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Comparative Evaluation of Small to Mid-Size U.S. Bus Transit Systems, 1997

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by

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This study provides an assessment of the overall comparative performance of 178 small to mid-size bus transit operations located in the United States, during 1997. It uses commonly applied measures of resources and results. This is the only known study that compares and ranks small to mid-size bus systems by combining both resources and results.

The selected data comes from the Federal Transit Administration's (FTA) *National Transit Database Profiles: Agencies in Urbanized Areas with a Population of Less than 200,000*. The nationally reported data is collected and published by the FTA under Section 15 of the Transit Act. Davis, California's Unitrans bus agency received the best performance rating. On the other end, the City of Anderson's (Indiana) transportation system finished with the worst ranking of the 178 different transit systems.

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CHAPTER I

INTRODUCTION

Importance of Transit Studies

Modern transportation planning is a rapidly changing undertaking that requires knowledge from many disciplines. Political science, public administration, economics, city planning, business management, environmental studies, and engineering are some of the primary disciplines that contribute to effective transportation policy.

Transportation is an issue that will receive heightened focus in the coming decades as more nations put an increased emphasis on clean air. In the United States, several environmental groups have targeted automobile transportation as the primary culprit in the quest for a high quality of air. In the upcoming 2000 presidential election, Vice-President Al Gore has made traffic concerns a primary plank in his "livability agenda" (Easterbrook, 18).

Congestion and gridlock are growing traffic problems in U.S. metropolitan areas. One obvious cause is the simple fact that more Americans are driving. Between 1983 and 1990, the average miles traveled annually per person in the United States rose by 19 percent; vehicle miles traveled went up even faster - by 37 percent (HUD, 36). That means Americans now spend the equivalent of almost two waking hours every day driving somewhere in their cars. Suburban residents spend almost three full weeks of work behind the wheel each year (HUD, x).[1] To lessen these congestion problems, public transportation is often advocated as a potential cure to get less people driving personal automobiles.

The importance of transportation, however, extends beyond environmental concerns. The transport of people even involves freedom. Indeed, the ability to move often makes it easier for an individual to escape from bad and/or seek what is good. When escaping dangerous weather, such as hurricanes, precious time is lost for those fleeing when there are no options to escape, except by walking. The transport of people and goods is also an important sector in the national economy.

A well-functioning American transportation system needs good, sustainable local and regional passenger transport. This contributes to employment and economic

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[1] This assumes an average driving speed of 30 mile per hour.

development. "The evidence is overwhelming that where you have efficient transportation, you increase productivity," says House Transportation and Infrastructure Committee Chairman Bud Shuster (R-PA), perhaps the most influential advocate in Washington for more transportation spending (Hosansky, 732). Peter "Jack" Basso, DOT's Assistant Secretary for the Budget and Programs adds, "Transportation and effective logistics are vital to our economic survival as we compete in the global market" (Hosansky, 733).

Urban areas are affected to an even greater degree by the shortcomings and solutions of transportation policy and planning. If transportation fails, the economic health of a city will likely suffer. The future of American urban areas depends in large part on transportation options for the underprivileged. For example, welfare reform requirements may require the former recipients to work in a different section of the city. Reformers have a responsibility to ensure that these workers can arrive at their jobs and be taken home on a daily basis.

Economic vitality in urban areas depends heavily on those who have the economic means when making a choice to enter or not to enter a downtown area. Affordable, efficient, and safe transportation will assist urban areas in attracting white-collar workers, shoppers, and tourists. Traffic congestion and parking availability are also considered when consumers evaluate the overall experience of a city.

Public transportation spending in the United States is less than in most other industrialized nations. However, it is not the amount of transit options that is lacking in the United States. The problem stands out in the quality and efficiency of American public transportation. Policymakers in the United States continue to increase subsidies toward public bus transportation systems, for example, despite most data that shows rising operating expenses and declining performance indicators (Cox, 3). Rapidly decreasing ridership rates indicate that increasing tax dollars spent on government bus systems may not be the best solution. This excessive subsidy goes against laissez-faire economic principles upon which the United States was founded.

Public transportation services are partially funded with taxpayer dollars. Therefore, managers have a dual responsibility to system users who expect adequate and safe transportation services at a fair price, and to taxpayers, who expect that fair, equitable and reasonable services be provided with a minimum public subsidy.

In taxpayers' and riders' views, the key questions related to public transit are simply:

1. How much are we paying in fares and subsidies (both examples of resources)?

2. What is done with the funds (vehicles, service, labor, unit costs)?

3. What is the result (ridership) (Hartgen, 2)?

Systems in which these elements are not balanced should be adjusted by governing bodies to achieve an acceptable balance. Ridership is the key measure of system performance because, without ridership none of transit's benefits (to patrons or to the community) can be achieved. Comparative analysis – the review of a system's operating statistics against others – allows the system's management to determine (relatively or absolutely) whether their measures are out of line with expectations or with other similar systems (Hartgen, 2).

Uniqueness of This Study's Bus Research

An important topic has been overlooked in bus transit literature. Often times, bus research focuses on large agencies in the "big three" cities: New York, Los

Angeles, and Chicago. This systematic study strives to contribute to research involving small and mid-size bus systems. No researcher is known to have extensively analyzed and/or comprehensively compared small to mid-size bus systems in the United States. In fact, very little literature and research even exists in the areas of small to mid-size bus systems. Hence, a "large-size bus system" theoretical framework will occasionally be used in sections of this study.

This study provides an assessment of the overall comparative performance of 178 small to mid-size bus transit operations located in the United States, during 1997. It uses commonly applied measures to rank these systems, using combined measures of resources and results. The performance variables are intended to measure which systems are the most efficient. Of course, economic efficiency is but only one goal of transit providers. For this study, however, the search for the most efficient bus system is fundamental. Rising subsidies and declining ridership makes efficiency particularly important when evaluating bus systems.

While comparing different bus systems, it is hoped that a better understanding will be gained into how a bus system can improve itself. In other words, how can a poorly ranked system operate in a manner similar to systems that received good rankings? The answer to this question will assist policy-makers and transit management in their quest for the best possible bus transit system for the tax dollars expended.

This study is not an evaluation of individual management or operator policies, but of system performance. Transit boards and commissions, not operators, typically set service and fare policies according to the needs of each community, and may therefore value goals and objectives differently from my approach. Neither is this study the only way - or necessarily the best way - to evaluate transit system performance (Hartgen, 3). As the literature review exhibits, there are many approaches to this problem. I believe, however, that this is a reasonable approach to developing a consolidated overall ranking. This is the only known study that compares and ranks small to mid-size bus systems by combining both resources and results.

This study meets King, Keohane, and Verba's (1994) call that social science research be practical and contributing to the discipline. My research project poses a question that is "important" in the real world. The topic is consequential for political, social, and economic life. Public transportation affects nearly everyone's life, either directly or indirectly. Additionally, the data in this study contribute to the existing bus transit literature by increasing our collective knowledge of small to mid-size bus systems (King, Keohane, and Verba, 15).

CHAPTER II

BACKGROUND OF BUS TRANSIT

Transportation is a broad arena for public policy research. However, literature that is recent, scholarly, bus related, and focused on small to mid-size systems is very limited. Fortunately, an extensive list of research on the broader topic, public transit, does exist and can be applied to this study's more specific focus of smaller bus transit systems. In this study, transit related literature has been organized into the following six perspectives: history, governmental involvement, economic, labor and management, customer-consumer, and rating transportation systems.

The History of Bus Transit in the United States

The public transit industry began in New York City. Abraham Brower established horsedrawn omnibuses in 1827. By the 1870s, "horsecars" were common in large cities and fairly common even in mid-sized cities. Steam-engine cable cars, electric streetcars, and railroads followed until dependence on free-wheel transportation established itself in the 1920s through the 21st century. In 1905, gasoline powered buses also made a debut in the nation's busiest metropolitan area, New York City. New York was ripe for transit innovation because of its high densities of people, economic activity, and various water barriers. Two decades later, urban transit peaked in 1926 with 17,234,000,000 riders nationwide (Hilton, 32, 42).

Early buses consisted of bulky wooden bodies on truck chassis. The improved engineering of motor buses between the world wars enabled buses to become more popular. Technological advances introduced rear-engined gasoline and diesel buses with automatic transmissions. As the interstate highway system was emerging in the 1950s, American transit became relatively homogenous with motorbuses. By 1965, about 80 percent of transit vehicles were buses for forty or more passengers (Hilton, 45).

Road-building escalated with the post-war economic booms of the 1950s and 1960s. As Americans turned decisively toward cars for transportation, privately operated transit systems across the country went into decline. Government ownership and management of bus agencies is a relatively recent experience. Until the mid-1960s, bus transit in most cities was self-supporting. Transit operations were privately managed and revenues exceeded costs. The decade of the 1960s is considered crucial in the transit industry's history.

Transportation can be analyzed in the broad context of improving urban ills. U.S. urban uprisings in the 1960s directed increased attention and study to problems associated with cities. During one year of this same decade, 1963, the public transit industry as a whole lost a record $880,000 (Hilton, 47). In 1964, Congress passed a massive program called Urban Mass Transportation Administration (UMTA), later renamed the Federal Transit Administration (FTA) in 1991. The goal of UMTA was to revitalize mass transit, but the Democratic Congress and President Johnson attempted to use transit policy as a lever for dealing with larger societal problems such as growing poverty and racial inequality (Lave, 4). As a result, U.S. public transit became bloated and was characterized by many as being inefficient and unresponsive to taxpayer's service demands.

The decline of public transit since the 1960s may provide answers to revitalizing transportation services in urban areas. Hanson (1986) has attributed public transit ills to increased affluence, increased dependence on automobiles for most urban trips, increased suburbanization of both population and economic activities with the result that transit is incapable of serving outlying urban areas, dispersal of some transit dependent populations throughout urban areas, and reductions in trips to the central cities of Standard Metropolitan Statistical Areas (MSAs).

Federal subsidies for the transit services grew as the cost of building expensive rail systems and operating them as well as bus services outpaced revenues from fares. Beginning in 1973, the federal government began supporting local transit authorities with money from the Highway Trust Fund. Despite objections from many rural states and localities who claimed that it was an unfair use of their constituents' tax dollars, the Highway Trust Fund became law (Hosansky 738).

The higher concentration of population found in cities typically leads to greater use of the bus system. Jacobs (1989) discovered that dense, mixed-use areas that are organic, spontaneous, and untidy are found in the types of cities where bus systems are most likely to have high ridership rates. To some, transportation planning in cities is a zero-sum game. A zero-sum based argument is that cities and streets that are designed for automobiles are not conducive to good public transportation (Jacobs, 1989).

Since World War II, the preference of millions of Americans to live in the suburbs has created additional challenges to public mass transit. These development patterns changed American's commuting patterns. Suburban areas continue to grow at faster rates than central cities (see Table 1). As residential development spread farther from downtown, many employers began moving to emerging suburban communities. As a result, commuting routes, once laid out clearly like the spokes of a wheel from a downtown hub, multiplied and shifted direction, resembling more closely a spider web branching from suburb to suburb. Laid out along traditional routes, bus and transit services failed to meet the demand of suburban workers (Hosansky, 738).

Bus travel is often difficult and time-consuming, especially in suburban areas where work, stores, and houses are often built far apart. It is difficult to serve dispersed travel patterns with public transportation. Even if mass transit attempts to expand further into the suburbs, it still serves a small percentage of trips in suburbia (Hosansky, 735).

