

TRANSIT RIDERS AND ACCESS TO BUS SERVICE: A NEIGHBORHOOD
ANALYSIS

by

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A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Public Policy

Charlotte

2009

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ABSTRACT

KIRSTIN E. WELLS. Transit riders and access to bus service: a neighborhood analysis. (Under the direction of DR. JEAN-CLAUDE THILL).

Intra-jurisdictional delivery of publicly provided services often results in observable differences in service levels that vary by spatial subunit (neighborhood). These variations are related to the socio-demographic characteristics of neighborhoods and have been hypothesized in prior literature to be the result of bias against or favoritism towards certain neighborhoods. Using a mixed-method approach, this dissertation examines publicly provided bus service in four cities – Asheville, NC, Charlotte, NC, Mobile, AL, and Richmond, VA – to examine whether the socio-economic character of a neighborhood is related to the share of municipal bus service it receives and if distribution of shares is impacted by politicized decision-making in the public bureaucracy. Specifically, do transit-dependent neighborhoods, or those with a high percentage of non-Caucasian, low-income, elderly, or student residents receive inferior bus service?

Findings confirm prior research that both professional norms and bias are present in service delivery decisions in all four cities. Bias toward upper-income neighborhoods is found in all four cities as well as bias against non-Caucasian neighborhoods in two of the four cities. Additionally, in cities with unreformed government structure, service delivery decisions may be politicized.

DEDICATION

This dissertation is dedicated with gratitude and in loving memory to Lois Wells whose consistent interest in and encouragement of both my professional and graduate school careers has been sustaining.

ACKNOWLEDGEMENTS

I am thankful to Dr. Jean-Claude Thill for agreeing to take on the responsibility of committee chair without having previously worked with me as a student. His thoughtful guidance and comments have made the dissertation much more thorough and compelling.

I would like to acknowledge Steve Wells, Dan Wells, Amber Patrick, and Diep Dao for teaching me how to use GIS.

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CHAPTER 1: INTRODUCTION

The breadth of public services provided by government at the local level has a material impact on day-to-day quality of life for American citizens. Basic needs of safety and public health in the form of police protection, clean drinking water, and trash collection as well as expectations of comfort and convenience such as good streets and parks are all ensured by the provision of local public services. Indeed citizens in America have come to expect that 911 calls will be answered promptly, that garbage will not be allowed to pile up, that libraries will be open and well-maintained, that schools will be safe places of good education, and that public transportation will be available at convenient times. This oft-cited quote from Teitz (1968) on the importance of urban services, which is from the 1960s, remains true and relevant today:

Modern urban man is born in a publicly financed hospital, receives his education in a publicly supported school and university, spends a good part of his life traveling on publicly built transportation facilities, communicates through the post office...drinks his public water, disposes of his garbage through the public removal system, reads his public library books, picnics in public parks, is protected by his public police, fire and health systems...his everyday life is bound up with governmental decisions on these and numerous other local public services. (p. 36)

Public services fall under the broad category of public goods, which are characterized by non-rivalry and non-excludability in consumption and thereby unsuitable for provision by private markets (Pacione, 2001). Because public goods such as those mentioned in the Teitz quote are often deemed critical for

maintaining a certain societal standard of living, government takes on the function of producer. Literature on public goods is abundant and focuses mainly on the problem of optimal output levels given that prices are not available to equilibrate supply and demand. Yet beyond the economic aspect of allocation, public goods have a spatial aspect as well. Public services are available to all residents within a jurisdiction, yet in many municipalities service levels vary by spatial subunit. Within a particular city or town, some schools are better than others, some parks better maintained than others, police seem more responsive in some neighborhoods than others, and so on. In addition, these service differentials often appear to be systematically associated with the socio-demographic characteristics of neighborhood areas. For example, schools and parks in inner city neighborhoods, which are more likely to have low-income and non-Caucasian residents, are often deemed inferior to schools in middle-class neighborhoods. Even though discrimination in service provision has long been illegal, complaints about service quality and quantity in certain neighborhoods are a chronic issue in urban America. As stated by Pacione (2001), “the nature of public-service provision remains a major determinant of the well-being of different social groups in the city” (p. 354).

Service differentials do not arise spontaneously. As pointed out in the above quote service delivery is the result of governmental *decisions*. Yet elected officials are seldom involved in day-to-day service administration and operations. Instead, local governments delegate this responsibility to agents, either by establishing public bureaucracies or by contracting with private firms to provide

services on the government's behalf (Moe, 1984). The purpose of this dissertation is to examine one local government service – namely bus transportation – in order to probe whether service differentials are systematically tied to the socio-demographic spatial distribution of residents within a municipal jurisdiction. The examination also includes whether certain local government structures are more likely create an environment where bureaucratic decision-making is subject to external influences from the political arena.

Bus transportation is the topic of this dissertation primarily due to a gap in the public policy service delivery literature. Prior studies in the body of research on intra-jurisdictional service distribution have focused mainly on services such as police and fire protection, libraries, sanitation, streets, and schools whereas few have focused on public transportation. Results on bus transportation, or any city service for that matter, are not automatically generalizable to other services because city services tend to have separate bureaucracies. Nonetheless, results on bus transportation may contribute to theoretical understanding of municipal service distribution. The fundamental research question is as follows: Is the socio-economic character of a neighborhood related to the share of municipal bus service it receives and are shares impacted by politicized decision-making in the public bureaucracy? The structure of the research design is based on a mixed-method approach, which is a combination of quantitative statistical modeling and qualitative archival and elite interview research.

This dissertation broadens the methodology for analyzing urban service delivery in two primary ways. First, whereas most prior studies have used a

single case study, this study examines bus service in four cities in order to compare and contrast results. Second, this study examines the impact of local government form on service delivery decisions. Urban areas are the focus of this study because of relevance (the majority of Americans live in urban areas) and to follow prior literature, which has focused on cities. In addition, rural areas have unique service distribution issues that suggest a different theoretical model than for urban areas. Cities constitute the sampling frame in this study for analytical simplicity because counties and regional metropolitan areas are comprised of multiple jurisdictions and multiple service bureaucracies. Neighborhood is the unit of analysis because in most American cities, neighborhoods are fairly homogenous units comprised of residents that share a common characteristic such as ethnicity, culture or economic status (Savas, 1978). Therefore, neighborhoods are logical units for comparing service levels by socio-economic characteristics.

In certain cases public services are provided by a public authority or special purpose government. Special purpose governments are government corporations established by state legislation with an organizational structure that is a mix of a private firm and a public agency (Foster, 1997). At the same time, they are like private firms in that they have administrative and financial independence from local government and typically do not have the authority to levy taxes. They are like public agencies in that they are providing public goods and are eligible to receive aid from federal, state, and local government sources. Originally, special district governments were created with the intent of separating

politics from administration so that public services would be provided within a private, business-like organizational structure (Mitchell, 1990). Because the organizational structure of these entities is specialized and unique, this study focuses on service delivery activities of public bureaucracies administered by general-purpose local governments.

The body of the dissertation is organized as follows. Chapters 2 through 4 discuss theories on public bureaucracies and service distribution and review literature that is theoretically relevant. Chapter 5 outlines a proposed synthesis of existing theories into a general theory with an accompanying model. Chapter 6 provides justification for further study. The research question, methodology, and research design are covered in Chapter 7 followed by results in Chapter 8. Discussion is covered in Chapter 9 and conclusions with suggestions for future research are discussed in the last chapter.

CHAPTER 2: THEORIES ON PUBLIC BUREAUCRACIES

Given that public agencies are the focal point for this study on the provision of urban services, a preliminary point of inquiry is an understanding of how they do what they do. In that regard, the body of literature examining public bureaucracies from a theoretical standpoint has considerable breadth and depth. One branch of this literature that is concerned primarily with the structural aspect of bureaucracies seeks to apply economic analysis of the private firm to public entities. Called by Moe (1984) the “new economics of organization,” this theory uses the Coasian notion of the efficiency of contractual relationships in institutional organization as well as the principal-agent paradigm to explain how institutions are structured by hierarchy, how supervisors control the behavior of subordinates, and how external actors control the behavior of institutions. Moe argues that the new economics of organization is not directly applicable to public bureaucracies because of the political environment in which they operate and the nonmarket-like nature of public goods, yet the framework does offer some theoretical insight to organizational structure and control.

Another branch of the study of public bureaucracies is deemed the “new institutionalism” (Koelble, 1995). Scholars in this field examine the behavior of individuals within the bureaucracy in order to understand how institutions make decisions. Within new institutionalism, separate schools of thought have

emerged. Rational choice institutionalists argue that individuals within the bureaucracy are utility-maximizers motivated by strategic self-interest. Self-interested actions, then, shape the institutions in which they operate. Douglass C. North (1990) is the most well-known proponent of this theory. Historical institutionalists argue that individual motivations are formed by the institutions of which they are a part. This view, commonly called bounded rationality or satisficing, is often attributed to March and Olsen (1984) whereby rationality is limited and individuals “behave according to a set of rules and procedures which define the appropriateness of their actions” (Koelble, p. 233). When rules are not clear, the result is a “garbage can” approach to decision making which is random and based on limited information. Finally, sociological institutionalists argue that individual self-interest and utility are only understood in terms of the culture and society in which individuals are embedded. In other words, individuals are fully bounded by external factors. Decision-making in this framework is completely dependent on cultural and societal norms as opposed to individual strategizing or satisficing behavior (Granovetter & Swedberg, 1993).

A third branch in the study of public bureaucracies is public administration. This field of study has a long history dating back to the 19th century when the administrative apparatus of government came into focus by the writings of President Woodrow Wilson. The study of public administration has a distinctly normative aspect as scholars were concerned with the best way to do bureaucratic operations such as staffing, budgeting, and management. The paradigm articulated by Wilson was one of professional public administration

whereby government used “science to pursue efficiency” (Kettl, 1983). An essential component of the professional bureaucratic structure as outlined by Wilson is the separation of administration and politics. Under this model, public services are provided according to standard professional norms by staff with technical and managerial training and expertise. Moe (1991) summarizes this model well:

A guiding principle during the formative years of public administration was the separation of politics and administration. According to this notion, a normative one about how good government ought to work, it was the job of elected officials to set public policy through the political process, and the job of administrators to execute policy impartially and effectively – which was possible only in the absence of politics. Politics, driven by concerns for constituency and patronage (and worse), worked against effective organization and had no place in the administrative process. Administration was, as Woodrow Wilson put it, “a field of business,” designed and operated according to the same principles of effective organization that apply in the private sector. (p. 108)

This model of professional management gave rise to the council-manager or “administrative” model for city government. The council-manager form of government is modeled after a private corporation with a board (council) setting policy that is executed by a president (city manager). The mayor in this model is one council member with equal power as the others, largely with symbolic powers (Frederickson, Johnson, & Wood, 2004). The city manager is a professional hired for their expertise in city planning. This form of government dominates the municipal landscape today and is touted by municipal organizations such as the International City/County Management Association (ICMA), whose stated goal is to promote excellence in local government through professional management.

Recognition by scholars and practitioners alike that public administration is not easily separated from politics opened up yet another branch of study on the conduct of public bureaucracies. Svara (1998) argues that the politics-administration dichotomy is overstated and that Wilson originally envisioned a cooperative role between administration and the political body, or the legislature. He notes that while Wilson outlined the importance of an independent administrator who is technically competent, Wilson also noted the importance of administrative discretion and accountability whereby “elected officials and administrators join together in the common pursuit of sound governance” Svara (2001b, p. 179). This cooperative model is more realistic than the model of a rational-technical bureaucracy insulated from political control because it recognizes “reciprocal influence” between administrators and elected officials. Professional bureaucrats are accountable to be responsive to elected officials; elected officials draw on the expertise of administrators to help shape public policy.

Moe (1991) also disputes the notion of the separation of politics and administration but his conceptualization of the role of the public authority is more coercive than cooperative. His argument is that bureaucracies are not institutions of mutual advantage, like private firms, but rather they are structures established by the “winners” of political battles to serve their own purposes which results in “legal coercion and redistribution” (p. 123). Yet winners understand that the political environment is inherently unstable and that its hold on control of power is tenuous. As a result, winners seek to insulate their bureaucratic agents

from contact with political enemies. The insulation is accomplished by a bureaucratic design that consists of detailed procedures and decision criteria. These procedures and criteria, in turn, protect the bureaucracy from having to be responsive to demands that originate from political enemies.

Impact of Public Bureaucracies

While these different theories are useful for understanding structure, hierarchy, decision-making, and the political environment of public bureaucracies, they do not address the question that is central to this study – that is, whether the delivery of public services is equitable. Indeed examination of equity in urban service delivery as a separate field of study began in the late 1960s and 1970s when American scholars in the field of comparative urban politics began to probe distributional aspects in the provision of public goods. These scholars argued that distributional questions are the most important aspect of local government services from a social welfare perspective because of the relationship between access to services and standard of living. As one of the foundational scholars in this field, Robert Lineberry, states, “Distributional considerations lie at the core of what is purportedly the central concern of contemporary political science: ‘Who gets what, when, how’” (Lineberry & Welch, 1974).¹

Distributional issues necessarily raise questions of equity. It is important at the outset to distinguish between equality in service levels and equity in

¹ “Who gets what, when, how” is the title of a 1958 book by the political scientist Harold Lasswell. Lasswell’s primary argument is that the influential elites (as opposed to the masses) “get the most of what there is to get” in the game of politics. The title of his book is referenced continually in public policy literature that is concerned with distributional questions.

service levels. This distinction is made by several scholars within the literature but most clearly outlined by Rich (1979). Equality in service delivery is when every neighborhood gets the same services, e.g., every neighborhood gets garbage picked up once per week. Equity in service delivery takes into account divergent neighborhood conditions and tailors service delivery accordingly, which results in equal outcomes. For example, if suburban neighborhoods generate more garbage because they consume and throw away more goods, they may require more frequent garbage collection than other neighborhoods that do not generate as much trash. Service is therefore more frequent in the suburban neighborhoods, but every neighborhood is equally clear of garbage. As noted by Rich, “the provision of equal service outputs to groups of consumers who are in highly unequal circumstances may produce inequitable outcomes” (p. 152). Conversely, unequal service delivery may result in equitable outcomes. The focus of this study and the literature on which it is based is not whether bureaucrats give the same amount of service to each neighborhood but whether “who gets what” is subject to bias, favoritism, or discrimination.

In fact, evidence of racial discrimination in service provision was one of the reasons that Lineberry began his empirical inquiry of urban service distribution (Lineberry, 1977). In 1971, the U.S. Court of Appeals ruled in *Hawkins v. Town of Shaw* that a town could not discriminate on the basis of race in providing services to citizens. In Shaw, Mississippi, parts of the town with an African-American majority received services that were clearly inferior to those in parts that had a Caucasian majority. This case highlighted what many urban

political scientists believed to be true about cities, namely that the provision of local government services was biased in favor of Caucasian, upper income, and politically powerful areas of the city. To formally test this belief, Lineberry (1975) proposes the underclass hypothesis and in so doing establishes the basis for examining municipal service delivery from an empirical perspective.² The underclass hypothesis states that neighborhoods with higher percentages of disadvantaged citizens – whether by ethnicity, class, or lack of political power – receive quantitatively and qualitatively inferior services. The underclass hypothesis is actually three simultaneous hypotheses deemed by Lineberry ‘race preference,’ ‘class preference,’ and ‘power elite’ (1975, p. 69).

Parallel Research in Urban Geography

Scholars in the field of urban geography have also probed the issue of equity in service differentials. The body of literature in this field has considerable breadth and depth and includes studies from the U.K. and Australia. While these scholars have different terms for spatial inequities including “territorial justice” (Harvey, 1973), “locational disadvantage” (Fincher, 1999), and the “social justice of collective consumption” (Pacione, 2001), the body of literature in this field is dedicated to analysis of the social impact of public facility location decisions. Typically urban geographers approach facility location questions from the perspective of efficiency and cost minimization. Harvey (1973) and others that followed argued that because public goods have a direct impact on quality of life

² Lineberry’s research on service delivery is pivotal in the sense that he formalized inquiry on the provision of public goods into a hypothesis that would be repeatedly tested in subsequent studies. His study is by no means the first on this topic. For a review of literature prior to Lineberry, see Burnett (1981). Burnett deems this literature “evaluation of urban outcomes.”

and social conditions, the location of public services should be approached not only with efficiency in mind but from the perspective of distributional justice as well. The urban geography perspective is summarized neatly in this diagram by Jones & Kirby (1982):

Social policy \Rightarrow spatial pattern \Rightarrow social outcomes (p. 301).

Equity has several aspects that may be used as guiding principles in order to achieve distributional justice in service location. These include: equal inputs, equal satisfaction of demand (Savas, 1978); distribution based on need (Boyne & Powell, 1991); equal opportunity, compensatory equity, market equity (Crompton & Lamb, 1983); and procedural fairness and rights (Hay, 1995). A full discussion of these concepts is beyond the scope of this research; however, the contribution of these scholars in urging evaluation of “current socio-spatial distributions against an ethically defined norm” (Pacione, 2001, p. 365) is directly relevant and parallel to the work of scholars in urban political science who were examining the underclass hypothesis.

A study by Currie, Enright, Hoey, and Paterson (2003) on the transportation disadvantaged population in rural Australia is a good example of a geospatial study of service delivery. Currie et al. devise a measure of need for public transit that includes adults without cars, persons over 60 years, and students and then map the spatial distribution of need by census area against the coverage of the transportation network. Currie et al. find that areas most in need of public transportation have relatively poor access to it. Another example of a geospatial study is analysis of park equity in Los Angeles by Loukaitou-Sideris

and Stieglitz (2002). The authors map inner city and suburban Los Angeles parks against measured need for open space and find that while parks are uniformly distributed in the area, supply in relation to need shows persistent inequity.³

Scholarship in urban service delivery by political scientists and geographers is plainly complementary. Burnett (1981) notes that research in these two fields is interdisciplinary in that both are ultimately concerned with who gets what, why, when and where.⁴ The underclass hypothesis could be examined from a political science or geography approach, the difference being a matter of perspective. For example, a geographer would examine spatial patterns in service delivery whereas a political scientist would use regression models to examine causality in service delivery. Another distinction noted by Burnett is that the political science literature heavily emphasizes the interplay between elected officials and the professional public bureaucracy in service delivery decisions.⁵

The approach to answering who gets what is also slightly different in these two fields of study. In general, the political science literature seeks to determine if levels of disadvantage vary by spatial subunit within a city and asks whether service distribution among those units is equitable according to the underclass

³ For a comprehensive review of literature on territorial justice from the 1970s and 1980s, see Boyne & Powell (1991).

⁴ In his literature review, Burnett (1981), a geographer, gives a friendly chide at political scientists who, "for all the statistical sophistication of their analysis do not treat us to so much as a map of the neighborhoods in their respective studies" (p. 215).

⁵ While much of the literature from urban geography on spatial equity does not focus on bureaucratic decisions, Hodgart (1978) mentions the importance of class and political bargaining on the allocation of service benefits.

hypothesis. The urban geography literature also seeks to determine if levels of disadvantage vary by spatial subunit within a city and asks whether service distribution patterns contribute to spatial disadvantage. In other words, geographers assume levels of “people poverty,” or economic differences, within spatial subunits and examine “place poverty,” or whether the distribution of public goods compounds the benefits or disadvantages of certain locations (Kirby, 1982). The difference in approach is subtle.

This dissertation is focused on the role of the public bureaucracy in service delivery and is based on a test of the underclass hypothesis using statistical methods. For this reason this research is more closely aligned and relies primarily, though not exclusively, on the body of political science literature.

CHAPTER 3: THE UNDERCLASS HYPOTHESIS AND BUREAUCRATIC DECISION-RULES HYPOTHESIS

To test the underclass hypothesis, Lineberry (1975) examines the delivery of municipal services in San Antonio, Texas, which at the time of his study was the eleventh largest city in the U.S. His project is to analyze the relationship between ethnic, economic, and political characteristics and the level of services in each neighborhood. Lineberry chooses two services, fire protection and park services, and calculates distances to these facilities for each census tract in the City as a measure of neighborhood service access. He calculates Pearson correlations between facility distance and variables capturing the ethnic make-up, economic class, and electoral power in each census tract. Based on these correlations he finds no evidence to support the hypothesis that disadvantaged areas receive poorer services. His results hold even after controlling for park quality. He concludes that different service levels in different neighborhoods “can best be described as unpatterned inequality” (p. 79) rather than discriminatory. This phrase unpatterned inequality is subsequently used as a term of art in the urban service delivery literature to indicate that neighborhood service differentials are random and not systematically related to the spatial distribution of residential grouping by income, race, or political power.

In his book Equality and Urban Policy (1977) Lineberry outlines a counter hypothesis on urban service delivery called bureaucratic decision-rules. Under

this hypothesis, the “crucial determinants of the allocation of municipal services” are the decisions of public bureaucrats that operate under a set of professional and administrative rules and procedures (p. 146). In his theory on the “public Santa Claus” as he likes to call municipalities, the missing link in understanding how services are provided are decision-rules, or a deterministic set of administrative behaviors that are routine, predictable, stable, and incremental. “Decision-rules result from some rough admixture of professional norms, rules and regulations or superordinate bodies, loose perceptions of both need and demands” and are the “minutiae of public administration” (p. 153).⁶ The bureaucratic decision-rule and underclass hypotheses are accepted as the two primary theories on urban service delivery within political science literature.

