Garrett and Taylor put it: “transit dependents do not represent a strong constituency for improved bus service since fewer poor and minority persons are registered to vote.” Second, as Taylor and Morris (2015) suggest, to maintain or increase funding transit agencies must appeal to members of the public who are more likely to vote. Members of the public who are more likely to vote are also more likely to be wealthy and less likely to be transit riders, especially bus riders (Taylor and Morris 2015). Thus, there is political incentive to focus service in areas with higher voter turnout and support, areas that are less likely to need better bus service. Finally, focusing on votes for elected officials is important because elected officials have significant influence over transit funding, governance, and policy, typically as either an elected member of a jurisdiction that operates a transit system or as a member of a multi-jurisdictional board (Fischer, Ray, and King 2021; A. C. Nelson et al. 2004; SIMON & SIMON Research and Associates 2002). Wachs (1985) emphasized the importance of this when he argued elected officials use their influence over transit governance and policy to achieve political goals.

The remainder of this chapter reviews the relevant literature and describes the research design before summarizing the results and discussion. The chapter concludes by describing how voting and transit service relate as well as opportunities for future work on this topic.

2.0 Literature Review

While politics likely affects the distribution of bus transit service, local conditions also play a role. As the literature described earlier indicates, a mismatch between voting support and transit users may mean politics may further transit inequalities. Conversely, research from Italy suggests in some cases the opposite might be true, that mayors may have higher approval in areas when more people use transit (Di Pietro 2019). However, the author notes in Italy people care about transit and use it extensively, something that can rarely be argued for the United States (US). On the other hand, Australia, like the US, has historically not prioritized transit nor seen transit as a tool to leverage votes. Yet, as Scheurer and Curtis (2015) demonstrate, transit inadequacies were still included in election discourse. The authors correlate increases in both bus and rail service with the elections of state officials who direct infrastructure policies, noting some of these decisions were made to coincide with elections even when previous increases in transit service did not result in electoral returns.

There is also evidence that different elected officials may have different relationships to bus service distribution based on their level of geographic responsibility. Specifically, at-large politicians are less likely to target specific constituencies with public goods or services than elected officials who are focused on a specific ward or district (Clingermayer and Feiock 1994; Krol 2018). A ward-focused city council member might be interested in expanding bus service to give more mobility options to local constituents while an at-large mayor might want to reduce service to curtail citywide costs. Mladenka (1981, 698) makes a direct link between ward politicians and public services, stating: “the public official is held accountable to neighborhood interests by recognition that ward constituents punish for inadequate service performance.” Work by Han et al. (2021) also appears to support this idea. In evaluating political priorities in Calgary, Canada, the authors found that city council members, as ward representatives, prioritized bus service while the at-large mayor didn’t mention bus at all.

In addition to politics, there are professional norms in bus planning that focus services around transit use or need (Ceder 2007; Kittelson & Associates et al. 2013; Vuchic 2005). These professional norms need to be accounted for in the evaluation of voting impacts on bus service. For example, voting turnout may be correlated with population density. That is, areas with more people might intuitively also have more people voting. This makes the effects of voting more difficult to tease out. Previous research on urban service delivery has evaluated the complexities between bureaucratic and politically driven delivery of other public services. Urban service delivery research is concerned with “who gets what, when, and how,” one of the most basic functions of urban politics (Lasswell 1936; Davidoff 1965). This area of research has two primary focuses that are captured by the term *patterned inequality*. The first focus asks if inequalities exist in the provision of public services. The second focus attempts to determine whether inequalities are bureaucratic (*unpatterned*) or political (*patterned*) in nature. This second focus is directly connected to distributive politics, the “policies that involve [...] the decisions about allocations of government goods and services to identifiable localities or groups” (Golden and Min 2013). Bureaucratic or apolitical inequalities may be explained by professional and bureaucratic norms, citizen initiatives, and external factors, like intergovernmental funding requirements. Alternatively, elected officials may play a role through shaping policy, influences over funding and budgets, or direct involvement in decision-making.

Although this branch of literature is over half a century old, previous research has been mixed on the drivers of inequitable service distributions. This may be due to methodological limitations (Bolotin and Cingranelli 1983; Miranda and Tunyavong 1994; Mladenka 1989), measurement error (Miranda and Tunyavong 1994; Talen and Anselin 1998), or the types of public service previously studied (Miranda and Tunyavong 1994). Differences may also be explained by chance. Some elections may have stronger political effects than others (Miranda and Tunyavong 1994) and choosing the wrong election for a study may miss political influences. Regardless of the causes, the lack of consensus leaves room for further work.

Transit has so far not featured heavily in urban service delivery literature. Much of the early urban service delivery literature was developed from the 1970s to the 1990s. Transit was in a state of flux in the US over a significant part of this period. Post WWII, freefalling ridership and a lack of public funds led to “widespread bankruptcies of public transport firms throughout the country” (Buehler and Pucher 2012). As a result, from 1960 to 1980, public ownership of transit companies increased from 5% to 55% (Wachs 1985). Consequently, during the early development of service delivery literature, transit decision-making was driven by capitalistic motives, protecting investments and maximizing profits, rather than political motives (Wachs 1985). Thus, the relative lack of potential political involvement and the subsequent changes to transit governance over the following decades may have meant transit was not a good candidate for determining whether decisions were driven more by bureaucrats or politicians.

Urban service delivery literature began considering transit in the tradeoff between bureaucrats and politicians in the 1990s. Miranda and Tunyavong (1994) included transit in their description of toll goods, a subclassification of public goods that are accessible to everyone but at a cost to the consumer. Specifically, the authors used the closing of bus routes as an example of politics influencing the allocation of toll goods. However, transit was not included in any empirical analyses. To date, only Wells (Wells 2009; Wells and Thill 2012) has explicitly evaluated transit in the context of urban service delivery literature. However, their work focuses more on equity than decision-making. Specifically, Wells and Thill (2012) evaluated transit to determine whether there was unpatterned inequality, like most early service delivery literature describes, or if there is patterned inequality in line with the “underclass hypothesis,” which explains services distribution as a function of a neighborhood’s racial or class composition (Lineberry 1975). While Wells found inequalities, suggesting services were designed based on neighborhood composition and not mobility need, the work does not delve into political causes. In their doctorate dissertation, upon which their 2012 paper is based, Wells’ (2009) included some political analysis, stating that three of the four transit agencies evaluated made more service decisions driven by professional

norms rather than politics. For the fourth transit agency, Greater Richmond Transit Company (GRTC), which operates transit in Richmond, Virginia, Wells wrote that, due to institutional rules “ultimately route decisions are made by politicians and not the bureaucracy” (Wells 2009, 117). While Wells concluded that the inequality in Richmond “may be a function of politicized decision-making” (Wells 2009, 122), the political analysis does not explicitly explore the influences of voting.

Overall, there is a demonstrated need to evaluate how, and under what circumstances, voting may affect the distribution of bus services. This chapter will help fill some of these gaps.

3.0 Research Design

Quantitative studies can be useful to try and explain both election outcomes as well as “what happens after elections in terms of policy and, especially, allocational outputs” (A. Clark and Krebs 2012, 94). Thus, this chapter relies on a quantitative approach as part of a quasi-experimental research design to answer the research question. I will use a multiple-case design with two transit agencies representing critical cases (Yin 2018). Critical case selection is important as previous work in urban politics research suggests differences in local governance can have large impacts on how reactive politicians are to voters (A. Clark and Krebs 2012; Hajnal and Lewis 2003).

3.1 Case Selection

Carefully choosing characteristics of the critical cases based on urban politics literature gives me the best chance of determining whether there is any link between voting and the provision of transit services. The Federal Transit Administration (FTA) National Transit Database (NTD) 2020 Annual Database contains 1,185 US transit agencies with bus service. To identify transit agencies for inclusion in this analysis, I developed a series of criterion to filter the FTA NTD database. Like Wells and Thill (2012), I started with removing any transit system that provided fixed-route transit options other than bus. As previous work (Taylor and Morris 2015) has noted, different transit modes are treated differently among elected officials, so removing transit agencies with more than one fixed-route mode removes some of the potential confounding political factors. This filter removed 58 transit agencies. Second, as elected officials are less

responsive when making decisions as part of a special district (Foster 1997), I filtered for transit agencies that are operated by local government entities, reducing my list down to 611 agencies. Wells and Thill (2012) highlighted the importance of ensuring a transit system was a minimum size to ensure it was large enough to analyze, using a minimum threshold of 1 million annual passenger trips. My fourth criterion uses a similar threshold, 1 million unlinked passenger trips (UPT). This removed another 523 agencies. Next, I removed systems that operate in college or resort towns as their seasonal operational patterns may complicate analyses. This reduced my list of agencies down to 51. Finally, to again reduce potentially confounding factors, I removed any transit agency that overlapped with a bigger system. This resulted in a final list of 34 transit agencies. From this final list of agencies GoRaleigh and the Milwaukee County Transit System (MCTS)¹⁰ were chosen as my cases. These agencies were chosen based primarily on data availability. Specifically, general transit feed specification (GTFS) and voting precinct data were available for all required years. Elections also took place with time for transit schedules to change before COVID-19 started affecting transit operations. The two transit systems have variations in size with their local jurisdictions differing by demographics, governance type, and local election type. While this makes it more difficult to observe patterns across agencies, it allows this analysis to explore more variety in electoral politics. The sections below briefly describe each agency's historical, ridership, and governance context. Table 3-1 provides case summary statistics with Figure 4-1 showing the bus networks.

3.1.1 GoRaleigh – Raleigh, North Carolina

Transit in Raleigh began with mule-drawn streetcars 140 years ago with electric streetcars soon following (Mims 2015; North Carolina State Historic Preservation Office 2009). Initially concentrated around the Capitol, streetcar service was used to help develop the city's suburbs (North Carolina State Historic Preservation Office 2009). Privately and publicly owned buses replaced streetcars in 1933, allowing transit routes to expand (North Carolina State Historic Preservation Office 2009). Modern operations began in

¹⁰ Although there is a streetcar in the City of Milwaukee, the route is only 2.1 miles. Because the system is so small it is not expected to significantly affect the voting and transit relationship being studied.

1975 when the city completely took over bus services. More recently, GoRaleigh’s ridership had been in steady decline with over a 20% decrease between 2013 and 2018. The system began seeing a modest ridership increase between fiscal years 2018 and 2019.

The transit system is currently managed by the City of Raleigh, the capital city of North Carolina. Raleigh is governed by a council-manager form of government where an unelected administrative manager is appointed as the city’s chief executive. The city’s elected officials include a mayor as well as a city council that serves as the city’s legislative body. The city council consists of seven councilors, five of whom are elected by districts (wards) with the remaining two elected at-large like the mayor. The mayor and councilors are nonpartisan, all serve two-year terms¹¹, typically elected in odd-numbered years, and are all elected at the same time. My analysis will focus on the 2015 and 2017 elections.

