What Determines Where Public Investment Goes? Regional Governance and The Role of Institutional Rules and Power

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June 4, 2019

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Regional Governance and The Role of Institutional Rules and Power

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Abstract: As an embodiment of collaborative governance model, metropolitan planning organizations in the United States allocate federal, state, and local funds to member municipalities for transportation projects across their regions. To examine how institutional rules and power shape where public investment goes, we examine the extent to which the allocation of local voting power in regional governing policy boards influences the spatial allocation of transportation investments. Our analysis shows that the power structure of regional policy boards is consistently a major factor associated with the observed geographic distribution of investments. Moreover, the results suggest that the degree of power concentration of the dominant city in the region influences whether the remaining cities' power matters. These results were far different than what was predicted by the policymakers we interviewed, suggesting that institutional governance rules may be more important than previously recognized.

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Introduction

Local governments in the United States have increasingly chosen collaborative approaches to resolve institutional collective action problems and to achieve better regional and local policy outcomes. Much of the recent research on interlocal collaboration asks what rules and incentives are available to local jurisdictions so that public managers can overcome transaction costs embedded in joint actions and maximize benefits (Song, Park, and Jung 2018; Yi et al. 2017; Lubell et al. 2017). One strand of scholarly inquiry focuses on what forms of governance should be adopted to integrate respective institutional collective action problems. Depending on the characteristics and scale of the policy problem and the degree of transaction costs entailed in collaboration, localities may join informal networks such as voluntary associations, create cross-jurisdictional special districts, or form regional councils of governments (Feiock 2013). This article focuses on the third of these.

Regional councils have been found to minimize transaction costs for high risk cooperation (Kwon, Feiock, and Bae 2014), which is particularly useful when the collaboration involves many actors and they need to make long-term investments jointly (Olson 1971). One such policy area is transportation planning, which, by its nature, carries interjurisdictional externalities that cannot be addressed by local governments' independent actions. In the United States, the regional council for transportation planning is the metropolitan planning organization (MPO). MPOs decide how to allocate federal, state, and (often) local funds for transportation investments at the regional level. As of 2019, there were 420 MPOs in the Unites States, and they collectively allocate hundreds of billions of federal dollars every year to member municipalities on regionally significant transportation projects (NARC 2019).

Despite their prominent role in American public policy, MPOs have not been a subject of empirical assessment in the scholarship with respect to what guides their investment allocation decisions.

In order to understand how MPOs manage their collective decision-making process of resource allocation, we interviewed 60 representatives in four large metropolitan areas including elected officials from member jurisdictions, professional managers, and the agency directors and staff. Despite some variations between the regions, the collective view we obtained from these semi-structured interviews was that the organizations' funding decisions were primarily data-driven and collaborative, such that no single jurisdiction's interests prevailed over others. Notably, the MPO policymakers and managers in the process believed that differences in voting power held by member jurisdictions did not affect their collaborative governance outcomes.

Our empirical analysis, which builds on institutional theories of urban governance and political power, indicates otherwise. Leveraging a unique dataset of geocoded transportation projects programmed and approved by the four largest MPOs in Texas, we show that the extent of cities' voting power in governing board is an important factor that explains the distribution of the projects across the local jurisdictions. This remains true even when we consider other external factors that were described to be more important by the interviewees, such as traffic and road pavement conditions, demographics, and the employment environment.

We also argue that the internal power structure of MPOs has consequences for whether the funding will be more equitably allocated to their member cities in the region or not. Our analysis lends support to this claim. In regions where local voting power is heavily concentrated in a primary dominant city, marginal shifts in power among the remaining localities do not significantly affect funding allocation outcomes. By contrast, when the rules establish a more even distribution of voting power, a marginal increase in power for a non-primary city translates into a significantly higher likelihood that a project located in the city will receive funding.

The results are far different than what was predicted by the policymakers and practitioners we interviewed, suggesting that institutional governance rules may be more important than previously recognized. Our article provides some avenues to enrich the discussions on the role of institutions on regional development from an equity perspective. First, the findings add to the discussions on ideal forms of government in metropolitan economies. While scholars have long debated whether a consolidated government form would enhance the efficiency and equity of public services, one area that often has been neglected in the literature is the role of existing regional institutions and how they can contribute to equitable development.

Second, in keeping with recent arguments on the distribution of power and institutional design in collaborative governance scholarship, our results suggest a connection between research and actions that policymakers are recommended to take. We suggest that policymakers and public managers must not only give attention to the institutional rules and distribution of power in intergovernmental organizations. They must also take actions to develop a more inclusive representative system. Developing such a system requires empowering less powerful localities in decision-making so that the funding allocation process is not dominated by a few powerful actors but rather is shaped by collective inputs across a range of participants. In doing so, policymakers would be tasked to strike a right balance between such inclusive representation and both efficiency and equity considerations of resource allocation.

The paper proceeds as follows: The next two sections provide a brief background on the literature on public goods provision as well as information on regional planning organizations and the role played by them in public investment allocation. It then builds on relevant theories to develop our arguments and hypotheses. The following section presents the data, methods, and empirical analysis. The paper is then concluded by discussing our contribution to the scholarly debates on metropolitan economy as well as policy implications.

Political Power and Public Goods Allocation across Localities in a Region

A large literature has identified multiple factors that shape the provision and spatial allocation of public goods across localities in a region. Tiebout (1956)'s seminal theory identified residential choice dynamics as a key consideration. By voting with their feet and allocating themselves across jurisdictions that vary in the bundle of public goods local governments provide, citizens reveal their demand.

Building on Tiebout (1956), Peterson (1981) introduces a City Limit model in which a competitive urban environment causes local governments to prefer development-oriented public investment, such as in highways and transportation infrastructure, to redistributive programs. While Peterson's theoretical argument has found some empirical support, both in terms of mayoral preferences (Saiz 1999) and city spending patterns (Schneider 1989; Minkoff 2012; Jimenez 2014), many have argued that the model reduces the complex structure of city decision-making to economic imperatives and constraints and overlooks the role of other factors, including political and institutional considerations (Basolo and Huang 2001; Einstein and Glick 2018; Hajnal and Trounstine 2010).

Indeed, a growing body of recent research finds that political ideology influences the allocation of public goods even at the local level, with a particular ideology being associated with lower levels of local public spending (de Benedictis-Kessner and Warshaw 2016; Gerber and Hopkins 2011), stronger support for redistributive programs (Einstein and Glick 2018), and greater collaboration through interlocal agreements (Song, Park, and Jung 2017; Gerber, Henry, and Lubell 2013). Yet, despite the prominence of theories on urban governance that have focused on political power (e.g., Dahl 1961; Stone 1989), relatively few empirical studies explicitly incorporate political power considerations into resource allocation decision-making process for urban public goods (Hochschild 2008). Our research adds to this limited literature by exploring how political power affects resource allocation decision-making in the context of regional planning organizations.

This article is also related to both distributive politics and collaborative governance scholarship. Political scientists have long argued that individual legislators in a national government care mainly about the public projects that flow into their districts (Weingast 1979). It is widely known that unequal distribution of power yields to an inequitable distribution of public spending in national politics (Ansolabehere, Gerber, and Synder 2002; Snyder, Ting, and Ansolabehere 2005). This pattern has also been observed in state politics for the allocation of major highway construction across counties (Nall 2018). Further, at the regional level, Gerber and Gibson (2009) argue that local competition in MPOs may shape their resource allocation decisions to reflect some aspects of distributive politics with a balance of power between local and regional interests.

The processes in regional planning organizations in principle, however, seem to more closely reflect collaborative decision-making than a zero-sum game (Deyle and Wiedenman 2014; Innes and Gruber 2005). As their core function is to establish a fair and impartial setting for effective regional decision making, member jurisdictions engage in a consensus-oriented and deliberative process to prioritize region-wide transportation investments that will benefit all in the area (Deyle and Wiedenman 2014), a feature frequently described as collaborative governance process in the literature.[1] Public administration scholars have noted that the distribution of power and resources across participants in collaborative governance is a critical factor for sustainability and success of the forum (Emerson, Nabatchi, and Balogh 2012; Ansell and Gash 2008; Tang and Mazmanian 2010; Choi and Robertson 2013). They argue that power disparities among participants hinder the pursuit of a joint course of action. These studies also suggest that such negative consequences of power can be diminished by sharing or redistributing power and resources so that weaker or underrepresented groups can be empowered in the decision-making process.

In this article, we show that, consistent with the distributive politics literature, a similar power dynamic among members of regional organizations causes higher shares of public dollars to shift to the jurisdictions with greater voting power (Shapley and Shubik 1954). We also show that the design of the rules, and the resultant degree of voting power concentration,

[1] While the focus of this article is city's MPO voting power in the governing policy board, the MPO process extensively involves nonprofit and community interests during technical advisory committee meetings and public hearing. Such process fits to the definition of collaborative governance process described by Emerson, Nabatchi, and Balogh (2012).

matters in regional decision making, as scholars of collaborative governance suggest. These findings are particularly striking because the policymakers and managers in these institutions did not acknowledge such an explicit role for power when they were asked. Perhaps power is more implicitly embedded in the institutions and shapes the decisions leading up to political choice, similar to a dynamic put forward by Stone (1980).