Table 1

The U.S. Population Continues to Suburbanize[2]

Year	All MSAs/PSMAs	Central Cities	Suburbs	Central City of U.S. Metro Population (percent)
1970	159,853,825	71,727,831	88,125,994	44.9
1980	177,399,088	72,586,529	104,812,559	40.9
1990	198,250,684	77,669,885	120,580,799	39.2
1996	211,879,835	80,401,868	131,477,967	37.9

Population growth areas are in cities without a tradition of public transit. Metropolitan areas like Dallas, San Antonio, Phoenix, Charlotte, and Orlando are accompanied with better job growth and economic opportunity than older U.S. cities. Older city centers are losing jobs, with new job growth located in the suburbs. This puts the traditional downtown network of bus routes at a disadvantage. For example, downtown Kalamazoo, Michigan has seen most of the its major employers leave the business district. Still, Metro Transit in the Kalamazoo area has very limited routes to the growing city and townships in the surrounding area. The 1998 U.S. Census shows the City of Kalamazoo losing 5.2 percent of

[2] Source: 1970, 1980, and 1990 Census of Housing, Bureau of the Cen-

its population since 1990. During the same period, the entire county experienced a healthy 2.6 percent growth rate. Bus agencies need to be flexible and up to date with demographic shifts. Bus service that remains focused in stagnant downtown areas will continue to be excessively costly to taxpayers.

If recent trends continue, mass transit will continue to grab record high amounts of tax dollars. In 1991, the United States Congress passed landmark transportation legislation, the Intermodal Surface Transportation Efficiency Act (ISTEA), that recognized the increasingly important role of transportation alternatives to the personal automobile. The vision was to create a balanced, intermodal transportation system for the coming years. The 1998 omnibus transportation act, Transportation Equity Act for the 21st Century (TEA-21), was a follow-up to ISTEA. Whereas the 1991 law emphasized building alternatives to highways and creating links between different modes of transportation, the new bill provides huge increases in funding for both highways and mass transit. Overall, TEA-21 is a $217.9 billion law that includes $41 billion in funding over six years for mass transit, and $2 billion for safety programs. The funds

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sus; 1996 Federal-State Cooperative Population Estimates, Bureau of boost transit's shares of the gasoline tax from 2 cents to 2.85 cents and has spurred a round of transit expansions across the nation, including 166 miles of additional bus routes and eight miles of trolley bus service. TEA-21 mandates inclusion of all modes of travel in local, regional, and national long-range transportation planning documents. The new law also allows employers to deduct more money for public transit subsidies for their workers (Hosansky, 736).

Governmental Involvement

Federal, state, and local levels of governments are significant factors to consider in the research of bus transportation. After all, most bus agencies in the United States are public. The influence of government on transportation should not be underestimated. Why is the government even involved with bus transportation? Various scholars argue that government is not the solution to transit problems. In fact, some literature states that government is the problem with transportation. Hilton (1985) finds that transit industry innovation was eventually replaced by subsidization due to government regulation and monopolies. *People 2000* (1992) argues that

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the Census.

ridership rates would dramatically increase if transportation was deregulated and privatized to more demand-friendly providers. In markets with private transportation providers, the desires of local residents are fully expressed in the policymaking process and the private sector is given the fullest possible latitude to provide needed goods and services (Staley, 1992).

In the past, well-meaning programs often took a narrow, single focus on urban problems. Although heavy subsidization toward transit did not begin until the mid-1960s, government has always been concerned with traditional issues like regulation of fares, cross-subsidization of weak routes by strong ones, and control over entry in order to protect the monopoly transit franchise.

Charles Lave (1985) identifies three primary rationales for government regulation: (1) cross-subsidization; (2) preservation of economics of scale; and (3) coordination of service. He concludes that not one of these rationales stands up after examination. First, it is economically inefficient to have strong routes cross-subsidize weak ones. This type of subsidization discourages the fullest development of the routes that produce the surplus. The popular routes should be expanded to attract more riders and provide them a higher quality of service. The subsidy also hides the weak routes and hinders innovation for poor performing routes. Second, the government has traditionally protected large bus operators to preserve economies of scale. This is flawed because large bus systems are not more efficient. In fact, most of the related empirical studies find that larger firms actually have higher operating cost per vehicle-hour of service (Lave, 5). Third, the coordination rationale stems from the belief that a single regulated monopoly is necessary to assure coordination of service and transfers. This has suppressed competition and innovation. Most cities now have only a single transit provider, producing a single kind of lowest-common-denominator transit service that is unacceptable to the overwhelming majority of Americans who do not use public transit (Lave, 6).

Lave and other conservative scholars assume that the purpose of a transit system is to maximize profits, or minimize losses. There are other goals that compete with profit maximization. Social equality, racial desegregation, less automobile emissions, and attempting to reduce traffic congestion are some alternative goals to a public transit system.

Despite increased governmental subsidies, ridership continues to decline. Samuel (1999) figured that around 340 billion dollars of U.S. taxpayer's money has been drained into capital and operating subsidies for public transit in the past fifty years. Again, the environment, social and racial equality, and traffic congestion are often cited as reasons to put travelers into buses. For purposes of profit maximization, though, the point remains. Policymakers continue pouring money into government transit despite a society that prefers personal automobiles.

Despite overall population growth in the United States, ridership is down from 23 billion yearly during World War II to 8 billion now. Of all local trips that Americans make, only 1 percent or 2 percent of them use public transit. Confine the calculation to commuting trips in metro regions, and buses and rails still account for only 5 percent (Peirce, 1999). Regardless of increased government spending on public transportation, it is unlikely that Americans will embrace public transportation in the near future. Transit ridership nationwide rose from 1996 to 1998 according to the American Public Transit Association. Still, ridership is actually down slightly from where it stood at the beginning of the decade (Hosansky, 735).

Fewer people are commuting, also. This one type of trip for which public transit can actually compete with the automobile is in decline. More people are working at home, working in different locations, and working flexible hours that do not fit a fixed-route bus. Only about 5 percent of all commuters use mass transit to get to work, compared with 85 percent who commute by car (Hosansky, 736).[3] A survey by Chilton Research Services suggests that public transportation is out of fashion. After World War II, 23 percent responded that they relied on buses, trolleys, or trains to take them to work. In contrast, only 9 percent of those surveyed currently take public transportation to their jobs (Morin, 34).

During this current 2000 Fiscal Year, the United States Department of Transportation (DOT) is spending record amounts on transportation programs (HUD, 82). *Community Transportation Choices* allocates $6.1 billion for public transit, $2.4 billion to implement innovative community-based transportation programs, and $1.8 billion to help communities with congestion and traffic problems meet the requirements of the Clean Air Act. The *Job*

Access and Reverse Commute Program spent $150 million to help communities implement new or expanded transportation services to help low-income people get to work.

Economic Factors

Assuming that efficiency is the primary goal of improving a bus transit system, government subsidy is a crucial variable to review. Several economists have written extensively on the benefits and downfalls of governmental subsidies to bus agencies. Since the 1960s, the increased supply of transit services was not accompanied by corresponding increases in the total passenger demand (Obeng, Azam, and Sakano, 1997). Obeng, Azam, and Sakano (1997) also found a positive relationship between rising subsidies and rising inefficiencies. Anderson (1984) indicated that subsidies increase costs by making transit management complacent in improving efficiency.

Free-market researchers have searched for, and found, compelling reasons for bus transit to be almost completely privatized. Transportation researchers Christine Johnson and Milton Pikarsky (1985) found that diverse alternatives offered by decentralized and fragmented private sector bus providers have important char-

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[3] The remaining ten percent use other modes of transportation such as

acteristics that benefit urban commuters: they are small, tailored to the needs of specific people who make specific trips, market coordinated, designed to actually meet the stated objectives of the regional transportation system, and often sponsored by firms that benefit from the travel (Staley, 27). While privatization models are complex, it is useful to review their conclusions because they bear directly on the issue of private versus public costs. One of these studies, by Anderson (1983), examined the impact of takeover and subsidies on costs; she concluded that, for the United States as a whole, the average operating cost per bus-hour increased 28 percent as a result of public takeovers and subsidy programs. The implication is that public agencies have simply been unable to provide bus service as affordably as private firms (Morlok and Viton, 1985).

Labor and Management

Labor's large costs make it an important factor to consider in the review of bus performance. Cox (1999) calculates cost analysis for the competitive contracting of labor, and found significant cost savings when bus agencies administer competitive contracting. The compe-

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walking or bicycling.

tition-based contracting of labor does not necessarily result in privatization or the breaking up of labor unions. There are several examples where the incumbent labor union outbid private companies for providing bus service (Cox, 1999). Employee-input, safety, performance-incentive programs, training, and collective bargaining are other factors that can hinder or promote cooperation between mass-transit management and labor (Jennings, Smith, and Traynham, 1986).

To buffer labor demands, management's point of view must also be reviewed. Contemporary transit agencies must be managed so that they produce service efficiently and ensure that taxpayer's contributions are being used effectively. Public managers need research within an intellectual framework suited to specialized endeavors (Fielding, 1987). Altschuler, Womack, and Pucher (1979) adopted a policy perspective that considers public transit as well as other transportation modes.

Customer-Citizen

Bus transportation research must also consider the perspective of the customer-consumer. Orski (1986) examines shared-ride taxis, fixed-route taxicabs, and "bus clubs" as part of a completely redesigned bus system that focuses on the customer, not the operator. Winnie and Hatry (1973) propose an effective measurement system to help local government officials analyze data from the standpoint of a rider. The decision-making process of transit consumers has been analyzed to discover how and why commuters choose their mode of transportation (Morlok, 1974).

More recently, several major studies of transit performance have been released. "The Campaign for Effective Passenger Transportation" recently issued *Dollars and Sense* (1997), purported to document a transit turn-around since 1970. However, a study by the Reason Foundation (Semmens, 1998) *Rethinking Transit Dollars and Sense* found serious flaws with that earlier report.

Rating Transportation Systems

The various research highlighted above provides a background for bus-related studies. However, no other author has published as an extensive (or as specfic) analysis of bus performance ratings as David T. Hartgen. Literature that is most significant and applicable to this study are the annual performance reports written by Hartgen, Coordinator of the Center for Interdisciplinary

Transportation Studies, at the University of North Carolina in Charlotte. The foundation of this study is built upon Hartgen's previous reports on the performance of bus agencies throughout the United States. Hartgen's comparative bus rankings are the most advanced quantitative pieces available for those in the transportation industry. Still, Hartgen's reports appear to be characterized by significant limitations and shortcomings.

The first condition deserves some discussion because of its importance. It is less determinate to compare certain financial data between some of the United States' biggest bus systems with some of the smallest. Yet, the systems that Hartgen analyzes vary extremely widely in size and function. The most profound example in his report is that of the Los Angeles, California and Fayetteville, North Carolina bus systems. For example, Hartgen groups bus systems into peer groups based on the size of service area population. However, the service area population of the Los Angeles system is *120 times greater* than the Fayetteville system! The peer groups are designed to minimize size differences, but the final rankings, probably the most important aspect of Hartgen's research, group together these systems that vary so widely in size. A more balanced and equitable selection of systems needs to be used when comparing big city bus systems with systems found in smaller communities. The title of Hartgen's report, *Comparative Performance of Major U.S. Bus Transit Systems*, suggests bigger bus systems will be analyzed. On the contrary, the Fayetteville bus system is not even considered a big system in this report which focus on small to mid-sized bus agencies. The Hartgen reports categorize bus systems into "peer groups." This report will not use "peer groups" because there is much less variation in the size of cities when compared to Hartgen's work.