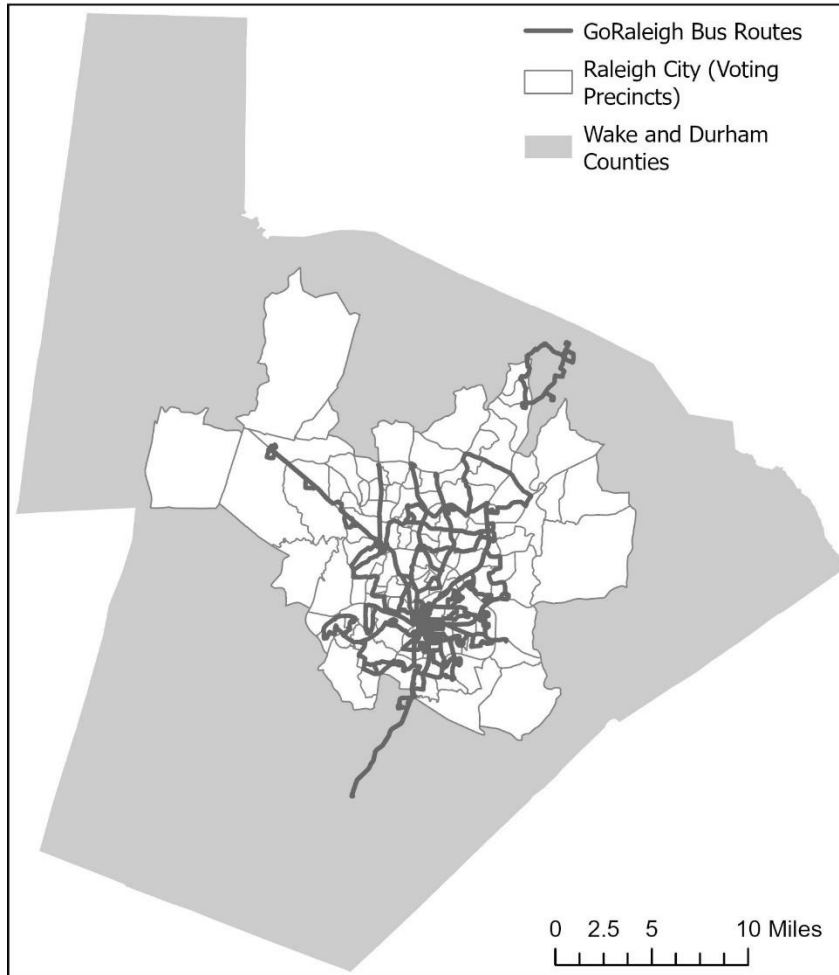
Table 4-1: Case summary statistics

Transit Agency Statistics [^]		
Statistics	GoRaleigh	MCTS
Service Area (Square Miles)	125	247
Service Area Population	469,298	948,201
Unlinked Passenger Trips (UPT)	5,271,428	28,972,674
Transit Use (UPT/Service Area Population)	11.2	30.6
Operating Expenses	\$35,597,102	\$131,291,412
Routes (ranges between evaluation years)	31 to 41	49 to 63
Bus Stops (ranges between evaluation years)	1,300 to 1,418	4,684 to 5,559
City Statistics [~]		
Statistics	Raleigh, NC	Milwaukee, WI
Resident Population	432,520	598,672
Jobs	427,150	299,911
% Black Population	29.3%	39.2%
% Below Federal Poverty Line	8.6%	14.2%
% Zero Car Households	6.3%	18.5%
% Regular Transit Commuters	2.1%	8.6%

[^]Pre-pandemic 2019 FTA NTD data used with routes and bus stops obtained from GTFS data (further described in section 3.3); [~]American Community Survey 5-year estimates used (further described in section 3.3)

¹¹ Although shorter electoral cycles mean shorter time for a transit agency to reflect political preferences, previous work has suggested that “responsive politics is shaped by electoral cycles that encourage speedy action” (Goetz 2015). With shorter election cycles, elected officials are incentivized to implement policies quickly to reap the political reward of reelection.

GoRaleigh (2015 bus routes and voting precincts)



MCTS (2016 bus routes and voting precincts)



Figure 4-1: GoRaleigh and MCTS bus networks

3.1.2 *Milwaukee County Transit System (MCTS) – Milwaukee, Wisconsin*

Milwaukee's transit services have been shaped by politics in a variety of different ways through the agency's history. During the streetcar era, political leaders invested in different transit lines, orientating their transit operations around their political supporters (Moore 2016). This resulted in a "tangle of routes [that] was uncoordinated and inefficient, causing long delays and discomfort for commuters" (Moore 2016). In the early 1900s, state, county, and city elected officials engaged in political battle, repeatedly changing the influence of Milwaukee city over transit services. While in the 1920s the mayor of Milwaukee was interested in the city taking over transit ownership, it never worked out. Instead, Milwaukee County took over operations in 1975 (Milwaukee County Transit System n.d.; Moore 2016). Somewhat reflecting national transit trends, MCTS's pre-pandemic ridership consistently dropped year-over-year with the agency losing almost 30% of its ridership between fiscal years 2016 and 2019.

Milwaukee County, who manages MCTS, has just under a million residents and is governed by the county's Board of Supervisors, an 18-member nonpartisan legislative body elected every two years. Supervisors are elected in a ward-based system. Within Milwaukee County is the City of Milwaukee. The City of Milwaukee is governed by a mayor-council government where an elected mayor serves as the city's chief executive and the city council (called the Common Council) serves as the city's legislative body. The council has 15 members representing 15 wards. As a strong mayor, the mayor of Milwaukee has veto power over the Common Council. The mayor and councilors are nonpartisan, all serve four-year terms, and are elected at the same time. The 2016 citywide election will be the focus of the analysis for MCTS. The analysis will also include the 2016 and 2018 county elections for precincts that overlap the city.

Unlike GoRaleigh, MCTS is governed by a county, not a city. However, the close relationship between the city and the county (the city covers 40% of the county's land area), the political history of transit in the region, the significance of the city's population (over 60% of the county's total population), and the city's economic contribution to the county, may still result in city elected officials having some

influence or interest in MCTS service. This is especially likely given the city's share of transit commuters was 67% higher than the national average of 5.1%.

3.2 Methodology

As voting is a primary focus of my evaluations, voting precincts are used as my unit of analysis. All voting, transit, and census data are estimated for, or transformed to, voting precincts. While this means results may be subject to some ecological inference issues for census data, both voting data and bus service data can be estimated directly to this geographic scale. Before evaluating the impact of voting, I started my analysis by performing Welch's t-tests on bus service and demographic data to indicate whether there might be vertical inequalities in the distribution of bus service. That is, do historically marginalized groups, who may have a greater need for bus service, get a disproportionately greater level of service? I use the t-tests to test whether voting precincts with a majority or above average level of a historically marginalized population have a higher average amount of bus service than a minority or below average level of the population. I specifically focused on Black populations, low-income households (defined as those at or below the federal poverty level), and zero car households.

Next, I evaluated census and bus service data to identify what non-political explanations may help explain changes to bus service. While previous work has indicated that transit should focus on demographics as well as land use (Ceder 2007; Kittelson & Associates et al. 2013; Vuchic 2005), land use is unlikely to change much over an electoral cycle. Consequently, this analysis focuses on demographics. Garrett and Taylor (1999) argued voting behavior may lead to bus services not being allocated based on "transit use or need." Some demographics are more associated with bus use or need than others (Wang and Renne 2023; Wells and Thill 2012). Consequently, I will use ordinary least squares (OLS) regression to determine how much of bus service is correlated with demographics associated with bus service. The resulting model can help normalize changes in transit service for later parts of the analysis (e.g., what is the amount of transit service per resident). Normalization is useful because political influence may look

like an increase in service without a proportionate change in transit demand, or it could look like stagnation in transit services when demand decreases. For example, in Richmond, GRTC transit planners recommended eliminating increasingly inefficient routes, but they were kept by the city council because of fear of political retribution (Wells 2009, 119).

While understanding demographic correlations is useful, they cannot adequately explain bus service distribution because the spatial relationship of bus routes violates the spatial independence assumed by OLS estimation. Buses operate on routes with a series of stops over space. Increasing frequency for a route generally affects the entire route, meaning spatial neighbors will see changes in service at the same time. To establish this, I used Moran's I to estimate spatial autocorrelation for bus service between voting precincts.

The last parts of the analysis evaluated bus service considering voting behavior. First, to establish if there is any correlation between voting and transit ridership, I again used Welch's t-tests to see if there is a correlation between bus service change and voting behavior in voting precincts. This also allowed potential political inequalities to become evident. I then used spatial regression to identify correlations between transit service and other characteristics to establish why differences might exist. I specifically used a spatial lag model, a form of spatial regression that allows the transit service in one precinct to affect service in neighboring precincts. This modeling strategy assumes the amount of bus service in one voting precinct affects the amount of bus service in a neighboring voting precinct. Following a similar approach to Burnett and Kogan (2017) my specification is as follows:

$$BusService_{ict} = \delta + \beta_1 Votes_{ict-1} + \beta_2 BusService_{ict-1} + \beta_3 w_{ic} BusService_{ict} + \varepsilon_{ic}$$

Where i is a voting precinct, c is a city, t is an election period, w_{ic} is a spatial weights matrix that specifies the spatial distance between voting precincts, and ε_{ic} is an error term. As a robustness check, I tested different operationalizations of bus service and voting, further described in the next section. Finally, I included a lagged transit variable that helps control for omitted variable bias. For example, even though

racially influenced infrastructure decisions may predict poorer service levels for historically Black communities (Fullilove 2016; Lucas 2004), they are not likely to change over a political term.

3.3 Data

To complete my evaluation, I collected census data, bus service data, and voting data for the cities of Raleigh and Milwaukee. All data were collected for scenarios that combine differences in transit agency and election, summarized in Table 4-2. Bus service data were collected for the election year and then again just before the next election, allowing for the maximum time for services to change. All data are described in detail in the following sections.

Table 4-2: Evaluation scenarios

Transit System	Evaluation Focus	Election Year	Transit Year 1	Transit Year 2
GoRaleigh	City election 1	2015	2015	2017
GoRaleigh	City election 2	2017	2017	2019
MCTS	City election	2016	2016	2020*
MCTS	County election 1	2016	2016	2018
MCTS	County election 2	2018	2018	2020*

*Data was collected for early March to minimize potential COVID-19 impacts.

3.3.1 Census Data

American Community Survey (ACS) census data were collected and spatially transformed to voting precincts using areal interpolation. These data include information on race, poverty status, journey to work transportation mode choice, and age. Two forms of ACS data were used. First, ACS 5-year estimates were collected for the demographic-related evaluations--specifically, the t-tests and OLS regression models. This is because ACS 5-year estimates have more geographic granularity. ACS 1-year estimates were used for normalizing bus service data (discussed in the next section). Although 1-year estimates are less granular and have larger margins of error than 5-year estimates, the rolling data collection process used for 5-year estimates makes them unusable for observing population changes for overlapping collection periods (Raglin 2022). As the census data is only used to help normalize the amount of transit supply, the data quality trade-off is not expected to significantly impact the results. In addition to ACS

data, Longitudinal Employer-Household Dynamics (LEHD) data were collected for each of the analysis years. These data provide employment estimates in each of the two cities.

All census data were collected for the year preceding the transit data collection year. This was done for two reasons. First, as there is always a lag in the availability of census data so earlier data are more likely to reflect the available data used for transit planning. Second, this choice avoids COVID-19 impacts to 2020 census data for the MCTS case.

3.3.2 *Bus Service Data*

Bus service data is key for this evaluation. However, measuring the supply of bus service can be subjective. Different measures can consider things like the location of bus stops, the roads a bus travels, service frequency, the number of destinations or jobs reached, or the number of people who can access a stop. Considering the plethora of options, I am using two different definitions of bus supply.

The first is simply the number of bus stops per square mile in a voting precinct. The measure is both conceptually simple and, as a visually fixed reminder of bus service, serves as a salient indicator of bus support. This makes it easier for an elected official to point to their commitment to keep or increase bus service. However, there are some limitations to this measure. First, more bus stops does not necessarily mean better bus service; too many bus stops can mean slower service (El-Geneidy et al. 2006). A second limitation is that the measure only includes a spatial representation of bus transit; bus transit also has a temporal dimension. A bus stop served every 60 minutes does not provide equivalent service to a bus stop served every 6 minutes, for example. Finally, there is evidence politicians use transit frequency, not just physical stops, to boost transit services (Scheurer and Curtis 2015). The second measure of bus transit accounts for these limitations.