Metropolitan Planning Organizations

MPOs are a class of regional organizations that focuses on transportation planning. Though they date to the 1930s, MPOs became much more prevalent after the Federal Aid Highway Act of 1962, which mandated that any urbanized area with a population greater than 50,000 should establish an MPO. The MPO role in allocating transportation funds was advisory until the 1991 enactment of the Intermodal Surface Transportation Efficiency Act (ISTEA) (Solof 1998; Lewis and Sprague 1997). Before ISTEA, regional transportation decision-making was a top-down management enterprise, with state and federal governments making the resource allocation decisions (Sanchez 2006). ISTEA reversed this by empowering MPOs to be programming bodies and not just planning agencies. The legislation gave MPOs authority and discretion over the project selection process, which to that time had primarily been managed by state highway departments (now called departments of transportation).

The jurisdictions in a metropolitan area generally comprise an MPO. The decision-making body of an MPO is its governing policy board.[2] The members of the governing policy board are representatives drawn from the MPO's member jurisdictions. These representatives are

[2] The nomenclature can vary by states and agencies. Some refer to them as "MPO Policy Board," "Regional Transportation Committee," or "Transportation Policy Council."

typically elected officials, such as mayors, city council members, county judges and commissioners, and often also include professional officials from transportation authorities. To more deeply understand how MPOs manage the collective decision-making process with various actors engaged, in the summer of 2017, we conducted site interviews with 60 policymakers and managers in the four largest metropolitan areas in Texas. All interviews were semi-structured and each lasted for between 30 and 60 minutes.[3] Table 1 shows that interviewees included elected officials from cities and counties, professional managers such as directors of public works and transportation, and MPO directors and staff.

[Table 1 here]

The interviews provided important insights on the MPO's decision process management. First, an MPO's project selection process involves multiple stages. Member jurisdictions submit transportation project proposals to the MPO for consideration. These projects typically represent long-standing priorities as articulated in the jurisdiction's comprehensive plan. Given the extensive public participation involved in developing such a comprehensive plan, the projects are likely to reflect something akin to jurisdictional consensus. Indeed, city councils will often attach resolutions or letters of support for the project(s) described in the submitted proposal.

For this reason, the interviewees indicated that their interests and approaches are not different whether they are elected officials or professional managers. This finding contrasts with the

[3] The list of all interviewees is available in the appendix B.

assumption used in Gerber and Gibson (2009) that elected officials would focus on local interests whereas public managers would pursue broad-based regional interests. Similarly, whether officials were elected at-large or from districts, the interviewed governing board members indicated that parochial interests regarding MPO projects were unimportant, given that they had been appointed to seats representing a whole city or county.

The MPO then assesses each submitted project proposal considering the needs and the likely impact of the project on their region. An MPO will often establish a scorecard to grade each proposal according to a specific set of factors. The three most common factors cited by the interviewees were the existing level of congestion on the road, physical road conditions, and traffic safety. Based on the scoring system, MPO staff rank order projects and present the list to the governing policy board, which then makes final allocation decisions.[4] Our interviews suggest that this list is generally accepted by the governing policy board and approved without any changes being made.

Theory and Hypotheses

The process detailed above suggests that allocation decisions are data-driven and independent of power and institutional factors. However, this simple story may not be correct. In studying governance, Stone (1980) highlights the notion of "systemic power," where all processes leading up to a collective decision are influenced by power

[4] Depending on the size of the MPO, the MPO may establish policy subcommittees on a particular theme (e.g., pedestrian and bicycle, transit, air pollution). These subcommittees review relevant transportation project proposals and make recommendations about what projects should be funded. However, even in these cases, the governing policy board retains ultimate decision-making authority.

considerations because of a recognition among the less powerful that those with power could exercise it to give or take away resources. This reality can shade decisions, regardless of whether those with more power intend to use it or if there is explicit competition or conflict between actors. Stone (1980) argues that local public officials are subject to this dynamic in their dealings with business enterprises and other upper-strata interest groups, even without the groups' overt political maneuvering.

Admittedly, Stone's power represents invisible and underlying influence that individuals or groups in dominant positions have; his theory does not focus on institutional decision-making. Other theories, however, such as institutional analysis and development framework in Ostrom (2009) and institutional collective action framework in Feiock (2013), scale up individual and inter-group problems to the institutional level. Further, Moe (2005) claims that such power relationships exist within and between governmental institutions. Applying these views to MPO context, we argue that if a kind of systematic power has been institutionalized into formal voting power via organizational rules, one should observe consequences for resource allocation. Indeed, Stone's systematic power to formal power construct suggests that institutionalized power should matter even in settings where policymakers within organizations do not explicitly acknowledge its role.

An empirical study conducted by Pfeffer and Salancik (1974) illustrates that this Stone-type power dynamic plays a critical role in resource allocation decisions in universities, which share some bureaucratic similarities with MPOs. They measure the power held by departments both from interviews with its heads (systematic type) and from the analysis of archival records of departmental representation on major university committees (formalized type), and show it is possible to distinguish between systematic and formalized power empirically. Their analysis finds that the departments with greater systematic power are consistently allocated larger budgets than others, even after controlling for workload, number of faculty and national rank.

Thus, there is reason to study power relationships in the context of regional decision-making even when participants in the process do not acknowledge so and understand more clearly their role in the allocation of resources across jurisdictions. Our baseline research question is a straightforward one: to what extent does the allocation of MPO local voting power influence the spatial allocation of transportation investments? We start with the following simple hypothesis:

H1) Institutional Power: A local government with more voting power on the governing policy board will see more resources flow to its jurisdiction even though local representatives do not intend to exercise their power in the decision-making process.

The perspective here is informed by the systemic power concept of Stone (1980), and so this hypothesis does not rely upon evidence that cities with more voting power sought to use it. If this hypothesis is confirmed, the fact that technical and advisory groups' recommendation of project selection is rubber stamped by the policy board suggests that the initial project list to be considered may have been already tailored to the power distribution of the ultimate decision-making authority. It then would validate Stone (1980)'s systematic power concept in this institutional setting.

Further, the influence of power regarding decisions about which projects to fund may depend on the degree to which power is concentrated or evenly distributed on the governing policy board, a feature we describe as *power structure*. Jones (2010) argues that a model of regional organization that relies upon transaction costs and voluntary cooperation frameworks (e.g., Feiock 2007) may be incomplete unless it incorporates elements of power relationships. He argues that special emphasis should be given to bargaining among governmental units at different levels of power in studies of regional organizations.

Given this, our second hypothesis considers these relative power relationships. If voting power is disproportionately distributed on the board, with one or a few primary cities having most of the power, those cities could exert a dominant influence on the board's decision-making. If true, we would expect the power held by the remaining local jurisdictions to be ineffectual in shaping the spatial distribution of transportation investments such that a particular jurisdiction received funds.

By contrast, if the rules establish a more even distribution of voting power on the governing policy board, individual jurisdictions may be more able to exercise power and see investments located within their boundaries. Here, cities with largest voting power may still be in primary power positions, but they may be short of possessing dominant power to disproportionately control the allocation decisions. In this case, the remaining cities would be able to collectively influence investment allocation outcomes.

Concentration of power has been identified as a critical consideration in collaborative governance research. Imbalances between the resources or power of different stakeholders threaten the legitimacy of collaborative process and thus can lead to policy outcomes in favor of powerful actors (Emerson, Nabatchi, and Balogh 2012; Ansell and Gash 2008; Choi and Robertson 2013). In these instances, institutions need to be (re)designed such that the rules accommodate a balance of power among the actors for the sustainability of the governance regime (Crosby and Bryson 2005; Tang and Mazmanian 2010). Thus, our second hypothesis is as follows:

H2) Power Structure: a more even distribution of voting power among cities in the MPO governing policy board is likely to result in more equitable allocation of public resources.

Data

This article uses unique data on transportation investment by the four largest MPOs in Texas: Dallas-Fort Worth, Houston-Galveston, Austin and San Antonio. We combine information from three sources to construct the MPO project database. First, data on every MPO-funded transportation roadway project built in Texas during 2001-2010 was obtained from the Texas Department of Transportation (TxDOT). These data include comprehensive information on each MPO-funded project, including the type of project, the sources and the amount of funding provided by federal, state and local governments, and the highways and roads on which the project was built. Regarding project categories, the data identifies 33 different categories. TxDOT categorizes projects using different levels of aggregation, and we use their highest levels of aggregation. This aggregation collapses the 33 into seven categories.[5] Second, TxDOT also provided detailed geospatial data, which allowed us to geocode each project and identify the city or cities in which it was built. Third, we collected spatial traffic information, such as annual average daily traffic flow, the level of congestion, speed limit,

[5] These seven categories are 1) Bridge 2) Freeway 3) Restoration 4) Traffic and Safety 5) Construction 6) Scenic 7) Miscellaneous.

and road pavement quality (International Roughness Index) for every highway and road that are managed by TxDOT. All data sources are documented in appendix table A1.

The full Texas MPO dataset included 7,350 projects in 25 metropolitan areas in the state. However, the geospatial database did not include 3,179 of these projects, and we dropped these projects from the working dataset as a result. The projects for which there was no geospatial data were typically small projects, and they comprised a small percentage of MPO total expenditures. The remaining 4,171 projects were merged with the data on traffic and roads to create an augmented project dataset. Among the 25 MPO planning areas, we chose the largest four MPO regions as a study frame for two reasons. First, our interviews were conducted only in these four metropolitan areas, so we wanted a consistency. Second, we faced sample size issues, as the other regions did not have many MPO project observations. Supporting this point, the four areas we decided to study had 61 percent of all geocodable MPO projects built in Texas during the period of this study. The choice of these four regions also provides useful variation in the concentration of cities' voting power in the policy boards, a key element to test the second hypothesis about power structure and the allocation of public investment.