Second, Hartgen's reports are written for policy-makers rather than academic researchers. As a result, the information is presented in a non-scholarly, report-type fashion. For example, the review of literature is shallow and offers very few options for readers to enhance their understanding of comparing bus transit systems.

Third, David Hartgen's reports do not reveal exactly how his twelve variables are formulated. Interested readers can figure this information out on their own, but only after much time and frustration. Research, especially the quantitative type, is solidified when other scholars can replicate the methods and calculations.

The last difference in Hartgen's work and this study is perhaps the most important. Hartgen does not offer any explanation of how a poorly ranked system can improve its comparative performance standing. In other words, what does a performance ranking tell us? In Hartgen's annual reports, Champaign-Urbana, Illinois receives a perennial ranking in the top five. However, he never explains why Champaign-Urbana receives a favorable ranking. More importantly, little insight is presented on how other systems could achieve a similar level of success.

CHAPTER III

DATA AND METHODS

The selected data comes from the Federal Transit Administration's (FTA) *National Transit Database Profiles: Agencies in Urbanized Areas with a Population of Less Than 200,000,* also commonly referred to as Section 15 Data. The nationally reported data are collected and published by the FTA under Section 15 of the Transit Act.

Following Hartgen's model, this study uses 12 variables to measure the performance of selected bus systems. These 12 variables are divided into two classifications: resources and results. Five measures of resources (vehicles, population base, fare revenue, non-fare revenue, and coverage area) will be normalized and compared with seven measures of results (operating expenses per mile and per hour, operating costs per passenger and per passenger mile, vehicle miles and hours of service provided, and ridership rates).

Systems are rank-ordered for each of the 12 measures, weighing each statistic equally. An overall ranking, or final ranking, is figured by simply averaging all 12 of the performance rankings.

This study includes every transit system in United States' urban areas with a population of under 200,000 with two exceptions: (1) agencies that do not have fixed-route bus service; and (2) agencies that receive data reporting exemptions from the FTA. Bus systems that are excluded because of these two criteria are listed in Appendices A and B. Overall, 178 small to mid-size bus transit operations are analyzed in this study.

The financial data are drawn from the overall system-wide Section 15 statistics for each operator. The profile in Appendix A is an example of FTA data for the Davis, California transit system,[4] and items that were calculated from it.

These items consolidate revenues: service area population and expenses by mode (fixed-route or multi-modal) for each operator. Unfortunately, details of revenues by mode are not readily available. Because of difficulties in combining costs and ridership, this study does not consolidate the "results" measured by mode. Instead, four measures for only the bus portion of the systems are

[4] The Davis Transit profile sheet was chosen because it received the highest ranking, according to the model adapted from David Hartgen.

used, while two are for the overall system. Because of these unavoidable problems, the "resource" measures and "results" are not exactly consistent for single-mode and multi-modal operators. If re-analyzed consistently, "resource" statistics for multi-modal operators would probably look somewhat better, relative to other operators. On the other hand, performance measures for demand-response and van-pool services operated by bus systems tend to be somewhat weaker than for fixed-route bus service. The bottom line is since these effects are often compensating, it is not possible to tell without extensive research whether the overall rankings of systems would be much different if both of the above effects were accounted for. The rankings represent a reasonable result in my view. Still, others are encouraged to take a more careful look.[5]

[5] Hartgen encounters the same problem. He also concludes these types of difficulties in the data usually "even out."

CHAPTER IV

DATA ANALYSIS

The following chapter discusses how each measure is calculated and the top and bottom three systems for each performance measure. For all 12 measures, lower numbers are associated with superior performance, while higher numbers indicate poor performance (see Appendix B for rankings).

Operating Expense per Vehicle Revenue Mile

This measure is transferred directly from the transit profiles in the *1997 National Transit Database* as a service efficiency performance measure. Operating expense per vehicle mile is calculated by dividing operating expense into vehicle revenue miles. Operating expense consists of the following four variables: salaries, wages, benefits; materials and supplies; purchased transportation; and other operating expenses. Vehicle revenue miles are the total miles that the bus accumulates while in service for customers.

The 1997 operating costs per vehicle mile averaged $3.29 for the 178 operators. The top-rated (lowest cost) operators for 1997 were Sumter, SC ($0.81); Binghamton, NY ($1.30); and Panama City, FL ($1.34); all these were less than 55% of the U.S. average. The highest cost systems were Yakima, WA ($6.16); Santa Cruz, CA ($6.03); and Medford, OR ($5.94), all with rates more than 75% above the national average.

Operating Expense per Vehicle Revenue Hour

This measure is transferred directly from the transit profiles in the *1997 National Transit Database* as a service efficiency performance measure. Operating expense per vehicle revenue hour is calculated by dividing operating expense into vehicle revenue hour. Operating expense consists of the following four variables: salaries, wages, benefits; materials and supplies; purchased transportation; and other operating expenses. Vehicle revenue miles are the total miles that the bus accumulates while in service for customers.

For 1997, the average operating cost per vehicle hour was $45.77. The top-rated systems (lowest cost) for 1997 were again Sumter, SC ($16.76); Florence, SC ($19.25); and Springfield (University), MO ($20.07), all less than 50% of the national average. At the high end, Medford, OR ($92.12); Santa Cruz, CA ($88.43); and Palm

Springs, CA ($83.60), all more than 80 percent more than the U.S. average.

Operating Expense per Passenger Mile

This measure is transferred directly from the transit profiles in the *1997 National Transit Database* as a cost effectiveness performance measure. Operating expense per passenger mile is calculated by dividing operating expense into passenger miles. Operating expense consists of the following four variables: salaries, wages, benefits; materials and supplies; purchased transportation; and other operating expenses. Passenger miles are the miles accumulated while the bus has passengers on board.

Average operating costs per passenger mile were $0.73. The top-rated (lowest cost) systems were Lancaster/Palmdale, CA ($0.12); Brownsville, TX ($0.14); and Monessen, PA ($0.16), all less than 75% of the U.S. average. Reporting the highest costs were Danville, VA ($2.69); Kingsport, TN ($2.44); and Merced, CA ($2.29), all more than twice the national average. Springfield (University), Missouri; Houma, Louisiana; and Frederick, Maryland[6] all received reporting exemptions from the Federal Transit Administration (FTA).[7]

Operating Expense per Trip

This measure is also transferred directly from the *1997 National Transit Database* as a cost effectiveness performance measure. Operating expense per passenger trip is calculated by dividing operating expense into unlinked passenger trip. Operating expense consists of the following four variables: salaries, wages, benefits; materials and supplies; purchased transportation; and other operating expenses. Unlinked passenger trips are the number of trips, minus transfers.

Operating expense per passenger trip averaged $2.71. Top-rated (lowest cost) systems for 1997 were newcomer Iowa City ($0.35); Fayetteville/Springdale, AR ($0.49); and Davis, CA ($0.68), all less than 75 percent of the U.S. average. At the bottom, Vero Beach, FL ($16.65);

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[6] On the transit profile, Frederick, Maryland reported operating cost per passenger to be 0. After notifying the transit agency, it was discovered that the Frederick system received a reporting waiver from the Federal Transit Administration (FTA) for this one particular variable.

[7] These three systems received reporting exemptions from the FTA for data on the operating expense per passenger mile. The three systems were not dropped from the analysis because this was the only category in which data was missing. In the rankings, operating expense per passenger mile for these three systems was assigned a zero value. As a result, the reporting exemptions did not benefit of adversely

Binghamton, NY ($11.74); and Newark, OH ($7.69), all more than double the national average. These systems have quite low ridership rates relative to costs. Of all the variables, this measure receives the most attention from bus agency managers (Hartgen, 33).

Vehicle Revenue Miles per Trip

Vehicle revenue miles per trip is calculated by dividing annual unlinked trips into annual vehicle revenue miles. This statistic, the inverse of its usual form, is a surrogate for ridership utilization, and can be viewed as a sort of "average distance" between boarding. The longer the "distance" between boarding, the lower ridership per unit of service.

Overall, the 178 systems averaged 1.11 vehicle miles between trips in 1997. Iowa City (university), Iowa (0.17); Fayetteville/Springdale, Arkansas (0.18); and Champaign/Urbana, Illinois (0.25) ranked best on this measure, all less than 75 percent of the national average. Florence, South Carolina (6.78); Myrtle Beach, South Carolina (4.81); and Newark, Ohio (4.22) were all over three times the U.S. average.

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affect their rankings.

Vehicle Revenue Minutes per Trip

Vehicle revenue minutes per trip is calculated by multiplying annual vehicle revenue hours by sixty, and then dividing that total by annual unlinked trips. The 1997 vehicle revenue minutes per trip (a measure of average time between boardings) was 5.08. Thus the average 1997 transit operator picks up a rider every 5.08 minutes.

Systems reporting the best boarding rates were Iowa City (University), Iowa (one rider every 1.018 minutes); Fayetteville/Springdale, Arkansas (one rider every 1.114 minutes); and Champaign/Urbana, Illinois (one rider every 1.228 minutes). The three best performers in this category were also the best three (same order also) in vehicle revenue miles per trip category. At the other extreme were Kingsport, Tennessee (one rider every 35.512 minutes); Saginaw, Michigan (one rider every 23.188 minutes); and Logan, Utah (one rider every 21.078 minutes).

Population Served per 1,000 Trips

The population base served per one thousand trips is a variable that evaluates a transit provider's output efficiency. It shows how much ridership each system receives relative to the population served. This statistic is the inverse of the usual "rider/population" statistic: the larger the population base required to generate ridership, the lower ridership rate the system has. Population served per 1,000 trips is calculated by dividing annual unlinked trips into the service area population, and multiplying that total by 1,000.

For 1997, the overall average population base per 1,000 trips was 148.43. The systems reporting the highest utilization rates were Duluth, Minnesota (0.04 population base per 1,000 trips); Lafayette, Louisiana (0.06 population base per 1,000 trips); and Merced, California (0.43 population base per 1,000 trips). Systems reporting the lowest rates of use were New Britain (Bristol), Connecticut (1,156.96 population base per 1,000 trips); Binghamton, New York (733.87 population base per 1,000 trips); and Panama City, Florida (732.60 population base per 1,000 trips).

Revenue Base per Population Served

This variable evaluates a transit provider's resources by measuring the total per capita support, including fare revenues and subsidies. The total annual revenue base per population served is calculated by dividing service area population into total operating funds expended.

Overall, the 178 systems reported 1997 total revenue base per person served (from all sources) at an average of $29.68. The systems reporting the lowest revenue base per resident were New Britain (Bristol)[8], Connecticut ($3.50); and Tuscaloosa, Alabama and Frederick, Maryland were tied with the second lowest revenue base per resident ($7.26), all less than 30% of the U.S. average. Systems reporting the highest revenue base per resident served were Richland/Kennewick/Pasco, Washington ($99.66); Champaign/Urbana, Illinois ($91.16); and Santa Cruz, California (86.18).

Average Fare Revenue per Trip

The average fare revenue per unlinked passenger trip is a variable for measuring a transit provider's resources. It is the total farebox revenue divided by unlinked trips, and includes cash (nominal) fares, discounts, transfers, and special fares for groups, times, or services or locations. Average fare revenue per trip

[8] The Bristol system received a poor ranking in the population served per one thousand trips measure (previous category), but received a high standing in this category, revenue base per population served. In other words, Bristol has poor ridership numbers, but only requires (requests) minimal support from taxpayers.

is calculated by dividing the amount of annual unlinked trips by passenger fares. Average fares are typically two-thirds to one-half of nominal fares.