The transit supply index (TSI) (Bertolaccini and Lownes 2013; Delbosc and Currie 2011), my second measure of transit supply, includes both spatial and temporal dimensions of bus transit services. It can be calculated using the equation below:

$$TSI_{VP} = \sum_R \left(\frac{Coverage\ Area_{R,VP}}{Total\ Area_{VP}} * f_{R,VP} \right)$$

Where $f_{R,VP}$ is the mean weekly vehicle arrivals for a stop, R is a specific route, and VP is a voting precinct. Bus service coverage area is calculated as quarter mile buffers around bus stops, merged by bus route. As bus stop buffers can extend across voting precinct boundaries, TSI can be calculated for portions of the buffer that extend into a voting precinct, even if the stop is not physically located in the precinct. While TSI provides a more comprehensive measure of the quantity of bus service supplied by a transit agency, it is more complex. This means it may be more difficult for an elected official to simply explain their contribution, making it potentially less useful as a form of political pork.

Both measures of bus service have advantages and disadvantages so using both will provide some additional robustness to the evaluations. Both measures are also easily calculated using publicly available GTFS data, a common data format for transit services. As mentioned earlier, the results of the OLS regressions will be used to normalize the measures of transit. Thus, there will be four different measures of bus transit used in this evaluation: bus stops, normalized bus stops, TSI, and normalized TSI.

3.3.3 Voting Data

Voting data is also important for this study. Voting data and voting precinct geographic data were obtained for both Milwaukee and Raleigh. Voting precincts are the smallest geographic scale available for voting data. Electoral data contained the number of votes for each candidate for each election for each voting precinct. From these data, I produced three measures of voting. First, votes for all candidates in a particular election were summed at the precinct level to give an indicator for voting turnout. The second measure was the number of precinct votes for the candidate who ultimately won the election. This represents a concentration of voter support. Finally, the second measure was divided by the first measure to get the percentage of support for each election's winning candidate in each voting precinct.

As previously mentioned, historically marginalized populations, including Black and low-income populations, have also historically had less voting power. These groups are also disproportionately likely

to use the bus so relationships between voting and marginalized groups could impact the results. Consequently, before performing my analysis, I calculated Pearson correlation coefficients to determine whether voting data in Raleigh and Milwaukee reflect these trends. Table 4-3 summarizes the results.

Table 4-3: Pearson correlation coefficients between voting turnout and historically marginalized populations percentages in voting precincts

City	Election Type	Percent Black [^]	Percent Below Poverty Line [^]
Raleigh	City Council - Ward (2015)	-0.27***	-0.19**
	City Council – At-Large (2015)	-0.26***	-0.18*
	Mayor (2015)	-0.15	-0.11
	City Council - Ward (2017)	-0.08	-0.08
	City Council – At-Large (2017)	-0.13	-0.12
	Mayor (2017)	-0.11	-0.11
Milwaukee	City Council – Ward (2016)	-0.25***	-0.59***
	Mayor (2016)	-0.24***	-0.60***
	County Supervisors (2016)	-0.24***	-0.59***
	County Supervisors (2018)	-0.32***	-0.63***

[^]ACS 5-year estimates were used to allow for more geographic granularity; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

As the table shows, voting turnout is consistently negatively correlated with Black and low-income populations for both cities, all election types, and all years. This aligns with the previous research cited earlier. However, there is some nuance in the data. In Milwaukee, there is a stronger negative correlation than Raleigh and the correlations do not change much between election types or years. In Raleigh, city council members have a stronger negative correlation in 2015 with the correlation weakening in 2017.

4.0 Results

As mentioned in section 3.2, the evaluation started with statistical tests between bus service and the percentages of different historically marginalized populations. The purpose of these tests was to get a baseline understanding of any potential bus service equity issues that might exist in Milwaukee or Raleigh. The results of the t-tests are shown in Table 4-4. As the table shows, in every case where bus service was statistically significant, voting precincts with greater concentrations of historically marginalized populations were correlated with greater levels of bus service. While t-tests are just a basic indicator for statistical relationships, not accounting for alternative factors that may affect the relationship, these results indicate bus services do not appear to be inequitably distributed in either Milwaukee or Raleigh.

Table 4-4: Welch's t-tests for bus service

Measure	Scenario		Count	Bus Stops	TSI
Milwaukee					
Bus Service per Square Mile	Majority of precinct is Black	Yes	143	52.8	10,042.6
		No	181	48.4	10,745.3
	Zero car households above city average~	Yes	154	59.4***	13,881***
		No	170	42.1***	7,313.6***
	Poverty percentage above city average~	Yes	162	55.5***	12,146.7***
		No	162	45.1***	8,723.7***
	Public transportation commute usage above city average~	Yes	146	60.0***	12,838.2***
		No	178	42.3***	8,464.2***
Change in Bus Service (2016-2020)	Voted for city council candidate who won the election	Yes	283	-1.6**	-65.3
		No	41	-0.8**	-24.6
	Voted for mayoral candidate who won the election	Yes	280	-1.3***	-60.7
		No	44	-2.6***	-56.9
Raleigh					
Bus Service per Square Mile	Majority of precinct is Black	Yes	13	20.8*	596.5
		No	94	9.5*	3,170.6
	Zero car households above city average~	Yes	34	19.2***	8,667.1
		No	73	6.9***	152.2
	Poverty percentage above city average~	Yes	26	17.3**	406.9
		No	81	8.8**	3,644.6
	Public transportation commute usage above city average~	Yes	30	21.3***	9,683.3
		No	77	6.8***	198.6
Change in Bus Service (2015-2017)	Voted for district city council candidate who won the election	Yes	65	-0.6	27.3
		No	42	-1.1	15.8
	Voted for at-large city council candidate who won the election	Yes	89	-0.4**	21.8
		No	18	-2.4**	28.0
	Voted for mayoral candidate who won the election^	Yes	-	-	-
		No	-	-	-
Change in Bus Service (2017-2019)	Voted for district city council candidate who won the election	Yes	100	0.9**	-55.2
		No	9	0.0**	-108.1
	Voted for at-large city council candidate who won the election	Yes	85	0.4*	-73.0***
		No	24	2.3*	-11.8***
	Voted for mayoral candidate who won the election	Yes	76	0.3*	-70.6
		No	33	2.0*	-34.2

~See Table 4-1; ^Only one voting precinct did not vote for the mayoral winner in 2015; *p<0.1; **p<0.05; ***p<0.01

In the second part of the analysis, I used OLS regression to establish what non-political factors might help explain differences in bus stops and TSI between voting precincts. While all of the historically marginalized populations included in Table 4-4 were considered for this analysis, the strong correlation between zero car households and the percentage of households below the poverty line, as well as between the percentage of households below the poverty line and the Black population percentage, meant I was not able to include all population measures in the regression. Thus, only the poverty measure was kept for the regression modeling. The results are summarized in Table 4-5.

Table 4-5: Linear regressions from pooled Raleigh and Milwaukee stop and TSI data

Independent Variable	Dependent Variables	
	Stops per Voting Precinct	TSI per Voting Precinct
Population and Job Density (log)	1.460** (0.672)	882.192*** (51.766)
Percentage of population over age 65	-0.033 (0.104)	-14.144* (8.009)
Percentage of households under the federal poverty line	-0.024 (0.051)	5.514 (3.940)
Constant	-0.903 (6.256)	-6,641.570*** (481.552)
Observations	431	431
R ²	0.012	0.471
Adjusted R ²	0.005	0.467
Residual Std. Error	9.932 (df = 427)	764.557 (df = 427)
F Statistic	1.767 (df = 3; 427)	126.605*** (df = 3; 427)

Note: *p<0.1; **p<0.05; ***p<0.01

The pooled regression results in Table 4-5 suggests two things. First, techno-rational assumptions around the delivery of bus service are an important component for predicting bus service. Both the number of bus stops and TSI were positively correlated with population and job density. This suggests, at least to an extent, bus service is allocated based on transit need. Second, the regressions indicate that there is much more to the distribution of bus service than the concentration of people and jobs. Neither

regression explained the majority of the variability with the estimation for bus stops being particularly poor.

Although the models do not fully explain bus service distribution, the statistical significance of population and job density means we can use these populations to normalize the measures for bus services. That is done under the assumption that if professional norms are dominating bus service distribution decisions, then controlling for transit need may result in voting becoming a poor predictor for bus service distribution over time. Table 4-6 provides summary statistics for all measures of bus service, including normalization of services and changes of service over time.

The table shows bus service distributions change over time, measurement type, and city. While TSI is relatively consistent in Milwaukee between years, there are some larger swings in Raleigh, for example. In Raleigh, the magnitude of bus service distribution often increases after accounting for changes in population and jobs. For example, average bus stops per precinct decrease by 6% between 2015 and 2017 but decrease by an average of 14% when accounting for population and jobs density. Thus, while normalizing bus service measures has an impact on service changes, service changes appear to be influenced by more than just changes to transit need.

Next, Moran's I was used to establish if spatial autocorrelation is prevalent in the distribution of bus stops. Spatial autocorrelation helps indicate if there are spatial associations in the data. Table 4-7 presents the results. As the table shows, bus service is spatially clustered. Specifically, neighboring voting precincts are more likely to have similar levels of bus service. However, the spatial clustering is not consistent across cities or bus service variables. For example, Milwaukee's bus stops and routes are more uniformly distributed across the city than Raleigh's (see Figure 4-1), explaining why Milwaukee has smaller coefficients. However, Milwaukee's route frequencies are not as uniformly distributed, resulting in greater spatial autocorrelation once they are accounted for in the TSI calculation.

Table 4-6: Bus service summary statistics in voting precincts

Variable	Year(s)	Minimum	Maximum	Median	Average	St. Dev.
Raleigh						
# Bus Stops	2015	0.0	61.0	9.0	12.6	14.1
	2017	0.0	57.0	7.0	11.8	13.3
	2019	0.0	58.0	8.0	12.4	13.5
Δ Bus Stops	2015-2017	-12.0	13.0	0.0	-0.8	2.7
	2017-2019	-9.0	20.0	0.0	0.8	3.6
Bus Stops Per 1,000 Population and Jobs Per Square Mile	2015	0.0	19.6	2.4	3.9	4.4
	2017	0.0	17.7	2.1	3.4	3.8
	2019	0.0	20.5	2.3	3.6	3.9
Δ Bus Stop Per 1,000 Population and Jobs Per Square Mile	2015-2017	-6.8	5.7	-0.1	-0.5	1.5
	2017-2019	-3.1	8.6	0.0	0.3	1.5
TSI	2015	0.0	1,653.0	160.8	229.6	317.7
	2017	0.0	2,112.1	174.2	252.4	369.5
	2019	0.0	1,670.3	87.7	188.2	304.3
Δ TSI	2015-2017	-53.5	500.3	7.5	22.8	60.8
	2017-2019	-693.9	160.6	0.0	-59.5	131.2
TSI Per 1,000 Population and Jobs Per Square Mile	2015	0.0	278.6	44.4	59.5	60.8
	2017	0.0	312.2	44.2	60.9	65.1
	2019	0.0	285.3	27.4	44.9	54.7
Δ TSI Per 1,000 Population and Jobs Per Square Mile	2015-2017	-35.1	145.0	0.0	1.4	20.1
	2017-2019	-215.4	34.8	-0.7	-14.9	34.9
Milwaukee						
# Bus Stops	2016	0.0	63.0	9.0	11.4	8.2
	2018	0.0	51.0	9.0	10.9	7.6
	2020	0.0	42.0	9.0	9.9	6.6
Δ Bus Stops	2016-2018	-12.0	3.0	0.0	-0.4	1.2
	2018-2020	-23.0	7.0	0.0	-1.1	2.7
	2016-2020	-33.0	6.0	0.0	-1.5	3.2
Bus Stops Per 1,000 Population and Jobs Per Square Mile	2016	0.0	7.3	1.6	1.9	1.3
	2018	0.0	7.1	1.5	1.8	1.2
	2020	0.0	6.8	1.4	1.6	1.1
Δ Bus Stop Per 1,000 Population and Jobs Per Square Mile	2016-2018	-1.2	0.6	0.0	-0.1	0.2
	2018-2020	-3.1	1.2	0.0	-0.2	0.4
	2016-2020	-3.4	1.3	-0.1	-0.2	0.5
TSI	2016	0.0	7,983.6	1,480.7	1,595.8	980.9
	2018	0.0	7,259.8	1,422.2	1,563.1	953.7
	2020	0.0	6,864.8	1,429.9	1,535.7	908.9
Δ TSI	2016-2018	-1,167.9	714.5	-30.7	-37.5	126.0
	2018-2020	-615.1	544.8	-17.6	-22.7	156.9
	2016-2020	-1,313.2	527.7	-54.6	-60.1	195.8
TSI Per 1,000 Population and Jobs Per Square Mile	2016	0.0	1,021.2	243.9	256.3	143.6
	2018	0.0	1,059.1	238.5	250.6	139.3
	2020	0.0	1,006.0	236.7	250.4	133.0
Δ TSI Per 1,000 Population and Jobs Per Square Mile	2016-2018	-73.3	116.3	-4.2	-5.7	22.5
	2018-2020	-134.2	181.5	-3.1	-0.2	35.3
	2016-2020	-207.4	228.6	-8.2	-5.9	44.7