A measure of city-level voting power was added to this MPO project dataset. To calculate city's power share, the rosters of governing policy boards were obtained from the four MPOs for the years between 2001 and 2010. We also tracked the bylaw documents and any revisions made on the rules for allocating voting seats in this period. Cities' voting power shares were calculated such that each seat had a proportional amount of power. For example, if the policy board had 10 seats, each seat would represent 10 percent of the power. This 10 percent would then be allocated to the city or cities that decide which representative will occupy the seat. For MPO policy board seats allotted to county or state district representatives, the interviews indicated that it would be reasonable to distribute the representative's voting power among the constituent cities, based on each city's voting-eligible population share of the total in that county or state congressional district. If multiple cities were jointly assigned a seat, their shares were divided based on their population.[6] Finally, based on the interviews, the votes held by state or regional transportation or transit-related authorities were dropped from the denominator when calculating voting power share, unless these agencies had a clear local political jurisdictional boundary and constituency.[7]

Figure 1 shows the spatial distribution of MPO projects and cities in the four regions with information on their numbers, mean and median of cities' voting power shares, average project duration years, and their size. An average MPO project took two to three years to complete and cost more than a million dollars. Alluding to the rank order of power concentration, the mean city voting power share was the lowest in the Houston metro area, followed by Dallas-Forth Worth, Austin, and San Antonio.

[Figure 1 here]

Figure 2 visually illustrates the degree of power concentration among the four regions by showing the distribution of voting power held by each city in the region. The rank order of power concentration among the four metropolitan areas—with the Houston-Galveston metro

[6] This incidence was only the case in Dallas-Fort Worth MPO. We also coded in an alternative way in which we allocate a full single seat to one city that represents its group. The results did not change under this approach.
[7] Our results do not change when we include these agencies into the denominator.

being the least concentrated, followed by Dallas-Fort Worth metro, Austin metro, and San Antonio metro as being the most concentrated—reflects the underlying differences in their institutional rules on voting seat allocation.

The rules in the Houston-Galveston and Dallas-Fort Worth areas establish a relatively even distribution of the voting seats, whereas the rules in the Austin and San Antonio areas allocate more power to its primary cities. As an example of how the rules operate, consider the Houston-Galveston MPO for 2006. Of its 25 seats, one seat was allocated for each of the 7 largest cities and each of the 8 counties in the region. The City of Houston received additional two seats and its county (Harris) additional one seat. Further, three seats were allocated to smaller cities in three large counties and the remaining four seats were filled by representatives of transportation agencies.

The Dallas-Fort Worth area MPO policy board comprised 40 seats. In their allocation, smaller cities were grouped together to exceed the population threshold for having a seat and for region-wide representation. The three largest cities in the region – Dallas, Fort Worth and Arlington – were allotted six, three, and two seats, respectively. Fourteen seats were reserved for individual cities or clusters of cities that had populations of 50,000 or greater. The two counties that include Dallas and Fort Worth (Dallas and Tarrant) received two seats apiece, and the other four counties in the metropolitan area were allocated one seat apiece. The remaining seven seats were allocated to transportation agencies and DFW international airport.

For the Austin area MPO as of 2006, of the 23 seats of its governing board, four seats were allocated to the City of Austin and three seats to its county (Travis). Each one seat was allocated to two other counties (Williamson and Hay) in the region and 10 seats were further allocated to state legislative districts that cover Austin either entirely or partially.[8] Among the cities, Round Rock was the one of two cities that received a seat in the region as their population exceeded 50,000. The other seat was allocated to a representative from small cities and City of West Lake Hills was the representative in that year. The remaining two seats were allocated to transportation agencies. Lastly, in San Antonio area MPO, among the 17 seats, the City of San Antonio and its county (Bexar) received six and four seats, respectively. The smaller cities in the region were divided into three groups, with each receiving a seat. The remaining four seats were distributed to transportation agencies.

The more inclusive representation in the Houston-Galveston region was possible because its MPO did not designate a high population threshold, which allowed representation for several other cities. It also included outlying counties in the region, which helped alleviate the power concentration of the city of Houston. The Dallas-Fort Worth MPO also adopted an inclusive representative system by clustering smaller municipalities with larger ones in groups so that they could jointly exceed the designated population threshold and be allocated a seat. Such considerations were less prominent in the Austin MPO and virtually absent in the San Antonio MPO. The Herfindahl index associated with each MPO in figure 2, which measures the degree of power concentration, confirms this rank order.[9]

[Figure 2 here]

[8] In Austin area MPO, state legislators were allotted ten seats between 2003 and 2007. Since 2008, the rule changed the allotment to three seats and it abolished their representation since 2011.

[9] The value of Herfindahl index closer to 0 indicates less concentration of power while the value closer to 1 indicates more concentration of power.

Methods

To examine if cities with more voting power see more investment flow to their jurisdictions, we estimate how the voting power share that a city holds on the MPO governing policy board predicts the likelihood that a city gets a project in its boundary. In choosing a model, we start by assuming that a project could be allotted to any city in the MPO planning area, but ends up being located in a certain city (or cities). Such a structure is conducive to the use of a conditional logistic regression technique (i.e. fixed effects logistic regression). Notationally, we estimate the following model:

$$\Pr(y_{ijt}) = \frac{\exp(\beta Power_{jt} + \gamma City_{jt} + \delta Project_{it} * Power_{jt})}{\sum_{k \in C_{(it)}} \exp(\beta Power_{kt} + \gamma City_{kt} + \delta Project_{kt} * Power_{kt})}$$

The unit of analysis is a project-city-year pair, and $Pr(y_{ijt})$ represents the latent probability that project i will be located in city j in a year t, given all other city options in the MPO's choice set of cities ($C_{(it)}$) at time t. Operationally, the dependent variable is an indicator variable coded 1 if a project is located in a city and 0 otherwise. Thus, if a project in a city gets funded by the MPO, the project-city pair for that city in a given year t would be coded as 1 and all the other city observations involving that project in year t would be coded 0. Consider figure 3 for an illustration of this model set up. In 2010, there were 125 cities in Houston-Galveston region. Suppose MPO project i was allocated to city A in the region in that year (denoted as City 1 in figure 3). Then, that MPO project-city A pair is coded 1 and all the remaining 124 MPO project-city pairs are coded 0. The model allows a project to be located in multiple cities to account for the cross-jurisdictional nature of transportation investment as shown in figure 1. For instance, if the allocated MPO project cross three cities (say city A, B, and C), three project-city pairs are coded 1 for this MPO project and the remaining 122 pairs are coded 0. Each MPO project in a given year is coded in this way.

[Figure 3 here]

The key independent variable of interest is a city's voting power share on the MPO governing policy council (*Power* in equation 1). To isolate the effect of power, the model includes city population, other city-level demographic variables, and measures of the highway demand and travel behavior of residents (collectively denoted as *City* in equation 1). The city-level demographic controls include measures of local economic vitality such as the unemployment rate, the share of people with incomes below 100% of the federal poverty line, and median household income. We expect that all three variables would be negatively associated with a city's likelihood of receiving an MPO project. Regarding median household income, studies often suggest that more affluent citizens are better able to exercise power, and so can successfully challenge and block projects that might introduce disamenities, such as the congestion that could arise with a significant upgrade in road capacity or quality (Glaeser and Ponzetto 2017; Brinkman and Lin 2019; Altshuler and Luberoff 2004).

We include a number of control variables that proxy for intensity of car use, based on the premise that higher car use will be associated with higher demand for transportation improvements. Three are demographic measures correlated with car use: the share of families with children younger than 6 years old, the share of the population with at least a bachelor's degree, and the percentage of the population older than 64 years old. Since families with children and adults with more education tend to rely on car use more than older people (Hanson and Hanson 1981; Shen 2000; Boarnet 2011), we expect that the first two variables will be positively associated with a city's likelihood of receipt of an MPO project and the third will show a negative relationship.

Two controls –the average commute time of residents and the percentage of residents who use their vehicles to commute – seek to capture intensity of car use, which we take to be a proxy for the demand for highways and roads. We expect that these will be positively associated with the likelihood a city receives an MPO project within its boundary.

We also include as controls the number of business establishments and their number of employees, which are measures of each city's economic capacity and could be indicators of whether roads are needed.[10] Data for all these controls were obtained from the Census. Summary statistics for all city-level variables are presented in table A2 in appendix.

Project-level highway and road characteristics should also affect MPO investment decisions, as the MPO practitioners we interviewed described them to be the most important factors. The most significant were congestion relief, mobility, connectivity, and safety. For example, projects to improve a highway with more congestion should be more likely to be pursued by the MPO than projects focused on less congested highways, all else equal. Thus, the model includes project type, road pavement quality (using the International Roughness Index), average annual daily traffic flow, road speed limit, current level of congestion, and future

[10] We report the results without the measures of business activities as they are highly correlated with city's population size. Substituting city's population for business measures or simply adding these measures, however, do not change the results in any substantive way.

level of congestion projected by state DOT as control variables (denoted as *Project* in equation 1).

To this project-level vector, we also include an MPO project size. While the model considers every city in a region as possible location(s) for the allocation of projects, its major drawback is that the binary nature of the dependent variable does not consider project size. Such an approach fails to capture a possibility that cities with greater voting power may systematically receive greater scale projects (measured by expenditure). To address this, we construct a binary variable that indicates if an MPO project's size in dollars falls in or above the 90th percentile of the project expenditure distribution.[11] Because project-level fixed effects are embedded in the conditional logistic regression, we incorporate these time-invariant project-level variables by creating interaction terms for each characteristic with the power variable. These interaction terms allow us to examine if the effects of power are moderated by project size considerations and road characteristics. Summary statistics for all project-level variables are presented in table A3 in appendix.