The 1997 average fare per trip (including discounts and transfers) was $0.66. The three systems reporting the lowest average fare all reported $0.00 average fare per trip. Fayetteville/Springdale, Arkansas; Springfield (university), Missouri; and Logan, Utah all collect no fares. This is common for systems on college campuses (like Springfield, Missouri) where students support the bus system through a separate fund. These types of accounts are often called "student activity funds" and support student services, such as bus transportation. The highest fares were reported by Florence, South Carolina ($5.76);[9] Binghamton, New York ($4.25); and Hyannis, Massachusetts ($3.61), all five times the national average.

Non-fare Revenue as a Percent of Budget

The non-fare revenue as a percent of total revenue is a variable that evaluates a transit provider's re-

[9] The Florence system was contacted regarding the high cost of their fares. City transit rates are $1.00, and transfers are $1.50. The primary reason for the high fares is because the Florence system provides a door-to-door van service that operates similar to a taxi service.

sources. It is a measure of the average fare subsidy to riders. Non-fare revenue is calculated by dividing the total operating funds expended into passenger fares, and then subtracting that number from one.

For 1997, the transit subsidy rate, defined as non-fare revenue as a percent of the budget, was 0.79 percent. Systems ranked highest in 1997 (reporting the lowest subsidy rate) were Florence, South Carolina (0.25%); Sumter, South Carolina (0.29%); and Santa Barbara, California and Elmira, New York were ranked the same (0.55%). At the other end, systems with the highest subsidy rates were the same three systems that do not collect fares from riders. Fayetteville/Springdale, Arkansas; Springfield, Missouri; and Logan, Utah all receive the maximum subsidy (100%).

Population Served per Vehicle in Maximum Service

Population served per vehicle in maximum service is a variable that evaluates a transit provider's resources. It is a measure of the population density of service provided. Population served per vehicle in maximum service is calculated by dividing the number of vehicles operated in maximum service into service area population. The less population that each transit vehicle is required to serve, the greater concentration of service is provided. For example, Florence, South Carolina had 117 vehicles operating in maximum service for 54,659 people. Hence, the Florence bus system had almost 1/33 of the population served per vehicle compared to the New Britain (Bristol) system, Connecticut where 3 vehicles serve 143,064 people.

Population served per vehicle in maximum service, a measure of service concentration, averaged 4,182.40 in 1997. The top-rated systems (lowest population served per vehicle) were Florence, South Carolina (611.97); Richland/Kennewick/Pasco, Washington (636.88); and Sumter, South Carolina (778.81). These three systems were less than 20 percent of the U.S. average. Systems ranking lowest (serving the most people per vehicle) were New Britain (Bristol), Connecticut (20,000); Tuscaloosa, Alabama (15,050); and the other New Britain, Connecticut agency[10] (13,045.45).

Area Served per Vehicle in Maximum Service

Area served per vehicle is a variable for evaluating a transit provider's resources by measuring the area density of service concentration. The less area required to be covered by each transit vehicle, the greater the concentration of service. This statistic is calculated by dividing the number of vehicles operated in maximum service into the service area square miles.

Area service density, defined as the area served per vehicle in maximum service, averaged 5.37 square miles per vehicle in 1997. Thus, transit systems can increase efficiency by concentrating their fleet size in denser areas. The top-rated (most concentrated) systems in 1997 were Kingsport, Tennessee (0.154 sq. miles/vehicle); Laredo, Texas (0.304 sq. miles/vehicle); and Florence, South Carolina (0.368 sq. miles/vehicle). The least concentrated systems were Tuscaloosa, Alabama (134 sq. miles/vehicle); Merced, California (70.833 sq. miles/vehicle); and Binghamton, New York (40.308 sq. miles/vehicle).

Overall Rankings

The overall top-rated system (Davis, California) did not receive a best ranking (#1) in any category. The Davis bus system's best ranking for an individual category was 3rd for operating expense per trip. The Davis bus system's worst ranking was a surprisingly low 164th as

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[10] The two systems in New Britain are separate and do not overlap

reported for non-fare revenue as a percent of overall budget.

Similarly, the overall lowest-rated system (Anderson, Indiana) did not receive the lowest ranking (#178) for any individual category. The Anderson, IN bus agency's worst ranking for an individual category was 167th in two categories: operating expense per passenger trip and non-fare revenue support as a percent of overall budget. The Anderson bus system's best ranking was 37th for average fare revenue per trip. The Davis, CA and Anderson, IN bus system rankings exhibit the fact that the best and worst performing systems are not in their respective positions by a great degree.

Examining the effect of independent variables such as geographic location and the size of the bus provider are beyond the scope of this study. Hartgen, however, has found that geographic location and size of the bus provider will likely have minor or insignificant effects on the performance rankings.

Best Ranked System: Davis, California

The bus system that serves Davis, California, finished with the highest performance ranking in this study.

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services.

As a result, more information on how the best system operates is given below. This section offers basic information on Davis' highly regarded bus system.

The City of Davis is located in the southern part of Yolo County, a predominantly agricultural county in California's Central Valley. Davis is the largest urbanized area within Yolo County. Davis is known for bicycles, energy conservation, a preference for carefully managed growth, and most notably the University of California - Davis (UCD). The University has a significant impact on the City of Davis. Historically, the population and geographic spread of the city has been driven by university enrollment. The current population of Davis is approximately 50,000. The ratio of city population to UCD enrollment has been steady at about 2:1 over the last twenty years. Its other notable physical characteristics are innovative neighborhood design, a traditional downtown, and an absence of large-scale shopping centers (www.ucdavis.edu).

Bus operations in the Davis area serve the entire county, including people in both the City of Davis and at the University of California in Davis. The agency, called Unitrans (University Transport System), is managed and operated by the UCD, not by any local governmental body. Since 1968, Unitrans' ridership has grown from approximately 20,000 to the current rate of 2,000,000 a year, with 70 percent of these rides coming from the student population. Unitrans consists of 13 fixed routes that cover over 100 miles. Unitrans has 27 vehicles operating in maximum service. These 27 vehicles operate for a service area population of over 52,000. Annual passenger miles are 5,422,822; and annual unlinked trips total 2,085,809. Annual vehicle revenue miles are 536,516; and annual vehicle revenue hours total 49,781. In 1997, Unitrans had a total budget of $1,411,094. Of the total budget, $106,866 was collected from passenger fares.

Below is a summary of the Unitrans Mission Statement that was created in the spring of 1997 (www.ucdavis.edu).

> We at Unitrans are committed to providing safe, friendly, dependable public transportation service to the University of California and the City of Davis.
>
> Providing this service is our primary function, yet we are dedicated to the preservation of a student-operated system.
>
> During the dramatic growth of Unitrans there have been many changes; however, there are core values that Unitrans employees have embraced and would like to preserve: tradition, service, and people.

This mission statement is not specific enough to provide significant insight on how Unitrans differs from what other bus systems aim to do. However, the Davis, California system is unique in a couple of regards. Unitrans is the only transit system in the United States to operate vintage British double-decker buses in daily service. Unitrans also takes great pride in the fact that it is the largest student owned and operated transit system in North America.

James McElroy, General Manager of Unitrans, described the parking availability as "extremely scarce" around UCD, and even throughout most parts of the city (phone interview; January 4, 2000). The bus system is subsidized through student fees. UCD students are able to ride the bus without paying a fare by simply showing their student identification cards. The majority of riders use the bus system to get around the campus areas of the city. McElroy attributes the "tremendous support from non-students" to the fact that there are a high number of buses around the city which makes for more routes and less waiting.

Worst Ranked System: Anderson, IN

The present public transit system in Anderson began during 1973. Originally established as a municipal transit utility, the City of Anderson Transportation System (CATS) became a department of the city in 1982. In 1994, CATS purchased the first of two electric vehicles to be utilized in its fixed route transportation network making CATS the first transit operator in the State of Indiana to operate these alternative fueled vehicles. A second vehicle was acquired in 1995. These transit coaches were acquired through a Section 9 federal grant from a private company in Chattanooga, Tennessee called Advanced Vehicles Systems (www.cityofanderson.com).

CATS falls under the jurisdiction of the Board of Public Works. The Board is responsible for the following: overseeing the day-to-day operations of the department, adopting transit goals and policy objectives, specifying CATS' management structure, approving fare and service modifications and bids for capital purchases, settling major issues or disputes, and recommending operating and capital budgets to the City Council. The City Council reviews and approves CATS' departmental budget on an annual basis. CATS' management is responsible for implementing the daily operations of the transit system. This includes: promoting the service through a marketing program, hiring and firing of employees, assigning buses and drivers to routes, purchasing materials and supplies, maintaining equipment and facilities, implementing service improvements, managing the system's finances, and monitoring the total operation. The Anderson City Planning Department (ACPD) performs research and development activities for CATS (www.cityofanderson.com).

The three major goals of the City of Anderson Transportation System are: (1) to provide convenient, reliable, safe, and comfortable service to all patrons; (2) to provide fixed route and demand-responsive services as efficiently and equitably as possible; and (3) to maximize potential ridership within the parameters set by CATS' service area and available funds (www.cityofanderson.com).

Currently, six fixed routes offer service at fifty-minute head ways, leaving the terminal on the hour before noon (6:00 a.m. - 12:00p.m.) and ten minutes after the hour in the afternoon (1:10 p.m. - 6:10 p.m.). Saturday service is always on the hour (9:00 a.m. - 3:00 p.m.). In addition to fixed route service, CATS provides a curb-to-curb demand responsive service known as Nifty Lift (www.cityofanderson.com).

The city first offered fixed route service in 1973. Ridership continually climbed upward and peaked at 530,000 passenger trips in 1979. During the early 1980s as the local economy endured a massive recession and the population of Anderson declined significantly, patronage of CATS' fixed route service declined by 59% (1980-1982). It was also during this time that the number of fixed routes were reduced from ten to eight, and head ways were increased from thirty minutes to fifty minutes. Passenger trips then increased in 1983, but with new calculating procedures eliminating the inclusion of transfers in total ridership figures, then ridership continued to decrease since 1984. Reasons for this decline may vary, but in some sense it could be linked to the growth and spread of the community away from the central city (www.cityofanderson.com).

CHAPTER V

POTENTIAL PRESCRIPTIONS FOR BETTER PERFORMANCE

Below are potential prescriptions that can be offered to improve the quality and cost of operating a transit system. In addition to being more responsive to customers, conservative policymakers and analysts are more apt to embrace competitive contracting of labor and/or the privatization of services. However, these two suggestions do not stand up when examining Davis, California and Anderson, Indiana. The highest ranked system in this model, Davis, California, does not competitively contract labor or offer privatized services. Similarly, Anderson, Indiana has never competitively contracted labor or privatized services.

Responsiveness to Citizens

A bus agency that responds to citizen preferences can expect an increase in ridership. Ridership is a key component in 8 of the 12 performance measures. In other words, bus systems that respond well to their customers will improve their performance measures and competitive ranking through increased ridership.

Citizen surveys are a tool that can assist agencies in their quest to remain flexible to citizen demands. Surveys are the best way to obtain information on citizens' perceptions of a bus transportation system. Surveys provide important feedback on the reasons for the lack of use of, or reason for dissatisfaction with, certain aspects of the local bus transit system and will probably suggest ways to improve service (Winnie and Hatry, 55). Feedback should be received both from users and non-users of the local bus system. Non-users often indicate shortcomings that are less obvious to someone from "within" the firm.