Table 4-7: Measure of spatial autocorrelation (Moran's I)

Scenario Year	Bus Stops	TSI
Raleigh: 2015 Election		
2015	0.519	0.700
2017	0.511	0.680
Raleigh: 2017 Election		
2017	0.521	0.683
2019	0.544	0.633
Milwaukee: 2016 City Election		
2016	0.169	0.649
2020	0.178	0.633
Milwaukee: 2016 County Election		
2016	0.169	0.649
2018	0.172	0.655
Milwaukee: 2018 County Election		
2018	0.172	0.655
2020	0.178	0.639

Note: All results were highly statistically significant

The final parts of the analysis considered both voting data and bus service data together. First, t-tests were used to observe patterns between voting and bus service. The results are summarized in Table 4-4. As the table shows, there are already observable differences between cities, election types, and bus service variables. For example, in Milwaukee, there were no statistically significant changes in TSI. Conversely, Raleigh saw a large, statistically significant change in TSI correlated with voting behavior for at-large council candidates in the 2017 election. Also observable are cases where decreases in bus service could still be considered a positive political outcome. For example, while voting for the winning mayor in Milwaukee was still associated with a decrease in bus stops, the decrease was, on average, half that for voting precincts that did not vote for the winning mayor. Finally, there is also some evidence that not all electoral support results in positive returns for transit. In Raleigh, voting precincts who supported the mayor in 2017 saw a smaller increase of bus stops than other parts of the city. Overall, while these results do not incorporate spatial relationships or non-political factors, they do provide initial evidence that voting behavior affects the distribution of bus service.

The spatial autocorrelation findings justified the use of spatial lag regression modeling. Consequently, spatial lag models were run for every combination of city, election type, voting variable, and bus service variable. Table 4-8 summarizes the results. As the model specification in section 3.2 showed, the only political model variable is voting. Consequently, only the coefficients and statistical significance of the voting variable from the regression models were included in Table 4-8.

The table results show that voting behavior is correlated with bus service levels, suggesting there is likely a relationship between voting behavior and subsequent changes to bus service. However, like with the previous results, the coefficient size and the strength of the relationship varies across regression iterations. There are multiple ways in which they vary. First, there are differences between elections. In Raleigh, the 2017 election was associated with more impacts to bus stops than the 2015 election, for example. Second, there are differences between the types of candidates. In Raleigh's 2017 election, a higher percentage of votes for a winning ward city council member was correlated with increases in bus stops while a higher percentage of votes for the winning mayoral candidate was correlated with a decrease in bus stops. Third, relationship differences are not consistent between cities. For example, Milwaukee saw a different trend for mayoral support compared to Raleigh with a higher percentage of votes for the winning mayoral candidate associated with an *increase* in bus stops.

The choice of bus service measure also made a large difference in the results. Voting was more often correlated with statistically significant changes to TSI than bus stops. This may be because it is easier to adjust service frequency (see Scheurer and Curtis 2015 for an example) than bus stops, which tend to be more fixed. Although TSI generally saw more statistically significant relationships, the directions of the coefficients were generally consistent with bus stops, indicating the two different types of measures of bus service were associated with voting behavior in a consistent way. Again, though, the patterns differed between cities. While TSI had a statistically significant correlation with voting in almost every model in Raleigh, relationships were a lot weaker in Milwaukee.

Table 4-8: Coefficients and statistical significance of voting variables

Election	Voting Variables	Bus Service Variables			
		Bus Stops	Bus Stops per 1,000 Job and Residents per Sq Mile	TSI	TSI per 1,000 Job and Residents per Sq Mile
Raleigh: 2015 Election					
Ward City Council Members	Total votes in precinct	-0.003*	-0.001	-0.049**	-0.028**
	Precinct-level count of votes for election winner	<0.001	<0.001	-0.063**	-0.037**
	Precinct-level percentage of votes for election winner	0.029*	0.013*	0.383*	-0.144
At-Large City Council Members	Total votes in precinct	-0.002*	-0.001	-0.032***	-0.018***
	Precinct-level count of votes for election winner	-0.002	-0.001	-0.058***	-0.035***
	Precinct-level percentage of votes for election winner	0.038	-0.001	0.279	-0.167
Mayor	Total votes in precinct	-0.003*	-0.001	-0.048**	-0.028**
	Precinct-level count of votes for election winner	-0.003	-0.001	-0.082***	-0.046***
	Precinct-level percentage of votes for election winner	0.036	0.005	-0.488	-0.248
Raleigh: 2017 Election					
Ward City Council Members	Total votes in precinct	<0.001	>-0.001	-0.113**	-0.017
	Precinct-level count of votes for election winner	0.003	<0.001	-0.125*	-0.008
	Precinct-level percentage of votes for election winner	0.060***	0.021**	0.490	0.345*
At-Large City Council Members	Total votes in precinct	<0.001	<0.001	-0.063**	-0.010
	Precinct-level count of votes for election winner	-0.001	-0.001	-0.167***	-0.031**
	Precinct-level percentage of votes for election winner	-0.077*	-0.037**	-4.715***	-1.185***
Mayor	Total votes in precinct	0.001	<0.001	-0.107**	-0.016
	Precinct-level count of votes for election winner	-0.004	-0.002**	-0.259***	-0.055***
	Precinct-level percentage of votes for election winner	-0.060***	-0.029***	-1.632***	-0.488***
Milwaukee: 2016 City Election					
City Council Members	Total votes in precinct	-0.002**	>-0.001***	-0.003	-0.028***
	Precinct-level count of votes for election winner	-0.001*	>-0.001***	0.037	-0.024*
	Precinct-level percentage of votes for election winner	0.013	0.003*	0.951	0.248
Mayor	Total votes in precinct	-0.001***	>-0.001***	0.026	-0.020**
	Precinct-level count of votes for election winner	-0.001	>-0.001	0.048	-0.021*
	Precinct-level percentage of votes for election winner	0.027***	0.006***	0.290	0.192
Milwaukee: 2016 County Election					
County Supervisors	Total votes in precinct	>-0.001	>-0.001*	0.080**	-0.001
	Precinct-level count of votes for election winner	>-0.001	>-0.001**	0.150**	0.002
	Precinct-level percentage of votes for election winner	>-0.001	<0.001	0.271	0.024
Milwaukee: 2018 County Election					
County Supervisors	Total votes in precinct	-0.004***	-0.001**	-0.108	-0.054***
	Precinct-level count of votes for election winner	-0.003**	-0.001**	-0.163*	-0.066***
	Precinct-level percentage of votes for election winner	0.010	0.001	-0.419	-0.214*

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Different measures of voting also played a role. Total votes in a voting precinct were often statistically significant at the same time precinct-level votes for the election winner was statistically significant. Both could arguably be considered measures of voter turnout. The percentage of votes for the election winner indicates electoral support without indicating how many votes are in a voting precinct. Consequently, this measure generally exhibited different relationships with bus service. Statistically significant measures of voter turnout were almost consistently negatively correlated with bus service, especially TSI.

Finally, it was evident that statistically significant relationships persisted even after controlling for changes to population and jobs. However, controlling for changes to population and jobs generally reduced the voting coefficient size. This suggests that, while voting likely has a persistent relationship with bus service, the effects are small when considering more bureaucratic explanations for changes in bus service. Even so, in some cases controlling for changes to population and jobs made the effects of voting even more pronounced. This is particularly demonstrated in Milwaukee.

5.0 Discussion

Although the study's evaluation of bus service and voting had multiple parts, a consistent takeaway is that the relationship between the two variables is not easily generalizable. The strength and size of statistically significant relationships between voting and bus service varied between elections, cities, and election types. However, this lack of generalizability is not surprising. As Han et al. (2021) wrote "Salient municipal issues vary over time, space, and social groups." Issue attention focusing on bus services in one city in one election might fall out of favor or focus in a different city or in a subsequent election. Krumholz (1982), for example, has demonstrated how easily the focus on transit can change between different political administrations. The differences between electoral administrations were also part of the

justification behind why previous work (Miranda and Tunyavong 1994) considered more than one election.

The different roles of different elected officials may also help explain some of the results. Earlier, I discussed how previous work (Han, Laurian, and Dewald 2021; Krol 2018; Mladenka 1981) emphasized ward-focused city council members may have different priorities to city-focused at-large politicians. The former increase service to be more responsive to constituents while the latter might want to decrease service to reduce citywide costs. The results from the Raleigh 2017 election support this theory. However, the differing relationships in Milwaukee suggest there may be more to the story.

In Milwaukee, an increase in the percentage of votes for the mayor was associated with an increase in service, a contrast to Raleigh. The difference in mayoral results may be explained by differences in institutional rules, as suggested by Wells (2009). Alternatively, city governance differences may influence the results. For example, the fact Milwaukee, as a mayor-council form of government with a strong mayor, makes the distribution of services more political than Raleigh, which is a council-manager form of government with a weak mayor. While “strong mayors are expected to use policies for political purposes” (Nuun 1996), council-manager systems adopt a more “business-like” practice to city management (Wollmann and Thurmaier 2012). Another explanation for the difference might be organizational. In Raleigh, transit costs are borne by the city while in Milwaukee they are borne by the county. Thus, Milwaukee's mayor might not see a risk of electoral punishment if they support maintaining or expanding bus service, nor would they use bus service as a part of policy focusing on financial prudence.

Support for county candidates, measured as percentage of total precinct-level votes, didn't appear to have a statistically significant relationship for either election observed. This is somewhat surprising given the bus system is managed by the county in Milwaukee, meaning

decision-making for MCTS is more explicitly under the control of Milwaukee County Supervisors rather than the city's elected officials. The lack of relationships is likely explained by the fact that about half of the candidates for county supervisor ran unopposed in both 2016 and 2018. Thus, without electoral competition, there may be less of a connection between voting and service delivery. Regardless, the effect of county politicians is difficult to ascertain from these data.