For a given MPO area, observations are pooled and a single regression is run with robust standard errors clustered by projects, since MPO projects are long-term investments that are implemented over multiple years. Note that, in the analysis, while cities' MPO voting power shares and populations are yearly available for the entire study period from 2001 through 2010, other city-level demographic controls are matched to the project-city-year pairs to the extent that data permits. Namely, the controls from 2000 Census are matched to the project-city-year pairs in 2001-2005 and the controls from 2006-2010 American Community Survey

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[11] The project expenditure size at the 90th percentile in each region is \$3.3MM (Dallas-Fort Worth), \$6.0MM (Houston-Galveston), \$3.6MM (Austin), and \$4.9MM (San Antonio).

are matched to those in 2006-2010. The project-level highway and road characteristics are matched to all pairs as interaction terms. Separate estimates are obtained for each MPO area, because an MPO's choice set (i.e., the set of cities it could choose to invest in) is mutually exclusive of the choice set of other MPOs. This permits a comparative analysis to assess the second hypothesis regarding power concentration, as the four MPOs show varying degrees of voting power distribution.

Results

We first describe the results in Houston-Galveston region, where the voting power is least concentrated, and later compare them to the other three regions. All coefficients are presented in odds-ratio to ease interpretation.

Regarding the power variable, our main variable of interest, panel A of figure 4 shows that power is consistently associated with the likelihood that a city receives an MPO project in its jurisdiction, and in the expected direction. A one percentage point increase in a city's power is associated with a 45% greater likelihood of receiving a project within its boundary.

Interestingly, while one might have expected population to be a key driver of the distribution of resources, given its central role in establishing the distribution of seats on MPO policy boards, the analysis suggests otherwise. Population is negatively associated with the likelihood of having a project within a particular city's jurisdiction.

Other control variables have associations that conform with general expectations laid out earlier. Cities with higher median incomes were less likely to have an MPO project located within their boundaries. Higher city unemployment and higher poverty rates are associated with decreases in the likelihood of that city receiving a project. An increase in the percentage of families with young children in a city is associated with a greater likelihood of receiving an MPO roadway project. We also see that the percentage of a city's population that is elderly is negatively associated with that city's likelihood of receiving a project, whereas the share of a city's residents with a bachelor's degree or graduate degree is positively associated with the likelihood of having a project in its city's boundary.

While the demographic relationships largely conformed to expectations, the relationships for the commuting variables did not. Cities with residents who spend more time commuting were less likely to get an MPO project, which runs counter to our expectation that commuting is a signal of the salience of road investment. Similarly, the finding that the share of workers who commute with their private autos was not related to the likelihood of getting a project. Lastly, there are some moderating effects of road and highway conditions on power, but the power variable itself remains as a strongly significant predictor.

[Figure 4 here]

Some might be concerned that the power and population variables are closely related, given the role that population plays in some MPO seat allocation rules. To explore this, we rerun the analysis including either power or population to see if results change in important ways. The results of this exercise are shown in panels B and C of figure 4. In panel B, which excludes population, the odds-ratio on power diminishes somewhat, but the results remain virtually the same. Similarly, when power is omitted from the model (panel C), the population variable remains negatively associated with the likelihood of receipt of an MPO project.[12]

Together, our analysis suggests that cities' voting power still significantly predicts the distribution of resources even after controlling for population, other city-level demographic and car use intensity, and project-level characteristics such as project size and road and highway conditions. The analysis thus supports the first hypothesis regarding institutional power. Further, the interaction term between project size and power is not significant, suggesting that cities with greater power did not receive larger scale projects. Rather, it is cities' influence through power that impacts the likelihood of bringing the projects their home.

Figure 5 reports the results on power for all four MPO regions in specifications including all controls. Recall that the second hypothesis posits that power should be a less important factor in explaining the MPO project distributions as one moves from regions where power is least concentrated to the region where power is most concentrated. Consistent with expectations, the coefficient associated with power decreases as one moves from the Houston-Galveston area to the San Antonio area. A percentage point increase in a city's MPO voting power in Houston-Galveston, Dallas-Fort Worth, Austin, and San Antonio area is associated with increases in the likelihood that city receives an MPO project by 45%, 39%, 18%, and 6%, respectively. Moreover, the power relationship is not statistically significant in San Antonio,

[12] We also repeated this exercise (panel C) for the other three regions. The coefficient for population was negative in the Dallas-Fort Worth metro, and positive in the Austin and San Antonio metro, and none of them was statistically distinguishable from zero, making a stronger case that it is power rather than population that is associated with the geographic distribution of MPO projects. Also, the results for the other three regions (panel A) remained robust when the analysis excluded population (panel B).

which is the MPO area with the greatest power concentration. Further investigation reveals that an interaction term between project size and power in San Antonio area is positive and significant, unlike the other three regions (See figure A1 in appendix). This indicates that the city of San Antonio consistently received bigger scale projects, a key driver of the weaker power result. San Antonio's dominant position for having large scale projects within its boundaries makes it virtually impossible for an increase in power among the remaining cities to affect allocation outcomes. Compared with the Houston-Galveston region, the effect of power in the Dallas-Fort Worth area is not statistically different, which suggests that the inclusive representational rules that both MPOs adopted affects the equity of their resource allocation in a similar way. As expected, the effect of power in Austin area is weakly different from the Houston-Galveston area ($p<0.1$), whereas the power effect in the San Antonio region is significantly different from that in the Houston-Galveston area ($p<0.001$).

[Figure 5 here]

Across the three regions, the results for the control variables, which we report in appendix figure A1, generally mirror those seen for the Houston-Galveston case, with some exceptions. The coefficient on population for the Austin and San Antonio MPOs is not statistically different from zero, making a stronger case that it is power rather than population that is key. Similarly, the coefficient on elderly population is not statistically different from zero for these two MPOs. Second, the relationship between project location and a city's unemployment rate is not consistent across the regions, suggesting that one should be cautious drawing conclusions about the nature of this relationship. Lastly, the coefficient on the percentage of a city's population that commutes using a personal automobile is positive in the Dallas-Fort Worth and Austin MPO, which offers some support for the salience argument introduced above.

While the coefficients on power decline consistent with our expectations, we cannot easily draw conclusions about the relative magnitude of effects across factors from the odds ratios since the units of the independent variables are different. One way to make magnitude comparisons is to quantify the size of the effect with a constant one standard deviation change in a variable. Table 2 shows such a comparison. In the Houston-Galveston region, the magnitude of the power effect is substantially greater than that of any other variables. Specifically, a one standard deviation increase in a city's power share in the region is associated with more than a doubling of the likelihood it receives an MPO investment in its jurisdiction. Other demographic variables explain the distribution of MPO projects more modestly. The other MPO regions are something of a mixed bag. Power is important in all but the most concentrated region (San Antonio), but the magnitude of the relationship does not vary monotonically as predicted.

[Table 2 here]

We also acknowledge that examining these four MPOs may not be an apples-to-apples comparison from the viewpoint of their differences in jurisdictional fragmentation. The varying degrees of metropolitan fragmentation may be a culprit that explains the underlying differences in an MPO's institutional rules on voting seat allocation across these four areas.

From a policy perspective, for example, it would be interesting to know if a more equitable allocation of resources would have occurred if the San Antonio MPO had distributed its voting power more evenly and inclusively.

To address this question, we investigate an MPO that saw significant changes in their rules over time and test whether this impacted the distribution of resources. Among the four regions, the Austin MPO had a substantial change in their rules and subsequently their distribution of voting power.[13] As a result, the power dominance in the city of Austin fell from 60 percent in 2001 to 57 percent in 2005 and to 45 percent in 2009. In figure 6, we repeat the analysis for the Austin MPO region with the period split into two: the 2001-2005 period when the city of Austin still had dominance with its majority voting status (panel A) and 2006-2010 period when the city lost its dominant power position (panel B).

The results affirm our second hypothesis. The power variable is positive and significant in the later period when the distribution of voting power became more even among localities with Austin losing its dominance (panel B). In contrast, it is not significant in earlier years when power was more concentrated in the city of Austin (panel A). Further, in these earlier years, the interaction term between project size and power is positive and weakly significant. Recall that this pattern was similarly observed in the San Antonio MPO. When the city of Austin maintained its dominant power position, it consistently received bigger scale projects. Compared with the later years, this helps explain why an increase in the remaining cities'

[13] By contrast, the other three regions did not see such significant changes in voting power. For example, the power share of city of Dallas, Fort Worth, Houston, and San Antonio in 2001 was 21.3, 14.4, 21.1, and 81.4 percent, respectively. The corresponding share in 2010 was 19.5, 13.5, 21.2, and 75. 5 percent, respectively.

power in those earlier years did not impact the likelihood of receiving an MPO project within their boundaries.

Hence, the analysis suggests that our claim on the second hypothesis is not only confined to the between-metropolitan comparisons that are in different levels of fragmentation, but it is also observed from a within-metropolitan change, holding the level of fragmentation constant. The finding illustrates that changes in an MPO's rules that induce a more even distribution of voting power can achieve a more equitable allocation of public resources across cities throughout the region.