Besides surveys, the actual use of available modes of transportation also provides insights into citizen perceptions. One example of a quality measure is figures on the ratio of transit passenger-trips to automobile passenger-trips. However, interpretation of the ratio relative to basic transportation system objectives presents serious difficulties. It may appear desirable to increase or decrease this ratio, depending on the local circumstances and characteristics of the existing local transportation system. High (or low) ratios relate to the complex set of local factors, and are not inherently bad or good (Winnie and Hatry, 55).

Davis, California's Unitrans is a system that strives to be responsive to customer preferences. The initial response to Unitrans' unique double-decker buses was very favorable in the early 1980s. As a result, Unitrans bought several more over the next few years and marketed the double-deckers' uniqueness. Davis also has a reputation for being environmentally conscious. As a result, Unitrans markets environmental responsibility in their advertisements. Parking is another example. If a community has limited parking spaces, like Davis, it is recommended that the bus system direct routes toward the areas of town where parking demand is high but parking supply is low.

Competitive Contracting of Labor

A bus agency that competitively contracts labor will likely experience a decrease in total operating expenses. Operating expenses are a key component in 4 of the 12 performance measures. In other words, bus systems that competitively contract labor can improve their performance measures and competitive ranking through lower operating expenses.

The purpose of competitively contracting labor is to increase accountability, keep prices in line, and promote adherence to performance standards. For the systems in this study, labor typically consists of over seventy percent of total operating expenses. Within an environment that promotes competition, laborers that perform duties such as maintaining equipment and driving buses will have strong financial incentives to perform at their highest level (Cox, 1999).

Private companies should compete with public agencies for labor on fixed bus route contracts. This competitive structure is flourishing in cities such as San Diego, Denver, Las Vegas, and Indianapolis. Traditionally, many transit unions have opposed competitive contracting. This protective strategy of opposing competition, however, may be a straitjacket on their own financial health. True, competition sometimes does cut union jobs. However, Indianapolis offers a model where taxpayers and organized labor both won. In the mid-1990s, 18 routes went up for bid and the union received 12 of them. For most of the routes, operating expenses have decreased and ridership has improved at a rate above the national average (Jimenez, 1998).

It must be recognized that savings generally occur in all factors of production when competitive contracting is practiced. There is much more to competitive contracting savings than just labor savings. In a competitive market, management is also faced with the potential for financial failure. Hence, there is an incentive to obtain more from virtually all factors of production. If financial failure does occur, the local government could bail out the private company, or begin a new contract with a different provider.

As mentioned previously in this chapter, ridership affects 8 of the 12 performance measures. Therefore, it is not very surprising that increasing ridership improves a bus system's overall performance ranking. For example, a 5% increase in ridership for Kalamazoo, Michigan's Metro Transit system would improve its overall performance ranking from 152^{nd} to 144^{th}, just over a 4.5% increase. In this scenario, the most improved performance measure for Metro Transit was fare revenue per trip. For fare revenue per trip, a 5% increase in ridership would improve Metro Transit's ranking 11 places, from 99^{th} to 88^{th}.

Private Services

Private bus providers force public bus agencies to be more competitive. Despite the needs and desires of potential passengers, public transportation agencies have been content to spend billions of dollars into existing routes and large inefficient buses, while ridership continues to decline. The poor performance of public transportation has resulted in the formation of private companies that are willing to offer illegal transportation services that cater to the patterns of individual consumers. An increasing number of private companies have arisen in congested metropolitan areas to provide "jitney" bus or van services to move workers to their jobs. These jitney vans typically pick people up at the subway station and take them directly to their doors, and almost always at less cost than the public system charges. The bus system in Florence, South Carolina is one example of an agency that has lowered its subsidies through these types of private-public joint ventures.

Johnson and Pikarsky (1985) found that transportation providers that are highly decentralized and fragmented have grown to meet the needs of commuters despite traditional mass transportation systems. Among the services emerging in Chicago are for-profit commuter bus lines that transport 3,000 commuters daily to over 80 suburban-based routes, public regional transit authority funding for community-managed and community-operated suburban paratransit services, transportation services that use a mix of vehicles to meet the needs of their clients, and two private transportation provider associations (Staley, 26).

Private transportation has also shown an amazing ability to adapt to the flexible demands of consumers in a short period of time. A 1979 transit strike in Chicago produced a large private commuter market. Private buses, vans, and taxis picked up service, and many temporary carpools were formed. By the third day of a four-day strike, absenteeism was only about 12 percent above normal in the City of Chicago (Staley, 26). The surrounding regions were hardly affected. Staley concluded that people did return to mass transit, but the strike showed that alternatives exist in the short-run.

The Chicago private transportation sector continues to challenge traditional beliefs about the need for publicly subsidized mass transportation. Johnson and Pikarsky's (1985) analysis of Chicago's public transportation discovered that the consolidation of mass transportation systems resulted in concentrated private interests and the excess of monopoly control. The monopoly structure supported through the Chicago Regional Transit Authority was unable to adapt to the new and growing demands of rapidly growing suburban metropolitan areas. Customer service and vision were compromised by consolidating numerous transportation providers into one organization. The researchers also found diseconomies of scale associated with large government-run transportation systems (Staley, 27).

In New York City, commuters are becoming frustrated at the lack of transportation alternatives to the public transportation system. Staley's (1992) study of commuter bus services found that government regulations were identified as a principal mechanism for protecting existing firms. Regulations existed in a manner that always gave the existing bus line the advantage. New York regulations made it virtually impossible for new transit companies to enter the market under existing rules and regulations.

For example, the city requires would-be van operators to obtain three different licenses. The New York law also forbids vans from picking up or discharging passengers on any street where public buses operate. If an application is not approved within 180 days, it is automatically rejected. These regulations help explain why 98 percent of all applications have been denied since 1994 (Charen, 1999).

A bus agency that privatizes poor performing services will likely experience a decrease in total operating expenses. Operating expenses are a key component in 4 of the 12 performance measures. In other words, bus systems that privatize poor performing functions can improve their performance measures and competitive ranking through lower operating expenses.

CHAPTER VI

CONCLUSION

Future Research

In the field of transit research, much fact-finding and description is still needed before well-grounded explanation can be used. Expanded analysis is needed for measuring the performance of bus transit systems. It is hoped that other researchers will replicate and improve upon David Hartgen's model and ranking system of bus agencies. The possibilities and realm of data that could be measured are many.

Here are three examples that would benefit the transit and scholarly communities. First, measuring the percentage of operating expenses to labor (salaries/wages) would be helpful in collective bargaining between management and labor. Second, the safety record of a bus agency could be figured using collisions per 100,000 vehicle revenue miles. Third, the reliability of a bus system's fleet could be learned by calculating mechanical failures per 100,000 vehicle revenue miles. Data for these three examples are available through FTA

Section 15 data.

Summary

Bus transportation is an issue that is likely to get increased attention in the coming years due to concerns of increased congestion and environmental concerns. Using David Hartgen's previous reports as a rough framework, this study has provided an assessment of the overall comparative performance of 178 small to mid-size bus transit operations located in the United States during 1997.

The background of bus transit highlights the complications and the assistance that government can foster. Additionally, there are competing interests and viewpoints that shape bus transit policy. These different groups include those that want more efficient bus systems with lower taxes, demands from organized labor, and the preferences of customers for higher quality service.

This study used 12 measures to rank-order 178 small to mid-sized bus transit systems. Of the 12 statistics, 5 measure resources and 7 measure results. Applying Hartgen's performance measures to transit systems in areas with a population base under 200,000, Davis, California's Unitrans received the best performance rating.

On the other end, the City of Anderson's (Indiana) Transportation System finished with the worst ranking of the 178 different transit systems. The differences between these two systems is not always obvious and beyond the scope of this study. However, it presents questions to future researchers on the validity of Hartgen's performance model.

Appendix A

Data Profile

UNITRANS, University of California, Davis

373 Memorial Union
Davis CA 95616-8759
(916)752-6525

Chief Executive Officer James McElroy
General Manager
ID Number 9142

System Wide Information

General Information

Urbanized Area (UZA) Statistics - 1990 Census

Davis, CA	
Square Miles	33
Population	52,711
Population Ranking Out of 405 UZAs	382

Service Area Statistics

Square Miles	11
Population	52,711

Service Consumption

Annual Passenger Miles	5,422,822
Annual Unlinked Trips	2,085,809
Average Weekday Unlinked Trips	8,305
Average Saturday Unlinked Trips	33
Average Sunday Unlinked Trips	0

Service Supplied

Annual Vehicle Revenue Miles	536,516
Annual Vehicle Revenue Hours	49,781
Total Fleet	40
Vehicles Operated in Maximum Service	27
Base Period Requirement	15

Vehicles Operated in Maximum Service

	Directly Operated	Purchased Transportation
Bus	27	0

Financial Information

Sources of Operating Funds Expended

Passenger Fares	$106,866
Local Funds	845,337
State Funds	0
Federal Assistance	320,000
Other Funds	138,891
Total Operating Funds Expended	**$1,411,094**

Summary of Operating Expenses

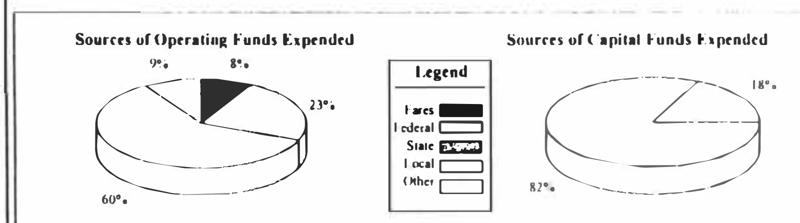
Salaries/Wages/Benefits	$1,078,804
Materials & Supplies	282,689
Purchased Transportation	0
Other Operating Expenses	49,601
Total Operating Expenses	**$1,411,094**
Reconciling Cash Expenditures	$0

Sources of Capital Funds Expended

Local Funds	$235,730
State Funds	0
Federal Assistance	1,108,913
Total Capital Funds Expended	**$1,344,643**

Uses of Capital Funds

	Rolling Stock	Facilities and Other	Total
Bus	$750,802	$593,841	$1,344,643



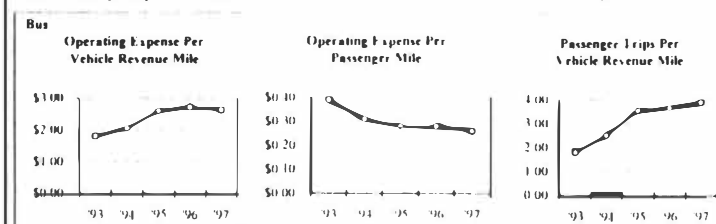
Modal Information

Characteristics

	Bus
Operating Expense	$1,411,094
Capital Funding	$1,344,643
Annual Passenger Miles	5,422,822
Annual Vehicle Revenue Miles	536,516
Annual Unlinked Trips	2,085,809
Average Weekday Unlinked Trips	8,305
Annual Vehicle Revenue Hours	49,781
Fixed Guideway Directional Route Miles	0.0
Total Fleet	40
Average Fleet Age in Years	18.9
Vehicles Operated in Maximum Service	27
Peak to Base Ratio	1.8
Percent Spares	48%

Performance Measures

Service Efficiency	
Operating Expense/Vehicle Revenue Mile	$2.63
Operating Expense/Vehicle Revenue Hour	$28.35
Cost Effectiveness	
Operating Expense/Passenger Mile	$0.26
Operating Expense/Unlinked Passenger Trip	$0.68
Service Effectiveness	
Unlinked Passenger Trips/Vehicle Revenue Mile	3.89
Unlinked Passenger Trips/Vehicle Revenue Hour	41.90