While percentage of voter support wasn't statistically significant in counties, the voting measures related to turnout often were. These measures were statistically significant for bus stops in the Milwaukee city election as well as TSI in Raleigh. As mentioned previously, the measures for turnout typically had negative coefficients. This might suggest that increased political attention does not encourage elected officials to use bus service as a form of political pork. An alternative explanation could be related to equity. As voting turnout was also negatively associated with higher percentages of historically marginalized populations, the negative relationship could indicate that bus transit might be used as part of an equity oriented policy. In the 2015 Raleigh election, for example, TSI was negatively associated with voting turnout to a statistically significant level. Looking at the data, changes to TSI were moderately correlated with different historically marginalized populations. The correlation between TSI change and the Black population percentage was about 0.25, correlations between households in poverty and change in TSI per person and job averaged 0.45, and correlations with zero car households ranged from 0.45 for TSI per person and job to 0.69 for change in TSI.

As described earlier, urban service delivery literature is concerned with equity in the distribution of public services. Although the Welch's t-test results suggest there are not any equity issues in bus service distribution in Raleigh or Milwaukee, understanding why is complicated. Does electoral politics increase or decrease equity in the distribution of bus services? The results indicate it might be both. First, as just shown, higher voting turnout is associated with decreased

bus service, especially when considering service frequency in TSI. There is some evidence that this may be the result of an increased focus on bus service equity. However, Raleigh's 2017 city council elections and Milwaukee's 2016 mayoral elections also saw increases in bus service correlated with increases in the percentage of voting support. This is more in line with a political pork theory of distributive politics. Consequently, the inconsistencies in relationships between voting and bus service may be due to differing political relationships affecting bus service distribution differently.

Research on urban service delivery also asks whether urban service distribution decisions are driven by political or bureaucratic decision-making. If bus service is purely explained through bureaucratic norms, then we might expect to find that coefficient magnitudes and statistical significance reduce once changes to population and jobs are controlled for. This would be because changes to service are related to shifts in population or jobs, not political influence. We do somewhat observe this. In the 2017 Raleigh elections, the statistically significant coefficients for bus stop regressions reduce in magnitude and the statistical significance almost completely disappears for TSI. However, in general, while coefficient magnitudes shrink, statistical significance remains. The results mean that it is likely bus service decisions are made through a combination of both bureaucratic norms as well as political influences. This is consistent with previous urban service delivery literature that posits both bureaucracy and politics play a role in service distributions (Koehler and Wrightson 1987).

6.0 Conclusion

This chapter began by asking if voting for elected officials affects the delivery of bus services. Through a quantitative evaluation of bus services in Milwaukee and Raleigh, this study demonstrates that the distribution of bus services is likely affected by differences in voting behavior. However, the relationship between voting and bus service is difficult to generalize. This is possibly because of changing political priorities between elections, differences in city

governance, the different focuses of different types of elected officials, and even changing dynamics of political competition.

In line with urban service delivery literature, this chapter also considers the equity implications of electoral politics in bus service distribution. While there are multiple arguments to be made that politics can have a regressive impact on bus transit, this study indicates the story might be a bit more complicated. Politicians may both support an equity policy in bus service distribution affecting overall bus service while also supporting targeted service increases for areas where they get higher percentages of voting support. These two different political actions may affect bus service equity differently.

This chapter also furthers the urban service delivery discussion about what drives urban service distribution decisions. Do politics drive distributions or are services distributed based on apolitical bureaucratic norms? The findings from this study are consistent with some of the previous research in urban service delivery (Koehler and Wrightson 1987; Miranda and Tunyavong 1994), supporting the argument that both bureaucracy and politics affect bus service. While bureaucratic decision-rules focusing on transit need, especially higher population or employment densities, appear to be the most significant driver, there are also political nuances that shape bus service over time and space.

While this evaluation considered multiple measures of bus supply and voting behavior using multiple different methods, there are some limitations. First, the use of areal interpolation for census data could lead to some ecological inference issues when interpreting demographic data. Second, the lack of geographic granularity for one-year census data makes it more difficult to assess population changes over a political cycle. However, because of the breadth in the evaluation, the impacts of these limitations are expected to be minimal.

There is also room for future work. This study focused on quantitative methods for understanding how voting behavior might affect bus service distribution. Thus, this topic could benefit from additional qualitative work that directly asks elected officials how they consider transit service planning in their role as an elected representative. This chapter also found that electoral politics plays a role in service distribution even when there is not a direct link between votes and transit governance. In Milwaukee, for example, votes for city representatives had a statistically significant relationship with bus service even though the bus service is managed by the county. Consequently, additional work could explore how voting translates to service outcomes. Further, politicians may be more incentivized to exercise their influence on bus service if it's part of their political platform. Consequently, future case analyses should consider elected official campaign materials (see Chapters 2 and 3). Finally, the results indicated a lack of generalizability in the relationship between voting and transit services. There are differences between cities, elections, and political candidates that warrant additional exploration. For example, there is not enough information to conclusively state why support for mayors in Raleigh and Milwaukee affects the distribution of bus services differently. These differences might be explained by changes in political moods, differences in city or transit governance, or differences in responsibilities between different types of elected officials. Further research may be required to better understand why such differences exist.

Chapter 5 – Conclusion

Electoral politics are important for understanding transportation policy. Both transportation issues and electoral politics are close to the local sphere of influence (A. Clark and Krebs 2012; Sadik-Khan and Solomonow 2016), transportation is used by politicians to increase their chances of reelection (Bertoli and Grembi 2021; Bracco 2018; Luca and Rodríguez-Pose 2019), and election results can help determine how responsive politicians are to transportation needs (Ejdemyr et al. 2015; Gorgulu, Sharafutdinova, and Steinbuks 2020). Consequently, the purpose of this dissertation was to further our understanding of transportation and electoral politics. Specifically, this dissertation advances our knowledge using two primary research questions: 1) How important are transportation issues to elections? 2) Does voting for elected officials affect the amount of bus service delivered? I responded to these questions using three different papers. The first, Chapter 2, explores how prevalent transportation issues are in local elections. Recognizing the influences of intergovernmental relations on transportation, the second paper, Chapter 3, explores transportation issues in state legislative elections. Finally, Chapter 4 investigates relationships between voting and the delivery of bus services.

Although Chapters 2 and 3 were in response to the same research question, the outcomes were different. These chapters demonstrate the importance of transportation issues in elections differs by the level of election. For example, in local elections, transportation issues were primarily correlated with the size of a jurisdiction's population, partisanship, and commuting mode choices. Conversely, at a state level, only transportation characteristics were correlated with the inclusion of transportation issues. The transportation content differed significantly also. While both the state and local elections studied mentioned public transportation the most after cars/roads, the state elections mentioned rail next most often while local elections mentioned active

transportation modes. Furthermore, top transportation issues in local elections were framed around the environment and maintenance while at the state level there was more of a focus around traffic congestion and jobs. Safety was a top issue for both election levels. Some of these differences may be due to partisan differences. For example, urban politics tends to lean more left (Parker et al. 2018) and the state results indicated active transportation, maintenance, and the environment were all more likely to be mentioned by Democrat candidates than Republican candidates. Alternatively, some of these differences may be explained by the different priorities or focuses of different levels of government under the purview of elected officials.

Differences between elections and types of elected officials was a theme that carried through to Chapter 4, where I evaluated relationships between voting and bus service. Although this chapter demonstrated there are statistically significant relationships between voting behavior and changes to bus service, the relationships change between elections, geographic locations, and types of elected officials.

The research in this dissertation has some important takeaways for practicing transportation planners. First, Chapters 2 and 3 highlight some of the factors that potentially affect political pressures in transportation policy and agenda setting. Specifically, what geographic, institutional, transportation, and political factors may influence (or at least correlate with) different political transportation priorities in local and state elections. Practicing planners can use this knowledge to advance support for different transportation plans and projects. As Forester (1982, 76–77) wrote:

Planners can respond to decision focused power by anticipating political pressures and mobilizing countervailing support. [...] Anticipating the agenda setting attempts of established interests, planners can counter such dominating influence through a variety of informal, information brokering roles, keenly attuned to the timing of the planning

process, its stages and procedures, and the interests and perceptions of the participants all along the way.

Understanding the factors that correlate with transportation platform issues can help transportation planners pick their political battles, prioritize the use of political capital, and better leverage their knowledge of bureaucratic processes to achieve their goals¹². While this knowledge can help transportation planners achieve their goals, this dissertation also serves as a reminder that transportation planning is both a technical *and* political exercise. Chapter 4 emphasizes this, demonstrating bus service outcomes might be explained by both bureaucratic and political influences. Although there are best practices and technical guidance for transportation planning, practicing transportation planners need to be cognizant of both the political and apolitical aspects to advance transportation policy and planning work. Mees (2010, 8) emphasizes this when discussing transportation policy change, writing: “Technical expertise is very important, but technicians can become set in their ways and resistant to change [...] Real innovation requires a creative tension between experts and the public.” In the context of this quote, Mees describes the public as “citizens and their elected representatives;” thus, rephrased, advancing transportation policy and planning requires a tension between the technical bureaucrat and politicians.

This research also has some important takeaways for academics. First, this dissertation has drawn from theories and research from several different fields including geography, public administration, public policy, political science, and urban planning. Transportation is an interdisciplinary field and the insights and knowledge developed through this dissertation required an interdisciplinary approach. Second, as emphasized in Chapter 1, transportation policy

¹² Kain (1990) provides an example of planners doing this, even if this specific example doesn't paint planners in a good light.

and planning research has underemphasized the political nature of the discipline. Transportation academics should continue to breach the wall of techno-rationalism. Specifically, more work needs to focus on how the political and apolitical meet and work together to advance transportation policy and planning. Finally, transportation planning is an inherently applied discipline. This research was inspired by my own experience as a transportation planner as well as some of the work of my peers and colleagues. Transportation academics should continue to leverage the experience of practicing transportation planners to better understand how transportation decision-making happens.

Overall, while this dissertation has furthered knowledge on transportation electoral politics, it also highlighted one of the major challenges to performing work on this topic. Namely, that variations between elections can have a significant impact on results. Variations can occur across geographies, levels of government, candidates, and time. This can make it difficult to generalize findings¹³. This challenge echoes work by Clark and Krebs (2012) who emphasized variations between cities and states as one of the most important issues for the study of elections and policy responsiveness. This challenge also thus poses a path forward for future work on transportation and electoral politics.

Clark and Krebs (2012) note that electoral systems can differ quite substantially, often differing within and between countries. In the US, for example, there is evidence campaigns and voter turnout differ in elections that use plurality voting, where candidates with the most votes win, compared to elections where ranked choice voting is used, where voters rank candidates in order of preference (Kimball and Anthony 2016; Kropf 2021). These kinds of differences could affect how transportation is included in elections or how it is used by politicians to appeal to voters.

¹³ While Chapter 3 somewhat addresses this, the chapter's data are still from one year and one country.

A particularly important limitation of the work in this dissertation is its focus on the US. Consequently, a useful contribution to transportation and electoral politics literature would be to advance work in other democracies where electoral systems, institutions, socioeconomics, and culture all vary and potentially impact how transportation is included in elections. Australia, for example, uses a parliamentary system where voting is a legal requirement. This may result in some substantial differences to the US. India also uses a parliamentary system, but has very different institutions and culture to Australia, so may produce different results again. Thus, there are many opportunities for cross-country comparisons to enrich this area of research.

As Chapter 4 has demonstrated, time is another important component that needs to be considered in future research. The chapter demonstrated that even when the city and type of election is the same, relationships between voting and bus service could still change between elections. Some might consider time as almost contradictory to the study of electoral politics. As Pierson (2004, 41) wrote:

Because the decisions of voters, which determine political success, are taken in the short run, elected officials generally employ a high discount rate. They will pay attention to long-term consequences only if these become politically salient, or when they have little reason to fear short-term electoral retribution.