[Figure 6 here]

Discussion and Conclusion

This article examines regional planning organizations that plan and allocate public investment in transportation and analyzes the extent to which the internal power structure of the governing board of those organizations explains the geographic distribution of its public investment across local jurisdictions. Focused on the four largest metropolitan areas in Texas, our analysis shows that the power structure is consistently a major factor. Moreover, the degree of power concentration of the dominant city in the region influences whether the power held by the other cities matters; if power concentration is sufficiently great, the importance of the distribution of the remaining power disappears. Aside from the finding that higher concentration of power mitigates the power relationship, we are unable to say more about this relationship for metropolitan areas with less intensive concentrations. Among the four regional planning areas, a monotonic power effect was not observed, which points to a more complex dynamic. More research will be needed to understand this better.

Interestingly, the results did not conform with the expectations of practitioners and policymakers working inside these organizations, who claimed that power was at best a minor factor shaping decision-making. Indeed, the findings revealed that the importance of the institutional rules on public investment allocation is much greater than professionals believe them to be.

Our study provides both theoretical and practical implications. On theoretical side, we extend Stone (1980)'s systematic power concept to institutionalized settings such as local voting power in regional governing policy boards. By extending Stone's theory, we argue that institutionalized power should matter even in a setting where policymakers do not acknowledge its explicit role. While our empirical investigation focuses on regional organizations, our perspective on institutionalized power may be relevant to other regional and interregional organizations that also play important roles in urban and regional governance and public goods provision.

Our work also provides a new perspective to the debate on the optimal structure and form of metropolitan governance. Advocates of metropolitan consolidation have argued that city-county consolidation can promote efficiency, equity, and accountability, a view many public choice scholars eschew. Such structural reform can mitigate growing inequalities between central cities and suburbs in principle, but consolidation referendum have not been popular in practice. As a result, several scholars have focused on alternatives such as municipal annexation, interlocal agreements and service contracts, and the creation of intergovernmental special districts (Carr 2004).

Along this line, many have started looking at the role that regional coalitions and governments can play to reduce the disparities across the metropolitan community (Dreier, Mollenkopf, and Swanstorm 2004; Orfield 2011; Rusk 1993). Most work on regional institutions have focused on whether they can facilitate coordination and regionalism (Sciara 2017; Kwon and Park 2014; Kwon, Feiock, and Bae 2014; Gerber and Loh 2011). Some scholars even suggest that existing regional bodies be granted more authority above their current control on transportation polices to scale up their influence in other areas, such land use and affordable housing, to advance equitable development (Orfield 2011).

Often neglected in these debates, however, is a discussion on how to design these institutions and strike a balance in power among the constituent local jurisdictions to achieve regional equitable outcomes. Savitch and Vogel (2004), for example, highlights that the power dimension in city-county consolidation, which holds a key to a successful reform, has been overlooked both by public choice scholars and consolidation reformers. From a governance reform perspective, our work contributes to this line of thought by suggesting that policymakers need to attend to the issue of balance of power in any existing collaborative institutions such as regional bodies for successful governance reforms.

Our key point is that the design and structure of rules allocating power in regional institutions matters for the subsequent distribution of resources across member jurisdictions. To allow for cities to meaningfully contribute to the collective decision-making process, we recommend that policymakers and public managers should develop representation systems in which voting power is shared more inclusively among the local actors.

The rules adopted in the Houston-Galveston and Dallas-Fort Worth MPOs provide some insights on this recommendation. In the Dallas-Fort Worth region, the organization adopted a cluster-based representation approach in which small municipalities were paired with larger ones in a group, so that seats represent the voices of smaller localities. The Houston-Galveston MPO did not establish a population threshold for seat allocation that was too high, and the board consequently included a broad range of cities. While designating a threshold that is proportional to the distribution of cities' populations is common in other MPOs, and may be inevitable to some extent, it can institutionally exclude smaller jurisdictions from the decision-making process. Also, both MPOs allocated seats to their outlying counties in metropolitan areas, which further helped alleviate the concentration of power in their central cities. These instances illustrate how various rules can help establish a collaborative governance model that results in equitable allocation of resources.

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Table 1: 60 MPO Policymakers Interviewed

Type of MPO Policymakers	Dallas-Fort Worth MPO	Houston MPO	Austin MPO	San Antonio MPO
Total (60)	21	18	12	9
Mayor	6	1	2	2
Council Member	2	1	1	2
City Manager	-	1	1	1
City Director	-	6	3	1
County Judge	2	-	1	-
Commissioner	4	2	2	1
MPO/State Staff	4	6	2	2
Others	3	1	-	-

Notes: - indicates no respondent in that position. Others include representatives from transit authority, business interest group, and county precinct administrator. The list of interviewees is available in the appendix.

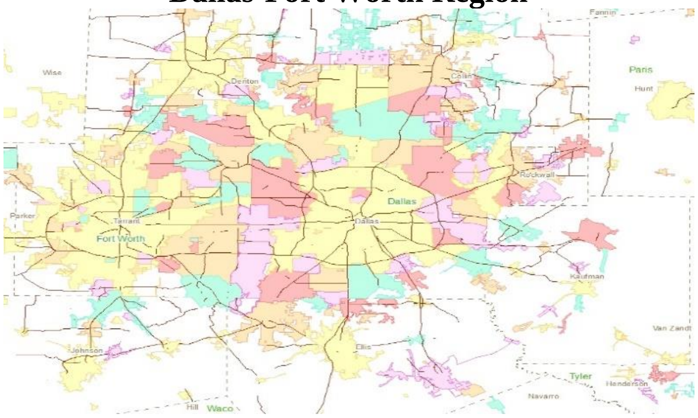
Table 2: Effects of Independent Variables by Standard Deviation

Variables	Houston-Galveston metro	Dallas-Fort Worth metro	Austin metro	San Antonio metro
Power (%)	**107%**	**91%**	**156%**	80%
Population (thousands)	**-27%**	**-32%**	-27%	-6%
Project size x power	0%	0%	4%	**12%**
Unemployment rate (%)	**-26%**	4%	-29%	17%
Poverty rate (%)	**-18%**	-6%	**-38%**	**-81%**
Median household income ($1000)	**0%**	**0%**	**0%**	0%
Family household with children (%)	**40%**	**9%**	**66%**	**27%**
Elderly population (%)	**-34%**	**-41%**	-3%	8%
Bachelor’s degree holder (%)	**31%**	**42%**	**68%**	-51%
Commute time (mins)	**-15%**	**-18%**	**-89%**	-27%
Commuter with private auto (%)	6%	**14%**	**85%**	-13%
Project type x power	-2%	-1%	22%	**-33%**
Road pavement quality (IRI) x power	4%	**6%**	7%	17%
Traffic flow x power	**23%**	**10%**	-4%	**-23%**
Road speed limit x power	**-45%**	**-16%**	**-161%**	45%
Current congestion x power	**84%**	**17%**	44%	**134%**
Future congestion x power	**-70%**	**-18%**	52%	**-101%**

Notes: The effects were calculated based on the results in figure A1 in appendix. Standard deviations of the variables are reported in table A2 and A3 in appendix. Bolded are the effects that are statistically significant at least at 0.05 level.

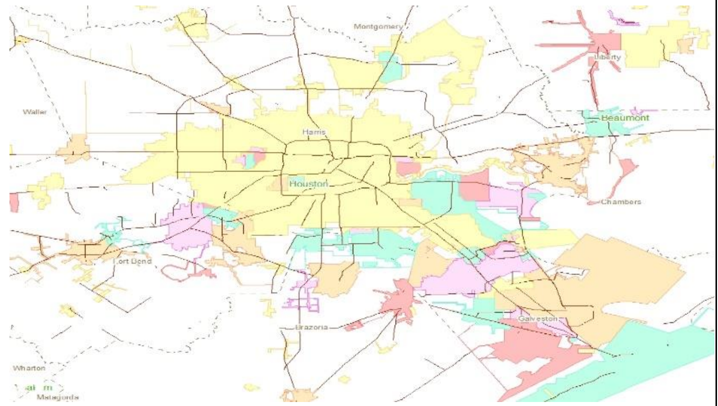
Figure 1: Summary Information on MPO Projects and Local Voting Power

Dallas-Fort Worth Region



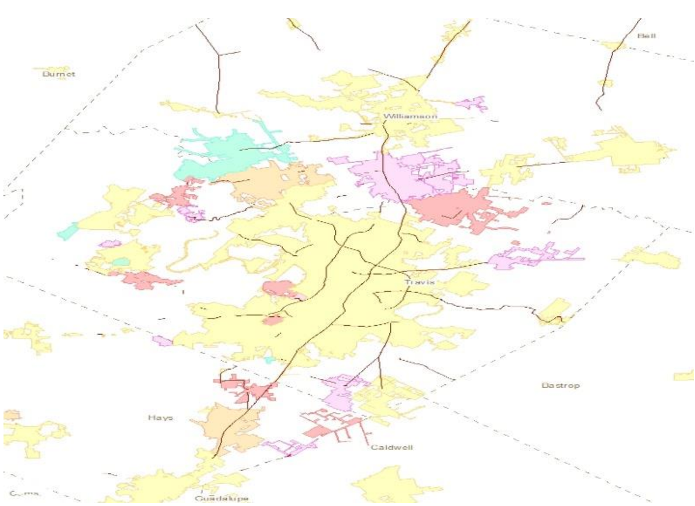
Population: 6.3 million (2010)
N of cities: 139
N of cities with non-zero power share: 136
Mean (0.75%) and median (0.13%) of cities' voting power share
N of MPO projects built in cities: 945
N of MPO project-year observations: 2701
Average project duration year: 2.86
Average project size in a year: $1.5 million