Another foundational work in urban service delivery that renders the same conclusion as Lineberry’s work is a study by Levy, Meltsner, and Wildavsky (1974) on elementary schools, streets, and libraries in Oakland, California. Levy et al. examine various government outputs such as per pupil expenditures, miles of street construction, and per branch library expenditures and then analyze those outputs by the ethnic and economic make-ups of neighborhoods. The authors identify three patterns that emerge from the findings: “the more the more,” or heavy service usage determines who gets more services; “compensation,” or the poorest areas get more services; and “resultants,” or distribution is more the result of unintended consequences of decisions than

⁶ Lineberry acknowledges that bureaucratic decision-rules are more of a truism than a hypothesis; however, he argues that it is necessary to shift service delivery analysis from a sociospatial perspective to an institutional perspective.

“conscious policy choices” (p. 224). Levy et al. conclude that all of these patterns are the result of actions taken by public bureaucracies, whose staff deal with the pressures of the public service environment by “devising operational procedures” that help with uncertainty in decision making. Further, they “adopt formal rules and procedures that embody professional standards” (p. 228) to help make decisions regarding service delivery.

Lineberry and Levy et al. establish the foundation for several studies that test the underclass and bureaucratic decision-rule hypotheses. The first batch of these studies all find evidence to reject the underclass hypothesis. In chronological order: Mladenka and Hill (1977) examine parks and library services in Houston; Antunes and Plumlee (1977) examine street quality in Houston (1977); Mladenka (1978) examines library services and parks in Virginia; Mladenka and Hill (1978) examine police service in Houston; Jones, Greenberg, Kaufman and Drew (1978) examine environmental enforcement, sanitation, and parks in Detroit; Coulter (1980) examines police service in Tuscaloosa; and Mladenka (1980) examines parks and fire protection services in Chicago. The methodology in each of these studies with the exception of Jones et al. (1978) and Coulter (1980) is either correlation analysis or comparative analysis. Jones et al. (1978) use regression analysis and Coulter (1980) devises a “coefficient of inequality.”⁷ Each of these studies fails to find evidence that the spatial

⁷ The coefficient of inequality is designed to measure the difference between the amount of service delivered to an area and the amount of service that should have been delivered given an appropriate equity standard. An example of an equity standard is population, thus the coefficient would calculate service per-capita in each neighborhood as well as service discrepancies. This coefficient is not used in subsequent studies.

distribution of services within a metropolitan area corresponds with the spatial distribution of certain demographic or electoral characteristics in a patterned way.

CHAPTER 4: THE UNDERCLASS HYPOTHESIS REVISITED: LITERATURE REVIEW

A series of studies in the 1980s and 1990s challenges prior studies on methodological and theoretical grounds. In terms of method, these studies question the use of correlation analysis as an appropriate way to examine the existence of bias in service provision. In addition, these studies include a variable to test the bureaucratic decision-rules hypothesis, which in prior studies had either been examined qualitatively or not tested. In terms of theory, certain of the studies introduce the need to consider environmental factors such as population mobility and facilities mobility in service delivery analysis and the need to distinguish among types of services. Overall, the 1980s/1990s studies enhance the knowledge base of urban service delivery and also find evidence to support the underclass hypothesis.

As discussed above, bureaucratic decision-rules was one of the two prevailing hypotheses on urban service delivery following Lineberry (1975) and Levy et al. (1974). While acknowledging that prior work had largely accepted the decision-rule hypothesis, Jones (1981) argues that politics enters into the service distribution process when political groups seek to manipulate rules to achieve desired outcomes. On the theory that organized groups may influence service decisions as intermediaries between residents and public bureaucracies, Jones studies the impact on service distribution of two types of groups – party agencies

and community groups – in neighborhoods where these groups are particularly strong. Jones examines the City of Chicago Department of Buildings, which at the time was responsible for building code enforcement. He tests the impact of group intermediation at three levels of the service process – citizen complaint, actions taken (outputs), and impact (resolution). Party agency strength is operationalized by a “deliverability index” that measures voter turnout and the number of votes for the winning and losing candidate in each ward. Community group strength is determined by surveys of groups who are involved with the code enforcement process. Using regression analysis to control for neighborhood conditions and characteristics, Jones finds that the strength of ward organizations impacts code enforcement at each level. Community groups, by contrast, have no impact. By using regression analysis to control for neighborhood conditions, Jones improves on prior methodology and finds that citizen political activism can influence service distribution “independently of the system of standard agency operating procedures” (p. 698).⁸

Cingranelli (1981) finds that political factors, business interests, and ethnic composition influence police and fire expenditures in Boston neighborhoods. Cingranelli’s study improves upon prior work in two important ways. First, he uses a path model to test direct and indirect effects of neighborhood characteristics on service delivery. Second, he includes a variable of neighborhood service need to test the hypothesis that service allocations are

⁸ In a subsequent theoretical piece Jones (1984) deems this service distribution process “political ecology” whereby formal administrative policies are altered by the “on-going interchanges between legislatures, bureaucracies, interest groups, interested individuals, and political parties” (p. 372).

made on the basis of standard rules followed by professional administrators.⁹ He measures need for police and fire by crime and fire rates, population density, the percent of land that is commercial, and the percent of occupied housing that is built prior to 1939. If the decision-rule hypothesis is correct, these variables would explain the variance in police and fire resources by neighborhood. Cingranelli finds that need is clearly important in explaining police and fire expenditures; however, the story is more complex than need alone. For example, ethnicity has a significant negative direct relationship to police expenditures, indicating that African-American neighborhoods receive fewer police resources than comparable Caucasian neighborhoods. Yet when the impact of ethnicity on expenditures is considered indirectly through political support, ethnicity has a positive relationship to police expenditures because at the time African-American neighborhoods were highly supportive of the mayor Kevin White and were the recipients of political favoritism. Cingranelli concludes that “it is difficult to select a single variable...which best explains the allocation of service expenditures” (p. 688). His study is an important contribution because he uses a path regression model to capture complex direct and indirect relationships in service delivery.

Boyle and Jacobs (1982) expand service delivery research further by increasing the number of services analyzed and introducing a new explanation

⁹ The presence of administrative decision-making is measured by need on the theory that if service decisions are made on the basis of rational-technical standards, need would be an obvious criterion used by bureaucrats to allocate services. Although administrators typically use multiple criteria to develop standard allocation procedures, need is a comprehensive measure that captures multiple facets such as the level of citizen complaints, usage, facility age, and the like. In studies that follow Cingranelli, need is used as a standard measure to test the decision rule-hypothesis.

for service distribution called the contributory hypothesis. Under this hypothesis, services are distributed in favor of neighborhoods that generate higher tax revenue than others. By selecting New York City as their case study, the authors are able to examine several different services rather than just one or two as in prior studies because at the time New York City provided a broad array of services directly (as opposed to being provided by different levels of government as in other cities). Using regression analysis with service expenditures as the dependent variable and socio-economic characteristics and tax contributions per capita as the explanatory variables, Boyle and Jacobs find that ethnicity and income do not impact service levels (they do not test for political factors). They do find, however, that need and tax revenues impact service distribution based on the type of service. Human services such as health and welfare are distributed based on need while property-based services such as police, fire, and sanitation are distributed according to the contributory theory.

Bolotin and Cingranelli (1983) also expand prior research by refining the definition of neighborhood. The authors argue that by not distinguishing between residential and commercial neighborhoods, previous studies are biased in that service needs are not comparable in residential and commercial neighborhoods. To illustrate their argument, the authors examine police expenditures in Boston neighborhoods. Using regression analysis, the authors estimate coefficients for residential and commercial neighborhoods separately and combined. They find that when neighborhoods are measured on a combined basis, services appear to be distributed based on need. Yet for residential neighborhoods alone, they find

that need declines in strength as a determinant of spending whereas electoral clout, measured as neighborhoods that voted for the mayor, increases as a determinant.

The four studies discussed above revisit the underclass hypothesis and find that while certain services may be distributed in systematic ways based on need, rejecting the underclass hypothesis in favor of bureaucratic decision-rules is premature. Elements of underclass bias – in particular ethnicity and political power – impact service delivery as well. These findings are important to the body of literature on urban service delivery because they introduce the idea that service delivery decisions are complex and can be impacted by multiple dynamics.

Koehler and Wrightson (1987) further refine the theory on urban service delivery by examining the role of environmental factors. In a comprehensive multi-decade study on the Chicago parks, the authors not only replicate the original Mladenka (1980) study and re-do it using regression analysis but they control for environmental variables such as neighborhood population heterogeneity, population mobility, and facilities mobility. The authors find that politics, measured by neighborhoods that helped re-elect the existing mayoral machine, does explain service distributions in neighborhoods where the conditions are more “favorable” to political influence. Favorable neighborhoods are those with mobile services such as police protection, which can be more easily manipulated than immobile services like swimming pools. In addition, favorable neighborhoods are those with more homogeneous populations where

“friends and enemies” are more easily identified (p. 93). Overall, like Jones (1981), Cingranelli (1981), Boyle and Jacobs (1982), and Bolotin and Cingranelli (1983), Koehler and Wrightson find both politics and standard administration at work in service distribution. Yet they also add to the literature by demonstrating that service delivery, “whether politically or bureaucratically grounded, is limited by environmental conditions” (p. 95).

In a critique of Koehler and Wrightson (1987) as well as his own prior work, Mladenka (1989) publishes the first longitudinal study of service delivery in Chicago covering a 22 year period. The longitudinal design is an answer to criticism that prior studies using cross-sectional design fail to address “whether a pattern of service distribution had changed significantly over time, or the extent to which such change favored some groups and neighborhoods and deprived others” (p. 562). A second critique that Mladenka seeks to address is that prior research does not use a “multi-indicator approach” for measuring services. For example, Koehler and Wrightson examine immobile services in their Chicago study. Yet Mladenka argues that in order to uncover the political nature of service distribution, mobile services as well as expenditures should be included in the analysis. His research design in this piece is an important enhancement to the literature because he picks up where Koehler and Wrightson left off in articulating a more complex analysis of resource distribution. For example as demonstrated by Koehler and Wrightson, analysis of access to immobile services is highly subject to population shifts, a result which Mladenka confirms in his study as well – as Caucasian families moved out of the City over time, African-

American access to parks improved dramatically. Yet population mobility is only part of the story. Mobile services, to which funds are more easily shifted by political whim, as well as expenditures, which are an indicator of governmental intent, need to be included in analysis in order to round out the service delivery story.

Overall, Mladenka (1989) finds that ethnicity declines in importance in explaining distributional patterns for both immobile and mobile services (the mobile service he studies is recreational programs). This finding is not surprising given the shift from discriminatory politics in the 1960s toward an emphasis on equal access to services in the 1970s and beyond. For expenditures, he finds no consistent predictor of variation. The most consistent finding from this study is that as race declines in explanatory importance over time, the level of home ownership in a neighborhood rises as a consistent predictor of who gets what services. Based on interviews with public officials, Mladenka concludes that home ownership is tied to a sense of community strength and that stronger communities are more likely to make demands regarding service levels. Public officials, in turn, are more likely to heed community demands in order to maintain “stability of middle- and upper-class neighborhoods” (p. 580) as a form of self-preservation. This finding is interesting because it reinforces the Jones (1981) article on the ability of intermediary groups to put pressure on the bureaucracy.

Miranda and Tunyavong (1994) also argue that service type has a bearing on whether distribution is subject political factors. Whereas Mladenka (1989) distinguishes between mobile and immobile services, Miranda and Tunyavong

distinguish among collective goods (police and fire), private goods provided by a third-party (vehicle towing, refuse collection), common pool resources (parks), and toll goods (transportation, utilities). Their theory is that the nature of the public good determines whether distribution may be unequal. For example, with toll goods such as public transit inequality in usage is more a function of ability-to-pay (due to user fees) than distributional bias. On the other hand, the determination of bus routes in a city may be highly politicized. In addition, the authors argue that excludability makes private goods are more susceptible to political distribution whereas joint consumption makes collective goods more difficult to parse out based on political favoritism. Common pool resources are also difficult to politicize due to immobility (the Koehler & Wrightson argument).

To test their theory, the authors examine allocations under several mayoral administrations in Chicago of federally-funded Community Development Block Grants (CDBG) and a locally-funded capital improvement plan (CIP). The authors choose these services because they are nonroutine and may provide mayors “with a considerable degree of latitude to influence the targeting of benefits” (p. 518). Miranda and Tunyavong argue that if the distribution of CDBGs and CIPs, which are similar to private goods, is not politically motivated, it is unlikely that collective or common pool goods would be either. Using regression analysis with allocations per ward as the dependent variable and controlling for neighborhood need, the authors find that electoral support for the mayor as well as aldermanic support for the mayor influence service distributions under certain mayors whose terms were characterized by “machine-style”

politics. Their study is unique in that it raises the idea that the nature of governance may impact service distribution.

Tests of the underclass and bureaucratic decision-rules hypotheses are enhanced in the late 1990s with methodological techniques using geographic information systems (GIS). GIS allows mapping and analysis of the spatial distribution of public facilities overlaid with spatial grouping of socio-economic characteristics. For example, Talen (1997) uses GIS to detect patterns in the spatial distribution of parks in Pueblo, Colorado, and Macon, Georgia. At the census block level (a more refined unit of measurement than census tracts as used in previous studies), Talen investigates whether poor and ethnic neighborhoods have better or worse access to parks than wealthy white neighborhoods by using visual “equity mapping.”¹⁰ These equity maps compare demographically-defined neighborhoods with the location of parks. Talen finds that park access in Macon is clustered around low-income, non-white neighborhoods while park access in Pueblo favors higher-income areas. Although the equity map technique is a more precise method for measuring geographic access to immobile services than correlation analysis, Talen’s model does not control for need. Thus in her study, no explanation is given for why poorer, low-income neighborhoods have better park access parks in Macon or why higher-income neighborhoods have better park access in Pueblo.

Table 1 summarizes the political science urban service delivery literature after Lineberry/Levy et al.

¹⁰ Talen notes that the equity maps are a form of exploratory spatial data analysis (ESDA), which is a family of techniques used to summarize and detect spatial characteristics of data.

Table 1: Underclass Hypothesis Revisited

Author(s)/Year	City	Services	Method	Findings
Mladenka & Hill (1977)	Houston	Parks/libraries	Correlation	Distributional decisions are made on the basis of decision rules
Antunes & Plumlee (1977)	Houston	Streets	T-test	Race and income do not account for street roughness
Mladenka (1978)	Several cities in Virginia	Libraries/parks	Correlation	Black and poor neighborhoods are not disadvantaged
Jones, Greenberg, Kaufman & Drew (1978)	Detroit	Environmental enforcement, sanitation, parks	Regression	Distribution is according to service rules
Mladenka & Hill (1978)	Houston	Police response time	Correlation	Services are distributed in response to need
Coulter (1980)	Tuscaloosa	Police	Coefficient of inequity	No evidence for systematic discrimination
Mladenka (1980)	Chicago	Parks, fire, refuse collection, education	Correlation	Ecology impacts distribution
Jones (1981)	Chicago	Building Code	Regression	Political party groups influence bureaucracy
Cingranelli (1981)	Boston	Police, fire	Path analysis	Politics, business elite, and race impact service distribution
Boyle/Jacobs (1982)	New York	Health, welfare, education, police, fire, sanitation	Regression	Human services distributed based on need; property services distributed based on per-capita tax revenue
Bolotin/Cingranelli (1983)	Boston	Police	Regression	Mayoral support influences distribution
Koehler & Wrightson (1987)	Chicago	Parks	Regression	Environmental factors impact the extent to which politics plays a role in distribution

Table 1 (continued)				
Author(s)/Year	City	Services	Method	Findings
Mladenka (1989)	Chicago	Parks, recreational programs	Regression	Over time, race declines as a predictor of distribution while home ownership increases in importance
Miranda & Tunyavong (1994)	Chicago	Capital Improvement Plan (CIP)	Regression	Electoral support and regime maintenance influence distribution
Talen (1997)	Pueblo, Colorado & Macon, Georgia	Parks	Exploratory Spatial Data Analysis	Socio-spatial service distribution is patterned

CHAPTER 5: GENERAL THEORY ON URBAN SERVICE DELIVERY

In summary, the literature on urban service delivery to date implies that who gets what with regard to public services is a function of both professional decision-rules as well as underlying actions that deviate from rules and procedures, which results in patterned inequality in certain services. Except in the case of political manipulation, which is essentially a trading-votes-for-service dynamic, or outright racial discrimination, the literature is not explicit about *sources* of patterned inequality. In other words, what causes poor or non-Caucasian neighborhoods to receive fewer public resources or upper income neighborhoods to receive more public resources, all else equal? At some point in the service distribution process, public agencies make decisions that result in patterned inequality. What factors contribute to these decisions? Several explanations originate from the political science and public administration literature that help frame a general theory on urban service delivery. The general theory is not new; rather, it is an attempt to synthesize ideas on service delivery from the extant literature. The theory is more comprehensive than the prevailing underclass and bureaucratic decision-rules hypotheses because it considers the context within which service delivery decisions are made.

Political Pressure

Clearly, as pointed out by Moe (1991) and others, public agencies do not operate in an insulated independent environment like a private firm. Agencies

operate in an inherently political arena and may be subject to pressure from elected officials. For example, an elected official who receives complaints from constituents about a particular service may approach the agency in charge of the service and request a deviation from standard allocations. In the extreme case where politicians have strong influence over the decisions of service agencies, this dynamic amounts to trading votes for services. Yet a more likely scenario is that public bureaucracies are constantly bombarded with requests and complaints about service levels in certain neighborhoods and then must decide if or how to respond to those complaints. The extent to which the bureaucracy is under political control depends on several factors including form of government in the jurisdiction (mayor-council versus council-manager) (Svara, 1999) and what the public agency believes are its responsibilities with regard to responding to outside influence (Greene, 1982). These two factors are discussed below.

The literature on government form and reformed political structures indicates that public agencies may be more influenced by elected officials under the mayor-council form of government than under the council-manager form. Svara (1999) argues that separation of powers between the mayor and council in a mayor-council form gives the mayor extensive control over policy, administration, and staff. As a result, mayors can “tap organizational resources or utilize executive powers to advance their political ends.” An example of this type of mayoral power is “cutting the budget for services in the districts of council members who oppose the mayor” (p. 147). Svara also points out that in mayor-council cities, competing policy goals between the mayor and council often

results in gridlock. In this scenario, the bureaucracy can “play the mayor and council off each other” and take on unique power of its own. Thus in a mayor-council form, the bureaucracy is more likely to be subject to manipulation or to exercise discretion. By contrast, in the council-manager form of government, the council has unitary power over the mayor and the bureaucracy. The council appoints a city manager who is accountable to the council and the office of mayor is largely ceremonial. In this form, bureaucratic manipulation and discretion are more limited.

The structure of city council elections might also impact the extent to which elected officials can pressure the bureaucracy. MacManus (1999) notes that when council members are elected by district rather than at-large, the constituency base for council members is district-based rather than city-wide. As a result, the potential for “ward style” politics is greater with district elections. Additionally, MacManus points out that districts can sometimes be drawn based on certain racial or ethnic groupings of residents. A community unified by racial or ethnic bonds may be more likely to organize and make demands for service to a “captive” council member than a heterogeneous community with varied demands for service.

Besides form of government and the structure of council elections, bureaucrats’ perception of job duty might impact the ability of elected officials to influence service outcomes. In a study of municipal administrators in New Jersey, Greene (1982) finds that receptivity is related primarily to how administrators understand their role. Greene examines two conceptualizations of

the “organizational man” borrowed from Harmon (1974): the professional technocrat and the politico-administrator. The former sees their job as the routine application of objective rules (similar to Lineberry/Levy) whereas the latter sees their job as involving compromise with citizens and elected officials. Professional technocrats are less responsive to demands from both citizens and officials because they believe bowing to external requests hinders the effectiveness of the agency. By contrast, politico administrators see their role as part of a larger political process and are more likely to try and respond to the concerns of elected officials and citizens. Greene finds that the majority of bureaucrats (75%) fall into the professional technocratic category. This finding is consistent with the summary of the literature above that most public service is delivered via standard procedures but with deviations from procedure in particular situations.

Although administrative receptivity is a part of the general theory on urban service delivery, it is not tested in this study on bus service. Testing for bureaucratic receptivity would involve collecting data directly from public administrators, which although it would be highly desirable data to round out the theory, is beyond the scope of this study. Instead a test for the impact of political pressure on bus service delivery is based on readily available data on government form and council election structure that indirectly capture the potential effect of the public bureaucracy.

Pressure from Community or Neighborhood Groups

In a dynamic that operates similarly to political pressure on the bureaucracy, advocacy by community and neighborhood groups might impact

service levels. This pressure may take the form of direct contact from a community group to the bureaucracy or indirect contact through an elected official. In either case, as noted by Jones (1981), “intermediary organizations...maybe able to take advantage of bureaucratic procedures to secure benefits, or even change the rules or alter their impact “ (p. 688). It is important to note here that some bureaucratic decision rules *allow* for requests from constituents to be a factor in determining service allocations. Many transit agencies have a citizen advisory committee that gains public input on service changes and they may also hold public meetings to gather input on proposed service changes. These activities would be considered part of standard decision-rules. But where this type of community input is not the case, bowing to pressure from a community group would be considered a deviation from standard professional procedures.