Source: 1997 National Transit Database

Appendix B

Rankings

area	st.	oper. exp. per veh. rev. mile		oper. exp. per veh. rev. hour		oper. exp. per pass. mile		oper. exp. per pass. trip		veh. rev. miles per trip		veh. rev. minutes per trip		pop. per 1000 trips		total rev. per pop.		fare rev. per trip		non-fare rev. as % of tot.		pop. per vehicle in max. serv.		sq. miles per veh. in max. serv.		overall rank
Davis	CA	$ 2.63	43	$ 28.35	15	$ 0.26	7	$ 0.68	3	0.26	4	1.432	4	25.27	6	$ 26.77	94	$ 0.05	4	0.92	164	1952.26	27	0.407	4	1
Lubbock	TX	$ 2.69	49	$ 35.32	36	$ 0.22	5	$ 0.97	6	0.45	16	2.006	14	57.71	39	$ 20.37	51	$ 0.44	57	0.63	16	4469.98	111	1.818	82	2
Fayetteville / Springdale	AR	$ 2.96	72	$ 30.51	18	$ 0.27	8	$ 0.49	2	0.18	2	1.114	2	30.94	11	$ 25.00	79	$ -	1	1.00	176	2806.60	62	1.200	51	3
Springfield (University)	MO	$ 2.43	31	$ 20.07	3	waiver		$ 0.86	4	0.35	9	2.579	32	28.56	9	$ 30.20	110	$ -	1	1.00	176	1656.00	18	1.579	69	4
Petersburg	VA	$ 2.67	47	$ 33.98	27	$ 0.53	56	$ 1.32	18	0.53	30	2.669	37	38.70	17	$ 35.71	129	$ 0.52	84	0.62	14	2252.50	38	0.583	17	5
Iowa City (University)	IA	$ 2.25	20	$ 24.33	8	$ 0.35	16	**$ 0.35**	1	**0.17**	1	**1.018**	1	19.50	5	$ 20.38	52	$ 0.61	114	0.98	174	3504.25	85	1.550	68	6
Laredo	TX	$ 4.11	143	$ 41.91	65	$ 0.30	11	$ 1.19	10	0.33	6	2.035	15	39.51	18	$ 36.38	130	$ 0.41	51	0.72	39	3694.78	89	0.304	2	7
Lynchburg	VA	$ 2.74	53	$ 38.62	53	$ 0.46	33	$ 1.21	11	0.47	19	1.973	11	41.10	20	$ 30.34	111	$ 0.39	46	0.68	23	4255.05	105	3.789	125	8
Galveston	TX	$ 3.36	104	$ 44.26	83	$ 0.63	82	$ 1.28	14	0.45	16	2.369	22	40.72	19	$ 34.26	122	$ 0.40	50	0.72	39	2568.26	52	0.522	10	9
Chico	CA	$ 2.54	41	$ 35.88	38	$ 0.42	25	$ 1.61	34	0.63	48	2.686	40	92.22	84	$ 17.41	40	$ 0.45	62	0.72	39	5384.62	138	0.846	37	10
St. Cloud	MN	$ 2.82	61	$ 39.75	57	$ 0.52	51	$ 1.56	33	0.65	50	2.912	53	37.72	16	$ 49.56	160	$ 0.37	37	0.80	76	2055.23	29	0.533	11	11
Champaign / Urbana	IL	$ 4.23	151	$ 51.55	126	$ 0.37	19	$ 1.05	7	0.25	3	1.228	3	11.67	4	$ 91.16	177	$ 0.15	6	0.86	129	1427.31	7	0.436	5	12
Athens	GA	$ 2.79	59	$ 40.72	60	$ 0.48	41	$ 1.37	21	0.55	33	2.311	21	64.77	49	$ 23.05	67	$ 0.43	55	0.71	31	4250.00	104	2.300	98	13
Fort Collins	CO	$ 3.38	105	$ 44.05	81	$ 0.46	33	$ 1.31	17	0.56	35	2.613	34	61.72	46	$ 27.58	97	$ 0.49	72	0.71	31	2523.81	51	1.048	45	14
Wilmington	NC	$ 3.29	100	$ 41.82	64	$ 0.48	41	$ 1.15	8	0.36	11	1.721	7	46.56	24	$ 26.38	90	$ 0.34	30	0.72	39	5048.18	131	2.909	113	15
Sioux City	IA	$ 3.25	96	$ 37.51	47	$ 0.44	29	$ 1.52	27	0.56	35	2.767	47	79.04	70	$ 22.91	64	$ 0.49	72	0.73	44	2600.92	53	1.784	80	16
Visalia	CA	$ 2.49	36	$ 36.29	40	$ 0.36	17	$ 1.42	25	0.68	60	2.771	48	85.18	76	$ 20.28	50	$ 0.46	64	0.73	44	5157.89	133	1.684	76	17
Decatur	IL	$ 2.66	45	$ 38.71	54	$ 0.52	51	$ 1.41	24	0.61	45	2.512	27	69.67	58	$ 21.03	57	$ 0.21	12	0.86	129	4001.63	96	2.083	93	18
Utica / Rome	NY	$ 3.25	96	$ 43.10	72	$ 0.37	19	$ 1.67	37	0.58	38	2.670	38	58.78	40	$ 32.06	116	$ 0.51	81	0.73	44	3162.24	68	1.243	53	19
High Point	NC	$ 2.73	52	$ 36.04	39	$ 0.56	66	$ 1.32	18	0.56	35	2.644	35	82.77	73	$ 19.56	49	$ 0.52	84	0.68	23	4628.27	117	2.939	115	20
Grand Forks	ND	$ 3.44	107	$ 47.75	110	$ 0.51	49	$ 1.63	35	0.62	46	2.728	45	76.48	66	$ 24.23	77	$ 0.35	33	0.81	89	2246.59	37	0.636	25	21
Lafayette / West Lafayette	IN	$ 3.00	76	$ 38.07	49	$ 0.49	43	$ 1.84	49	0.67	55	3.221	67	64.81	51	$ 30.51	112	$ 0.44	57	0.78	63	2981.78	66	0.806	35	22
Terre Haute	IN	$ 3.59	118	$ 39.19	56	$ 0.32	12	$ 1.22	12	0.34	8	1.871	8	70.37	59	$ 17.37	39	$ 0.15	6	0.88	147	7991.38	165	2.250	95	23
Beaumont	TX	$ 3.51	113	$ 44.72	88	$ 0.36	17	$ 1.27	13	0.45	16	2.134	16	55.85	35	$ 28.48	102	$ 0.31	24	0.81	89	4866.53	127	2.412	105	24
Pocatello	ID	$ 1.89	13	$ 24.97	10	$ 0.29	9	$ 1.38	23	0.89	91	4.267	106	150.93	122	$ 11.98	15	$ 0.32	27	0.81	89	5035.64	130	2.909	113	25
Santa Barbara	CA	$ 4.21	150	$ 55.47	143	$ 0.40	24	$ 1.37	21	0.33	6	1.484	5	28.48	8	$ 48.90	158	$ 0.63	117	0.55	3	3305.08	76	1.356	58	26
Lafayette	LA	$ 3.96	134	$ 50.72	125	$ 0.37	19	$ 1.16	9	0.37	12	1.915	9	0.06	2	$ 23.52	70	$ 0.18	9	0.86	129	5864.47	148	2.647	107	27
Reading	PA	$ 4.03	139	$ 46.57	104	$ 0.62	79	$ 1.55	32	0.50	23	2.547	31	57.44	38	$ 33.94	121	$ 0.80	144	0.59	6	2217.46	35	0.619	21	27
Williamsport	PA	$ 3.13	88	$ 46.20	99	$ 0.55	63	$ 1.52	27	0.49	22	1.983	12	57.11	37	$ 26.68	92	$ 0.37	37	0.76	57	4360.25	108	5.125	137	29
Annapolis	MD	$ 2.98	75	$ 43.45	76	$ 0.45	31	$ 1.42	25	0.70	62	2.932	56	70.90	61	$ 32.70	118	$ 0.55	94	0.76	57	3846.15	92	0.769	33	30
Wausau	WI	$ 3.20	91	$ 47.40	109	$ 0.60	75	$ 1.88	51	0.67	55	2.693	41	46.12	23	$ 44.50	153	$ 0.37	37	0.82	98	1482.50	11	0.833	36	30
Roanoke	VA	$ 2.85	63	$ 36.83	43	$ 0.56	66	$ 1.95	57	0.81	79	3.759	85	52.91	31	$ 39.12	143	$ 0.72	132	0.65	18	2285.71	40	1.024	41	32
Binghamton (Broome County)	NY	$ 3.41	106	$ 45.65	97	$ 0.49	43	$ 1.29	15	0.51	25	2.187	18	52.71	30	$ 30.03	107	$ 0.54	92	0.66	20	3437.50	82	14.833	165	33
State College	PA	$ 4.88	166	$ 49.67	122	$ 0.59	71	$ 1.30	16	0.30	5	1.664	6	32.91	12	$ 42.20	148	$ 0.59	109	0.57	5	2128.39	32	3.694	123	34
Winston-Salem	NC	$ 3.76	128	$ 43.69	78	$ 0.75	109	$ 1.73	40	0.69	61	2.789	49	50.71	28	$ 37.63	136	$ 0.53	89	0.72	39	1659.43	19	1.039	44	35