However, I argue time is an important component of transportation and electoral politics. First, different candidate priorities and election context can result in different election campaign strategies. An important transportation issue in one election might be less visible in a subsequent election, for example. Second, as Chapter 4 demonstrated, different candidates may respond to votes in different ways. Politicians may play a role in transit decision-making after one election but may have less of a role in subsequent elections. This may be due to changing positions on public boards, the changing salience of other issues, or just because a politician might feel they

have achieved what they wanted to achieve. Third, while electoral politics puts a lot of emphasis on shorter-term decisions (Pierson 2004), many transportation projects extend beyond an electoral cycle. Thus, the incremental decision-making process incentivized by electoral politics (Pierson 2004) may have significant implications for decisions that require longer-term thinking and commitment.

Finally, the design of this dissertation was based on a conceptualization of the political process by Easton (1957) where the political system transforms inputs into outputs (see Figure 1-1). In the case of transportation, I have demonstrated inputs can include characteristics like partisan ideology, local geography, transportation behavior, and voting behavior, while outputs can include changes to transportation infrastructure or services. However, more needs to be done to explain how inputs are turned into outputs. How do politicians use local geography, ideology, and voter behavior to produce transportation outcomes? What are the institutional or political mechanisms employed? Further, as Figure 1-1 demonstrates, there is a feedback process, a particularly important aspect given while “perhaps modest initially, [inequalities] can be reinforced over time and often come to be deeply embedded in organisation and dominant modes of political action and understanding, as well as in institutional arrangements” (Pierson 2004, 11). Thus, the politics of transportation policy feedback also needs to be further explored. Finally, this whole system exists within a local context or environment. As already emphasized in this chapter, variations in environmental context need to be incorporated into future studies.

In conclusion, while this dissertation enhances our understanding of transportation and electoral politics, there are many areas of opportunity to expand on this work and provide more insight into how and why politically motivated transportation decisions are made.

References

- Agranoff, Robert, and Beryl A. Radin. 2015. "Deil Wright's Overlapping Model of Intergovernmental Relations: The Basis for Contemporary Intergovernmental Relationships." *Publius* 45(1): 139–59.
- Aidt, Toke S., and Julia Shvets. 2012. "Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures." *American Economic Journal: Economic Policy* 4(3): 1–29.
- Altshuler, Alan. 1979. *The Urban Transportation System: Politics and Policy Innovation*. Cambridge, MA: MIT Press.
- Auerbach, Gedalia. 2012. "Urban Planning: Politics vs. Planning and Politicians vs. Planners." *Horizons in Geography* 79(80): 49–69.
- Bartels, Larry M. 1998. "Where the Ducks Are: Voting Power in a Party System." In *Politicians and Party Politics*, ed. John G. Geer. John Hopkins University Press, 43–79.
- Baumgartner, F., and B. Jones. 1993. *Agendas and Instability in American Politics*. Chicago: University of Chicago Press.
- Bertolaccini, Kelly, and Nicholas E Lownes. 2013. "Effects of Scale and Boundary Selection in Assessing Equity of Transit Supply Distribution." *Transportation Research Record: Journal of the Transportation Research Board* 2350: 58–64.
- Bertoli, Paola, and Veronica Grembi. 2021. "The Political Cycle of Road Traffic Accidents." *Journal of Health Economics* 76: 102435.
- Besley, Timothy, and Anne Case. 2003. "Political Institutions and Policy Choices: Evidence from the United States." *Journal of Economic Literature* 41(1): 7–73.
- Bolotin, Fredric N, and David L Cingranelli. 1983. "Equity and Urban Policy: The Underclass Hypothesis Revisited." *The Journal of Politics* 45(1): 209–19. <https://www.jstor.org/stable/2130332>.
- Bowman, Ann O.M., and Richard C. Kearney. 2012. "Are U.S. Cities Losing Power and Authority? Perceptions of Local Government Actors." *Urban Affairs Review* 48(4): 528–46.
- Boyatzis, Richard E. 1998. *Transforming Qualitative Information: Thematic Analysis and Code Development*. SAGE Publications.
- Bracco, Emanuele. 2018. "A Fine Collection: The Political Budget Cycle of Traffic Enforcement." *Economics Letters* 164: 117–20.
- Buehler, Ralph, and John Pucher. 2012. "Demand for Public Transport in Germany and the USA: An Analysis of Rider Characteristics." *Transport Reviews* 32(5): 541–67.
- Burnett, Craig M., and Vladimir Kogan. 2014. "Local Logrolling? Assessing the Impact of Legislative Districting in Los Angeles." *Urban Affairs Review* 50(5): 648–71.
- . 2017. "The Politics of Potholes: Service Quality and Retrospective Voting in Local Elections." *Journal of Politics* 79(1): 302–14.
- Burns, Nancy, and Gerald Gamm. 1997. "Creatures of the State: State Politics and Local Government, 1871-1921." *Urban Affairs Review* 33(1): 59–96.

- Carpintero, Samuel, and Matti Siemiatycki. 2016. "The Politics of Delivering Light Rail Transit Projects through Public-Private Partnerships in Spain: A Case Study Approach." *Transport Policy* 49: 159–67.
- Ceder, Avishai. 2007. *Public Transit Planning and Operation: Theory, Modeling and Practice*. Burlington, MA: Elsevier.
- Cervero, Robert. 1991. "Suburban Traffic Congestion: Is There a Way Out?" *Built Environment* 17(3/4): 205–17. <https://www.jstor.org/stable/23286656>.
- Chaney, Paul. 2014. "Mixed-Methods Analysis of Political Parties' Manifesto Discourse on Rail Transport Policy: Westminster, Scottish, Welsh and Northern Irish Elections 1945-2011." *Transport Policy* 35: 275–85. <http://dx.doi.org/10.1016/j.tranpol.2014.06.002>.
- City of San Francisco. 2023. "311 Cases." <https://data.sfgov.org/City-Infrastructure/311-Cases/vw6y-z8j6> (June 5, 2023).
- Clark, Alistair, and Timothy Krebs. 2012. "Elections and Policy Responsiveness." In *The Oxford Handbook of Urban Politics*, eds. Karen Mossberger, Susan E. Clarke, and Peter John. Oxford, UK: Oxford University Press, 87–113.
- Clark, Ben, Kiron Chatterjee, and Steve Melia. 2016. "Changes in Level of Household Car Ownership: The Role of Life Events and Spatial Context." *Transportation* 43(4): 565–99.
- Clingermayer, James C, and Richard C Feiock. 1994. "Campaigns, Careerism, and Constituencies: Contacting Council Members About Economic Development Policy." *American Politics Quarterly* 22(4): 453–68.
- Coan, Travis G., and Mirya R. Holman. 2008. "Voting Green." *Social Science Quarterly* 89(5): 1121–35.
- Damore, David F., Robert E. Lang, and Karen A. Danielson. 2020. *Blue Metros, Red States: The Shifting Urban-Rural Divide in America's Swing States*. Brookings Institution Press.
- Davidoff, Paul. 1965. "Advocacy and Pluralism in Planning." *Journal of the American Planning Association* 31(4): 331–38.
- Delbosc, Alexa, and Graham Currie. 2011. "Using Lorenz Curves to Assess Public Transport Equity." *Journal of Transport Geography* 19: 1252–59. <http://dx.doi.org/10.1016/j.jtrangeo.2011.02.008>.
- DeSantis, Victor, and Tari Renner. 2002. "City Government Structures - An Attempt at Clarification." *State and Local Government Review* 34(2): 95–104.
- Dixit, Vinayak, Elisabet Rutstrom, Michael Mard, and Ryan Zielske. 2010. "Transit Referenda and Funding Options: Bonds Versus Taxes." *Transportation Research Record* (2143): 44–47.
- Duncan, Michael, and Robert K. Christensen. 2013. "An Analysis of Park-and-Ride Provision at Light Rail Stations across the US." *Transport Policy* 25: 148–57.
- Easton, David. 1957. "An Approach to the Analysis of Political Systems." *World Politics* 9(3): 383–400.
- Ejdemyr, Simon, Clayton Nall, Zachary O'Keeffe, and Brandon Tam. 2015. "Building Inequality: The Permanence of Infrastructure and the Limits of Democratic Representation." In *Annual Conference of the American Political Science Association*, , 1–50.

- El-Geneidy, Ahmed M, James G Strathman, Thomas J Kimpel, and David T Crout. 2006. "Effects of Bus Stop Consolidation on Passenger Activity and Transit Operations." *Transportation Research Record: Journal of the Transportation Research Board* 1971: 32–41.
- Elmelund-Præstekær, Christian, and David Nicolas Hopmann. 2013. "Understanding Differences in Voter Perceptions of Campaign Agendas: The Case of Local Elections in Denmark." *Environment and Planning C: Government and Policy* 31(4): 571–84.
- Farmer, Jayce L. 2011. "County Government Choices for Redistributive Services." *Urban Affairs Review* 47(1): 60–83.
- Fischer, Lauren Ames, Rosalie Singerman Ray, and David A. King. 2021. "Who Decides? Toward a Typology of Transit Governance." *Urban Science* 5(6): 16.
- Forester, John. 1982. "Planning in the Face of Power." *Journal of the American Planning Association* 48(1): 67–80.
- Forsyth, Ann. 2012. "Defining Suburbs." *Journal of Planning Literature* 27(3): 270–81.
- Foster, Kathryn A. 1997. *The Political Economy of Special-Purpose Government*. Georgetown University Press.
- Freemark, Yonah, Yipeng Su, Wilton Oliver, and Olivia Fiol. 2022. *Making the Case for Improved Bicycling Infrastructure: An Analysis of the Final Mile Bicycle Infrastructure Program*. Washington, DC. <https://www.urban.org/sites/default/files/publication/105402/making-the-case-for-improved-bicycling-infrastructure.pdf> (July 1, 2023).
- Fry, Richard. 2020. *Prior to COVID-19, Urban Core Counties in the U.S. Were Gaining Vitality on Key Measures*.
- Fullilove, Mindy Thompson. 2016. *Root Shock How: Tearing Up City Neighborhoods Hurts America, And What We Can Do About It*. New Village Press.
- Garrett, Mark, and Brian Taylor. 1999. "Reconsidering Social Equity in Public Transit." *Berkeley Planning Journal* 13: 6–27.
- Gerber, Elisabeth R., and Daniel J. Hopkins. 2011. "When Mayors Matter: Estimating the Impact of Mayoral Partisanship on City Policy." *American Journal of Political Science* 55(2): 326–39.
- Gerring, John. 2004. "What Is a Case Study and What Is It Good For?" *The American Political Science Review* 98(2): 341–54.
- Gibson, Rachel. 2012. "From Brochureware to 'MyBo': An Overview of Online Elections And." *Politics* 32(2): 77–84.
- Goetz, Klaus H. 2015. "A Question of Time: Responsive and Responsible Democratic Politics: Responsive and Responsible?" In *The Role of Parties in Twenty-First Century Politics*, eds. Luciano Bardi, Stefano Bartolini, and Alexander H. Treschel. London: Routledge, 149–72.
- Golden, Miriam, and Brian Min. 2013. "Distributive Politics around the World." *Annual Review of Political Science* 16: 73–99.