A typical American city has an assortment of neighborhood and community groups, some more active than others. Often the interests of neighborhood groups are property-related, for example mobilizing against gentrification or commercial development. In other cases groups mobilize to reduce drug dealing or other kinds of crime. In still other cases and of import to this study on bus service, groups mobilize to improve municipal services (Mesch & Schwirian, 1996). The ability of community groups to impact service decisions depends on several factors. Mesch and Schwirian find that effectiveness depends on socio-economic status and organizational complexity. They examine a sample of neighborhood groups in Columbus, Ohio and the ability of these

groups to influence policy makers in conflicts over land use. Effectiveness is measured both in terms of process and outcomes. The authors find that higher socioeconomic status of a neighborhood is associated with more effective collective action, but not because residents of these neighborhoods are necessarily more active than residents in poorer neighborhoods. This finding suggests an elitist bias in favor of upper-income neighborhoods on the part of city officials. In addition, the authors find that the more resources that associations can mobilize from its members, such as newsletter publication and meeting attendance, the more effective the collective action. This result is not surprising and suggests that any neighborhood, whether low- or upper-income, could effectively lobby for services if they are well organized. Mesch and Schwirian analyze neighborhood racial composition as well and found that race did not impact the effectiveness of group action.

Berry, Portney, and Thomson (1993) arrive at similar conclusions in their in-depth five-city study on citizen participation in policy-making. Like Mesch and Schwirian (1996) they find that socioeconomic status is positively correlated with neighborhood group activity yet unlike Mesch and Schwirian this relationship is because residents in higher income neighborhoods are more active. This result holds true regardless of organizational complexity. They also conclude that the participation structure established by a city positively impacts citizen involvement. In other words, if city officials have a process for gathering input from community groups, citizen participation increases. Yet even in cities with good participation structures, Berry et al. find that the ability of community groups to impact the

“agenda building process” within a city is limited. Thus the presence of active community groups does not mean that these groups are able to secure the benefits they desire. This conclusion is similar to that of Jones (1981), discussed above, who found that party organizations were able to influence service outcomes but community groups were not. When all of these dynamics on neighborhood action are considered with respect to bus service, we may expect to find that upper income neighborhoods receive disproportionately better bus services than others but not necessarily as a result of active community groups in these neighborhoods.

Impact of Rules

Political pressure or pressure from neighborhood groups may cause a public agency to deviate from established service delivery rules, resulting in a pattern of service distribution that varies according to the social or racial characteristics of a neighborhood. Yet it is also possible that service distribution variations arise not because of the underlying actions of public bureaucrats but directly as a result of established service delivery rules. Rules that appear fair, neutral, and predictable may end up having an unintended distributional impact whereby one neighborhood is favored over another.

It is critical from a theoretical standpoint to distinguish between intended and unintended distributional impacts. As discussed in Chapter 2, because of differences in neighborhood conditions, equitable decision rules would result in some neighborhoods receiving more or less service than others. For example, high-crime neighborhoods would be expected to receive more police patrols than low-crime neighborhood. Similarly neighborhoods where a high proportion of

residents have no cars would be expected to receive more bus service than neighborhoods where most people have cars. Because high-crime and low-car neighborhoods are often poor and non-Caucasian neighborhoods, rules that distribute resources according to need would have the intended consequence of less police and bus service in upper-income Caucasian neighborhoods. What is of more interest from an outcome perspective is where seemingly fair rules have unintended consequences that result in patterned inequality.

The literature in Table 1 has several examples where standard rules lead to non-neutral distributive outcomes. For example in Oakland, California, Levy et al. (1974) found that certain rules favored high-income neighborhoods (i.e., “the more the more”). Because rules for teacher transfers allowed teachers with more seniority to request a certain school, experienced teachers requested upper-income schools because they were perceived to be easier to teach in. The result was that more experienced teachers, who also had higher degree attainment because they received advanced degrees while on the job, taught in white upper-income schools. In another example, Mladenka and Hill (1977) found that in Houston library resources were allocated based on circulation rates. Since circulation rates were higher in branch libraries located in higher income neighborhoods, this seemingly fair and neutral rule resulted in less library resources for low-income neighborhoods.

Jones, Greenberg, Kaufman and Drew (1978) also note the distributional impact of service rules in their study of Detroit sanitation service. They discovered two decision rules in place for service delivery; first, allocate

resources according to the amount of garbage generated, and second, allocate more resources to the center city. The first rule was implemented for operational efficiency with the intended effect of equality in neighborhood sanitation conditions even though some neighborhoods would receive more sanitation resources. Yet analysis by Jones et al. found that the amount of garbage was positively correlated with income, thus the unintended result was higher income neighborhoods receiving more sanitation resources. The second rule was also implemented for operational efficiency because center city neighborhoods have more alleys, which make garbage collection more difficult than “front pick-up.” Because the center city was populated with poorer residents, the second rule had the unintended result of benefitting poor neighborhoods disproportionately.

These examples indicate that an analysis of bus service delivery rules is an important component in understanding bus service distributions.

Discretionary Behavior

When decision-rules are vague, loosely worded, open to interpretation, serve as guidelines, or only define minimum levels of service, the door is opened for individuals within a public agency to exercise discretion in service allocation. The body of literature on bureaucratic discretion is rich and offers several explanations for the behavior of individuals within a public bureaucracy. When discretionary behavior comes into play, outcomes of bias or favoritism in service delivery are more likely.

Theories on bureaucratic behavior are best understood on a theoretical continuum. As discussed in the Introduction, the new economics of organization, which is based on Coasian transaction cost theory, assumes that bureaucrats

are rational, utility-maximizing public employees that arrange themselves in contractual relationships based on authority to accomplish the mission of the organization in the most efficient way (Moe, 1984). Behavioral theories such as those based on the work by Herbert Simon (1947) are founded on the importance of going beyond neo-classical assumptions of individual rationality to understand how “people actually think.” Simon introduced the concept of bounded rationality and satisficing behavior whereby individuals in an organization cope with the overwhelming complexities of the organizational mission by following simplified routines. As a result, organizational output may not be efficient. Also in the behavioral tradition, March and Olsen (1984) argue that individuals within an organization do not necessarily seek to maximize their utility but rather seek to follow rules and behaviors that have been established by the organization as appropriate. In cases where established rules are not clear, individuals “dip into a garbage can of possible solutions” that emerge from habit or routine (Koelble, 1995). These behavioral theorists lay the foundation for understanding discretion in bureaucratic decision-making.

Another framework of bureaucratic behavior that builds on prior theory but adds more depth to the understanding of how individuals in public agencies do what they do is principal-agent theory (Spence & Zeckhauser, 1971). Based on neo-classical economic theory, the principal-agent model characterizes organizations as agents that carry out the mission of principals (elected officials) to whom they are contractually bound. Within the organization is another layer of principal-agent relationships with supervisors as principals and workers as

agents. This structure creates certain incentives for each party based on information asymmetry. The principal has an incentive to ensure that the agents carry out the work that the principal is responsible for and the agents have an incentive to carry out the wishes of the principal only if it is their best interest. In this model, the agents are rational utility maximizers whose main motive is to maximize nonwork, which results in “shirking.” Principals in turn control shirking by different forms of monitoring. Although the principal-agent model is not directly applicable to public bureaucracies because there is no “residual” or pecuniary reward with which to control agent behavior such as in a private firm, Moe (1984) argues that this model is applicable to public bureaucracies because its focus on hierarchical control “captures the essence of organizational relationships and offers a coherent framework for integrating both the bureaucratic and the political dimensions of administrative performance” (p. 772).

Brehm and Gates (1999) offer a more fully developed model of bureaucratic behavior using the principal-agent framework that they call the “enhanced principal-agent model.” Their main premise is that “bureaucratic accountability depends most of all on the preferences of individual bureaucrats” (p. 2). Their model hinges on expanding the utility function of bureaucratic workers to allow for the utility of work to vary across tasks according to preference for a particular project. Therefore this model allows that agents may actually like the work they do and want to see policies succeed. Their behavior choice is expanded from just working versus shirking to working, leisure-shirking (traditional shirking), dissent-shirking (because of opposition to a project), and

sabotage (negative output). This expanded model also has implications for principal or supervisory control of workers because the motives of workers are more complex. Brehm and Gates find that while pecuniary rewards still matter for bureaucrats, the most efficient means to encourage work is to give workers projects that give them a sense of accomplishment and feeling that they have done a good job. By including a range of possible behaviors, the Brehm and Gates framework offers a robust and thorough description of what happens inside bureaucracies.

The focus of the theories discussed above is an understanding of behavior inside public bureaucracies. Another branch of this literature focuses on the behavior of street-level bureaucrats, or bureaucrats whose work involves direct contact with citizens. Lipsky (1980) outlines the most influential theory on the behavior of street-level public workers. Lipsky argues that bureaucrats respond to the pressures of their work environment – namely inadequate resources, challenges to their authority, and ambiguous job expectations – by creating simplifying routines and mechanisms to help them get through their tasks and minimize stress. The structure of these routines is informed by the stereotypes and biases of the bureaucrats. Thus a student who is perceived as brighter and less hostile may receive more attention from a teacher than a student who is perceived as difficult. Or a suspect who is perceived as aggressive may be treated more harshly by police than a suspect who is perceived as compliant. Inevitably, race and class stereotypes influence perceptions. The result is inequitable service delivery that is defensible according to the bureaucrat but

biased in the eyes of the citizen. Lipsky argues that the result of these dynamics in street-level bureaucracy is that workers may be incapable of providing better service to some clients.

Maynard-Moody and Musheno (2003) describe the street-level dynamic in different terms than Lipsky. They argue that conflict between two different narratives – the “stage-agent” whereby bureaucrats seek to apply laws and regulations, and “citizen-agent” whereby bureaucrats make judgments about the moral character of the people they are serving – interact to describe why street-level workers do what they do. The result is that some citizens receive discretionary treatment from “risk-taking street-level workers,” others receive what the rules allow, and “still others are excluded from help or...maligned and abused” by street-level workers (p. 5). In this model of behavior, discretion is a powerful tool that can impact social order for the better or for the worse.

Taken as a whole, theories on bureaucratic behavior are useful for understanding why staff within a public agency may exercise discretion in service allocations. It is not difficult to envision that faced with the complexities of deciding where to put bus stops and routes, staff may fall back on habits and routines to get around rules or even shirk the rules if they did not believe rules were justifiable. And although bureaucrats that make decisions on bus service are typically not street-level workers, similar dynamics may operate for bus agency staff. Staff may make judgments about residents in particular neighborhoods and whether or not they were worthy of the bus service that rules require.

Even if bureaucrats generally follow standard procedures due to a sense of doing what is right for the organization (March & Olsen, 1984) or because they have a preference for doing a good job on a project that they believe in (Brehm & Gates, 1999), it seems likely that they could also be influenced by subtle biases. Stone (1980) argues that the predispositions of public officials cause them to favor “upper-strata interests” in service delivery decisions. In Stone’s theory, society is stratified according to power and influence and this stratification results in systemic power of the upper-strata because of their economic position in society. Public officials are cognizant of this power and are thus predisposed to favor the upper-strata even if the favoritism is “unplanned and unforeseen” (p. 979). Stone argues that presumed unpatterned inequality of urban services does not make sense in light of a “higher level of dissatisfaction with service delivery among lower-income and minority groups” (p. 986). Stone, however, does not offer evidence of either predispositions on the part of bureaucrats or dissatisfaction on the part of residents.

Overall, the literature on bureaucratic behavior suggests that discretion is a key element in understanding the allocation of public resources. Bureaucratic discretion is difficult to measure without gathering data directly from individuals making service decisions. Gathering this data is beyond the scope of this study; however, if data used in this study find a pattern of inequality in bus service, further research on bureaucratic behavior will be required.

Type of Service

Finally, the type of public service impacts the degree to which delivery rules can be manipulated. Jones & Kaufman (1974) suggest that social services

such as education, police, and health may be more prone to political control because these services are more subject to “demand-making” by citizens. In other words because issues with social services are more frequently the target of community concern, they are more likely to be subject to public accountability and thereby political involvement. Yet in a study of New York City, Boyle and Jacobs (1982) found the opposite result – that social services were distributed according to economic need whereas resources for “property-related” services such as police, fire, and sanitation were distributed according to who paid higher taxes. (This contrast is due in part to differing definitions of police protection as a social service or a property-related service).

Jones et al. (1978) also argue that fixed facilities are less susceptible to political manipulation than mobile facilities because they are the least amenable to change in a short time period. Cingranelli (1981) makes this argument as well with respect to police and fire services in Boston, where his model had higher explained variance for police than fire services due to “greater short-term manipulability of neighborhood police allocations” (p. 676). A quote from his study summarizes this point well: “Fire protection is a capital-intensive service function, relying on immobile facilities spatially disbursed within a community. Police services, on the other hand, are mobile, labor intensive, and would be expected to be more responsive to short-term administrative, political, or economic influences...”(p. 676). In their study of Chicago parks, Koehler and Wrightson (1987) also find that neighborhoods with park facilities that are less susceptible to short-term redeployment (e.g., outdoor facilities such as swimming

pools) are less subject to political favoritism in distribution than more mobile park facilities (e.g., indoor programs such as art and music).

Besides fixed versus mobile facilities, Baer (1985) states that it is important to distinguish between labor- and capital-intensive public services because the decision-making process differs for these two types of services. For example, labor-intensive services, such as police patrols and garbage collection, are routine and repetitive with decision-making that is short-term and easily revisable. By contrast, capital-intensive services, such as new baseball fields or transit lines, require long-term budgeting and planning with decision-making that is not easily reversible. Baer argues that because capital-intensive services are often subject to public approval, bureaucrats may be forced to “provide well-articulated and publicized justifications of distributive decisions” (p. 891). Decision-making for labor-intensive services, on the other hand, is more behind the scenes in the bureaucracy.

As discussed above, Miranda and Tunyavong (1994) argue that a distinction must be made among collective goods, private goods provided by a third-party, common pool resources, and toll goods in the analysis of urban service delivery. With regard to bus service they argue that the toll good aspect may mitigate distributional bias while on the other hand the labor-intensive determination of bus routes may invite distributional bias. Overall, bus service, or the provision of bus routes and stops, is a mobile, labor-intensive service. (The capital-intensive portion of bus service, which is the purchase of new equipment and new transit lines, is not the subject of this study). To the extent that bus

service provides for the mobility needs of urban residents, it could be considered a social service as well. Thus we would expect that bus service might be more susceptible to rule manipulation.

Theoretical Model

The preceding discussion suggests a theory of service distribution that is depicted by the chart shown in Figure 1.

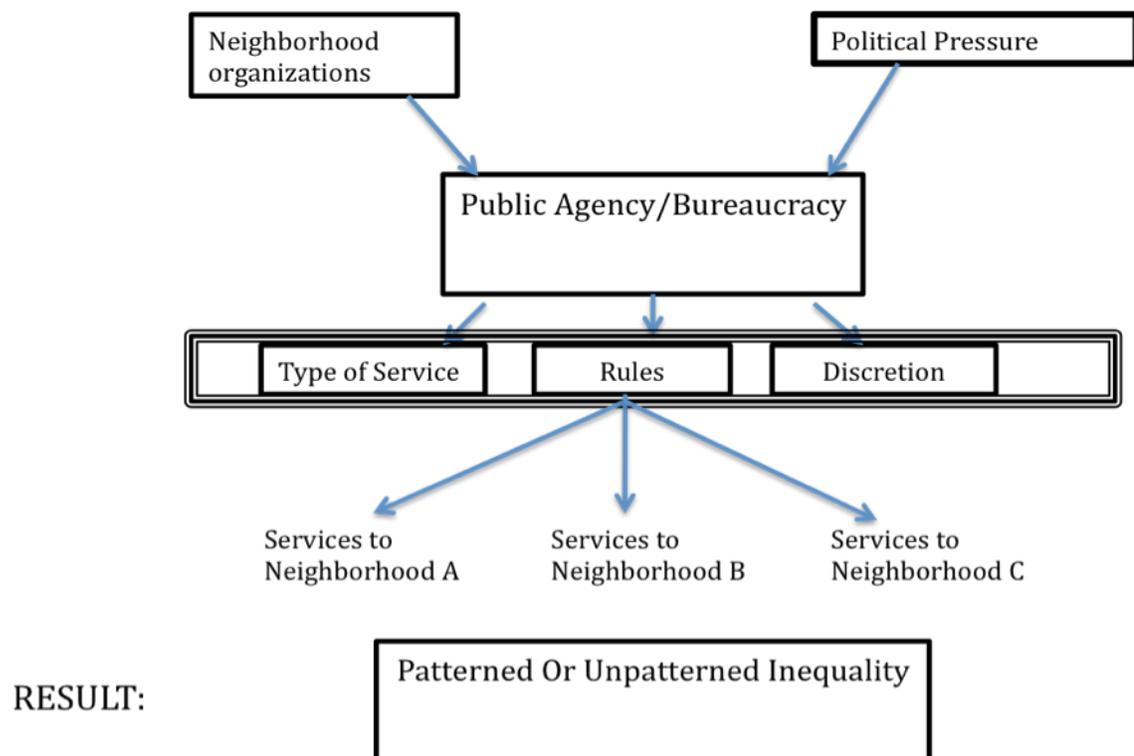


Figure 1: Model of Service Distribution

The core of the model is the public agency or bureaucracy that is charged with providing a public good. The public agency translates budgetary allocations into service outputs, which are then distributed geographically throughout the metropolitan jurisdiction. Service distribution takes two forms: patterned inequality, where geographic distribution across the jurisdiction is skewed to certain areas because of political pressure, neighborhood group pressure, discretionary behavior on the part of staff in the public agency, the rules

themselves, or the type of service; or unpatterned inequality, where geographic distribution across the jurisdiction results in service level differences devoid of such systematic relationships. This model provides the basis for the research design and analysis in this dissertation.

CHAPTER 6: JUSTIFICATION FOR FURTHER STUDY

Given the theory established above, the next step is to test the theory on a particular service or services within a metropolitan jurisdiction or multiple jurisdictions. This study focuses on public transportation and bus service in particular. Although the literature on equity in public transportation is broad (as discussed below), few studies specifically test the underclass hypothesis and bus service. Grengs (2001), using a GIS-based method similar to Talen (1997), measures neighborhood access to grocery stores in Syracuse, New York via public transportation. Grengs finds that African-American and low-income residents likely find it more difficult to reach grocery stores than other residents. Like Talen, his model does not control for neighborhood need. Miranda and Tunyavong (1994) discuss transportation theoretically as a toll good but do not empirically analyze transportation in their Chicago study.¹¹ Currie et al. (2003) use a needs-gap method to demonstrate that access to transportation in rural Australia is inequitable. Yet their study focuses on whether the transport system was designed to meet community needs. Thus a test of the theory on urban service delivery and public transportation on a neighborhood basis would be a contribution to the literature.

¹¹ Miranda and Tunyavong argue that inequality in the distribution of a public good depends on the type of good. Types of public goods are collective goods, (police), private goods (parking meters), common-pool resources (parks) and toll goods (museums, transportation). They argue that toll goods may be less subject to unfair distribution access depends first on ability to pay. On the other hand, bus route placement may be a highly politicized activity.

Public transportation is an opportune service to study for two primary reasons. First, public transportation is vital to the economic and social well being of urban areas from a public policy perspective. The American Public Transportation Association (APTA) (2008a) reports that almost 60 percent of transit rides are for commuting to work. Given the economic and environmental costs of automobile congestion in urban areas, public transit provides a necessary and viable option for mitigating the side effects of car-based commuting. Public transit has become even more important in light of the recent rise of gas prices. In 2008 when fuel prices rose above \$3.00 per gallon, transit systems across America reported increases in ridership, which corresponded with a decrease in car vehicle miles traveled. The response of transit use to gas prices indicates that where transit is available, users are able to transition fairly quickly from cars to transit with the associated benefits of cost savings and reduced road congestion. The transition from cars to transit held even when gas prices fell in the later half of 2008. The APTA reports that in 2008 transit ridership was the highest that it had been in 52 years, with increases on all modes of transit (APTA, 2009). Increased ridership suggests that users switching from cars to transit for cost reasons have found transit a suitable alternative to cars.

Public transit also provides mobility for those without access to private transportation. Eleven percent of transit trips are for going to school and nine percent for shopping and medical visits (APTA, 2008a). For some urban residents, the availability of transit can mean the difference between being able

to access schools, stores, or the doctor or not. The Federal Highway Administration (2002) reports in a transit rider survey that 21 percent of riders had no other means of reaching their destination (including walking) without public transit. As noted by Murray (2001), “the ability to maintain one’s network of family and friends is vital to perceptions of quality of life since transportation provides the means for this interaction” (p. 177).

A series of studies conducted in various Australian areas highlight the link between social exclusion and mobility. As summarized by Dodson, Buchanan, Gleeson and Sipe (2006), these studies find a relationship between low socio-economic status and transit-poor areas of Melbourne (Morris, 1981, Cheal, 2003, Dodson, 2004) and Sydney (Battellino, 1997). In addition, Dodson et al. (2007) find that connectivity between residential areas and employment centers via public transit in Gold Coast City is low for more disadvantaged residents. The main project of these studies is to demonstrate that lack of mobility compounds social disadvantage because without access to transit, poorer residents cannot access employment and other services needed to improve their economic status.

Second, bus transportation is a service that has been the target of criticism for patterned inequality. Several transit agencies across America have been subject to complaints for discrimination against minority riders in terms of the quantity and quality of service provided including Los Angeles, San Francisco, Boston, St Louis, and Chicago (Pucher, 1982). Common complaints are insufficient service provided to inner city areas, particularly from inner city areas to suburban job areas, and more crowded, less dependable, and slower

service in inner city areas. Because in many metropolitan areas the majority of inner city riders are non-Caucasian residents, complaints about transit service have in some cases been filed as violations of Title VI of the Civil Rights Act of 1964, which prohibits discrimination against minority groups in federally funded projects (Pucher, 1982). Los Angeles is the most prominent example of a Title VI legal action. In 1996 the NAACP Legal Defense and Education Fund, Inc. filed a class action lawsuit against the Los Angeles County Metropolitan Transportation Authority claiming that the system operated separate and unequal bus and rail systems. The plaintiffs, which included the Bus Riders Union and the Korean Immigrant Workers Advocates, claimed that inner city buses were more crowded and that proposed fare hikes, which were being levied to fund light rail systems, were unfair. The plaintiffs won the suit. As a result, fares were not increased and more buses were put on inner city routes (Environmental Defense Fund, 2008).