area	st.	oper. exp. per veh. rev. mile		oper. exp. per veh. rev. hour		oper. exp. per pass. mile		oper. exp. per pass. trip		veh. rev. miles per trip		veh. rev. minutes per trip		pop. per 1000 trips		total rev. per pop.		fare rev. per trip		non-fare rev. as % of tot.		pop. per vehicle in max. serv.		sq. miles per veh. in max. serv.		overall rank
Kenosha	WI	$ 3.31	101	$ 47.98	113	$ 0.62	79	$ 2.02	67	0.64	49	2.684	39	54.07	33	$ 38.15	138	$ 0.30	22	0.85	121	2338.89	44	0.583	17	36
Lakeland	FL	$ 2.15	19	$ 33.52	25	$ 0.49	43	$ 1.82	48	1.03	107	4.112	96	83.05	74	$ 28.05	100	$ 0.41	51	0.82	98	3225.29	70	2.265	96	37
Burlington	VT	$ 4.04	140	$ 45.89	98	$ 0.50	46	$ 1.85	50	0.50	23	2.745	46	49.62	27	$ 43.40	152	$ 0.56	99	0.74	52	2382.35	45	1.176	50	38
Eugene / Springfield	OR	$ 4.30	152	$ 59.38	154	$ 0.46	33	$ 1.97	60	0.51	25	2.220	19	28.10	7	$ 73.85	174	$ 0.44	57	0.79	69	2170.59	34	1.059	46	39
Port Huron	MI	$ 3.20	91	$ 36.87	44	$ 0.43	27	$ 1.35	20	0.75	72	3.206	66	74.20	63	$ 27.90	99	$ 0.23	13	0.89	154	4184.93	103	1.933	88	40
Spartansburg	SC	$ 3.81	129	$ 46.39	101	$ 0.37	19	$ 1.52	27	0.40	14	1.968	10	135.10	117	$ 11.27	13	$ 0.37	37	0.76	57	10000.00	174	5.714	142	40
Oshkosh	WI	$ 3.45	108	$ 45.64	96	$ 0.73	105	$ 1.70	38	0.80	77	3.480	74	53.87	32	$ 40.00	145	$ 0.36	34	0.83	109	1469.27	10	0.537	12	40
Bloomington	IN	$ 3.09	84	$ 42.53	68	$ 0.66	89	$ 2.06	71	0.72	64	3.261	70	64.65	48	$ 36.47	132	$ 0.46	64	0.80	76	2887.29	65	0.571	15	43
Richland / Kennewick / Pasco	WA	$ 3.11	85	$ 52.37	131	$ 0.29	9	$ 1.94	55	1.14	122	3.523	76	29.42	10	$ 99.66	178	$ 0.28	19	0.90	157	636.88	2	0.509	9	44
Rochester	MN	$ 2.78	57	$ 44.36	84	$ 0.46	33	$ 1.79	43	0.75	72	2.906	52	90.54	79	$ 21.72	60	$ 0.73	133	0.63	16	3675.04	88	6.261	146	45
Amarillo	TX	$ 2.44	33	$ 36.93	45	$ 0.47	38	$ 1.81	45	0.87	89	3.525	77	103.06	94	$ 20.39	53	$ 0.18	9	0.91	159	5991.81	152	1.625	71	46
Moorhead / Fargo, ND	MN	$ 2.30	24	$ 34.30	31	$ 0.68	91	$ 1.95	57	0.89	91	3.670	84	93.27	85	$ 23.99	73	$ 0.28	19	0.87	144	3843.00	91	1.778	79	47
Asheville	NC	$ 3.28	99	$ 42.55	69	$ 0.55	63	$ 1.79	43	0.74	69	3.628	82	66.25	53	$ 29.76	106	$ 0.51	81	0.74	52	3594.00	86	1.722	78	48
Springfield	OH	$ 3.57	115	$ 44.72	88	$ 0.91	138	$ 1.64	36	0.55	33	2.528	29	135.54	118	$ 13.14	23	$ 0.31	24	0.83	109	4699.06	119	1.294	54	49
Gainesville	FL	$ 3.02	78	$ 34.45	32	$ 0.58	68	$ 1.71	39	0.65	50	3.284	71	75.26	64	$ 27.24	96	$ 0.44	57	0.79	69	4000.00	95	19.565	169	50
Albany	GA	$ 2.96	72	$ 44.05	81	$ 0.46	33	$ 1.73	40	0.76	74	3.137	62	109.36	99	$ 20.78	56	$ 0.32	27	0.86	129	6709.46	160	1.308	55	50
Logan	UT	$ 2.72	50	$ 33.98	27	$ 0.53	56	$ 0.90	5	0.35	9	21.078	176	37.09	15	$ 28.39	101	$ -	1	1.00	176	4875.00	128	6.125	145	52
Sumter	SC	**$ 0.81**	1	**$ 16.76**	1	$ 0.72	103	$ 1.52	27	3.25	172	8.048	158	92.20	83	$ 43.30	151	$ 2.84	175	0.29	2	778.81	3	0.622	23	53
Monroe	LA	$ 3.05	80	$ 42.18	67	$ 0.38	23	$ 2.44	88	0.81	79	3.581	79	65.47	52	$ 34.68	125	$ 0.56	99	0.76	57	3235.29	72	1.824	83	54
Brownsville	TX	$ 4.54	158	$ 56.00	145	$ 0.14	2	$ 1.54	31	0.44	15	2.524	28	78.80	68	$ 23.69	72	$ 0.50	78	0.73	44	6666.67	159	2.778	109	55
Tallahassee	FL	$ 4.17	147	$ 48.45	118	$ 0.60	75	$ 1.81	45	0.52	29	2.649	36	36.23	13	$ 58.80	167	$ 0.63	117	0.70	27	2650.25	55	1.811	81	56
New Bedford	MA	$ 4.63	161	$ 56.00	145	$ 0.70	98	$ 1.91	54	0.48	21	2.386	23	54.52	34	$ 45.64	155	$ 0.46	64	0.81	98	2523.39	50	0.635	24	57
Bangor	ME	$ 1.76	10	$ 27.35	12	$ 0.47	38	$ 2.01	65	1.14	122	4.416	110	157.69	123	$ 12.78	19	$ 0.60	111	0.70	27	5582.00	143	6.455	147	57
Johnson City	TN	$ 2.43	31	$ 34.51	33	$ 0.69	96	$ 1.81	45	0.93	99	4.389	109	121.30	110	$ 18.68	45	$ 0.39	46	0.83	109	4115.08	101	2.750	108	59
Erie	PA	$ 4.85	164	$ 62.30	161	$ 0.63	82	$ 1.96	59	0.66	53	3.007	59	60.66	45	$ 30.64	113	$ 0.56	99	0.70	27	2504.19	49	1.067	47	60
Las Cruces	NM	$ 3.22	94	$ 38.54	52	$ 0.59	71	$ 1.94	55	0.74	69	3.856	89	94.27	87	$ 26.17	89	$ 0.37	37	0.85	121	3451.44	83	3.167	117	61
Iowa City	IA	$ 4.15	144	$ 50.45	124	$ 0.98	148	$ 1.90	53	0.58	38	2.927	54	44.21	21	$ 51.51	164	$ 0.61	114	0.73	44	2059.93	31	0.759	31	62
Brockton	MA	$ 5.03	168	$ 62.24	160	$ 0.43	27	$ 2.05	70	0.60	43	2.793	50	48.47	25	$ 54.80	166	$ 0.93	156	0.65	18	2154.60	33	1.390	59	63
Evansville	IN	$ 3.22	94	$ 43.42	74	$ 0.80	118	$ 2.41	85	0.82	81	4.186	102	98.81	90	$ 25.62	82	$ 0.50	78	0.80	76	3164.93	69	1.025	42	64
Waco	TX	$ 2.63	43	$ 34.03	30	$ 0.59	71	$ 1.98	61	0.90	96	4.190	104	160.42	126	$ 14.07	31	$ 0.46	64	0.80	76	6474.38	156	5.688	141	65
Topeka	KS	$ 3.02	78	$ 45.28	94	$ 0.61	78	$ 2.01	65	0.83	84	3.229	68	111.10	102	$ 21.35	58	$ 0.48	70	0.80	76	4027.78	98	4.194	130	66
Dubuque	IA	$ 4.67	162	$ 42.07	66	$ 0.75	109	$ 1.98	61	0.53	30	3.332	72	109.47	100	$ 20.76	55	$ 0.39	46	0.83	109	4615.38	114	1.846	84	67
Pueblo	CO	$ 4.06	141	$ 59.21	153	$ 0.52	51	$ 1.74	42	0.58	38	2.499	26	127.46	114	$ 15.47	34	$ 0.27	16	0.86	129	8000.00	166	2.333	100	68
Glens Falls	NY	$ 2.46	35	$ 35.69	37	$ 0.54	61	$ 2.33	82	0.99	103	3.875	90	198.32	136	$ 12.60	18	$ 0.45	62	0.82	98	7059.38	161	4.750	133	69
Racine	WI	$ 3.62	122	$ 45.23	93	$ 0.94	143	$ 2.33	82	0.83	84	3.975	92	56.22	36	$ 42.22	149	$ 0.79	143	0.67	21	2335.42	43	0.563	13	70
Salem	OR	$ 4.16	145	$ 58.94	152	$ 0.76	112	$ 2.22	76	0.53	30	2.258	20	45.61	22	$ 48.62	157	$ 0.37	37	0.84	117	3720.93	90	1.628	72	70
Great Falls	MT	$ 2.91	67	$ 37.32	46	$ 1.04	154	$ 2.89	120	1.03	107	4.970	126	135.34	118	$ 22.42	62	$ 0.26	15	0.91	159	2234.48	36	0.621	22	72
Redding	CA	$ 2.35	27	$ 41.25	62	$ 0.47	38	$ 2.46	89	1.40	141	5.275	130	84.76	75	$ 41.20	147	$ 0.47	69	0.87	144	2057.14	30	1.857	85	73
Ithaca	NY	$ 2.76	56	$ 47.34	107	$ 0.55	63	$ 2.26	79	0.94	101	3.373	73	76.38	65	$ 32.84	119	$ 0.65	121	0.74	52	2412.74	47	12.590	164	74