Houston-Galveston Region



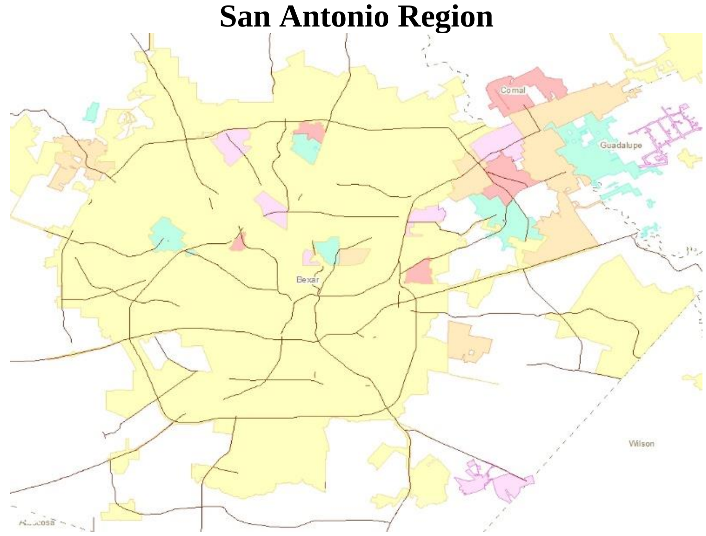
Population: 6.0 million (2010)
N of cities: 125
N of cities with non-zero power share: 125
Mean (0.69%) and median (0.04%) of cities' voting power share
N of MPO projects built in cities: 649
N of MPO project-year observations: 1942
Average project duration year: 2.99
Average project size in a year: $1.9 million

Austin Region



Population: 1.7 million (2010)
N of cities: 46
N of cities with non-zero power share: 46
Mean (2.11%) and median (0.08%) of cities' voting power share
N of MPO projects built in cities: 152
N of MPO project-year observations: 511
Average project duration year: 2.33
Average project size in a year: $1.0 million

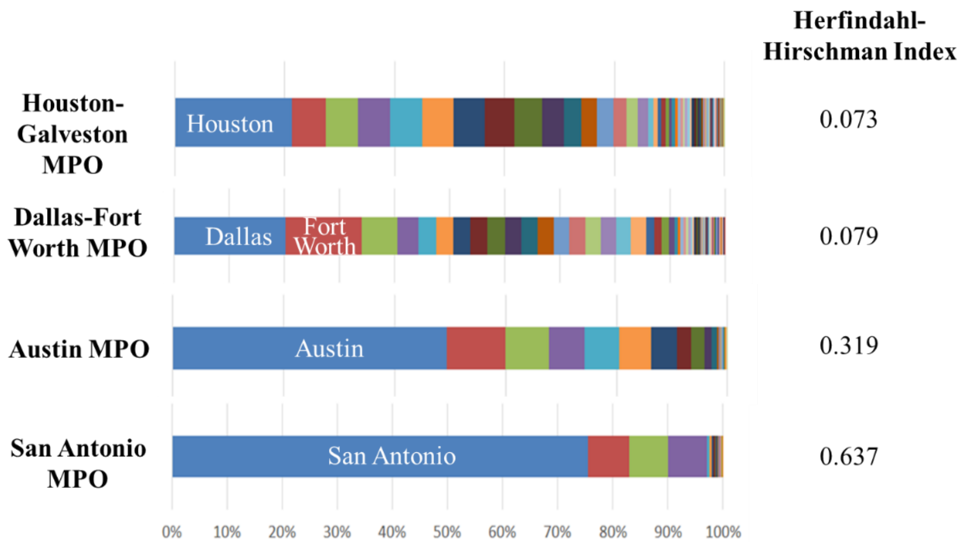
San Antonio Region



Population: 1.8 million (2010)
N of cities: 28
N of cities with non-zero power share: 27
Mean (3.58%) and median (0.1%) of cities' voting power share
N of MPO projects built in cities: 279
N of MPO project-year observations: 917
Average project duration year: 3.29
Average project size in a year: $1.0 million

Notes: All unincorporated areas in each county is considered as a single place and is counted in the number of cities

Figure 2: Distribution and Concentration of MPO Local Voting Power



Notes: Herfindahl index was calculated from the cities' average voting power shares in 2001-2010.

Figure 3: Conditional Logit Model Setup

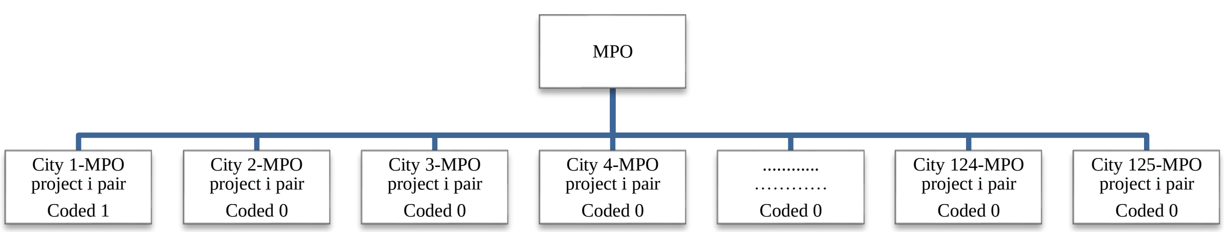
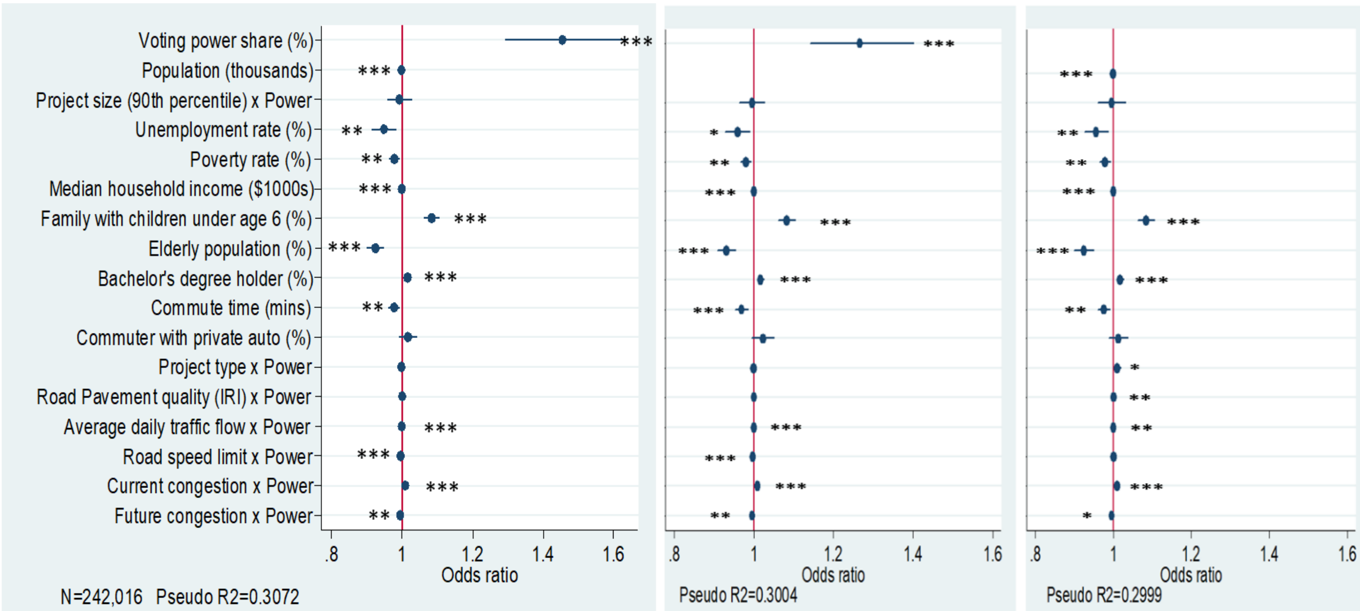


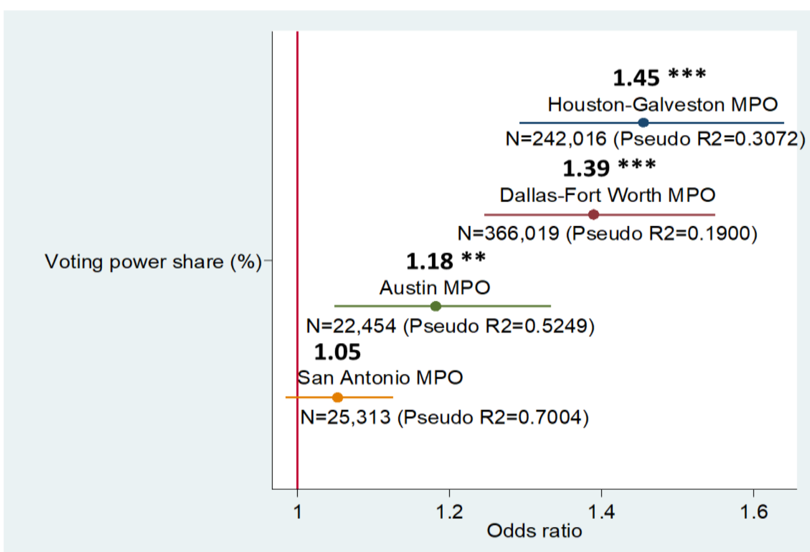
Figure 4: Conditional Logit Regression Results for the Houston MPO

Panel A Panel B Panel C



Notes: unit of analysis is project-year-city pair. A total of 1942 project-year pairs were matched to 124 (2001, 2003-2005) or 125 cities (2006-2010), resulting in 242,016 observations for the analysis. The data for 2002 was not available. *** p<0.001, ** p<0.01 * p<0.05.