Equity issues in bus service have been raised not only with regard to the quality and quantity of service but with regard to finance practices that result in unfair inter-modal and intra-modal subsidization.¹² Across transit modes, almost every public transit system in the U.S. receives government subsidies in order to help cover costs. The subsidies match 50 percent of operating costs and 80 percent of the net cost of new capital projects. Garrett and Taylor (1999) argue that due to ridership patterns these subsidies have a social equity impact. Inner

¹² A useful summary of transit equity evaluation research is found in Iseki, H. and Taylor, B. D. (2001). *The Demographics of Public Transit Subsidies: A Case Study of Los Angeles*. Presented at the 81st Annual Meeting of the Transportation Research Board. Washington, D.C., January 2002.

city residents who are typically low-income and non-Caucasian tend to rely more on bus and subway whereas suburban residents who are typically higher-income and Caucasian rely on express bus and rail transit. Due to federal subsidy rules that favor new capital investments over operating expenses as well as the political reality of voters who tend to favor commuter rail projects over less-appealing bus transit, subsidy dollars are more likely to go towards new capital-intensive commuter and light rail lines. Thus subsidy dollars are skewed in favor of upper-income riders. Li and Wachs (2004) confirm this argument in a study of San Francisco's Geary Corridor transit line. They find that the preferred light rail alternative for improving the corridor would generate the most financial support from the federal government even though an alternative that would have upgraded the existing bus system would have been more efficient from a cost perspective.

Subsidy variations exist within bus service as well. Because most transit systems charge a flat rate per trip, short trips are more profitable to a transit system than long trips (Pucher, 1982). Because inner city low-income and non-Caucasian riders tend to travel shorter distances than suburban commuters, inner city riders effectively subsidize commuters. A study by Iseki and Taylor (2001) of transit riders in Los Angeles confirms this argument. Iseki and Taylor calculate subsidy per passenger trip, which is essentially cost minus fare revenue, and find that subsidies for express bus service used by higher-income commuters have a higher subsidy than local short-trip bus service. Martinelli and Medellin (2007) report similar results in a study of bus service in Columbus, Ohio.

Using fare per mile and travel time per mile as measures of equity instead of subsidy per trip, Martinelli and Medellin find that fares per mile were lower for longer-distance trips and travel time per mile was shorter as well. They conclude that “not only do privileged groups appear to pay less per mile, but they also appear to receive a better quality service in terms of speed...” (p. 36).

Inequities in the quality of transit service and transit subsidies are symptoms of a larger dilemma in public transit – that is, the problem of conflicting goals. Public transit receives federal funding both to serve the mobility needs of all residents within a metropolitan area as well as to reduce road congestion and poor air quality by taking cars off the roads (APTA, 2008b). The conflict arises because meeting these two goals necessarily entails questions of resource allocation between two different types of transit markets: transit-dependent or captive riders and choice riders. Transit-dependent riders typically encompass a certain demographic segment of the population, namely senior citizens, students, and those who cannot afford to buy and maintain a car. The latter tend to be segregated into certain neighborhoods within a metropolitan area and are highly correlated with low-income and non-Caucasian neighborhoods. By contrast, choice riders use transit primarily for commuting and tend to be segregated in more middle- and upper-class neighborhoods. Therefore resource allocation has equity implications.

The issues with transit service quality and subsidies discussed above suggest that resources may be tilted in favor of choice riders. Grengs (2004) argues that the goal of reducing congestion actually undermines the goal of

universal mobility because enticing choice riders to switch to transit requires offering the type of service that is attractive to them, namely, expensive rail lines with comfortable stations and coaches. Thus scarce resources are diverted from bus lines to rail lines or from inner city bus service to suburban bus service. With regard to bus service, the perception in many urban areas across America is that suburban transit routes receive more transit resources, whether it is more frequent service that runs on time or express bus routes on comfortable, newer buses. Inner city transit is perceived as more run down, with older buses that are crowded and do not run on time. Whether or not the perception is true is the focus of this study; however, the suburban-city tension in transit service is a perpetual issue.

The suburban-city tension in transit is closely related to another public policy issue – spatial mismatch. Spatial mismatch, or the separation of job seekers from available jobs, is the result of a decades long trend of job suburbanization. Cheaper land in the suburbs and access to major highways in suburban locations has changed the economics of locating plants and offices in cities, thereby opportunities for employment in the inner cities has decreased. The impact of job suburbanization is felt on the low-skilled labor force, who tend to reside in lower-income inner city neighborhoods and who are thereby more likely to rely on public transportation to get to work. As more jobs for which inner city residents are qualified move to suburban zones in a metropolitan area, the need increases for transportation from the city to suburban employment centers. As reported by Wachs and Taylor (1998), “Though not necessarily a problem for

workers who have reliable cars, employment suburbanization can dramatically reduce job opportunities for those who depend on traditional, fixed-route, public transit to reach the increasingly far-flung job sites. In a study of low-skilled commuters in ten American cities, for example, Taylor and Ong (1995) found that dependence on public transit reduced employment access far more than did any other factor analyzed, including residential location” (p. 16).

The transportation element of spatial mismatch is particularly relevant in the context of welfare reform legislation in 1996, which requires welfare recipients to work after a certain time period. As discussed above, employment opportunities for these workers are often located in suburbs and require reliable transportation from city to suburban areas. Yet recent investments in public transit have been directed to rail transit, which does not serve the needs of inner city riders. Giuliano (2005) reports that between 1984 and 2000, the supply of transit service in the U.S. increased 38%, with a 25% increase for bus service, 61% for commuter rail, 37% for heavy rail, and 214% for light rail. The emphasis on rail service is to attract riders who travel from suburban areas to white-collar downtown jobs. By contrast, investments in reverse-commute transit that would benefit inner city job seekers has lagged (Wachs & Taylor, 1998). Thus inequities in public transit are germane to broader social issues of urban poverty and equality of opportunity. The following quote from Sanchez, Upton, Jones and Lucas (2007) summarizes well the importance of studying the distribution of bus resources in urban areas:

The process of transportation planning and decision-making allocates social and economic opportunity. Because the allocation of public service

benefits and costs are distributed in space and influence the location patterns of both social and economic classes, the examination of spatial patterns of these benefits has inherent equity implications (p. 1).

CHAPTER 7: RESEARCH QUESTION AND METHODOLOGY

The history of inequities in service quality, subsidies, and investments between inner city and suburban transit service as well as prior literature on underclass bias in service delivery and the extent to which public bureaucracy is professional raises the following research question: is the transit-dependent character of a neighborhood related to the share of municipal bus service it receives and are shares impacted by politicized decision-making in the public bureaucracy? Transit-dependent neighborhoods are defined as those with lower incomes and a higher percentage of non-Caucasian residents. Neighborhoods with a high percentage of students or elderly residents may be considered transit-dependent as well (Pucher, 1982). In addition, with the exception of elderly neighborhoods, transit-dependency may typically be associated with a lack of political clout. Thus the definition of transit-dependent is broader than the Lineberry definition of underclass neighborhoods. Anecdotally, the hypothesis that transit-dependent or underclass neighborhoods receive inferior bus service seems fairly plausible given observed differences in bus quality and complaints from riders in these neighborhoods that their service is not as good as say, service on express routes from suburbs to cities. The hypothesis also seems fairly plausible from the standpoint of economic theory because captive riders have inelastic demand for bus service and thus would be more willing to tolerate

fare increases, crowded buses, and poorly-maintained bus stops because they simply do not have a choice. The null hypotheses generated from the primary research question are that:

- (1) neighborhood income has no relationship to bus service;
- (2) neighborhoods with high percentages of non-Caucasian, elderly, and student residents have no relationship to bus service; and
- (3) politicized decision making has no relationship to bus service.

As noted in the literature, the other hypothesis on service delivery is that distributions are made according to bureaucratic decision-rules without systematic bias. If this hypothesis is correct, we would expect to find that service distributions are related to a standard criterion such as need. The project of the quantitative portion of this dissertation, therefore, is measuring the availability and quality of bus service and explaining the variance in bus service on a neighborhood-by-neighborhood basis.

Unit of Analysis

The research design is based on neighborhood as the unit of analysis. Neighborhood is the most appropriate unit of analysis because in America, neighborhoods in metropolitan areas have almost in all cases developed as segregated socio-economic units due to the phenomenon of decentralization. Decentralization, also known as suburbanization, began in the post World War II era and continues to the present day in many American metropolitan areas. Decentralization is essentially the result of the pursuit of better quality of life away from densely populated cities to areas with more space. For the most part this

pursuit is available to those with the means to buy land outside of the city and cars needed to commute, namely middle- and upper-income residents. Dreier, Mollenkopf and Swanstrom (2001) describe the phenomenon in class terms: “The separation of the rich from the poor is a long-standing tradition in American society...Moving up the economic ladder has also meant moving away from the dust, grime, immigrants, and poor people crowded into the cities to high-status, sylvan suburbs” (p. 31).

Empirical evidence on decentralization is well documented. For example, Berube (2006a) analyzes demographic shifts between large cities and their suburbs using 1990 Census data. Berube found that for the 100 largest U.S. cities, decentralization was the dominant population trend between 1980 and 1990 – these cities grew half as fast as their suburbs and growth in the top 80 of 100 cities was outpaced by growth in the suburbs. These patterns held for cities all across the country, suggesting what Berube calls “common metropolitan destiny” (p. 40). The suburbanization trend is dominant even though several cities have experienced population growth in core urban areas in the form of “downtown rebound” (Sohmer & Lang, 2006).

Suburbanization has an ethnic context as well as an economic context whereby low-income city residents are predominantly ethnic minorities. Berube (2006b) finds that between 1990 and 2000, population in the 100 largest cities in the U.S. shifted from white to “majority minority.” Growth in Hispanic and Asian immigration to cities added to the existing African-American population of cities, which was already high (24.7 percent in 1990). Non-Caucasian populations are

highly correlated with lower-income populations. As reported by Downs (1994), median household income in 1990 was 38 percent higher in the suburbs than in the central cities. In metro areas with population greater than 1 million, the difference was 45 percent.

Not only do inner cities have greater percentages of minority and low-income residents, these populations tend to be concentrated. For example, Glaeser and Vigdor (2006) measure the extent of African-American segregation between 1990 and 2000 and find that, although segregation is at its lowest point since the 1920s, the average index of dissimilarity for African-American residents in metropolitan areas is 0.65, which is generally interpreted as “hypersegregation” on a scale between zero and one. Logan (2006) confirms these findings and reports that in addition, African-Americans tend to live in more segregated neighborhood than Hispanics and Asians.

Beyond socio-economic differences, city and suburban neighborhoods have certain distinct ecological characteristics. Suburban neighborhoods are characterized by low-density land use where newer homes are constructed on more acreage. Suburban retail areas are more dispersed and connected to residential areas by arterial roads. Mobility is exclusively based on private automobile although some residents choose to use public transit for commuting. By contrast, city neighborhoods are characterized by high-density land use, older construction, and multi-family housing units. Mobility in these neighborhoods is typically more pedestrian or transit-oriented.

Because neighborhoods in most cities represent discrete areas containing residents with shared socio-economic and ecological characteristics, the neighborhood is a valid unit of analysis for examining intra-jurisdictional differences in service delivery. Indeed, the research question is only interesting and relevant because of the socio-economic structure of American neighborhoods – if neighborhoods contained a mix of residents, possible bias in service delivery would not be a public policy issue.

In this study, the concept of neighborhood is captured by the census tract. While a few studies in the body of urban service delivery literature have used other units of analysis such as traffic analysis zones or census blocks, most have used census tracts. This choice is logical given the definition of census tract. The Census Bureau defines tracts as “small, relatively permanent geographic entities within counties...to be as homogeneous as possible with respect to population characteristics, economic status, and living conditions” (U.S. Census Bureau, 2008, p. 10-1). Clearly social scientists would argue that the neighborhood is a concept with varying definitions. As discussed by Martin (2003), neighborhood could be a literal place-based definition such as dwellings within close proximity that have similar characteristics and market values. Or it could be a social-based definition such as the area around a certain church or school. Or it could be defined by political ward boundaries. Yet a generally accepted conceptualization of neighborhood is a sub-unit within a metropolitan jurisdiction where housing characteristics, people, and culture are similar. Although census tract does not explicitly consider cultural homogeneity, the

Census definition of census tract fits fairly well with the generally accepted conceptualization of neighborhood. It is also a convenient operational unit of analysis as all Census data are released at this level of geography, and data by many other federal, state, or local agencies are published at this resolution.

Given the unit of analysis, the second step in the research design is to select a sample of neighborhoods for analysis. One way would be to select a random sample of individual neighborhoods across the country in cities that have public bus service. Although a random sample is in many cases a desirable approach, for this study the amount of data gathering from hundreds of bus systems around the country (in order to have a sufficient sample size) that would be required to execute a randomized design is not feasible. Therefore a purposive nonrandom sample of neighborhoods is a second best approach. The issue with a nonrandom sample, of course, is that neighborhood non-comparability creates selection bias. For example, in each city in America the political climate, level of activism, history of the bus system, governance of the bus system, attitudes toward transit, climate, geography, and demographic characteristics differ. These differences would confound the analysis of variation in bus service if a subset of neighborhoods were selected from selected metropolitan areas. A more valid approach would be to select all neighborhoods from a particular jurisdiction so that area characteristics and bus system characteristics are the same for each neighborhood. This design approach is in fact dictated by the general theory on urban service delivery. The theory states that form of government, strength of neighborhood organizations, type of service,

staff discretion, and rules impact how services are delivered to neighborhoods. These variables only make sense within the context of a certain jurisdiction because they are unique for each jurisdiction. Therefore comparison within jurisdictions is more valid than comparison across jurisdictions.

All of the studies listed in Table 1 with the exception of Talen (1997) examine neighborhoods within a single city. The authors do not provide justification for selection of a particular city – presumably they were selected based on research convenience. This dissertation seeks to improve on prior literature by explicitly specifying a method of selecting cities for analysis.

Design

To answer the research question, a single-city case is sufficient as long as the method for analyzing variance in neighborhood bus service is valid and reliable. Yet the results from a single-city case may not be as useful from a theoretical standpoint as a multi-city case. Yin (2003) argues that single case studies are useful when the case represents either a critical, unique, or revelatory case or a representative, typical case. The theory on urban service delivery is more concerned with discovering patterns in service delivery than explaining unique or representative cases. As a result, Yin argues that replication logic calls for a multi-city case study. A single-city study may “uncover a significant finding,” however the “immediate research goal would be to replicate this finding by conducting a second, third” and more cases (p. 47). A multi-case design improves upon past studies that, while adding to theoretical understanding, do not allow for detection of systematic patterns across cities in the delivery of the same service.

In addition to a multi-case research design, Yin argues that a robust study would include at least four cases – two cases from two subgroups, or a “two-tail” design. The subgroups are deliberately chosen based on a key characteristic driven by theory that differentiates the two groups. The two cases within each group have similar characteristics to capture “literal” replication. The two distinct subgroups capture “theoretical” replication whereby the results from the first subgroup may contrast from the results of the first subgroup but for predictable reasons based on theory. Of course a larger sample of cities – ten to 20 – would be desirable in order to increase the number of observations. Time limitations on data collection and analysis dictate no more than four cities for this study on bus service.

Following a two-tail design, the four cities in this study are broken into two subgroups and deliberately chosen on the basis of the form of government in the city. Form of government is the basis for selection because it is one of the key components of the general theory on urban service delivery (as shown in Figure 1). The theory states that political pressure is one reason that a public agency would deviate from standard procedures in making service allocations. Prior studies testing the underclass hypothesis have measured political pressure on a neighborhood basis, usually by measuring support for the mayor or voter turnout by neighborhood. Yet in reformed (council-manager) structures, mayoral support is not necessarily a valid proxy for the political clout of a neighborhood because mayors have less power to influence a public agency than in non-reformed (mayor-council) structures. Furthermore, high voter turnout in a neighborhood

does not necessarily mean that the neighborhood will be otherwise politically active. Thus finding a valid measure for political clout by neighborhood is problematic. Instead, I introduce the concept of political pressure into the model on a city basis instead of a neighborhood basis by using government form as a key point of comparison among cities. This design allows for a test of the theory on the impact of government form on service distribution patterns.

The first step in a multi-city approach requires selecting a purposive sample of cities with bus service. City is the appropriate geographical unit for this study as opposed to metropolitan area because the theory on service delivery is focused on intra-jurisdictional rather than inter-jurisdictional service decisions. The political dynamics and public bureaucracies of various municipalities within a larger metropolitan area differ even though they may be geographically proximate. Analyzing neighborhoods across jurisdictions in a metropolitan area would thereby introduce the issue of non-comparability. This point is important especially in light of bus service, which unlike other services that are provided along jurisdictional boundaries such as police protection, tends to be provided in multiple jurisdictions across a metro area, often on a regional basis. Yet the focus of analysis is neighborhood differences in service delivery, not regional differences. Therefore the geographical area of study must be limited to a single jurisdiction.

Sample Selection

The population from which the sample is drawn is all U.S. cities with public transit service. The sampling frame is data published in the American Public Transportation Association 2008 Public Transportation Factbook (APTA,

2008a). These data rank transit agencies by mode and by various categories including by passenger trips, revenue vehicle miles, and vehicles available at maximum service. Because passenger trips is a common statistic used in public transportation, I worked from the list ranking bus systems by passenger trips to select cities and systems for comparison.¹³ The APTA data list 490 bus systems in total (the data are based on primary data from the Federal Transit Administration's National Transit Database). The top 24 systems have greater than 50 million annual passenger trips. The next 50 systems have between 10 million and 50 million annual passenger trips, 205 have between 1 and 10 million trips, and the remaining 211 have less than 1 million trips.

The first criterion I used to select cities for analysis is that bus is the only form of public transit in the city. The intent of selecting cities with bus service only is to reflect cities where the only true choice for travel besides car (and bike and walking, which constitute a very small percent of travel) is bus service. As such, access to bus service is highly relevant for those without cars or those with cars who choose to use public transportation. That criterion excludes 23 of the top 24 systems. The second criterion is that the bus system is operated by a local government (city, county) as opposed to a special purpose government (public authority). This criterion is critical because the theory on urban service delivery outlined above applies to government bureaucracies and not public authorities, which are corporate-like in structure and are insulated from the

¹³ Trips are reported on an "unlinked" basis, which means that each boarding is counted as a separate trip. Thus a trip from a point of origin to a destination that requires a transfer(s) is counted as multiple trips. Passenger data is commonly reported as unlinked due to the ease in data collection.

political process. This criterion eliminates several cities as the majority of bus systems are operated by public authorities.

The third criterion is that the city has demographic characteristics that allow for a test of underclass bias. This criterion has two components – the city must have a sufficiently large African-American population and a very low Hispanic population. The reason for these components is twofold. First, African-Americans are heavy users of bus transit in general and also use transit more heavily than Hispanics.¹⁴ Second, African-Americans tend to live in more segregated neighborhoods than Hispanics, which facilitates testing of underclass bias by neighborhood.¹⁵ Thus using cities with African-Americans as the dominant ethnic group keeps the samples comparable. This criterion eliminates many cities in the West, Southwest, and Midwest. Fourthly, the transit system must be of a certain minimum size in order to have a sufficient number of bus routes for analysis. This criterion eliminates 211 cities with systems registering fewer than 1 million annual passenger trips.

Finally, the system must not be located in a city that is dominated by a college or university because bus routes that cater to universities do not reflect typical urban residential areas. For example, Tallahassee, Florida has 25 city bus routes, nine of which serve two large universities, Florida State University

¹⁴ In a study based on data from the 1995 Nationwide Personal Transportation Survey, Pucher, Evans & Wenger (1998) find that African-Americans make more than 10 times as high a percentage of their travel trips by bus than Caucasians and almost three times as high a percentage as Hispanics. In a more recent report issued by APTA on rider profiles (APTA, 2007), the APTA found 35.7% of roadway transit riders are Black/African American and 13.7% are Hispanic/Latino.

¹⁵ Using 2000 Census data, Logan (2006) finds that African-Americans are much more segregated from Caucasians than are Hispanics or Asians.

and Florida A&M University. Students are counted as residents by the Census and as a result about one-third of the census tracts in Tallahassee have more than a 20 percent college student population, including the downtown areas. In a typical city not dominated by a university the student population in most census tracts would be about 12 percent or fewer (and would include students of all ages). Therefore bus access results for Tallahassee would be highly skewed.

Based on these criteria, about 16 cities remain from the original list of 490. Of the 16, four are selected, two each with a comparable form of government for the two-tailed case study design as discussed above. Table 2 shows the cities that meet these criteria.