- Gorgulu, Nisan, Gulnaz Sharafutdinova, and Jevgenijs Steinbuks. 2020. *Political Dividends of Digital Participatory Governance: Evidence from Moscow Pothole Management*. <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-9445> (March 15, 2023).
- Gormley, William T. 1986. "Regulatory Issue Networks in a Federal System." *Polity* 18(4): 595–620.
- Griffin, John D., and Brian Newman. 2013. "Voting Power, Policy Representation, and Disparities in Voting's Rewards." *Journal of Politics* 75(1): 52–64.
- Hajnal, Zoltan L., and Paul G. Lewis. 2003. "Municipal Institutions and Voter Turnout in Local Elections." *Urban Affairs Review* 38(5): 645–68.
- Han, Albert Tonghoon, and Lucie Laurian. 2022. "Tracking Plan Implementation Using Elected Officials' Social Media Communications and Votes." *Environment and Planning B: Urban Analytics and City Science*.
- Han, Albert Tonghoon, Lucie Laurian, and Jim Dewald. 2021. "Plans Versus Political Priorities: Lessons From Municipal Election Candidates' Social Media Communications." *Journal of the American Planning Association* 87(2): 211–27.
- Hannay, Robert, and Martin Wachs. 2007. "Factors Influencing Support for Local Transportation Sales Tax Measures." *Transportation* 34(1): 17–35.
- Harding, Robin. 2014. "Attribution and Accountability: Voting for Roads in Ghana." *World Politics* 67(4): 656–89.
- Harmony, Xavier. 2023. "Saliency of Transportation Policies in State Legislative Elections: The Case of Virginia." In *51st Urban Affairs Association Conference*, Nashville, United States.
- Hatzopoulou, M., and E. J. Miller. 2009. "Transport Policy Evaluation in Metropolitan Areas: The Role of Modelling in Decision-Making." *Transportation Research Part A: Policy and Practice* 43(4): 323–38.
- Herrick, Rebekah. 2016. "Gender Themes in State Legislative Candidates' Websites." *The Social Science Journal* 53(3): 282–90. <http://dx.doi.org/10.1016/j.soscij.2016.05.001>.
- Hertz, Zachary L., Lucas B. Pyle, and Brian F. Schaffner. 2021. "Virginia's Upcoming Election Pits Rural Voters against Urban Ones." *The Washington Post*.
- Holbrook, Thomas M, and Emily Van Dunk. 1993. "Electoral Competition in the American States." *The American Political Science Review* 87(4): 955–62.
- Iseki, Hiroyuki. 2016. "Equity in Regional Public Transit Finance: Tradeoffs between Social and Geographic Equity." *Journal of Urban Planning and Development* 142(4): 1–10.
- Jensen, Amalie, William Marble, Kenneth Scheve, and Matthew J Slaughter. 2021. "City Limits to Partisan Polarization in the American Public." *Political Science Research and Methods* 9(2): 223–41.
- Kain, John F. 1990. "Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation." *Journal of the American Planning Association* 56(2): 184–96.
- Karner, Alex, and Aaron Golub. 2015. "Comparison of Two Common Approaches to Public Transit Service Equity Evaluation." *Transportation Research Record* 2531: 170–79.

- Kębłowski, Wojciech, and David Bassens. 2018. "‘All Transport Problems Are Essentially Mathematical’: The Uneven Resonance of Academic Transport and Mobility Knowledge in Brussels." *Urban Geography* 39(3): 413–37.
- Kębłowski, Wojciech, Tauri Tuvikene, Tarmo Pikner, and Jussi S. Jauhiainen. 2019. "Towards an Urban Political Geography of Transport: Unpacking the Political and Scalar Dynamics of Fare-Free Public Transport in Tallinn, Estonia." *Environment and Planning C: Politics and Space* 37(6): 967–84.
- Kimball, David C, and Joseph Anthony. 2016. "Voter Participation with Ranked Choice Voting in the United States." In *Annual Meeting of the American Political Science Association*,.
- King, David A., and Lauren Ames Fischer. 2016. "Streetcar Projects as Spatial Planning: A Shift in Transport Planning in the United States." *Journal of Transport Geography* 54: 383–90.
- Kittelsohn & Associates et al. 2013. *Transit Capacity and Quality of Service Manual*. Washington, DC.
- Klein, Nicholas J., Kelcie Ralph, Calvin Thigpen, and Anne Brown. 2022. "Political Partisanship and Transportation Reform." *Journal of the American Planning Association* 88(2): 163–78. <https://doi.org/10.1080/01944363.2021.1965495>.
- Koehler, David H, and Margaret T Wrightson. 1987. "Inequality in the Delivery of Urban Services: A Reconsideration of the Chicago Parks." *The Journal of Politics* 49(1): 80–99.
- Krol, Robert. 2018. *Mercatus Research Political Incentives and Transportation Funding*. Arlington, Virginia.
- Kropf, Martha. 2021. "Using Campaign Communications to Analyze Civility in Ranked Choice Voting Elections." *Politics and Governance* 9(2): 280–92.
- Krumholz, Norman. 1982. "A Retrospective View of Equity Planning-Cleveland 1969-1979." *Journal of the American Planning Association* 48(2): 163–74.
- Lasswell, Harold. 1936. *Politics: Who Gets What, When and How*. New York, NY: McGraw Hill.
- Lazo, Luz. 2021. "With Minimal Transportation Platform, Youngkin Will Take over a Virginia with Many Road, Rail Priorities." *The Washington Post*.
- Levy, Frank S., Arnold J. Meltsner, and Aaron Wildavsky. 1974. *Urban Outcomes: Schools, Streets, and Libraries*. Berkeley and Los Angeles, CA: University of California Press.
- Lineberry, Robert. 1975. "Equality, Public Policy and Public Services: The Underclass Hypothesis and the Limits to Equality." *Policy & Politics* 4(2): 67–84.
- Liu, Haijing, Mashrur Rahman, and Alex Karner. 2023. "Bus Network Redesigns and Public Transit Equity Analysis: Evaluating System-Wide Changes in Richmond, Virginia." *Travel Behaviour and Society* 31: 151–65.
- Lowe, Kate. 2021. "Undone Science, Funding, and Positionality in Transportation Research." *Transport Reviews* 41(2): 192–209. <https://doi.org/10.1080/01441647.2020.1829742>.
- Luca, Davide, and Andrés Rodríguez-Pose. 2019. "Building Consensus: Shifting Strategies in the Territorial Targeting of Turkey’s Public Transport Investment." *Regional Studies* 53(11): 1591–1602.
- Lucas, Karen. 2004. *Running on Empty: Transport, Social Exclusion and Environmental Justice*. Bristol: The Policy Press.

- Manville, Michael. 2019. *Measure M and the Potential Transformation of Mobility in Los Angeles*. Los Angeles.
- Manville, Michael, and Benjamin Cummins. 2015. "Why Do Voters Support Public Transportation? Public Choices and Private Behavior." *Transportation* 42: 303–32.
- Marsden, Greg, and Louise Reardon. 2017. "Questions of Governance: Rethinking the Study of Transportation Policy." *Transportation Research Part A: Policy and Practice* 101: 238–51. <http://dx.doi.org/10.1016/j.tra.2017.05.008>.
- van Meerkerk, Jordy, Annemiek Verrips, and Hans Hilbers. 2015. "A Social Cost Benefit Analysis of Road Pricing Schemes in the Netherlands." In *European Transport Conference*, Frankfurt, Germany. <https://www.cpb.nl/sites/default/files/publicaties/download/cpb-background-document-social-cost-benefit-analysis-road-pricing-netherlands.pdf> (March 15, 2023).
- Mees, Paul. 2010. *Transport for Suburbia: Beyond the Automobile Age*. New York, NY: Routledge.
- Melia, Steve. 2020. "Learning Critical Realist Research by Example: Political Decision-Making in Transport." *Journal of Critical Realism* 19(3): 285–303.
- Meyer, Michael, and Eric J. Miller. 2001. *Urban Transportation Planning*. 2nd ed. McGraw-Hill Primis.
- Milesi-Ferretti, Gian Maria, Roberto Perotti, and Massimo Rostagno. 2002. "Electoral Systems and Public Spending." *The Quarterly Journal of Economics* 117(2): 609–57.
- Milwaukee County Transit System. "History." <https://www.ridemcts.com/who-we-are/history> (September 7, 2023).
- Mims, Bryan. 2015. "When Trolleys Ruled the Roads of North Carolina." *Our State*. <https://www.ourstate.com/history-of-north-carolina-streetcars/> (September 9, 2023).
- Miranda, Rowan A., and Ittipone Tunyavong. 1994. "Patterned Inequality? Reexamining the Role of Distributive Politics in Urban Service Delivery." *Urban Affairs Quarterly* 29(4): 509–34.
- Mladenka, Kenneth R. 1981. "Citizen Demands and Urban Services: The Distribution of Bureaucratic Response in Chicago and Houston." *American Journal of Political Science* 25(4): 693–714.
- . 1989. "The Distribution of an Urban Public Service: The Changing Role of Race and Politics." *Urban Affairs Review* 24(4): 556–83.
- Mondschein, Andrew, and Emily Parkany. 2017. "Hitting the Sweet Spot: Variability in Commute Lengths and Vehicle Emissions across a Diverse State." *Transportation Research Part D: Transport and Environment* 54: 348–59.
- Moore, Karen W. 2016. "Mass Transit." *Encyclopedia of Milwaukee*. <https://emke.uwm.edu/entry/mass-transit/> (September 9, 2023).
- Nall, Clayton. 2015. "The Political Consequences of Spatial Policies: How Interstate Highways Facilitated Geographic Polarization." *The Journal of Politics* 77(2): 394–406. <http://www.journals.uchicago.edu/doi/10.1086/679597>.
- Nall, Clayton, Asha Agrawal, and Hilary Nixon. 2016. "No Democratic Roads or Republican Roads: Partisanship and the Making of Transportation Policy Attitudes." *Transportation Research Board, 96th Annual Meeting* 923: 1–16.

- National Conference of State Legislatures. 2021. "Full- and Part-Time Legislatures." <https://www.ncsl.org/research/about-state-legislatures/full-and-part-time-legislatures.aspx> (January 11, 2021).
- Nelson, Arthur C, Thomas W Sanchez, James F Wolf, and Mary Beth Farquhar. 2004. "Metropolitan Planning Organization Voting Structure and Transit Investment Bias Preliminary Analysis with Social Equity Implications." *Transportation Research Record: Journal of the Transportation Research Board* 1895: 1–7.
- Nelson, Kimberly L., and James H. Svara. 2012. "Form of Government Still Matters: Fostering Innovation in U.S. Municipal Governments." *American Review of Public Administration* 42(3): 257–81.
- Newman, Peter. 1996. "Reducing Automobile Dependence." *Environment and Urbanization* 8(1): 67–92.
- Nolan, Anne. 2010. "A Dynamic Analysis of Household Car Ownership." *Transportation Research Part A: Policy and Practice* 44(6): 446–55. <http://dx.doi.org/10.1016/j.tra.2010.03.018>.
- North Carolina State Historic Preservation Office. 2009. *National Register of Historic Places: Carolina Coach Garage and Shop*. <https://files.nc.gov/ncdcr/nr/WA4968.pdf> (September 9, 2023).
- Nuun, Samuel. 1996. "Urban Infrastructure Policies and Capital Spending in City Manager and Strong Mayor Cities." *American Review of Public Administration* 26(1): 93–112.
- Oliver, J. Eric, and Shang E. Ha. 2007. "Vote Choice in Suburban Elections." *American Political Science Review* 101(3): 393–408.
- Parker, Kim et al. 2018. "Urban, Suburban and Rural Residents' Views on Key Social and Political Issues." *Pew Research Center*. <https://www.pewresearch.org/social-trends/2018/05/22/urban-suburban-and-rural-residents-views-on-key-social-and-political-issues/> (December 1, 2023).
- Pierson, Paul. 2004. *Politics in Time: History, Institutions, and Social Analysis*. Princeton, NJ: Princeton University Press.
- Di Pietro, Giorgio. 2019. "Do Citizens Hold Mayors Accountable for Local Conditions? Evidence from Italian Municipalities." *Local Government Studies* 45(1): 24–42.
- Raglin, David. 2022. "Period Estimates in the American Community Survey." *United States Census Bureau*. <https://www.census.gov/newsroom/blogs/random-samplings/2022/03/period-estimates-american-community-survey.html> (September 3, 2023).
- Reese, Laura A., Xiaomeng Li, and Kellee Remer. 2020. "Local Government Structure: Maybe It Doesn't Really Matter?" *Cities* 96: 102419.
- Reynolds, James, and Graham Currie. 2021. "New Approaches and Insights to Managing On-Road Public Transport Priorities." In *Handbook of Public Transport Research*, ed. Graham Currie. Cheltenham, UK, 172–201.
- Rich, Richard C., Craig Leonard Brians, Jarol B. Manheim, and Lars Willnat. 2018. *Empirical Political Analysis*. 9th ed. New York, NY: Routledge.
- Sadik-Khan, Janette, and Seth Solomonow. 2016. *Streetfight: Handbook for an Urban Revolution*. Penguin Random House.