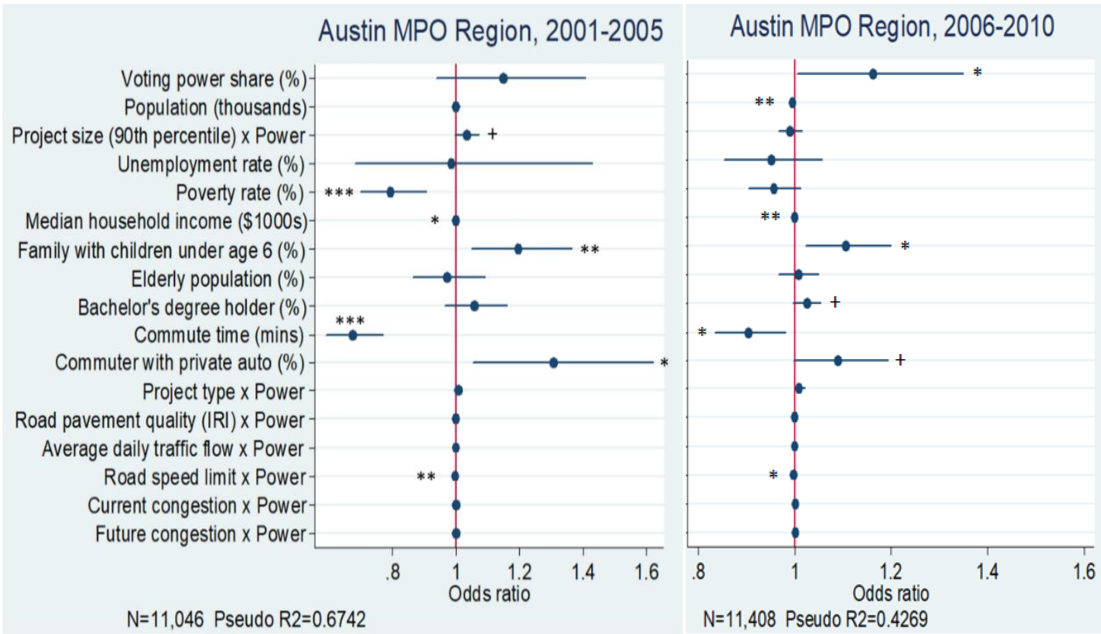
Figure 5: Conditional Logit Results on Power in All Four Regions



Notes: The figure summarizes four models with full controls.
*** p<0.001, ** p<0.01 * p<0.05

Figure 6: Conditional Logit Results on Austin MPO by Period

Panel A Panel B



Notes: *** p<0.001, ** p<0.01 * p<0.05. + p<0.1

Supplemental Appendix A

Figure A1: Conditional Logit Results for the Four MPO Regions

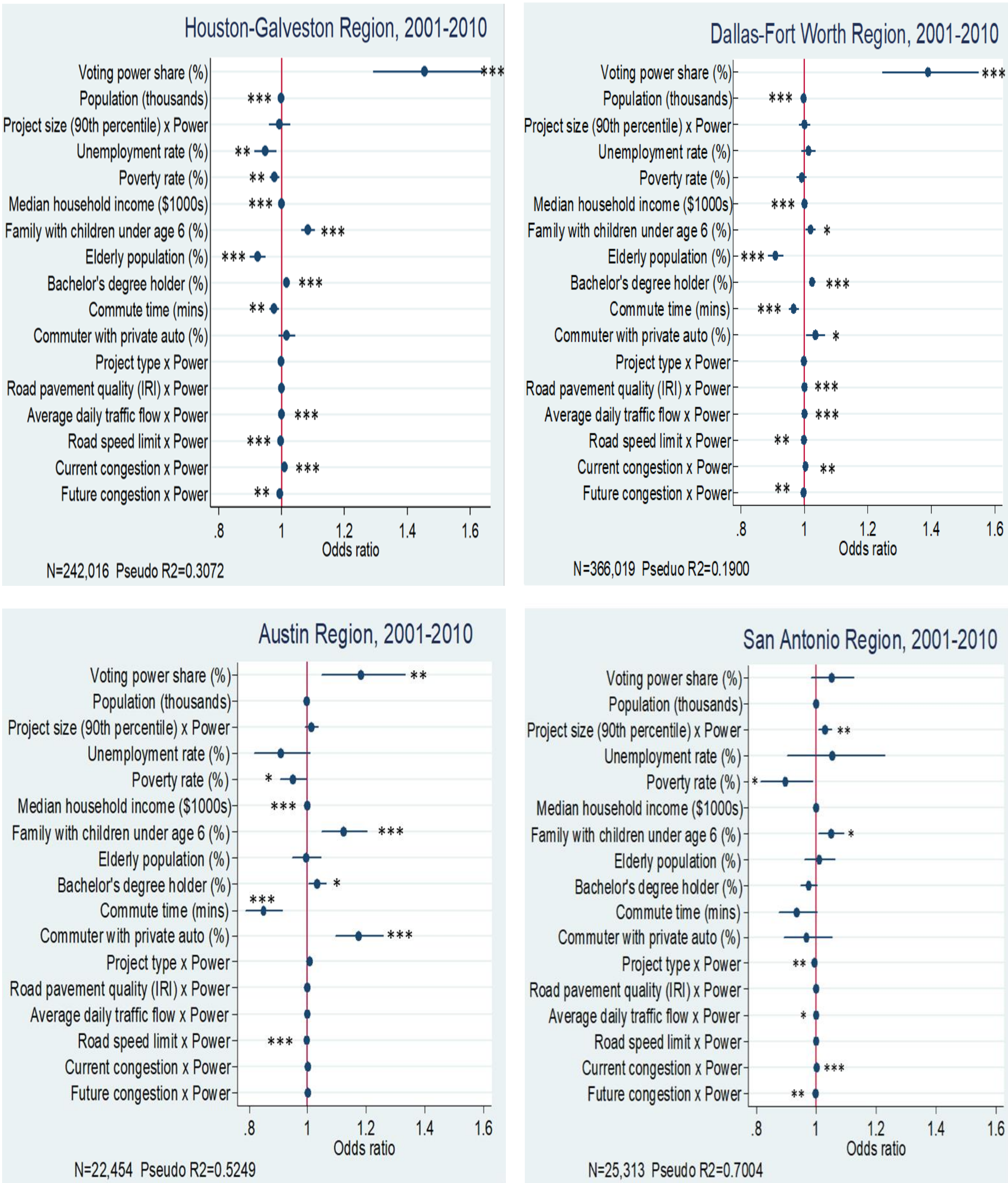


Table A1: Data and Source

Data/Variables	Description	Source
Voting Power	The share of voting power that cities have in a MPO governing board. The number of eligible voters in 2000 census blocks is used to translate power from counties/state congressional districts to cities.	Joint Power Agreement or Bylaws documents obtained from each MPO; U.S Census; National Historical Geographic Information Systems (NHGIS); Texas Legislative Council
MPO project list with geospatial and expenditure information	All MPO roadway projects implemented in Texas during 2001-2010. All geocoded with expenditure information	Texas Department of Transportation
Annual Average Daily Traffic (AADT) count	Total volume of vehicle traffic of a highway or roadfor a year divided by 365 days (vehicles/day)	Texas Department of Transportation
Road Speed Limit	Road Speed Limit (mph).	Texas Department of Transportation
Road International Roughness Index	A value that describes the amount of roughness measured in inches per mile, with readings taken at intervals of 0.1 miles by a profiler van driving the roadway. Measurements are independent of weather conditions (temperature, sunlight, or wind). IRI values range from 1 (smoothest) to 950 (roughest). Unit: Inch/mile	Texas Department of Transportation
Level of Current Congestion	Vehicle density on the roadway (vehicles/mile)	Texas Department of Transportation
Level of Future Congestion	Vehicle density on the roadway projected for 2032 (vehicles/mile)	Texas Department of Transportation
Demographic Control Variables	City's population (both total population size and % of population in the region), unemployment rate, poverty rate, median household income, % of bachelor's degree holders among the population 25 years older, % of the elderly population, % of Family household with own children under 6 years, commute time, and % of commuters using private vehicle	U.S. Census Decennial Census 2000 & American Community Survey 2006-2010
Employment Environment Variables	Number of business establishments, number of paid employees	U.S. Census Zip Code Business Patterns 2001 to 2010