Table 2: Cities with Bus Service Selected for Study

	Mobile AL	Richmond VA	Asheville NC	Charlotte NC
Population	194,091	198,869	74,897	649,578
Percent African-American	48.5%	52.3%	14.7%	33.7%
Percent Hispanic	1.6%	4.2%	4.2%	10%
Unemployment	7.6%	10.6%	5.6%	7.7%
Total Housing Units/Units per Capita	89,020/0.46	93,730/0.47	38,101/0.51	296,465/0.46
Mean travel time to work (minutes)	21.1	20.8	17.6	24.1
Median HHI	35,239	37,442	37,996	51,050
Percent of families below poverty	18.7%	16.2%	11.5%	9.3%
Unlinked passenger trips – (rank)	855 thousand (296 th)	13.4 million (58 th)	1.1 million (262 nd)	20.4 million (46 th)
Form of Gov't.	Mayor-council	Mayor-council	Council-manager	Council-manager

	Mobile AL	Richmond VA	Asheville NC	Charlotte NC
Number of Routes/Total Route Miles	11/377	31/658	24/391	47/1000
Index of Ethnic Dissimilarity ¹⁶	63.3	68.3	56.4	61.1
Number of Census Tracts	84	64	30	127
Land Area in Sq. Miles/Pop. Per Square Mile	117.9/1686.9	60.1/3292.7	40.9/1685.9	242.3/2681.2

Source: 2005-2007 Census Bureau American Community Survey 3-Year Estimates

The subgroup of mayor-council cities is composed of Mobile, AL and Richmond, VA. With the exception of size of the bus system and population density, these cities are quite similar. The subgroup of council-manager cities consists of Asheville, NC and Charlotte, NC. Charlotte is larger in population and land area and more affluent than the other cities, yet the size of its bus system is comparable to Richmond. In 2008, the Charlotte Area Transit System opened a light rail line, which would disqualify the City from consideration in the sample. To maintain comparability, I used bus system data from 2006.

Dependent Variable

Given the unit of analysis and the cities selected for analysis, the next step is to define the concept of bus service in order to measure how resources are distributed among different routes and neighborhoods. The challenge is to conceptualize service in a way that can be measured. Past studies on service delivery have conceptualized service in different ways. One commonly used

¹⁶ Source: www.CensusScope.org.

measure examines service expenditures (Cingranelli, 1981), (Bolotin & Cingranelli, 1983), (Boyle & Jacobs, 1982), (Mladenka, 1989). The advantage of measuring service by expenditures is that data are often readily available and easily understood. The primary disadvantage is that expenditures do not measure service benefits or outcomes – in other words just because more money is spent in one neighborhood than another does not mean that neighborhood will have better services. Other confounding reasons such as differences in costs and needs impact the level of expenditures as well. Mladenka (1989) summarizes this point well by stating that “money is a significant indicator of governmental effort and intent” but to assume that “low expenditure level represents evidence of government neglect would be misleading” (p. 570).

Recognizing the complexities of conceptualizing and measuring service, Lineberry and Welch (1974) give a lengthy and convincing discussion of the importance of outcomes as service measures. In one of the first theoretical pieces on service delivery within political science literature, Lineberry and Welch outline challenges with trying to empirically measure government service output. Since public goods cannot be measured in physical or monetary terms like private goods, the authors argue that the next best way to measure the output of a public agency is “the contribution of its service activities (resource inputs) to its objectives(s), or in other words, in terms of the effect of its service activities on selected community conditions” (p. 704). Direct measures of output such as fire-loss rates and achievement test scores are inappropriate measures of output

because other variables impact community conditions such as density, ethnicity, and income. In other words, neighborhood security is a function of more than just police protection. What are needed instead are proxy measures that correlate with service delivery quality.

Lineberry and Welch then suggest 80 such measures that are divided into six categories: indicators of input quantity relative to potential demand (e.g., per capita police, street lights per miles of street); indicators of input quantity relative to expressed demand (e.g., police per reported crimes, bus seats per passengers); indicators of input quality (e.g., cleanliness of swimming pools); indicators of service delivery quality from the consumer's perspective (e.g., frequency of bus service, proximity of service facilities); indicators of community service facility condition (e.g., smoothness of streets); and indicators of community conditions (e.g., crime rates). Of these, the authors argue that indicators of *service delivery quality from the consumer's perspective* are the most appropriate measures because they "are direct functions of service agency activity and decision-making" (p. 708). The key to this point is agency decision-making, which is at the core of the theory on urban service delivery.

Furthermore, these proxies view service from the standpoint of the consumer, which is ultimately the most important aspect of who gets what and satisfaction with public services.

Similar to Lineberry and Welch's notion of measuring service by its impact on community conditions, Levy et al. (1974) argue for the use of outcomes as service measures. They state that when evaluating service distribution, it is

important to distinguish between government *outputs* (new swings at the park, or new paint at the public memorial) and *outcomes*, which are the “so-what” of politics, or the “judgments by which citizens evaluate their government” (p. 1). Like Lineberry and Welch, they focus their analysis on “citizen-consumers” of government goods. To apply their concept of service in the study of Oakland schools, streets, and libraries, Levy et al. collect various output measures such as per-pupil expenditures, miles of street construction, and books ordered. They then evaluate the outputs based on how they affect different groups of citizens. To evaluate outcomes they ask questions such as “should rich and poor be treated alike in per-pupil expenditures?” and “should each library purchase the same number of books?” Thus rather than using direct outcome measures such as those suggested by Lineberry and Welch they use output measures in comparative evaluation to address outcomes.

A competing approach for measuring service is offered in the same year by Jones and Kaufman (1974). The authors distinguish between “effort expended by a public authority” and the “desired goal state” that the effort is supposed to achieve (p. 339). In direct contradiction to Lineberry and Welch, they argue that effort is the valid measure of service levels because the desired goal state, or outcome, is a function of neighborhood conditions in addition to effort expended. Because of these varied neighborhood conditions, outcomes are not comparable. Interestingly, Jones and Kaufman use the same logical argument on the confounding effect of neighborhood conditions that Lineberry and Welch use to distinguish between outputs and outcomes. Yet Jones and

Kaufman come to a different conclusion. To illustrate their argument they use an example from the private sector: “The services of a medical doctor...are not the sole or even a major determinant of a patient’s health...” In other words, “services rendered are seldom determinative of the desired goal state” (p. 340). Using this logic, Jones and Kaufman argue that effort or the “quality and quantity of the staff and equipment” used to produce a service is the appropriate measure of service. By contrast, Lineberry and Welch would classify these measures as indicators of input quantity and quality.

Table 3 summarizes the various measures of public services discussed above.

Table 3: Measures of Public Services

Approach	Authors	Examples
Expenditures	Cingranelli, Boyle & Jacobs, Bolotin & Cingranelli, Koehler & Wrightson	Police expenditures per neighborhood
Effort (Inputs)	Jones & Kaufman	Garbage routes/1000 persons
Outputs	Levy et al.	Miles of repaved street
Outcomes	Lineberry & Welch, Mladendka & Hill, Antunes & Plumlee, Talen	Proximity of service facilities

Of these different approaches in Table 3, this study will follow the Lineberry and Welch conceptualization of service measured by outcome. If the ultimate question of service delivery research is who gets what, or who gets the benefits of government activities, or who “wins and loses” with regard to the public Santa Claus, it is clear that considering distribution from the perspective of the beneficiaries is the most valid indicator of service. A public agency may believe that their police patrols are equitable based on certain formulas, needs,

or mandates, but if residents do not believe they have adequate police protection then something is amiss. In other words, effort does not tell the entire story.

Levy et al. summarize this point well:

Consider government as a mechanism that makes decisions about what it should do. The decisions result in the production of outputs. Officials dispense these outputs to citizens in such a way that we talk about distribution of outputs or discern a pattern of resource allocation. When anyone evaluates this distribution or pattern, we refer to outcomes. To inquire about the impact of an outcome is to ask how the lives of individual citizens are altered by governmental action in the future (p. 2).

The use of outcomes as a measure of public service is validated by other scholars in urban service delivery and appears to be the most widely accepted measure. For example, Rich (1979) argues that outcomes should be the focus of inquiry because they measure the effectiveness of services in meeting the needs of different groups rather than just what local government did for different groups. Burnett (1981) states that concerning who gets what, outputs, or the actions of public authorities, tell only part of the story whereas outcomes indicate the consequences of outputs on the people affected by them. Pacione (1990) agrees and states that while outputs are the products of public agency activities, outcomes are the “changes in relevant social conditions brought about by a service” (p. 61). These authors emphasize the importance of measuring the impact of service on quality of life, which is consistent with the Lineberry concept of service from consumers’ perspective.

Measuring Bus Service

Using the Lineberry and Welch (1974) classification as guide for conceptualizing service, the next step is to determine a specific measure of bus service. In the public transportation literature, the concept of service is typically

understood as *access* (Kittelsohn et al., 2003b, Murray et al., 1998). For example, having bus service in a neighborhood means residents are able to board a bus somewhere fairly close to their residence, typically within walking distance. Bus access is a broad concept that could be measured with multiple variables including the number of bus stops in each neighborhood, the number of routes, frequency of service, access to key destinations (downtown, medical, shopping), transfer times, and proximity to bus stops. These variables measure different aspects of access. The number of bus stops measures relative availability of access whereas frequency measures the relative convenience of access. Equality in the number of bus stops in each tract does not necessarily mean that service is as frequent in each tract. Likewise, frequency of service does not necessarily mean that the routes take people to major service areas without multiple transfers. Ultimately a variable that captures all aspects of access, including service quality, would be useful for this analysis.

The question, then, is how to operationalize the concept of access in a way that considers the multiple aspects of access. The first and most commonly used measure in the urban service delivery literature is called a container measure of access, which is simply a count of the number of facilities or services contained within a given geographical area (Talen & Anselin, 1998). Lineberry (1975), and Mladenka (1978) primarily used container measures in their studies and calculated, for example, average distance from each census tract to the nearest park or library. The advantage of a container access measure is each of

calculation; however, they are useful only for measuring access to fixed facilities such as bus stops.

More sophisticated measures of accessibility are used in modeling analysis and capture “the spatial distribution of potential destinations, the ease of reaching each destination, and the magnitude, quality, and character of the activities found there” (Handy & Niemeier, 1997, p. 1175). These measures have typically been used to model urban transportation planning and travel demand. These measures include cumulative opportunity measures, which count the number of travel “opportunities” or destinations reached within a given distance, gravity-based measures, which weigh the travel opportunities by an impedance function (i.e., travel time or cost), and utility-based measures, which measure the utility a consumer gets from one travel choice relative to all others.¹⁷

As noted above, cumulative opportunity, gravity, and utility-based access measures are typically used to model travel planning because they indicate “the inherent characteristic (or advantage) of a place with respect to overcoming some form of spatially operating source of friction” (Dalvi & Martin, 1976, p. 18). Sources of friction include cost, distance, time, and convenience. In other words these measures indicate the relative ease of reaching a certain destination such as a workplace or medical facility. In the public transportation context, model-based measures of access would be appropriate for measuring bus service in a comparative sense in terms of the ease of reaching a given destination by bus versus another form of transportation. Yet this study is more concerned with the

¹⁷ For a comprehensive overview of these access measures see Morris, Dumble, and Wigan (1978).

quantity and quality of access on a neighborhood basis than with comparative, destination-based access. Additionally, these measures are based on fairly data-intensive calculations that require a list of all relevant origins and destinations within a certain travel zone, travel cost or time cost from each origin to each opportunity, and, for utility-based measures, a function that captures the attractiveness of a destination. In many cases, gathering these data involves travel surveys collected from individual households within the travel zone of interest (Handy & Niemeier, 1997).

A less data-intensive alternative to opportunity, gravity, and utility-based measures of access is a geographic information systems- (GIS) based analysis of access. GIS is a computer-based tool that analyzes and displays geographic information based on locational characteristics, which according to Nyerges (1995) is highly relevant to the study of transportation because transportation is explicitly concerned with spatial relationships. For example, GIS allows analysis of spatial relationships of such variables as street networks, neighborhood boundaries, bus stops, and major employment centers as well as economic, social, and environmental conditions within a particular area. Understanding these relationships allows transportation planners to draw conclusions about both technical planning issues such as bus route location and policy-related questions such as whether certain destinations are accessible by public transportation.

Thill (2000) extends Nyerges' piece and notes that GIS is well-suited for transportation analysis because of the multi-disciplinary context in which transportation analysis is conducted. Transportation planners must consider not

only transit and highway networks but the “natural, social, and economic systems” that integrate with transportation networks (p. 4). GIS allows for this integration by visually modeling relationships among data from unrelated sources, such as transit routes, neighborhoods, and neighborhood characteristics. This integration is key for the analysis of bus service access because the focus of this study is bus availability as it relates to the socio-economic conditions of neighborhoods.

Grengs’ (2001) study on grocery stores in Syracuse, New York is a good example of this integration. Grengs devises an indicator of accessibility to transit for what he calls “vulnerable” households, or households that do not have access to a car. By mapping those households using GIS with the transit network as well as the location of local grocery stores, he is able to analyze access to grocery stores by vulnerable households. Grengs’ technique is similar to the “equity maps” used by Talen in the study mentioned above on park access in Pueblo and Macon. Another example of a GIS-based access measure developed in the U.K. is a public transit accessibility level (PTAL) index, which measures accessibility from a point of origin to a transit network based on walking time and availability of transit. PTALs are then displayed on a map of a particular transit network allowing visualization of access by area (Wu & Hine, 2003).

Although GIS-based analysis is highly effective in transportation analysis, a third approach for measuring access that incorporates spatial as well as other elements of access is drawn from research on public transportation performance

measures. Traditional measures of transit performance, such as those collected by the National Transit Database, focus on efficiency from the transit agency's perspective. These measures are traditionally used in a business environment and include such things as cost efficiency (total vehicle miles per operating expense), labor efficiency (revenue hours per employee), and vehicle efficiency (high passenger loadings per vehicle miles) (Perry & Babitsky, 1986). In contrast to these traditional measures of efficiency, the Transportation Research Board (TRB) has spearheaded research on performance measures that are customer-oriented. The TRB argues that while traditional efficiency measures are important to transit agencies and funding bodies, the public also has an interest in how well transit is performing and whether "transit provides a valuable service for them, for someone they know, or for the community as a whole" (Kittelsohn et al., 2003b, p. 4).

Specifically, TRB-sponsored research argues that customer satisfaction of public transit is important to several different categories of users including typical riders, welfare-to-work clients, employers, the community, and transit agencies. Typical riders will be more likely to use transit again if they have a pleasant experience and if the service is convenient. For welfare-to-work clients, transit availability may be the difference between being able to find work and not. Likewise for employers whose workers either do not have a car or who find public transportation more convenient, transit availability can improve productivity. For the community, customers who like using transit may increase ridership and ease

funding constraints. Finally, for transit agencies higher levels of customer ridership increase loyalty and increase demand (Kittelsohn et al., 2003b).

Research on customer-oriented performance measures indicates that two measures are most important to customers: availability and comfort and convenience (Kittelsohn et al., 2003a). Availability includes both a spatial element (can a rider access the service) and temporal availability (is the service provided at convenient times and with sufficient frequency). Comfort and convenience encompasses several elements including safety, travel time, and reliability. Selecting a measure that considers availability and comfort and convenience for this study accomplishes two things. First, such a measure would encompass a broad definition of access to bus service, which is more desirable than for example a simple container measure (e.g., the number of bus stops in a neighborhood). Second, this measure would be consistent with the Lineberry and Welch (1974) framework that urges customer-focused measures of outcome.

Several different measures of spatial access, temporal access, and comfort and convenience have been either used or proposed. A comprehensive review of these measures with accompanying calculations is found in both the Transit Cooperative Research Program's Guidebook for Developing a Transit Performance-Measurement System (Kittelsohn et al., 2003b) and in a report by the Center for Transportation Research at the University of Texas Austin (Bhat, Guo, Sen, & Weston, 2005). Choosing an appropriate measure of access from the choices mentioned in these reports requires finding a measure that covers the two main elements of customer satisfaction but that can be calculated with

relative ease from readily-available data. Bhat et al. suggest that one of the better composite measures of transit access is the Local Index of Transit Availability (LITA), developed by Rood (1998) for the Sacramento-based Local Government Commission. The LITA measures three aspects of service: route coverage (spatial availability), frequency (temporal availability), and capacity (comfort and convenience). This measure of access can be calculated with readily available data from transit agencies using GIS as a tool to analyze results at the census tract level.

The original intent of the LITA was to provide urban policy makers and planners a tool that indicates which parts in a metropolitan area the most transit “intense” in order to facilitate transit-oriented development (Rood, 1998). Put differently by the author, “the purpose of LITA is to inform land use and transportation decisions, which are often made under assumptions of near-universal automobile travel without regard to accessibility by alternative modes” (p. 3). Although the LITA is intended for use by city planners, index construction (discussed below) as well as the ability to calculate the index at the census tract level makes it a suitable measure for examining socio-spatial distribution of bus service.

The index has three parts as shown in Table 4.

Table 4: Local Index of Transit Availability

Element	Definition
Capacity	<p>(Total daily seats on a bus line) x (route-miles of transit line in each census tract)/(total population of tract).</p> <p><i>Where</i> Total daily seats = (vehicles per day on each route) x (vehicle capacity) Route miles = (length of two-way route completely within tract) + (½ x length of route bordering tract) Total population = (resident population + worker population)</p>
Frequency	<p>Total daily vehicles in a tract IF the line has at least one stop in a tract.</p> <p><i>Where</i> Totally daily vehicles = (standard + alternate vehicles per day)</p>
Service Coverage	<p>(Number of bus stops in a tract by route)/(square miles of land area in the tract).</p> <p><i>Where</i> Number of bus stops in a tract = (number of intersections with at least one transit stop completely within the tract) + (½ x number of intersections with at least one transit stop bordering the tract)</p>

For each of the three components, a total is calculated by route in each tract and z-scores are calculated for each component. Finally, the three standardized scores are averaged to arrive at an overall LITA score in each tract.

This dissertation uses a LITA score as the dependent variable. Although the LITA does not consider all aspects of transit access such as safety, cleanliness of bus stops, and the like, it is a fairly comprehensive measure in that

it incorporates measures for spatial and temporal availability as well as comfort.¹⁸

In addition, the LITA index can be calculated using GIS and spreadsheets for any transit system for which bus stop and route data are available in database form.

For model estimation, LITA is used as the dependent variable as well as the three components of LITA – capacity, frequency, and coverage – in order to analyze separately these three different aspects of access.

Independent Variables

The hypotheses are that neighborhoods defined by transit-dependency, whether because they have a high percentage of non-Caucasian residents, low income residents, students, elderly, or are lacking political power, receive worse access to bus service than others all else equal. An alternative hypothesis is that bus service is distributed according to equitable standard rules and procedures that result in random variations in service access across neighborhoods. The operationalization of transit-dependency variables is straightforward. Data are from the 2000 decennial Census of Population and Housing and are simply total non-Caucasian population, student population defined as high school, college, and graduate, and elderly population defined as residents over age 65 divided by the total population in each census tract.¹⁹ Income is operationalized as median household income in each census tract.

¹⁸ Capacity is a proxy for comfort in that it measures crowding. Crowding is clearly only one aspect of comfort yet data on more refined measures of comfort such as the age of buses, cleanliness, and climatization are not readily available by route.

¹⁹ Census data measures ethnicity in two different ways. The first is by category such as African-American, American Indian, Asian, other, and two or more “races.” The second way uses the same categories but distinguishes between Hispanic and non-Hispanic. Thus total non-Caucasian population may be calculated either way. I calculated both measures and the Pearson

Using ethnicity and income as explanatory variables is consistent with prior studies on urban service delivery shown in Table 1. In fact ethnicity and income are two of the three primary elements in the underclass hypothesis. None of these prior studies, however, properly dealt with the issue of multicollinearity between ethnicity and income. The validity of using these as separate independent variables is in many cases problematic. Data used in this study show a Pearson correlation between the percent of non-Caucasian residents and household income in a census tract is to be -0.67, which is a moderately high correlation but below a generally accepted cutoff point of 0.80. This study adds two more variables, student and elderly population, as explanatory variables because students and older residents are more likely to be transit-dependent. The APTA (2008a) reports 10.6 percent of transit trips are for going to school, which is the second highest reason stated for a transit trip after commuting to work. As well, elderly residents would be more likely to ride transit because their car mobility is more limited.

Standard rules and procedures are more difficult to measure in quantitative form. Prior studies have measured this variable using an indicator of need for service based on the assumption that decision rules would typically consider need as one of the primary determinants of service delivery. This assumption is reasonable in light of the rational-professional model of bureaucracy that dominates metropolitan public entities – if need were not the primary driver of service decisions, the bureaucratic process would be suspect.

correlation of the two measures is 0.99. Therefore to calculate percentage non-Caucasian I used the simpler approach of adding all the non-Caucasian categories divided by total population.

For this study, need is measured by the percent of households in the census tract without access to a car. Presumably if a high percentage of households in a tract do not have a car, the need for bus service will be greater and these tracts in turn would receive relatively more bus service.

Control Variables

Several factors account for the level of bus service that, while not directly related to the transit-dependent hypotheses, should be considered as control variables. These include population density and the percent of residents who take public transportation to work. These variables have a demonstrated relationship to public transportation. First, residents living in densely-populated neighborhoods are less likely to have cars and thus more likely to ride transit (Salon, 2006). In addition, high-density areas have closer proximity to transit (Polzin & Maggio, 2007). Second, neighborhoods with a high percentage of residents that ride transit to work would be expected to have better access to transit.

While including a variable that measures the percent of residents that take the bus to work has obvious intuitive appeal as a control variable, it is likely not a valid measure due to endogeneity. It could be as stated above that neighborhoods with a high percentage of residents that ride the bus to work would have better access to transit. It could also be that more people ride the bus to work because they have better access to transit in their neighborhood. Determining causality is problematic, yet it is important to keep commuter demand for bus transit in the model because commuters represent such a large portion of transit users and the presence of commuters in a neighborhood could

be a factor in determining need for transit. In order to retain the factor of commuter demand in the model while avoiding endogeneity issue, the variable population density is replaced with commuter density, which is defined as the percent of workers not working at home divided by total square miles in a census tract. Using this variable keeps population density as a control variable while refining density to be more specific and capture the commuter element in transit demand.²⁰

A list of all variables used in the study is shown in Table 5.