- Sances, Michael W. 2018. "Ideology and Vote Choice in U.S. Mayoral Elections: Evidence from Facebook Surveys." *Political Behavior* 40(3): 737–62.
- Sapotichne, Joshua, and Bryan D. Jones. 2012. "Setting City Agendas: Power and Policy Change." In *The Oxford Handbook of Urban Politics*, eds. Karen Mossberger, Susan E. Clarke, and Peter John. Oxford, UK: Oxford University Press, 442–67.
- Sapotichne, Joshua, and James M. Smith. 2012. "Venue Shopping and the Politics of Urban Development: Lessons from Chicago and Seattle." *Urban Affairs Review* 48(1): 86–110.
- Scheurer, Jan, and Carey Curtis. 2015. "The Impacts of Political Changes on Public Transport Accessibility in Melbourne, 2008-2014." In *7th State of Australian Cities Congress*, Gold Coast.
- Schimek, Paul. 1997. "Household Motor Vehicle Ownership and Use: How Much Does Residential Density Matter?" *Transportation Research Record* 1552: 120–25.
- Schragger, Richard C. 2005. "Can Strong Mayors Empower Weak Cities? On the Power of Local Executives in a Federal System." *The Yale Law Journal* 115: 2542–78.
- SIMON & SIMON Research and Associates. 2002. *TCRP Web Document 21: Public Transit System Policy Boards: Organization and Characteristics*.
- Spoon, Jae Jae, and Heike Klüver. 2014. "Do Parties Respond? How Electoral Context Influences Party Responsiveness." *Electoral Studies* 35: 48–60.
- Squire, Peverill. 2017. "A Squire Index Update." *State Politics and Policy Quarterly* 17(4): 361–71.
- Sulkin, Tracy, Cortney M Moriarty, and Veronica Hefner. 2007. "Congressional Candidates' Issue Agendas On- and Off-Line." *The International Journal of Press/Politics* 12(2): 63–79.
- Talen, E., and L. Anselin. 1998. "Assessing Spatial Equity: An Evaluation of Measures of Accessibility to Public Playgrounds." *Environment and Planning A* 30(4): 595–613.
- Taylor, Brian D., and Eric A. Morris. 2015. "Public Transportation Objectives and Rider Demographics: Are Transit's Priorities Poor Public Policy?" *Transportation* 42(2): 347–67.
- Thomas, David R. 2006. "A General Inductive Approach for Analyzing Qualitative Evaluation Data." *American Journal of Evaluation* 27(2): 237–46.
- Trounstine, Jessica. 2013. "Turnout and Incumbency in Local Elections." *Urban Affairs Review* 49(2): 167–89.
- US Census Bureau. 2020. "2020 State & Local Government Finance Historical Datasets and Tables." <https://www.census.gov/data/datasets/2020/econ/local/public-use-datasets.html> (October 9, 2022).
- USDOT Bureau of Transportation Statistics. 2022. "Transportation Fatalities by Mode." <https://www.bts.gov/content/transportation-fatalities-mode> (June 15, 2023).
- Vuchic, Vukan. 2005. *Urban Transit: Operations, Planning and Economics*. Hoboken, New Jersey: John Wiley & Sons.
- Wachs, Martin. 1985. "Management Vs. Political Perspectives on Transit Policymaking." *Journal of Planning Education and Research* 4(3): 139–47.

- . 1995. "The Political Context of Transportation Policy." In *The Geography of Urban Transportation*, ed. Susan Hanson. New York: The Guilford Press, 269–86.
- Walks, Alan. 2015. "Stopping the 'War on the Car': Neoliberalism, Fordism, and the Politics of Automobility in Toronto." *Mobilities* 10(3): 402–22.
- Wang, Xize, and John L. Renne. 2023. "Socioeconomics of Urban Travel in the U.S.: Evidence from the 2017 NHTS." *Transportation Research Part D: Transport and Environment* 116.
- Warshaw, Christopher. 2019. "Local Elections and Representation in the United States." *Annual Review of Political Science* 22: 461–79. <https://doi.org/10.1146/annurev-polisci-050317->
- Wells, Kirstin. 2009. "Transit Riders and Access to Bus Service: A Neighborhood Analysis." PhD Dissertation. University of North Carolina at Charlotte.
- Wells, Kirstin, and Jean Claude Thill. 2012. "Do Transit-Dependent Neighborhoods Receive Inferior Bus Access? A Neighborhood Analysis in Four U.S. Cities." *Journal of Urban Affairs* 34(1): 43–63.
- Werbel, Richard A, and Peter J Haas. 2002. "Voting Outcomes of Local Tax Ballot Measures with a Substantial Rail Transit Component: Case Study of Effects of Transportation Packages." *Transportation Research Record* 1799(1): 10–17.
- Wilson, Adam, and Raktim Mitra. 2020. "Implementing Cycling Infrastructure in a Politicized Space: Lessons from Toronto, Canada." *Journal of Transport Geography* 86.
- Wollmann, Hellmut, and Kurt Thurmaier. 2012. "Reforming Local Government Institutions and the New Public Management." In *The Oxford Handbook of Urban Politics*, eds. Karen Mossberger, Susan E. Clarke, and Peter John. Oxford: Oxford University Press, 179–209.
- Wolman, Harold. 2012. "What Cities Do: How Much Does Urban Policy Matter?" In *The Oxford Handbook of Urban Politics*, eds. Karen Mossberger, Susan E. Clarke, and Peter John. Oxford, UK: Oxford University Press, 415–41.
- Wood, Curtis. 2002. "Voter Turnout in City Elections." *Urban Affairs Review* 38(2): 209–31.
- Wright, D. S. 1988. *Understanding Intergovernmental Relations*. 3rd ed. Pacific Grove, CA: Brooks/Cole.
- Xenos, By Michael A, and Kirsten A Foot. 2005. "Politics As Usual, or Politics Unusual? Position Taking and Dialogue on Campaign Websites in the 2002 U.S. Elections." *Journal of Communication* 55(1): 169–85.
- Yin, Robert K. 2018. *Case Study Research and Applications: Design and Methods*. 6th ed. Thousand Oaks, CA: SAGE.
- Yusuf, Juita-Elena, John St. Burton III, and Ivan K Ash. 2014. "The Role of Politics and Proximity in Sea Level Rise Policy Salience: A Study of Virginia Legislators' Perceptions." *Journal of Environmental Studies and Sciences* 4: 208–17.
- Zwerling, C. et al. 2005. "Fatal Motor Vehicle Crashes in Rural and Urban Areas: Decomposing Rates into Contributing Factors." *Injury Prevention* 11(1): 24–28.

Appendix A: Chapter 2 Model Variable Summary Statistics

Table 5-1: Summary statistics

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
Jurisdiction Population	407	869,518	1,084,398	23,944	321,328	932,260	10,018,932
District Population Density	407	4941.0	4493.0	156.0	2008.0	7332.0	32852.0
Commute Drive Alone (%)	407	69.0	14.0	16.0	67.0	77.0	90.0
Household Ownership (%)	407	53.0	13.0	18.0	45.0	62.0	85.0
Previous Election Win Margin (%)	407	31.0	32.0	0.0	5.4	44.0	100.0
Website has Transportation Policy	407						
No	220	54%					
Yes	187	46%					
Jurisdiction	407						
County	93	23%					
City	314	77%					
At-Large Candidate	407						
No	292	72%					
Yes	115	28%					
Contested Election	407						
No	78	19%					
Yes	329	81%					
Incumbent	407						
No	305	75%					
Yes	102	25%					
Election Type	407						
Council	350	86%					
Mayor	57	14%					
Nonpartisan	407						
No	129	32%					
Yes	278	68%					
Democrat	407						
No	339	83%					
Yes	68	17%					
Mayor-Council	407						
No	287	71%					
Yes	120	29%					
Strong Mayor	407						
No	272	67%					
Yes	135	33%					

Appendix B: Chapter 3 Model Variable Summary Statistics

Table 5-2: Summary statistics (all data)

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
TotalPopulationE	191	86,177	7,518	71,623	81,989	89,251	128,974
PctDriveAlone	191	73.5	8.9	40.3	68.3	79.8	85.5
AvgCarsHH	191	1.979	0.26	1.3	1.85	2.175	2.42
AvgCarsPop	191	0.742	0.079	0.57	0.69	0.805	0.91
AvgWinMarginPct	191	44.981	33.882	0.53	12.555	74.63	97.46
AvgVoteTurnout	191	23,861	4,954	12,017	20,589	27,417	38,753
VoterTurnoutPct	191	38.0	7.1	20.2	33.4	42.1	59.7
RoadsSqMile	191	8.34	6.80	0.79	2.35	14.31	26.81
TransitSqMile	191	7.27	13.52	0.00	0.30	6.38	67.51
BikeFacSqMile	191	0.62	0.90	0.00	0.04	0.89	3.87
RailSqMile	191	0.53	1.23	0.00	0.06	0.39	9.06
HasTransportPolicy	191						
No	126	66.0%					
Yes	65	34.0%					
Democrat	191						
No	98	51.3%					
Yes	93	48.7%					

Table 5-3: Summary statistics (transportation policies)

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
TotalPopulationE	65	87,590	7,071	76,563	82,351	92,875	105,664
PctDriveAlone	65	70.8	9.5	40.3	65.6	78.1	84.9
AvgCarsHH	65	2.01	0.29	1.33	1.85	2.20	2.42
AvgCarsPop	65	0.73	0.09	0.57	0.68	0.77	0.90
AvgWinMarginPct	65	45.3	35.6	2.2	9.9	81.2	96.7
AvgVoteTurnout	65	24,067	5,266	12,017	20,589	27,488	38,753
VoterTurnoutPct	65	38.7	7.9	20.2	34.9	43.4	59.7
RoadsSqMile	65	9.10	6.81	0.79	2.86	14.31	24.45
TransitSqMile	65	8.81	16.02	0.00	0.39	7.08	67.51
BikeFacSqMile	65	0.79	1.01	0.00	0.08	1.43	3.87
RailSqMile	65	0.56	1.42	0.00	0.04	0.40	9.06
Democrat	65						
No	28	43%					
Yes	37	57%					
FundInvest	65						
No	32	49%					
Yes	33	51%					
JobsEconomy	65						
No	48	74%					
Yes	17	26%					
CongestionTraffic	65						
No	33	51%					

Yes	32	49%
ExpandWiden	65	
No	32	49%
Yes	33	51%
MaintainRepair	65	
No	50	77%
Yes	15	23%
Safety	65	
No	46	71%
Yes	19	29%
GeogEquity	65	
No	57	88%
Yes	8	12%
EquityAfford	65	
No	57	88%
Yes	8	12%
SustainEnviro	65	
No	51	79%
Yes	14	22%
Tolling	65	
No	56	86%
Yes	9	14%
SustainableTransport	65	
No	30	46%
Yes	35	54%
PublicTransit	65	
No	37	57%
Yes	28	43%
ECars	65	
No	62	95%
Yes	3	5%
Trains	65	
No	51	79%
Yes	14	22%
Bicycles	65	
No	54	83%
Yes	11	17%
Pedestrians	65	
No	56	86%
Yes	9	14%