Table A2: Summary Statistics for City-level Independent Variables 2001-2010

VARIABLES	Dallas Fort-Worth Area					Houston-Galveston Area				
CITY-LEVEL	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
Power (%)	1310	0.75	2.33	0	21.51	1049	0.69	2.35	0.00	21.24
Population (in thousands)	1310	39.93	125.06	0.03	1202.72	1049	27.98	187.79	0.05	2108.95
Population (%)	1310	0.72	2.25	0.00	23.94	1049	0.52	3.48	0.00	41.03
Unemployment Rate (%)	1310	5.16	3.13	0	20.95	1049	6.38	5.02	0	58.05
Poverty Rate (%)	1310	8.63	6.67	0	38.69	1049	11.89	8.28	0	43.47
Median Household Income (in thousands)	1310	75.96	36.53	28.75	261.71	1049	67.59	37.64	20.50	250
% of Elderly Population	1310	9.13	4.55	2.25	27.78	1049	11.42	4.49	2.25	31.21
% of Population with Bachelor's Degree	1310	28.42	17.16	0	82.39	1049	23.82	19.85	0	85.29
% of Family with Own Children under 6 Years	1310	11.19	4.60	0	26.92	1049	9.39	4.70	0	23.95
Commute Time (mins)	1310	29.24	5.29	16.19	46	1049	28.46	6.48	17.95	59.44
% of Commuters with Private Autos	1310	92.67	4.01	67.68	100	1049	93.63	3.88	76.46	100
VARIABLES	**Austin Area**					**San Antonio Area**				
CITY-LEVEL	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
Power (%)	410	2.11	8.57	0	59.98	265	3.58	15.15	0	84.52
Population (in thousands)	410	26.62	112.69	0.2	795.53	265	52.63	235.82	0.43	1334.41
Population (%)	410	1.85	7.87	0.01	55.63	265	3.29	14.71	0.03	80.23
Unemployment Rate (%)	410	5.15	3.18	0	14.91	265	4.71	3.13	0.44	13.59
Poverty Rate (%)	410	8.91	7.80	0	36.86	265	8.91	7.90	0	34.44
Median Household Income (in thousands)	410	72.42	30.83	26.73	160.98	265	77.76	35.49	26.63	172.5
% of Elderly Population	410	11.88	7.09	1.82	37.40	265	14.47	7.48	3.72	36.57
% of Population with Bachelor's Degree	410	31.31	20.44	1.94	86.57	265	36.24	21.85	3.71	79.17
% of Family with Own Children under 6 Years	410	10.39	5.37	0	26.04	265	8.94	5.33	0.91	28.17
Commute Time (mins)	410	29.93	5.88	17.78	47.26	265	24.43	4.24	14.72	33
% of Commuters with Private Autos	410	91.36	4.87	76.95	100	265	92.63	4.19	76.50	98.75

Table A3: Summary Statistics for Project-level Independent Variables 2001-2010

VARIABLES	Dallas Fort-Worth Area					Houston-Galveston Area				
PROJECT-LEVEL	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
Project size (90^{th} percentile)	2701	0.10	0.30	0	1	1942	0.10	0.30	0	1
Project type	2701	3.97	1.52	1	7	1942	4.12	1.43	1	7
Road pavement quality	2701	116.13	39.66	0	314	1942	114.39	36.35	0	274
Average annual daily traffic flow	2701	37188	29164	260	135852	1942	42179	37675	0	144005
Road speed limit	2701	56.29	8.10	0	70	1942	56.66	8.26	0	70
Current congestion	2701	32.55	24.00	1.14	160.35	1942	29.81	23.89	0.56	131.18
Future congestion	2701	48.04	34.44	1.95	224.49	1942	45.69	37.76	1.19	234.17
Project size x Power	2701	0.05	0.55	0	21.30	1942	0.04	0.35	0	6.20
Project type x Power	2701	1.88	5.33	0	97.29	1942	3.27	10.56	0.001	141.62
Road pavement quality x Power	2701	54.21	152.71	0	2785.22	1942	86.92	261.73	0	3122.74
Average annual daily traffic flow x Power	2701	16718	51182	0	1372463	1942	31265	114067	0	2072264
Road speed limit x Power	2701	26.29	71.88	0	1290.65	1942	45.29	139.88	0	1380.80
Current congestion x Power	2701	14.72	40.64	0	893.45	1942	23.08	87.21	0.003	1495.34
Future congestion x Power	2701	21.86	61.26	0	1312.83	1942	35.19	132.11	0.004	2093.46
VARIABLES	**Austin Area**					**San Antonio Area**				
PROJECT-LEVEL	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
Project size (90^{th} percentile)	511	0.10	0.30	0	1	917	0.10	0.30	0	1
Project type	511	3.21	1.14	1	5	917	3.99	1.46	1	7
Road pavement quality	511	88.68	30.09	0	190.76	917	101.16	37.48	0	299.46
Average annual daily traffic flow	511	41173	26282	249	94265	917	40347	28779	1897	111335
Road speed limit	511	60.14	7.34	36.81	75	917	59.38	10.35	29.36	70
Current congestion	511	34.19	24.36	1.68	111.50	917	30.15	15.47	2.60	83.67
Future congestion	511	52.65	35.59	2.35	167.14	917	47.56	24.08	4.22	117.14
Project size x Power	511	0.24	2.64	0	56.67	917	0.34	3.95	0	84.52
Project type x Power	511	7.99	30.36	0.003	283.34	917	14.97	62.28	0	528.71
Road pavement quality x Power	511	214.84	756.21	0	5955.81	917	393.28	1693.71	0	25310.41
Average annual daily traffic flow x Power	511	101961	429965	3.85	4813865	917	159801	771274	0	7304841
Road speed limit x Power	511	150.23	538.89	0.16	3843.58	917	224.34	893.65	0	5700.03
Current congestion x Power	511	78.59	337.22	0.03	5196.99	917	113.27	496.45	0	4678.34
Future congestion x Power	511	120.50	502.09	0.05	7638.60	917	179.82	793.57	0	7344.15

Supplemental Appendix B- MPO Practitioners Interviewed (60)

San Antonio Metropolitan Area (9)

MPO and TxDOT Staff

Isidro Martinez	Director of Alamo Area Metropolitan Planning Organization
Mario Jorge	District Engineer of TxDOT San Antonio District
Transportation Policy Board member	
Kevin A. Wolff	County Commissioner Precinct 3, Bexar County
Renee Green	Director of Public Works/County Engineer, Bexar County
Ron Reaves	Council Member District 3, City of New Braunfels
Chris Riley	Mayor, City of Leon Valley representing Greater Bexar County Council of Cities
Ray Lopez	Council Member District 6, City of San Antonio
Ron Nirenberg	Mayor, City of San Antonio
Scott Wayman	City Manager, Live Oaks representing Northeast Partnership

Austin Metropolitan Area (12)

TxDOT Staff

Terry McCoy	District Engineer, TxDOT Austin District
Kevin Dickey	Deputy District Engineer, TxDOT Austin District
Transportation Policy Board member	
Ann Kitchen	Council Member District 5, City of Austin
Dale Ross	Mayor, City of Georgetown
Trey Fletcher	Assistant City Manager, City of Pflugerville
Craig Morgan	Mayor, City of Round Rock
Gerald Daugherty	County Commissioner Precinct 3, Travis County
Brigid Shea	County Commissioner Precinct 2, Travis County
Sarah Eckhardt	County Judge, Travis County
Technical Advisory Committee	
Bob Daigh	County Engineer, Williamson County
Gary Hudder	Director of Transportation, City of Round Rock
Meredith Johnson	Planner II, City of Buda representing small cities in Hays County

Houston Metropolitan Area (18)

Houston Galveston Area Council and TxDOT Staff

David Wurdlow	Transportation Program Manager
Nicholas Williams	Transportation Coordinator
Rick Guerrero	Intergovernmental Relations Manager
Hans-Michael Ruthe	Principal Planner
Bill Brudnick	Director of Transportation Development and Planning, TxDOT Houston District
Tucker Ferguson	District Engineer, TxDOT Beaumont District

Transportation Policy Council

David Robinson	Council Member District At-Large 2, City of Houston
Karun Sreerama	Director of Public Works and Engineering, City of Houston
Kenneth Clark	County Commissioner Precinct 4, Galveston County
Gary Trietsch	Executive Director of Harris County Toll Road Authority, Harris County
James Patterson	County Commissioner Precinct 4, Fort Bend County
Joe Zimmerman	Mayor, City of Sugar Land

Technical Advisory Committee

Jeffrey Weatherford	Deputy Director of Public Works and Engineering, City of Houston
Robert L. Hall, Jr.	County Engineer, Chambers County
Auggie Campbell	President of West Houston Association representing Citizen and Business Interests
Trent Epperson	Assistant City Manager, City of Pearland
Lisa Kocich-Meyer	Director of Planning, City of Sugar Land
Yancy Scott	County Engineer, Waller County

Dallas-Fort Worth Metropolitan Area (21)

MPO and TxDOT Staff

Michael Morris	Director of Transportation, North Central Texas Council of Governments
Amanda Wilson	Transportation Program Manager, North Central Texas Council of Governments
Kelly Selman	District Engineer, TxDOT Dallas District
Mohamed Bur	Director of Transportation and Development, TxDOT Dallas District

Regional Transportation Council

Andy Eads	County Commissioner Precinct 4, Denton County
Clay Lewis Jenkins	County Judge, Dallas County
Jeff Williams	Mayor, City of Arlington
Gary Fickes	County Commissioner Precinct 3, Tarrant County
Rebecca Barksdale	Precinct Administrator, Precinct 3, Tarrant County
B. Glen Whitley	County Judge, Tarrant County
Oscar Trevino Jr.	Mayor, City of North Richland Hills
Ron Jensen	Mayor, City of Grand Prairie
Jungus Jordan	Council Member District 6, City of Fort Worth
Rudy Durham	Mayor, City of Lewisville, representing Lewisville, Flower Mound, and Highland Village
Stephen Terrell	Mayor, City of Allen, representing Allen, Lucas, Wylie, Rowlett, Sachse, and Murphy
Duncan Webb	County Commissioner Precinct 4, Collin County
Douglas Athas	Mayor, City of Garland
David Magness	County Commissioner Precinct 4, Rockwall County
Sara Bagheri	Council Member At-Large Place 6, City of Denton representing Denton, Sanger, Corinth, and Lake Dallas
Gary Slagel	Board Member and Secretary, Dallas Area Rapid Transit
John R. Polster	Consultant representing Denton County (Technical Committee)