Table 5: Dependent and Independent Variables

Variable	Data Source	Measurement
LITA	Calculated from bus route and stop information	Bus service access
LITA – Capacity	Calculated from bus route and stop information	Comfort
LITA – Frequency	Calculated from bus route and stop information	Temporal access
LITA – Coverage	Calculated from bus route and stop information	Spatial access
Percent minority	Census	Transit-dependency
Household Income	Census	Transit-dependency
Percent of residents that are students	Census	Transit-dependency
Percent of residents that are elderly (over 65)	Census	Transit-dependency
Percent of households with no car	Census	Need for bus service
Commuter density	Census	Control

²⁰ The literature on transit service planning indicates that population density, along with the physical characteristics of a neighborhood, are key elements considered by transit planners when designing bus routes. See for example Benn (1995).

The toll good aspect of public transportation raises a measurement issue with the transit-dependent variable. As noted by Miranda and Tunyavong (1994), because toll goods rely on user fees, “inequality would depend largely on the ability to pay” (p. 514). Thus in poorer neighborhoods where people may not be able to afford to ride the bus, there may be fewer bus stops not because of discrimination but because fewer people demand bus service. In this case, income would be measuring need in addition to economic status. However, this effect is mitigated by the fact that more people in poor neighborhoods are car-less and thus dependent on transit no matter what the cost (Grengs, 2001). In addition, social service agencies often give free bus passes to lower income clients to enable them to ride the bus. Thus measurement bias is limited. Further, because the model controls separately for need, economic status and need are measured holding other factors constant.

Statistical Model

The analytical tool to examine these relationships on bus service is determined by the research question and the hypothesized relationships explaining bus service distribution. Figure 2 shows the hypothesized relationships.

The relationships in Figure 2 suggest a path regression model as the appropriate tool for analysis.²¹ Path analysis is an extension of multiple regression where certain variables are both endogenous and exogenous to the model. In other words, a chain of causality is allowed whereby one variable may

²¹ For a discussion of path analysis, see for example Alwin and Hauser (1975).

have a direct impact on the dependent variable and may also act indirectly through another variable as a mediator on the dependent variable. Path analysis begins with a model showing relationships among variables with arrows indicating causality. Exogenous variables whose causes are not modeled have no arrows going toward them. Exogenous variables may be correlated, which is indicated with a line going between them. Endogenous variables are shown with incoming arrows and are either mediating variables with a line coming in and out or dependent variables with only an incoming arrow. A model with one dependent variable is conventionally termed the final endogenous variable. In path analysis, successive equations are estimated for each endogenous variable using ordinary least squares.²² The assumptions for OLS regression also extend to path regression. Estimation results are called path coefficients, which are standardized regression coefficients. Each equation has a disturbance term that is conventionally represented as unexplained variance e , or $1-R^2$. Once successive equations are estimated, the resulting path model is shown with arrows drawn only for coefficients that are statistically significant.

Path coefficients are used to decompose the model into direct, indirect, and unanalyzed effects. Direct effects are paths with no mediating variables on the final endogenous variable. Indirect effects are those transmitted through mediating endogenous variables. The value of an indirect path is the product of path coefficients leading to the dependent variable. Total effect is the sum of direct and indirect values. Unanalyzed effect is the Pearson correlation of

²² Maximum likelihood estimation may be used as well.

exogenous variables, which is not included in the total effect but sometimes included in presentation of results for the sake of completeness.

In the model of bus service distribution, five variables are hypothesized to have a direct impact on the level of bus service: commuter density, percent non-Caucasian residents, percent of households with no car, household income, and percent students. In addition, percent no car and income are endogenous variables that may influence bus access through indirect paths. Finally, the percent of elderly residents is hypothesized to impact bus access only indirectly because the demand for transit services is primarily a function of carless status. Table 6 outlines these relationships.

Table 6: Rationale for Bus Access Relationships in Path Model

Variable (expected direction of relationship)	Direct Relationship	Indirect Relationship
Commuter Density (positive)	Neighborhoods with dense populations of commuters provide a larger potential customer base of transit riders than neighborhoods with dispersed population	Influence via carless households because people living in dense areas are less likely to own cars
Percent Non-Caucasian (positive)	Neighborhoods with a high percent of non-Caucasian residents are more likely to use bus transit	Impact via carless households because non-Caucasians are more likely not to own a car
Percent of Households with no Car (positive)	Neighborhoods with a high percent of carless households need access to transit for mobility	NA
Household Income (negative)	Higher income residents choose to use cars	Impact via carless households because higher income residents are more likely to own cars
Percent of Residents Elderly (positive, negative)	NA	Positive through carless households because the elderly are less likely to drive and negative through income because the elderly tend to have higher incomes
Percent of Residents that are Students (positive)	Neighborhoods with a high percentage of students may have higher demand for bus service	NA

A path model captures these relationships more accurately than a single-equation regression model. With the exception of Lineberry (e.g., 1975) and Mladenka (e.g., 1990) whose research used correlation analysis, most studies in urban service delivery have used a single-equation regression model to test the causality of each hypothesized factor in determining service distribution while controlling for other factors. For example, Bolotin & Cingranelli (1983) use the following equation to test the underclass hypothesis for Boston police service:

$$\begin{array}{l} \text{Per Capita} \\ \text{Police} \\ \text{Expenditure} \end{array} = \alpha + \beta_1(\text{Income}) + \beta_2(\text{Crime Rate}) + \beta_3(\text{Mayoral Support}) + \beta_4(\% \text{ Black}) + \varepsilon$$

Their equation captures the three elements of the urban underclass – ethnicity, class, and political power – and a measure of need (crime rate) to control for bureaucratic decision rules. Yet as noted by Cingranelli (1981) in his study of police and fire services in Boston, service delivery is complex whereby some variables may intervene with others on the outcome variable. Cingranelli analyzed his data using both single-equation regression and a path model and concluded that “path-analytic techniques proved useful in relating isolated elements of the alternative explanatory frameworks to one another” (p. 688). Thus comparison of direct and indirect effects allows for a more complete understanding of the explanations for bus service delivery. All inferential interpretations made in Chapter 8 are based on the 0.05 significance level.

Qualitative Component

As discussed above, the political power aspect of the underclass hypothesis is analyzed based on government form of the four cities. The impact of local government politics on bureaucratic decisions is multi-layered including interactions between the bureaucracy and mayors, city councils, city managers, and neighborhood groups. Thus measuring political power raises a question of internal validity. Kirk and Miller (1986) argue that a method of measurement has theoretical (construct) validity if the observations in a study correspond to the theoretical basis for the study. To ensure that a measure is valid, or in their words to ensure that the researcher is “seeing what she thinks she sees,” Kirk and Miller argue for diversity in method (p. 30). Therefore in order to execute a

valid and rigorous analysis of the research question, the path regression approach is supplemented with two qualitative components – archival research and elite interviews.

Archival research is used to gather information on the electoral and administrative arrangements in each of the four cities as well as legal relationships between elected officials and bus systems. This research is based on a review of city charters and organizational charts for city government administration, both of which are publicly available via online sources. Confidential interviews with a city council member and a member of the planning staff for each bus system are used to further understand how government and the bureaucracy interact. The interviews are conducted using a standardized open-ended questionnaire instrument, which allows for transparency and ease of comparing answers (Patton, 2002). The interview instrument is included as Attachment A. Due to limitations on travel, the interviews are conducted on the phone. Data from archival and interview research are used to understand the extent and impact of politicized decision-making in the four cities.

CHAPTER 8: RESULTS

Table 7 shows descriptive information for the variables in the model.

Maps of LITA scores by census tract for each city are show in Figures 4, 5, 6, and 7 for each of the four cities under study, respectively. Frequency distributions for the LITA index and its three components are shown in Figure 8.

Table 7: Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Dev.
LITA – pooled data	0.00	27.71	9.12	4.75
<i>Asheville</i>	0.00	20.02	9.27	4.36
<i>Charlotte</i>	6.71	27.71	12.04	3.94
<i>Mobile</i>	0.00	16.44	4.23	2.31
<i>Richmond</i>	5.45	21.16	10.57	3.30
LITA Component 1: Capacity – pooled data	0.00	26.08	8.42	4.29
<i>Asheville</i>	0.00	17.20	8.26	3.59
<i>Charlotte</i>	6.71	26.08	11.10	3.56
<i>Mobile</i>	0.00	14.12	4.04	2.16
<i>Richmond</i>	5.39	19.58	9.73	3.10
LITA Component 2: Coverage – pooled data	0.00	28.42	9.43	5.10
<i>Asheville</i>	0.00	19.25	9.26	4.43
<i>Charlotte</i>	6.71	28.42	12.44	4.28
<i>Mobile</i>	0.00	19.29	4.27	2.53
<i>Richmond</i>	5.48	23.90	11.22	3.73

Variable	Minimum	Maximum	Mean	Std. Dev.
LITA Component 3: Frequency – pooled data	0.00	28.62	9.52	5.04
<i>Asheville</i>	0.00	23.60	10.29	5.22
<i>Charlotte</i>	6.71	28.62	12.58	4.23
<i>Mobile</i>	0.00	15.91	4.37	2.36
<i>Richmond</i>	5.48	19.99	10.75	3.28
Percent non- Caucasian (%) – pooled data	0.01	1.00	0.47	0.34
<i>Asheville</i>	0.01	0.76	0.20	0.20
<i>Charlotte</i>	0.01	0.99	0.42	0.30
<i>Mobile</i>	0.03	1.00	0.55	0.34
<i>Richmond</i>	0.01	1.00	0.61	0.34
Household Income (\$ – pooled data	\$5,714	\$163,284	\$39,586	\$22,214
<i>Asheville</i>	\$14,331	\$118,980	\$36,381	\$18,243
<i>Charlotte</i>	\$9,494	\$144,058	\$49,748	\$23,933
<i>Mobile</i>	\$5,714	\$80,572	\$29,876	\$14,312
<i>Richmond</i>	\$7,635	\$163,284	\$33,533	\$20,821
Percent of households with no car (%)²³ – pooled data	0.00	0.81	0.14	0.13
<i>Asheville</i>	0.01	0.36	0.11	0.08
<i>Charlotte</i>	0.00	0.65	0.10	0.12
<i>Mobile</i>	0.00	0.66	0.13	0.12
<i>Richmond</i>	0.01	0.81	0.23	0.16
Commuter density (person/mi²) – pooled data	17	13,163	1421	1477
<i>Asheville</i>	58	1,730	645	470
<i>Charlotte</i>	124	4,705	1,289	777
<i>Mobile</i>	17	2,913	1,016	583
<i>Richmond</i>	194	13,163	2,573	2,628

²³ Percent no car and commuter density are transformed by base 10 log in the regression analysis to account for outliers and reduce skew in the regression standard residuals.

Variable	Minimum	Maximum	Mean	Std. Dev.
Percent of residents that are students (%) – pooled data	0.03	1.00	0.12	0.10
<i>Asheville</i>	0.07	0.41	0.11	0.06
<i>Charlotte</i>	0.03	0.85	0.11	0.08
<i>Mobile</i>	0.05	1.00	0.13	0.11
<i>Richmond</i>	0.06	0.87	0.14	0.13
Variable	Minimum	Maximum	Mean	Std. Dev.
Percent of residents that are elderly (over 65) (%) – pooled data	0.00	0.30	0.12	0.06
<i>Asheville</i>	0.10	0.25	0.17	0.04
<i>Charlotte</i>	0.00	0.26	0.09	0.05
<i>Mobile</i>	0.00	0.30	0.13	0.06
<i>Richmond</i>	0.02	0.30	0.14	0.06

N=279

In estimating the path model, census tracts that contain the central business district (CBD) of the city are omitted from analysis. These tracts (in the case of Richmond, the CBD is located in two tracts) contain an abundance of bus stops and routes because they are the point of origin and destination for the majority of routes. Thus the level of access is highly skewed and not meaningful in the sense of residents' ability to access bus service. In addition, bus routes that serve only a university or college in a city are omitted from analysis because those routes are used only to shuttle students within a university area. Express routes are omitted as well because the LITA calculation does not properly distinguish between express and non-express routes. Express routes arguably offer superior access to residents in the neighborhoods where they stop, yet the

LITA methodology scores these neighborhoods as having less, not more, access because they have fewer stops. Finally, five observations are eliminated from analysis as they are identified by casewise diagnostics as outliers.

Results with Four Cities Analyzed as Pooled Data

The first iteration of analysis is to estimate the statistical model with all four cities stacked into one panel of data with LITA as the dependent variable. A dummy variable with a value of 1 for the council-manager cities and 0 for the mayor-council cities is included in the pooled analysis to determine whether the two groups of cities statistically differ. This iteration involves three separate regression equations according to the path diagram shown in Figure 2. Results of these equations are shown in Figure 3.

Direct Effects

In the regression equation with bus access (LITA) as the dependent variable, the model has unexplained variance of 0.42, a moderately strong model. Percent non-Caucasian and percent students are not statistically significant ($\alpha=0.21$ and 0.14, respectively). The latter is not remarkable – even though students are heavy users of transit, households with students are probably dispersed within a city (the variable captures high school, college, and graduate students) and thereby not likely to impact the demand for transit within a particular neighborhood. The finding on non-Caucasian neighborhoods, however, is more noteworthy. According to the underclass hypothesis, neighborhoods with a high percentage of non-Caucasian residents may receive poorer service delivery due a bias against these neighborhoods on the part of

service delivery decision-makers or their lack of ability to impact local government hierarchy and influence elected officials. The data on bus access refute that hypothesis when the four cities of interest are considered as a panel of data. Although the path coefficient is negative, it is not statistically significant ($\alpha=0.21$).

Concerning the remaining path coefficients that are statistically significant, the direction of the relationship to bus access is in the expected direction with the exception of household income. Commuter density (0.30) has a weak positive relationship to bus access and the percent of households with no car (0.69) has a strong positive relationship to bus access. These results are not unexpected if bus access is distributed based on need. Because these variables are associated with factors that transit planners typically consider in bus system design, these findings support the hypothesis that bus service is delivered according to standard procedures. The strength of the coefficient for carless households is particularly telling about the relationship between bus access and need.

By contrast, the coefficient for household income is the most surprising result in the panel data. Income has a weak positive relationship to bus access (0.27), suggesting that all things being equal the greater the income of a neighborhood the better the bus access. This finding implies that residents with greater means receive better services and confirms at least one aspect of the underclass bias hypothesis. When considered together with the results for commuter density and percent no car, direct relationships to bus access

corroborate prior literature that found both need and bias present in the distribution of public services.

Finally the coefficient for the dummy variable that separates the four cities into two groups related by government form is significant and positive (0.59). A significant dummy variable indicates that the council-manager cities are statistically different than the reference group of mayor-council cities. Further, the positive coefficient indicates that average access in the council-manager cities is higher than the mayor-council cities. Bus access for the two groups analyzed separately is discussed in detail below.

Indirect Effects

The two remaining regression equations in the path model have percent of households with no car and household income as endogenous variables. These intervening variables function as mediators between the exogenous variables and bus access. Klem (1995) notes that a “variable functions as a mediator if the path coefficient is sizeable enough to establish that some of the causal influence is indeed traveling on the indirect route” (p. 202). Results from these regression equations indicate that income does not mediate between elderly and bus access as hypothesized in Table 6. And percent no car does mediate between income and non-Caucasian and bus access but not commuter density or elderly and bus access. This result is shown in Figure 3 by the path coefficients: the relationship between elderly and income is not significant; the relationship between elderly and percent no car is not sizeable (0.17); the relationship between commuter density and percent no car is not sizeable (0.14). Total effect of percent elderly

is 0.12 and commuter density is 0.10. The conclusion from these results is that elderly and commuter density do not have much bearing on bus access via an indirect path even though the results are statistically significant.

By contrast, the path coefficients in the equation with percent no car as the dependent variable for percent non-Caucasian (0.40) and income (-0.53) are sizeable. These relationships are also in the expected directions. The greater percentage of non-Caucasian residents in a neighborhood means a greater percentage of carless households and higher income neighborhoods means fewer carless households. When multiplied by the path coefficient for percent no car on bus access (0.69), the indirect relationship of percent non-Caucasian (0.28) to bus access is positive and weak and the indirect relationship of income (-0.37) to bus access is negative and moderate. The indirect relationship of percent non-Caucasian is interesting because even though the direct effect of non-Caucasian residents on bus access is not significant, non-Caucasian neighborhoods still have an impact on bus access through an indirect path. Moreover, because the relationship is positive, this impact is what would be expected if bus access decisions are made based on areas with greater need for service. This same conclusion holds true for the indirect effect of income, though the impact is in the opposite direction (less need, less bus access). In fact the strength of the indirect path of income (-0.37) counteracts the positive direct impact of income (0.27) on bus access for a total effect of (-0.10). Thus the indirect and direct effects of income on bus access essentially net to zero.

Unanalyzed Effects

The remaining paths in the bus access model result from the correlation between income and minority. These relationships are not considered from a causal perspective because they are the result of a correlation between exogenous variables. The unanalyzed effect of minority is negligible (0.07) and the unanalyzed effect of income is weak (-0.18).

Total Effects

Total effects are displayed in Table 8. Overall, percent no car is the overriding explanation for bus access. This result as well as the total effects for commuter density, percent non-Caucasian, income, and percent elderly all support the bureaucratic decision-rules hypothesis and refute the hypothesis that transit-dependent neighborhoods receive worse bus access. Yet although the total effect of income is negative, the positive direct effect indicates that favoritism toward upper-income neighborhoods impacts bus access as well.

Table 8: Effect Decomposition for Pooled Data

Variable	Direct Effect	Indirect Effect	Total Effect
Commuter Density	0.30	0.10	0.40
Percent Non-Caucasian	Not sig.	0.28	0.28
Percent No Car	0.69	NA	0.69
Income	0.27	-0.37	-0.10
Percent Elderly	NA	0.12	0.12
Percent Student	Not sig.	NA	
City dummy	0.59	NA	0.59

Path Regressions of LITA Components

The next iteration of analysis is to estimate the path model using each component of the LITA index – capacity, coverage, and frequency – as the final exogenous variable. Analysis of each component separately will reveal if relationships between the explanatory variables and three aspects of bus access are consistent. The path coefficients from these equations are multiplied by the coefficients from the equations with income and percent no car as dependent variables to calculate total effects. As shown in Table 9, total effects for the three components are quite similar to the total effects using LITA as the dependent variable. This result indicates strong co-variance among the three components of access and the overall index of access. Pearson correlations between LITA and capacity (0.98), coverage (0.99), and frequency (0.98) confirm this co-variance. Because the three components and LITA are not distinct, the remaining analysis in this study is based on LITA as the final endogenous variable.

Table 9: Effect Decomposition with LITA Components

Variable	Component	Direct Effect	Indirect Effect	Total Effect
Commuter Density	LITA	0.30	0.10	0.40
	Capacity	0.30	0.10	0.40
	Coverage	0.32	0.10	0.42
	Frequency	0.27	0.10	0.37
Percent Non-Caucasian	LITA	Not sig.	0.28	0.28
	Capacity	Not sig.	0.28	0.28
	Coverage	Not sig	0.28	0.28
	Frequency	Not sig.	0.28	0.28
Percent No Car	LITA	0.69	NA	0.69
	Capacity	0.66	NA	0.66
	Coverage	0.69	NA	0.69
	Frequency	0.69	NA	0.69
Income	LITA	0.27	-0.37	-0.10
	Capacity	0.28	-0.37	-0.09
	Coverage	0.27	-0.37	-0.10
	Frequency	0.26	-0.37	-0.11
Percent Elderly	LITA	NA	0.12	0.12
	Capacity	NA	0.12	0.12
	Coverage	NA	0.12	0.12
	Frequency	NA	0.12	0.12
Percent Student	LITA	Not sig.	NA	
	Capacity	Not sig.	NA	
	Coverage	Not sig.	NA	
	Frequency	No sig.	NA	

Bus Access Results Analyzed by City Group

As discussed in the research design section, the four cities used in this study – Richmond, VA, Mobile, AL, Asheville, NC, and Charlotte, NC – are divided into two sub-groups for analysis based on a key theoretical distinction. In the model of bus access this distinction is the form of government in the city. Richmond and Mobile have mayor-council (non-reformed) governments and Asheville and Charlotte have council-manager (reformed) governments. Because the dummy variable used in the pooled data path analysis indicates that the two reformed cities are statistically different from the non-reformed cities, the two groups are investigated separately.²⁴ Path regression results for the pooled data and the two groups are shown in Table 10 and discussed below.

²⁴ Path regression results for the two cities in each group are similar and are not reported separately.

Table 10: Effect Decomposition for City Groups

Variable	City	Direct	Indirect	Total
Commuter Density				
	<i>Pooled</i>	0.30	0.10	0.40
	<i>Richmond/Mobile</i>	0.32	0.21	0.53
	<i>Charlotte/Asheville</i>	0.21	0.61	0.82
Percent Non-Caucasian				
	<i>Pooled</i>	Not significant	0.28	0.28
	<i>Richmond/Mobile</i>	-0.32	0.51	0.19
	<i>Charlotte/Asheville</i>	0.22	0.25	0.47
Percent No Car				
	<i>Pooled</i>	0.69	NA	0.69
	<i>Richmond/Mobile</i>	0.91	NA	0.91
	<i>Charlotte/Asheville</i>	0.61	NA	0.61
Income				
	<i>Pooled</i>	0.27	-0.37	-0.10
	<i>Richmond/Mobile</i>	0.34	-0.31	0.03
	<i>Charlotte/Asheville</i>	0.27	-0.31	-0.04
Percent Elderly				
	<i>Pooled</i>	NA	0.12	0.12
	<i>Richmond/Mobile</i>	NA	0.10	0.10
	<i>Charlotte/Asheville</i>	NA	0.19	0.19
Percent Student				
	<i>Pooled</i>	Not significant		
	<i>Richmond/Mobile</i>	0.13	NA	0.13
	<i>Charlotte/Asheville</i>	Not significant		

Richmond & Mobile: Non-Reformed Cities

The strength of the primary regression equation is slightly stronger when Richmond and Mobile are analyzed together ($e=0.42$) than when the four cities are analyzed together ($e=0.40$). Path regression results based on Figure 2 for Richmond and Mobile are similar to the pooled data with one key exception – the direct relationship between percent non-Caucasian and bus access is significant and negative (-0.32), which may indicate discrimination in bus access for non-Caucasian neighborhoods in these cities. The indirect effect of ethnicity through carless households is in the same direction (positive) as for the pooled data (0.28), but the effect is much stronger (0.51), which would indicate the presence of both discrimination in access and access based on need. As in the pooled data, the direct effect of income on bus access is positive (0.34), which in combination with the direct result for non-Caucasian residents reinforces the hypothesis that bus access is not necessarily based on need. The other difference between Richmond and Mobile and the pooled data is that the path coefficient for percent student is significant, yet the relationship is very weak (0.13).

Charlotte and Asheville: Reformed Cities

Unexplained variance for the primary regression equation when Charlotte and Asheville are analyzed together is 0.57 , which is lower than for the pooled data ($e=0.40$) and for Richmond and Mobile as a group ($e=0.42$). Like Richmond and Mobile, path regression results based on Figure 2 for Charlotte and Asheville are also similar to the pooled data with the exception of percent non-Caucasian.

Yet whereas the direct relationship in Richmond and Mobile indicated bias against non-Caucasian neighborhoods, the direct relationship between non-Caucasian and bus access in Charlotte and Asheville is significant and positive (0.22). This result may indicate that in Charlotte and Asheville bus access is driven by need when ethnicity is considered. Indeed the total effect for percent non-Caucasian is much stronger for Charlotte and Asheville (0.47) than Richmond and Mobile (0.19). With Richmond and Mobile, total effect of ethnicity is weak because the direct (-0.32) and indirect effects (0.51) of percent non-Caucasian counteract each other whereas with Charlotte and Asheville the direct (0.22) and indirect effects (0.25) reinforce each other. The end result is that the hypothesis that bus access is determined by need is reinforced more strongly in the reformed cities than in the non-reformed cities.

CHAPTER 9: DISCUSSION

As outlined in the research design, the intent of a two-tailed four-city case study was to make use of a valid method for testing the political component of underclass bias. The underclass hypothesis states that certain neighborhoods may be disadvantaged in service delivery due to underclass status. Underclass status is defined in either ethnic, economic, or political terms. For this dissertation, underclass status is also seen more broadly to include transit-dependent neighborhoods with a high percentage of students or elderly residents. Ethnic, economic, student, and elderly compositions of neighborhoods are easy to measure using census data as was done in the preceding path analysis. Yet the extent of neighborhood political power can be more difficult to conceptualize and measure. Almost every prior study from Table 1 that tested the impact of neighborhood political power on service delivery used an independent variable measuring either voter turnout or the percent of residents that supported the mayor in a recent election. A critique of this type of explanatory variable is that it is not necessarily a valid measure of political power. Just because a certain neighborhood voted overwhelmingly for the mayor does not mean that this neighborhood will receive favors from the mayor, particularly in cities where the mayor has ceremonial rather than executive power. I argue that the opportunity for favoritism or neglect of certain neighborhoods is more a

function of the form of local government than voter activism. As discussed in Chapter 5, the mayor-council form of government, which is based on separation of powers between the mayor and city council with the mayor as chief executive, is more prone to favoritism and neglect than council-manager form, which is based on unitary legislative and executive power and professional management.

To test the political aspect of the underclass hypothesis, the data on bus access are separated into two groups: two council-manager cities and two mayor council cities. Two cities were selected for each group to increase the number of observations. As discussed in the results, the groups are statistically different from each other. Indeed, results from the two non-reformed cities (Richmond and Mobile) seem to confirm the hypothesis that transit-dependent neighborhoods, as indicated by income and ethnicity, have inferior access to bus service. By contrast, results from the reformed cities (Asheville and Charlotte) indicate that bus access is based on need where ethnicity is concerned. Yet is government form the true basis for distinction between the two cities? Form of government is a key variable in the model of bus access, yet does it have true explanatory power? To get at this question, a more thorough analysis of the impact of government form on decision-making is required.

Municipal Government Statutory and Legal Form

Along with a commission form of government, which is rare in the U.S. today, mayor-council and council-manager platforms are the two legal-statutory types of local government (Frederickson, Wood, & Logan, 2001). Both of these forms resulted from the good government movement in the late 19th century when, according to Frederickson et al. (2001), a group of political reformers

organized to “rid cities of corrupt political machines” (p. 4). The group ultimately resulted in the creation of the National Civic League (NCL), which outlined a “Model City Charter” designed to foster good government. Good government was defined as one that would serve the entire community rather than the interests of special groups. The Model Charter has been revised several times with the most recent version published (8th) in 2007. The first versions of the model charter advocated both the mayor-council structure and the council-manager structure. Although both forms of government are advocated by the NCL, from the early 1900s forward the council-manager form has been promoted due to its reliance on professional management and limited mayoral power. In 2008, 49% of municipalities use council-manager form of government and 43.5% of municipalities use the mayor-council form (International City/County Management Association, 2008).²⁵

Traditionally, the mayor-council form of government is characterized by an elected mayor who holds executive power and an elected council who holds legislative power. Council members are typically elected by voting district and focus on constituency services. Mayors are responsible for day-to-day management and governance and may veto decisions taken by the council. The council-manager form is characterized by an elected city council, one of whose members is the mayor with ceremonial power, and an appointed city manager that holds executive power. Council members are typically elected at-large and set the overall policy guidance that is carried out by the day-to-day management

²⁵ Data are for municipalities with populations of 2,500 or greater.

of the city manager (MacManus, 1999). Yet as discussed by Frederickson et al. (2004), over time the differences between these two forms have evolved and each form has adapted characteristics of the other. As Svava (2001a) points out, much of the evolution is attributed to changes in electoral structures rather than the actual form of government. For example, many mayor-council cities have adopted at-large elections for city council members or a mix of district and at-large elections in order to shift focus from constituency services to city-wide governance. Council-manager cities, on the other hand, in a move toward more representative governance, have shifted from at-large to district election of city council members and direct election of the mayor.

In addition to changes in electoral structure, many cities with a mayor as executive have moved toward a more professional management structure. These mayor-council cities have instituted a Chief Administrative Officer position, a nonelected position much like a city manager that reports to the mayor and is responsible for management. Frederickson et al. (2004) deems cities with evolved electoral or administrative structures to be “adapted.”

A review of the electoral and administrative arrangements in the four cities that are the subject of this study indicates that indeed three of the four have adapted form of government to a certain degree. Table 11 below, which is based on Frederickson et al. (2004, p. 108), lists the four cities and their structural characteristics. Highlighted cells indicate where the city structure has evolved away its traditional statutory form.

Table 11: Adapted Cities

City	Asheville	Charlotte	Richmond	Mobile
Statutory Form	Council-manager	Council-manager	Mayor-council	Mayor-council
Election of mayor	Direct	Direct	Direct	Direct
Council elections	At-large	Mixture of at-large and district	District	District
Mayor acts as Chief Administrator?	No	No	No	Yes
Mayor has veto power?	No	Limited	Yes	Yes
Mayor is full-time?	No	No	Yes	Yes
Partisan elections	No	Yes	No	No

Both Asheville and Charlotte have adopted direct election of the mayor. In fact Frederickson et al. (2004) note that by 1990, over 60 percent of mayors in council-manager cities were directly elected. Frederickson et al. (2004) claim that the evolution to a directly-elected mayor resulted from the need for “more effective political leadership” (p. 70). Even if the actual power of the mayor does not change with direct election, this type of mayor gives the city a focal point of leadership with an important public relations role and informal power to lead a policy agenda. This result appears to be the case in Asheville and Charlotte, where the directly-elected mayor retains a part-time role with limited veto powers. The City of Charlotte has also adopted a mix of district and at-large election of the city council, which Frederickson et al. (2004) claim indicates a desire for more constituency-focused leadership.

The City of Richmond, which only recently switched charters from council-manager to mayor-council in 2005, has adopted a Chief Administrative Officer (CAO) appointed by the mayor. The CAO replaced the city manager that was formerly appointed by the city council. Typically this type of structure is intended to bring professional management into executive decision-making that would be otherwise in the hands of the mayor.

Thus Charlotte, Asheville, and Richmond may be properly characterized as adapted cities. The important point about adaptation with regard to this study on bus access is whether the evolution in government form impacts the extent to which government form has explanatory power regarding service delivery decisions. Results from path regression indicate that service delivery decisions in the two mayor-council cities are based less on professional norms and standards than in the two council-manager cities. Does adaptation of government form change this interpretation of results? A summary of the relationship between elected officials and the transit system in each city is required to answer this question.

The summary is based on archival research including the legal city charter and the organizational chart of the bus system. In addition, I conducted confidential elite interviews with a city council member and a member of the planning staff of the bus system in each city.

Asheville

Asheville Transit is one division within the City Transportation & Engineering Department whose director reports to the City Manager. The transit

division is headed by a general manager with a small staff. Bus service operations are contracted out to a private company (a common practice in transit operations) but day-to-day management, planning, and service changes are handled by transit service staff. Service delivery decisions are made using standard guidelines and procedures developed by Asheville Transit. Guidelines used to determine route and stop placement include density, physical feasibility, and customer input.

To gather customer input the City established a Transit Commission whose members are appointed by City Council. City Council also has a liaison to the Transit Commission. In Asheville, the Transit Commission is the primary point of contact for citizen concerns about the bus system as well as the primary link between City Council and the bus system. The Commission serves as an advisory group for the bus system with no actual power over transit decisions. Ultimately the City Manager is accountable for transit system operations. Thus it appears in Asheville that direct election of the mayor has little impact on the professional nature of the bus system. While fiscal matters such as budgeting, purchasing, and fee changes are approved by City Council, day-to-day service delivery decisions are made by bureaucrats.

Charlotte

Management of transit services in Charlotte is considerably more complex than in Asheville. The Charlotte Area Transit System (CATS) is managed by the Public Transit Department within the City that reports to the City Manager. Bus service operations are contracted out to a private company but day-to-day

management, planning, and service changes are handled by CATS staff.

Service delivery decisions are made using standard guidelines and procedures developed by CATS that are continually modified over time. Guidelines used to determine route and stop placement include safety, physical feasibility, and customer input.

The complexity in the CATS bureaucracy is the result of a policy board, the Metropolitan Transit Commission (MTC), which was established by interlocal agreement among the City, Mecklenburg County (the county in which Charlotte resides), and the six other towns in Mecklenburg County. The CATS service area extends beyond the City and the MTC gives elected officials from the Charlotte area region a voice in long-range transportation planning. Voting members on the MTC include the mayors from Charlotte and six towns in Mecklenburg County as well as the Chair of the Board of County Commissioner.

Interaction between elected officials and CATS occurs primarily at the MTC level rather than at the City Council level. The MTC sets policy for CATS including standard criteria for route changes. The MTC also gathers input from a citizen bus rider committee. City Council members may provide input regarding CATS to the MTC but ultimately service delivery decisions are made by the bureaucracy, which is accountable to the MTC. Because the MTC is comprised of elected officials from several municipalities, the opportunity for an elected official from Charlotte to sway service delivery decisions is limited. As in Asheville, it appears that direct election of the mayor and a mix of district and at-

large council elections has little impact on the professional nature of decision-making.

Richmond

Greater Richmond Transit Company (GRTC) is a nonprofit jointly owned by the City of Richmond and Chesterfield County (southeast of the City of Richmond). The six-member Board of Directors is appointed by the City Council and the Chesterfield County Commissioners. The Board hires senior management of GRTC, which is contracted out to a private company. With this management structure, GRTC is not purely a city bus system in that GRTC employees are not City employees. Yet the primary service area of GRTC is within the City limits and GRTC is accountable to the Land Use Committee of the Richmond City Council. Service delivery decisions are made by GRTC staff based on standard considerations such as safety, usage, land use, and location of existing routes and stops.

Interaction between GRTC and City Council begins with the Land Use Committee. The mayor may lobby at the Land Use Committee but has no specific power to influence its decisions. Citizen input is also funneled through the Land Use Committee, where service changes are vetted prior to being reviewed by the City Council. The City Council, in turn, by City ordinance has veto power over decisions taken by GRTC regarding changes in routes. Thus ultimately route decisions are made by politicians and not the bureaucracy. The presence of the Chief Administrative Officer reporting to the mayor does not

impact the political nature of decision-making with regard to the bus system routes.

Mobile

Wave Transit is owned by the City of Mobile, which contracts with a private company for management and operations. The General Manager of Wave Transit works with the City Director of Public Services to coordinate infrastructure changes that are needed to accommodate bus operations. The Mobile City Council approves the budget for Wave Transit but service changes and operations are managed by the private bureaucracy and do not require approval from the City Council.

Over ten years ago, the city bus system in Mobile was operated by a public authority, whose mismanagement of the system drove it into receivership. The City took over the bus system and decided to contract management and operations to a private company in order to bring stability to the system and also to keep politics out of system operations. Citizen complaints are funneled through the Council to Wave Transit and service changes are made independently of the Council. Thus in Mobile, bus decisions are professional even though the form of government does not operate with a professional management structure.

In summary, the fact that three of the four cities have characteristics of adapted electoral and administrative government form does not impact the manner in which bus service delivery decisions are made. The move toward more representative government in the council-manager cities of Asheville and

Charlotte does not appear to politicize the otherwise professional bureaucracy of the transit agencies. Likewise, the role of the professional Chief Administrative Officer does not impact the political nature of bus service decisions in Richmond. In Mobile, which is not an adapted city, service decisions are not related to government form due to privatization of management. Overall, government form is relevant to bus service delivery decisions in three of the four cities.

Does government form, then, explain the differences in results of bus access between the two groups of cities? Clearly in Richmond the bus service decision-making is more politicized than in Asheville or Charlotte. The opportunity for favoritism or neglect of certain neighborhoods is more likely in a climate of politicized decision-making. For example, within the last year GRTC recommended the elimination of certain routes in Richmond that were inefficient and losing money. Yet the City Council has refused to take up the recommendation for fear of political retribution. As it stands today, the issue with these routes is ongoing. However in Mobile decision-making is not politicized in spite of the city government structure.

Although service delivery decision-making is different between the two groups of cities, we cannot reliably assume causality between government structure and bus access in general. In fact, politicization could work in favor of minority neighborhoods just as much as it could work against them. Indeed the structure of municipal government in Richmond and Mobile would presumably be more favorable to minority neighborhoods due to the history of council elections in these cities. Both cities were the subject of voting rights lawsuits before the

United States Supreme Court in the late 1970s and early 1980s. These lawsuits resulted in a change from at-large council elections to district council-elections as a way to increase minority representation in elected office. In *Bolden v. City of Mobile*, a district court found that at-large elections in Mobile's then commission form of government diluted the black vote and thereby were discriminatory in effect. Although the Supreme Court overturned the decision and ruled that there must be discriminatory intent, retrial in the lower court found sufficient evidence of discriminatory intent to exclude minorities from public office. A subsequent referendum put a mayor-council structure in place with district-based council elections (McCrary, Gray, Still, & Perry, 1994).²⁶ In *City of Richmond v. United States*, the Supreme Court found that Richmond's annexation of a neighboring community was intentionally designed to dilute the black vote in the City. Richmond at the time had a council-manager form and the court ruling led to the abolition of at-large city council elections in favor of district elections (Moeser & Silver, 1994). Thus in both Mobile and Richmond (and in several other Southern cities as well), district elections for city council were a legal remedy to increase black political representation. Based on these facts, a fair assumption would be that an increase in black political representation would be associated with better municipal services in black neighborhoods as well. For bus service in 2009 in Richmond and Mobile, this assumption does not hold true.

²⁶ The *Bolden* case was a landmark in the history of the Voting Rights Act in that the Court established a new standard of proof for discrimination in election practices. Strong reaction against the ruling from civil rights leaders and public officials resulted in a Congressional amendment to the Act (The *Bolden* Amendment) that clarified that "Congress intended that the courts outlaw election practices that were discriminatory in effect, without requiring proof of invidious racial purpose (McCrary et al, p.52).

Perhaps a legacy of poor services in minority neighborhoods carries forth in 2009. In *Bolden v. City of Mobile*, the lower court judge found not only that the at-large system was being used for discriminatory intent and also that “the city government was unresponsive to the black community in the delivery of municipal services” (McCrary et al, p. 51). This finding is similar to *Hawkins v. Town of Shaw* – the lawsuit that spurred the body of research on urban service delivery – and many others like it of that era. Although inferior municipal services in Richmond are not documented in the urban service delivery literature, it is safe to assume that as a highly segregated town operated by “dominance of the white aristocracy” (Moeser & Silver, p. 527) in the 1960s and 1970s that a similar dynamic was going on with municipal services. Overall, the finding that bus access is positively related to income and negatively related to minority status in Richmond and Mobile is likely the result of many factors including a history of discrimination in the provision of municipal services combined with inertia and incremental change (Boyne & Powell, 1991).

CHAPTER 10: CONCLUSION AND FUTURE RESEARCH

In conclusion, results of the four-city case study of bus access confirm findings from prior research on urban service delivery that both professional norms and underclass bias are present in service delivery decisions. As well, government form may impact the extent to which public bureaucracies are subject to external pressure from the political arena. In Charlotte and Asheville, with the exception of lower-income neighborhoods, transit-dependent neighborhoods do receive better bus access, which is likely due to a professional bureaucracy. In Richmond and Mobile, transit-dependent neighborhoods defined by ethnicity and income receive worse access than other neighborhoods, which may be a function of politicized decision-making in Richmond but which is not related to city government structure in Mobile.

Opportunities for Future Research

One opportunity for further research raised in this study is operationalization of the dependent variable. As discussed in the design section, bus access is a multi-faceted variable. The LITA encompasses three key components of access – frequency, capacity, coverage – but does not include other aspects that may be important to bus riders. These other aspects include safety, cleanliness, timeliness, availability of shelters and benches at bus stops, number of transfers required to reach a destination, and topographical as well as

physical barriers to bus stop access. In fact casual discussions with individual bus riders in various cities lead me to believe that these other factors often determine whether or not someone will choose to ride the city bus. However, the ability to collect data on these other factors in a timely manner is challenging. Many transit agencies collect data on safety violations and timeliness but not in a standardized format. Likewise many agencies have information on the location of shelters and benches yet compiling this information in each census tract would be time consuming. Calculating the number of transfers from certain origins to certain destinations would be time consuming as would noting all the topographical and physical barriers to bus stops. Yet all of these endeavors would be worthwhile for further research. In addition, bus rider surveys would be a valid way to triangulate which aspects of bus service are the most valued by riders.

A second opportunity for further investigation is the level of resolution in the unit of analysis. Census tract is a logical unit for the reasons discussed in the methodology section; however, certain census tracts may encompass several miles of land area that may result in overestimation of bus access for a particular tract. For example, a census tract may have multiple bus routes and stops but if they are all located in one section of the tract that is not walking distance from all parts of the tract, the LITA score for that tract may be skewed. Census blocks, block groups, or traffic analysis zones, which encompass smaller geographic areas than census tracts, may be more suitable units of analysis. Yet data availability for these smaller units is problematic. Devising a procedure to

overlay data from the tract level onto smaller geographic units may be a promising approach for using a different unit of analysis.

Data availability raises a third area for future research. In this study there is a nine-year mismatch between the dependent and independent variables because the independent variables are from Census 2000 whereas the LITA is calculated with data from 2009. The only exception is Charlotte, where the LITA was calculated from 2006 data so as to pre-date introduction of light rail in the City. Bus stop and route data from 2000 were not available in each city; therefore, the second best option was to use the data that were available. The American Community Survey of the Census Bureau provides updates to Census 2000 data in between the decennial census years, but these data are not available at the census tract level. Re-doing the study when results of the 2010 Census become available and concurrent with new stop and route data would be ideal to capture any changes in neighborhood composition that occur between decennial census data.

Finally, expanding the research to include an examination of the relationship between local funding for transit and the level of access on an intra-city basis would add to the understanding of comparative levels of access. For example, some municipalities such as Charlotte, NC have implemented an incremental sales tax dedicated to transit funding whereas other cities may be more dependent on federal funding. Analysis of local funding arrangements, which may be an indication of transit preference by local residents, might impact

whether the city has resources to fund adequate mobility in transit-dependent neighborhoods.

Design Issues

A limitation with the research design is the case study approach. As discussed above, a random sample of neighborhoods would be a preferable method of comparing service delivery. The results of city studies are not directly generalizable to comparable cities. The results are what Yin (2003) calls “analytic” rather than statistical generalization. In fact all studies on urban service delivery suffer from this limitation. Yet from a public policy perspective, results that confirm or disprove the hypothesis on bus service may be interesting to transit agencies in general and may prompt further research into specific cities and bus systems.

Further, the research design is limited in that it does not consider bus systems that are owned by special purpose governments or public authorities. This design approach is due to theoretical reasons. Because the body of literature on urban service delivery does not consider the impact of public authorities, it is important to research bus service from a similar perspective. Yet unlike police and fire protection and parks and libraries, public transportation is a public good that is often provided by public authorities. Further research should develop a theory and empirically test urban service delivery on a neighborhood basis from a public authority perspective and compare these results with the results for city bus systems.

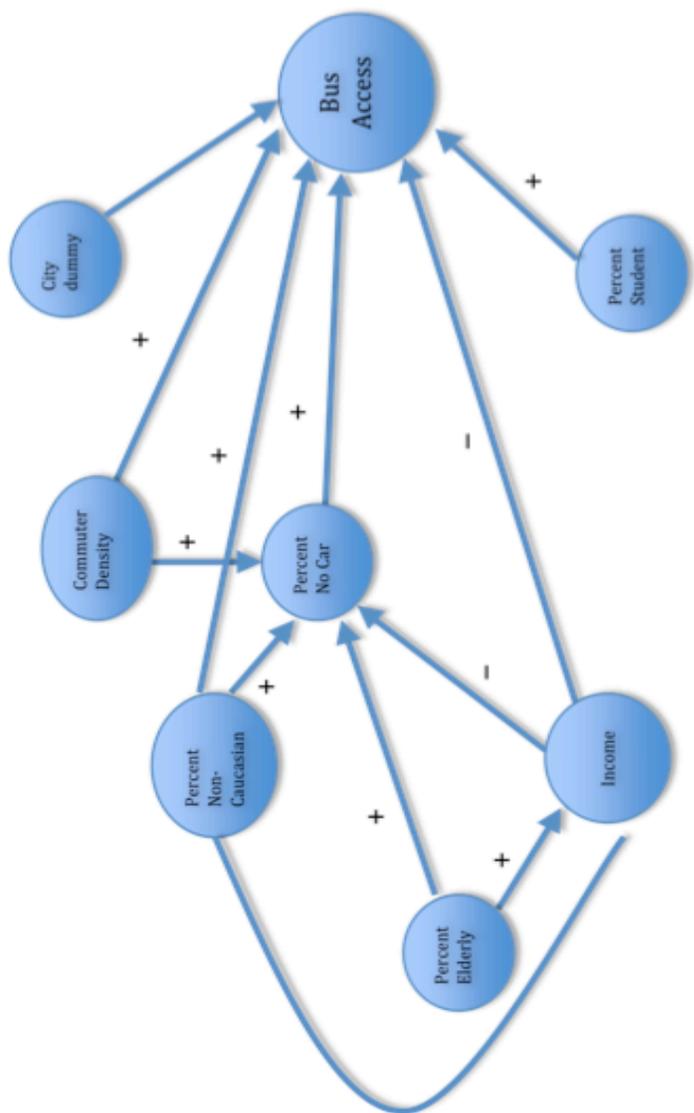


Figure 2: Path Diagram of Bus Service

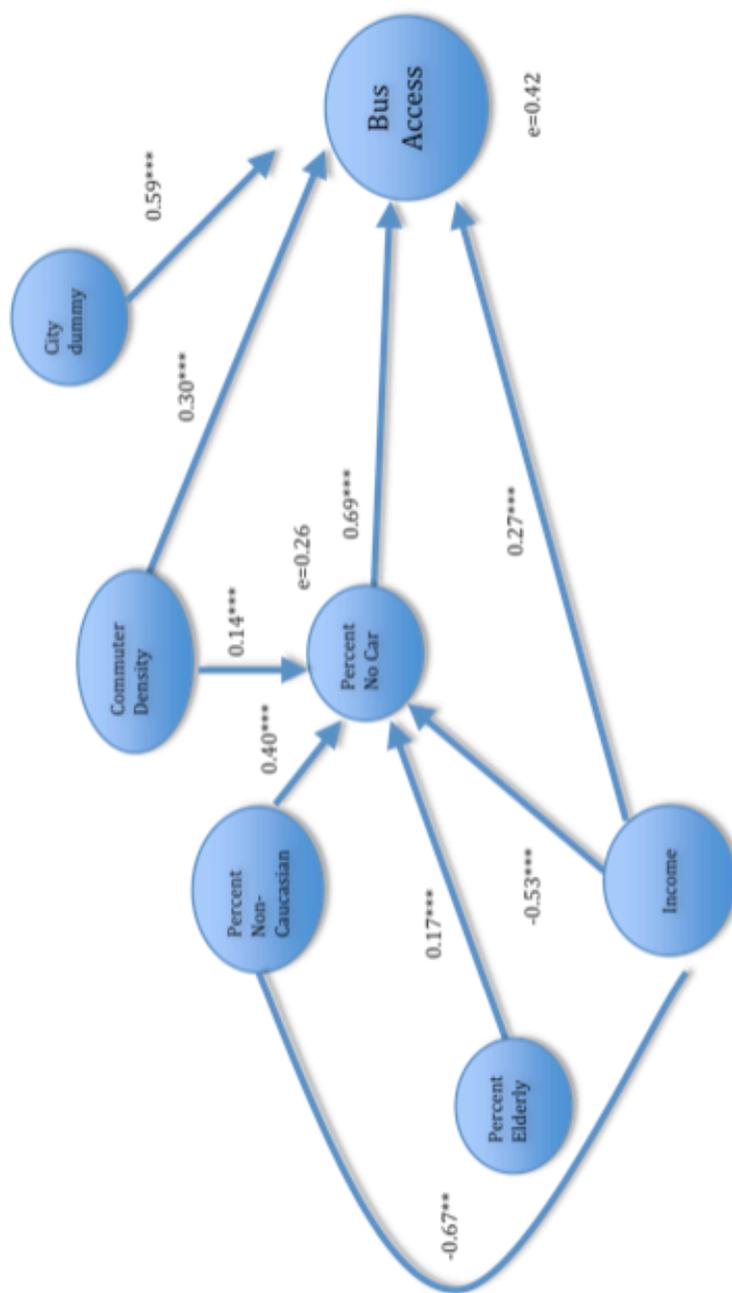


Figure 3: Results of Path Regression

p=.01, *p=.001

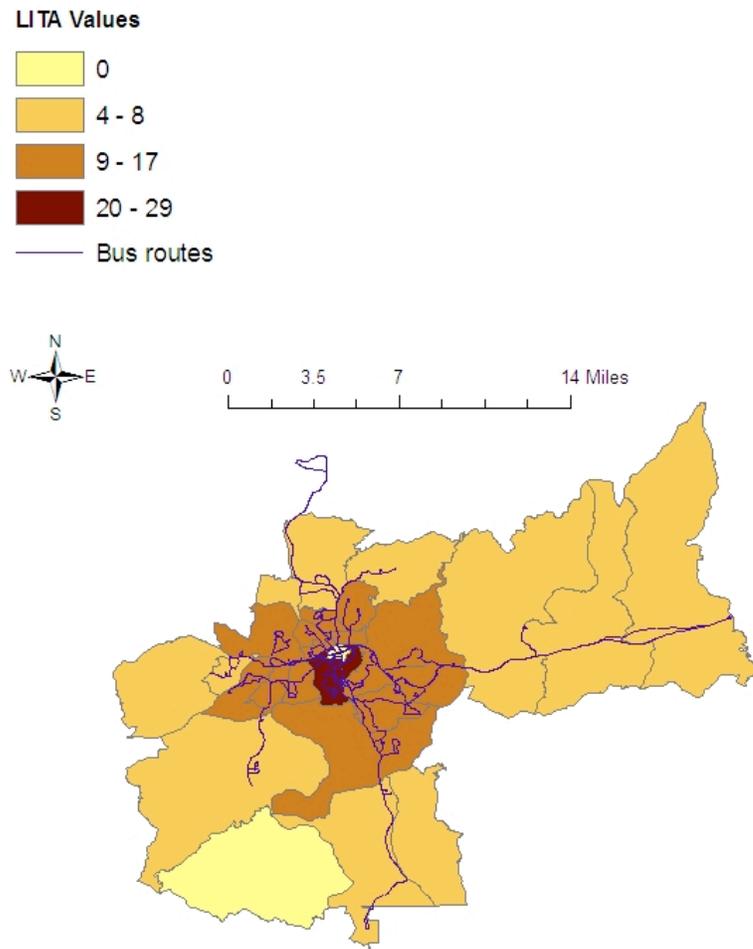


Figure 4
LITA Values and Bus Routes for Asheville, NC

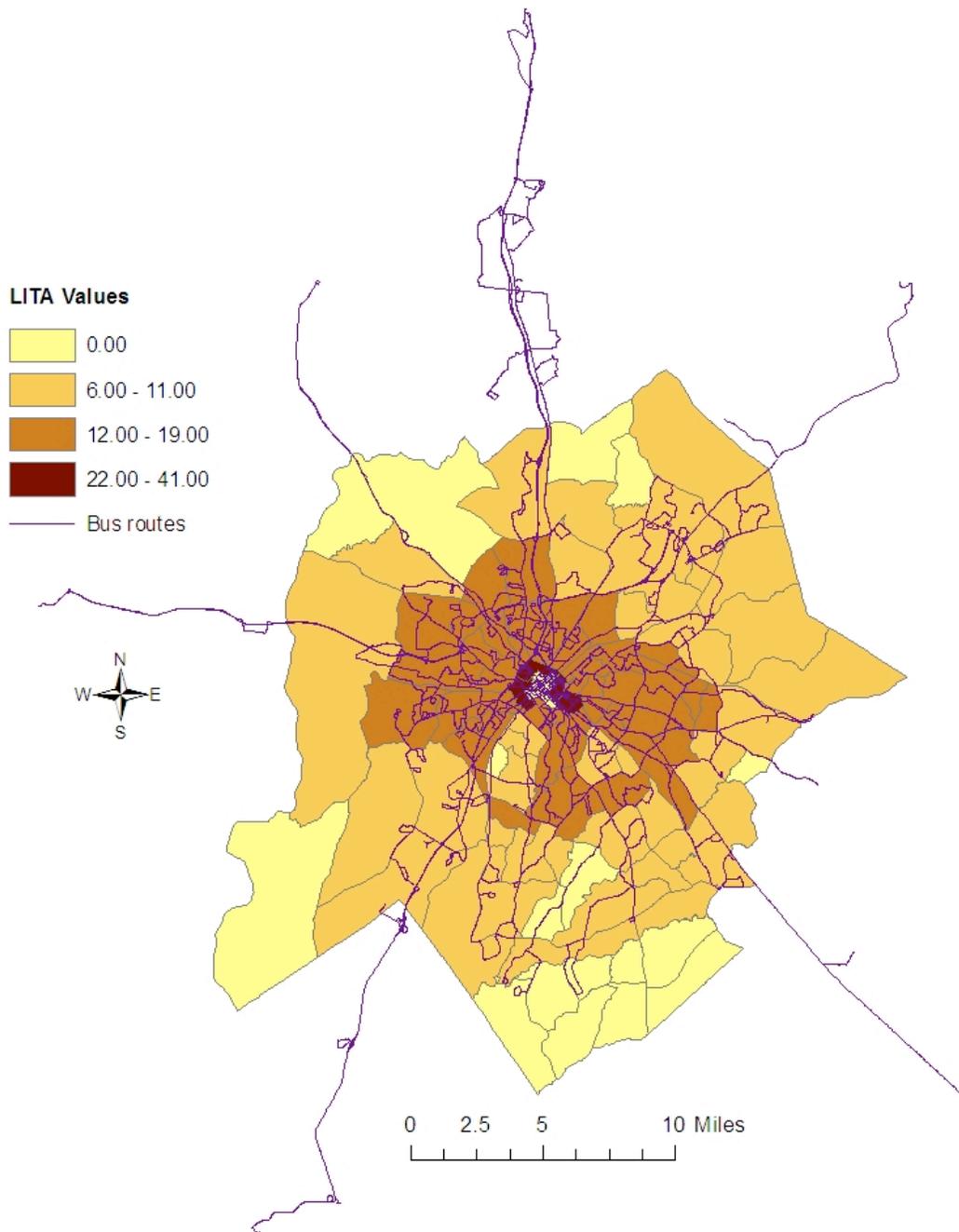


Figure 5
LITA Values and Bus Routes for Charlotte, NC

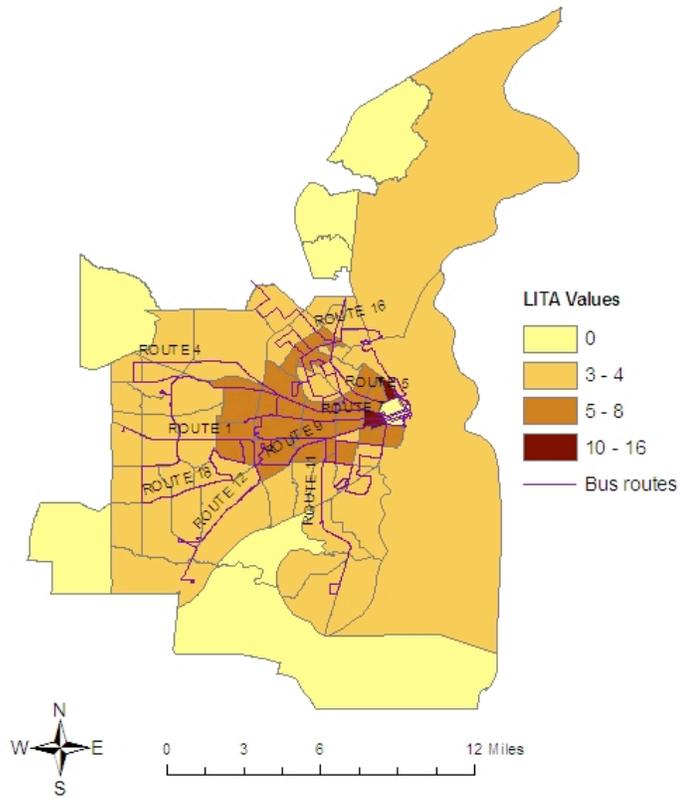


Figure 6
LITA Values and Bus Routes for Mobile, AL

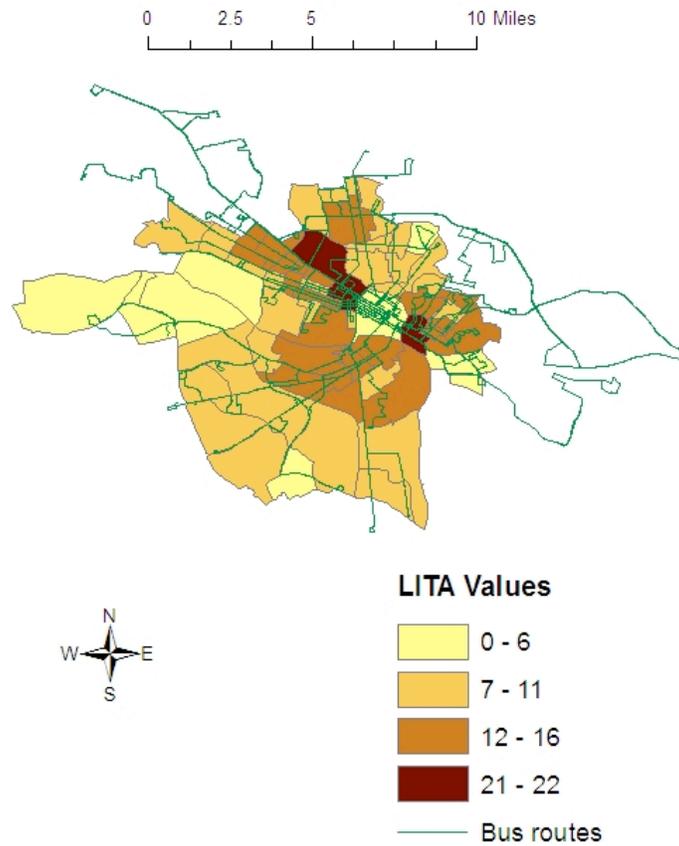


Figure 7
LITA Values and Bus Routes for Richmond City

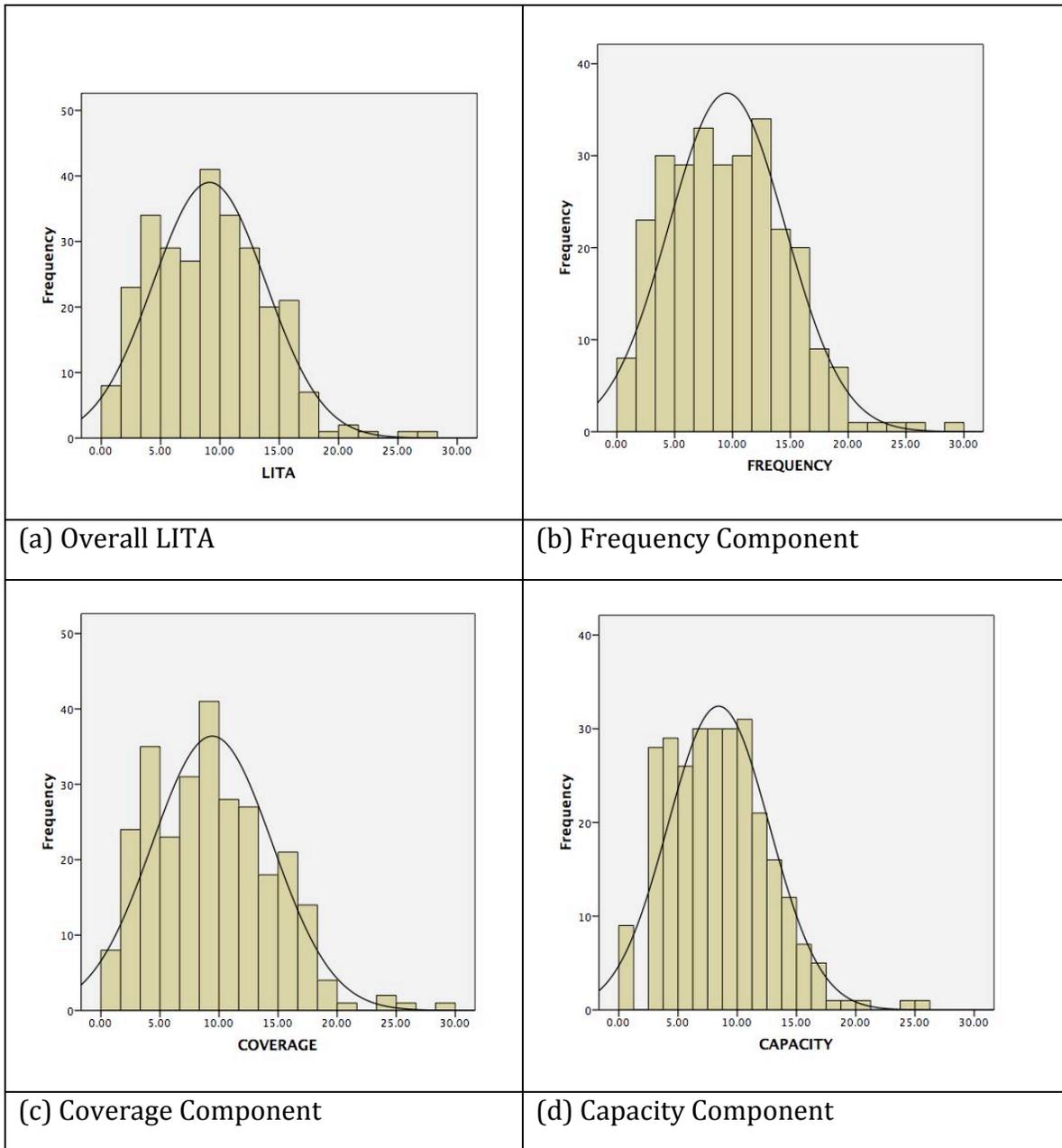


Figure 8: Frequency Distributions for LITA and Components

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APPENDIX A: QUESTIONS FOR BUS PLANNERS AND ELECTED OFFICIALS
AND CONFIDENTIALITY FORM

Questions for professional bus route planners:

- 1) Will you describe the process used for determining bus routes and stops in the [City of Asheville]?
- 2) What factors are taken into account when determining new routes or changes in routes?
- 3) Are these factors established by rules/standard operating procedures or are they more informal?
- 4) Under what conditions would [Asheville Transit] deviate from using these factors in setting service?
- 5) To what degree do relevant stakeholders outside of [Asheville Transit] (e.g., citizens, community groups, elected officials) have input to the determination of new routes? Please elaborate.
- 6) Are recommendations of this department ever over-ruled by senior [Asheville Transit] officials? If so, can you give an example of when this has occurred?

Questions for Elected Officials

- 1) What is the nature of your involvement with the bus planning and/or operations division?
- 2) To what extent does the City Council interact with [Asheville Transit]?
- 3) What are the other avenues for interaction between the City Council and [Asheville Transit]?
- 4) Would you describe the procedure used by the City Council to gather input from citizens on satisfaction with the bus system?
- 5) How is citizen input channeled from the City Council to [Asheville Transit]?
- 6) Would you describe the interaction of the City Council and [Asheville Transit] as a politicized process? If so, how? If not, why not?

Statement of Confidentiality & Consent
Bus Service Study

I understand that this interview is voluntary and that I may discontinue participation at any time. I understand that this interview is for academic research only and my name or institutional affiliation will not appear on any of the analysis, transcriptions, reports, or other data shared with people associated with this project. In addition, no data bearing my name or institutional affiliation will be shared with persons outside the project.

Signature of Study Participant

Date

Signature of Researcher

Date