area	st.	oper. exp. per veh. rev. mile		oper. exp. per veh. rev. hour		oper. exp. per pass. mile		oper. exp. per pass. trip		veh. rev. miles per trip		veh. rev. minutes per trip		pop. per 1000 trips		total rev. per pop.		fare rev. per trip		non-fare rev. as % of tot.		pop. per vehicle in max. serv.		sq. miles per veh. in max. serv.		overall rank
Santa Rosa	CA	$ 5.39	172	$ 67.59	171	$ 0.75	109	$ 2.12	73	0.47	19	2.450	24	63.34	47	$ 35.45	128	$ 0.65	121	0.71	31	4615.38	114	0.962	39	75
Seaside / Monterey	CA	$ 3.99	137	$ 60.42	156	$ 0.50	46	$ 2.42	86	0.76	74	2.844	51	70.79	60	$ 37.15	134	$ 1.04	163	0.60	10	3294.34	74	1.341	57	75
Lancaster / Palmdale	CA	$ 2.74	53	$ 58.89	151	**$ 0.12**	1	$ 1.99	64	0.93	99	2.597	33	94.62	88	$ 30.17	109	$ 0.94	158	0.67	21	4456.90	110	11.810	162	77
Florence	SC	$ 1.49	5	$ 19.25	2	$ 0.86	130	$ 2.65	106	6.78	178	20.219	174	119.76	109	$ 64.39	171	$ 5.76	178	**0.25**	1	**611.97**	1	0.368	3	78
Rapid City	SD	$ 2.11	16	$ 27.12	11	$ 0.58	68	$ 2.25	78	1.43	143	6.561	149	233.76	150	$ 13.71	26	$ 0.87	152	0.73	44	4543.58	112	2.833	111	79
Jackson	TN	$ 2.27	21	$ 28.23	13	$ 0.51	49	$ 2.52	93	1.28	131	6.050	143	133.80	116	$ 21.81	61	$ 0.73	133	0.75	55	4800.91	125	3.636	121	80
Huntsville	AL	$ 1.74	9	$ 28.31	14	$ 0.63	82	$ 2.54	95	1.50	148	7.784	156	272.55	159	$ 9.24	8	$ 0.38	45	0.85	121	3997.00	94	4.200	131	81
Altoona	PA	$ 3.82	130	$ 54.23	139	$ 0.84	128	$ 2.74	112	0.74	69	3.142	63	103.87	96	$ 26.98	95	$ 1.11	165	0.61	12	1933.56	25	0.694	28	81
Waterbury	CT	$ 3.99	137	$ 53.52	136	$ 0.86	130	$ 2.19	75	0.60	43	2.705	43	93.41	86	$ 25.77	86	$ 0.73	133	0.70	27	4260.16	106	1.526	67	83
Charlottesville	VA	$ 3.71	127	$ 46.41	102	$ 0.68	91	$ 2.52	93	1.32	133	5.630	137	91.71	82	$ 30.16	108	$ 0.50	78	0.82	98	1438.21	8	0.575	16	84
Lancaster	PA	$ 2.97	74	$ 43.66	77	$ 0.53	56	$ 1.98	61	1.00	104	4.003	93	179.46	132	$ 14.84	33	$ 0.77	140	0.71	31	4625.49	116	10.462	159	85
Muncie	IN	$ 3.60	120	$ 50.03	123	$ 0.85	129	$ 2.47	90	0.82	81	3.797	87	59.16	42	$ 50.83	162	$ 0.23	13	0.92	164	2429.33	48	0.600	19	86
Missoula	MT	$ 2.79	59	$ 42.80	70	$ 0.82	125	$ 2.54	95	1.01	105	4.134	99	103.27	95	$ 26.70	93	$ 0.42	53	0.85	121	3385.00	80	2.000	89	87
Duluth	MN	$ 4.31	153	$ 56.04	148	$ 0.89	134	$ 2.57	102	0.66	53	3.046	60	**0.04**	1	$ 69.49	172	$ 0.48	70	0.82	98	1597.03	15	1.857	85	88
Newark	OH	$ 1.73	8	$ 60.69	157	$ 0.20	4	$ 7.69	176	4.22	176	16.569	172	189.56	135	$ 18.79	46	$ 1.46	172	0.59	6	1643.85	16	0.765	32	89
Bremerton	WA	$ 4.20	149	$ 75.55	174	$ 0.33	14	$ 2.47	90	0.90	96	2.697	42	417.41	167	$ 69.93	173	$ 0.31	24	0.89	154	988.79	5	0.569	14	90
Billings	MT	$ 3.00	76	$ 47.81	111	$ 0.73	105	$ 2.70	110	1.13	121	4.452	111	112.32	105	$ 25.57	80	$ 0.34	30	0.88	147	2798.31	59	1.103	48	91
Cedar Rapids	IA	$ 3.59	118	$ 48.30	117	$ 0.54	61	$ 3.19	141	1.05	110	4.560	113	90.68	80	$ 37.92	137	$ 0.46	64	0.86	129	1994.20	28	0.449	6	92
Abilene	TX	$ 2.27	21	$ 34.01	29	$ 0.78	117	$ 1.89	52	1.25	129	4.930	125	226.92	148	$ 12.52	17	$ 0.39	46	0.86	129	5928.17	151	6.111	144	93
Boise City	ID	$ 3.26	98	$ 45.14	92	$ 0.68	91	$ 2.56	100	0.90	96	3.850	88	123.81	113	$ 23.03	66	$ 0.58	106	0.80	76	4370.59	109	1.647	74	94
Biloxi / Gulfport	MS	$ 1.78	11	$ 24.32	7	$ 0.52	51	$ 2.93	123	2.11	161	8.590	160	286.74	161	$ 13.75	27	$ 1.14	166	0.71	31	5600.00	145	1.514	66	94
Fairfield	CA	$ 2.72	50	$ 48.52	119	$ 0.68	91	$ 2.64	105	1.03	107	3.612	80	123.46	112	$ 24.10	75	$ 0.64	120	0.79	69	5000.00	129	1.333	56	96
Stamford	CT	$ 5.21	170	$ 60.87	159	$ 0.81	121	$ 2.02	67	0.39	13	1.995	13	59.08	41	$ 34.36	123	$ 0.84	150	0.59	6	5443.87	141	2.839	112	97
York	PA	$ 3.49	110	$ 43.96	80	$ 0.89	134	$ 2.49	92	1.11	120	6.390	147	98.97	91	$ 36.40	131	$ 1.44	171	0.60	10	1928.80	24	0.463	7	98
Greeley	CO	$ 2.28	23	$ 32.41	21	$ 0.71	101	$ 2.54	95	1.31	132	6.005	142	170.08	130	$ 18.89	47	$ 0.51	81	0.84	117	4743.79	122	2.786	110	99
Eau Claire	WI	$ 3.11	85	$ 46.33	100	$ 0.63	82	$ 2.73	111	1.07	113	4.583	115	91.64	81	$ 32.03	115	$ 0.52	84	0.82	98	3299.74	75	1.474	63	100
Santa Cruz	CA	$ 6.03	177	$ 88.43	177	$ 0.53	56	$ 2.82	117	0.51	25	2.153	17	36.32	14	$ 86.18	176	$ 0.70	128	0.78	63	2405.94	46	4.366	132	101
Bloomington / Normal	IL	$ 3.13	88	$ 40.17	59	$ 0.76	112	$ 2.59	104	0.89	91	4.170	101	110.47	101	$ 25.62	82	$ 0.44	57	0.85	121	5322.35	136	1.706	77	102
Santa Maria	CA	$ 2.51	38	$ 34.66	35	$ 0.82	125	$ 2.02	67	1.10	119	4.904	124	240.88	154	$ 11.91	14	$ 0.52	84	0.82	98	8333.33	167	2.583	106	103
Mansfield	OH	$ 3.11	85	$ 38.44	50	$ 1.01	152	$ 2.31	81	0.80	77	4.098	95	215.70	142	$ 12.87	21	$ 0.29	21	0.90	157	7177.09	162	2.000	89	104
New Britain	CT	$ 2.66	45	$ 39.84	58	$ 0.64	87	$ 2.58	103	0.97	102	3.883	91	352.98	164	$ 7.34	4	$ 0.83	149	0.68	23	13045.45	176	4.909	134	105
Savannah	GA	$ 3.49	110	$ 46.82	105	$ 0.73	105	$ 2.34	84	0.78	76	3.503	75	60.50	44	$ 40.42	146	$ 0.76	138	0.69	26	3320.11	77	6.841	151	106
Alexandria	LA	$ 3.89	133	$ 51.86	130	$ 0.52	51	$ 2.15	74	0.62	46	2.713	44	88.20	78	$ 29.21	104	$ 0.32	27	0.88	147	6143.90	153	6.800	150	106
Green Bay	WI	$ 3.20	91	$ 45.05	91	$ 0.62	79	$ 2.96	126	1.09	116	4.840	123	111.17	103	$ 28.96	103	$ 0.54	92	0.83	109	2826.41	64	1.034	43	108
Kingsport	TN	$ 2.44	33	$ 31.13	19	$ 2.44	174	$ 6.11	175	2.47	167	35.512	178	99.52	92	$ 34.44	124	$ 0.27	16	0.92	164	823.69	4	**0.154**	1	109
Beloit	WI	$ 4.96	167	$ 65.23	168	$ 0.97	146	$ 2.66	108	0.58	38	2.534	30	81.84	72	$ 33.37	120	$ 0.37	37	0.86	129	3233.91	71	1.455	61	109
Binghamton	NY	$ 1.30	2	$ 36.33	41	$ 0.59	71	$ 11.74	177	0.51	25	16.961	173	733.87	177	$ 14.06	30	$ 4.25	177	0.59	6	4025.92	97	40.308	176	111
Norwalk	CT	$ 4.86	165	$ 62.82	163	$ 0.96	144	$ 2.56	100	0.67	55	3.235	69	59.45	43	$ 53.47	165	$ 0.71	130	0.78	63	1771.40	23	0.776	34	112
Nashua	NH	$ 2.51	38	$ 32.85	22	$ 0.58	68	$ 2.26	79	1.50	148	6.976	153	281.33	160	$ 12.87	21	$ 0.61	114	0.83	109	5910.71	149	2.286	97	113
Yuba City	CA	$ 2.42	30	$ 39.06	55	$ 0.32	12	$ 2.55	98	1.49	146	5.332	132	215.38	141	$ 16.51	37	$ 0.97	159	0.73	44	5082.94	132	26.625	173	114

area	st.	oper. exp. per veh. rev. mile		oper. exp. per veh. rev. hour		oper. exp. per pass. mile		oper. exp. per pass. trip		veh. rev. miles per trip		veh. rev. minutes per trip		pop. per 1000 trips		total rev. per pop.		fare rev. per trip		non-fare rev. as % of tot.		pop. per vehicle in max. serv.		sq. miles per veh. in max. serv.		overall rank
Greensboro	NC	$ 3.98	136	$ 54.36	140	$ 0.77	115	$ 2.22	76	0.82	81	3.142	63	112.20	104	$ 23.42	69	$ 0.55	94	0.79	69	5297.30	135	2.216	94	115
Portland	ME	$ 4.72	163	$ 56.78	149	$ 0.80	118	$ 2.79	115	0.59	42	2.946	57	67.23	55	$ 42.97	150	$ 0.77	140	0.73	44	3640.91	87	1.455	62	116
LaCrosse	WI	$ 3.58	117	$ 47.39	108	$ 0.81	121	$ 3.05	131	1.09	116	4.970	126	68.28	56	$ 49.23	159	$ 0.67	123	0.80	76	2684.21	58	0.474	8	117
Janesville	WI	$ 3.47	109	$ 53.01	134	$ 0.96	144	$ 2.99	128	0.87	89	3.547	78	117.71	108	$ 25.62	82	$ 0.57	104	0.81	89	3257.72	73	1.500	64	118
Sioux Falls	SD	$ 2.94	70	$ 40.98	61	$ 0.99	149	$ 3.00	129	1.45	145	6.999	154	174.66	131	$ 25.97	87	$ 0.81	147	0.82	98	1419.75	6	0.679	27	119
Houma	LA	$ 2.34	25	$ 37.56	48	waiver		$ 3.17	138	1.36	135	5.061	129	247.60	155	$ 12.80	20	$ 0.67	123	0.79	69	7200.00	163	2.400	103	120
Benton Harbor	MI	$ 2.40	29	$ 32.37	20	$ 0.92	139	$ 3.67	149	2.17	162	12.084	167	169.66	129	$ 36.79	133	$ 1.37	170	0.78	63	1543.75	12	0.875	38	121
Clarksville	TN	$ 2.67	47	$ 43.95	79	$ 0.45	31	$ 2.69	109	1.25	129	4.703	118	216.83	143	$ 14.63	32	$ 0.53	89	0.83	109	9916.22	173	8.333	154	122
Appleton / Neenah	WI	$ 2.84	62	$ 48.04	114	$ 0.76	112	$ 2.88	119	1.36	135	5.390	133	132.39	115	$ 26.03	88	$ 0.57	104	0.84	117	2298.83	42	1.671	75	123
Lodi	CA	$ 2.94	70	$ 33.29	23	$ 0.88	133	$ 2.65	106	1.22	128	6.872	151	220.27	145	$ 18.24	42	$ 0.56	99	0.86	129	5500.00	142	1.200	51	124
Johnstown	PA	$ 3.88	132	$ 51.58	127	$ 1.62	168	$ 2.76	113	0.65	50	3.126	61	69.56	57	$ 39.47	144	$ 0.55	94	0.80	76	3423.70	81	3.481	120	125
Olympia	WA	$ 3.96	134	$ 54.53	141	$ 0.93	141	$ 3.18	139	1.05	110	4.271	107	49.30	26	$ 77.19	175	$ 0.42	53	0.89	154	1593.55	14	0.718	29	125
Panama City	FL	$ 1.34	3	$ 24.44	9	$ 1.72	169	$ 5.34	170	4.13	175	20.915	175	732.60	176	$ 7.72	6	$ 2.17	174	0.62	14	3151.31	67	2.026	91	127
Rome	GA	$ 3.06	82	$ 54.61	142	$ 0.97	146	$ 3.45	145	1.21	126	4.243	105	79.03	69	$ 45.80	156	$ 0.80	144	0.78	63	1444.10	9	1.143	49	128
Denton	TX	$ 1.70	7	$ 23.22	6	$ 0.50	46	$ 4.10	160	3.00	170	12.654	170	640.07	174	$ 7.82	7	$ 0.74	136	0.85	121	4733.57	120	3.857	126	129
Bellingham	WA	$ 5.46	173	$ 77.47	175	$ 0.77	115	$ 2.43	87	0.67	55	2.928	55	52.17	29	$ 62.35	170	$ 0.20	11	0.94	171	2289.71	41	11.412	161	129
Vero Beach	FL	$ 1.78	11	$ 23.14	5	$ 1.95	171	$ 16.65	178	3.78	173	16.413	171	455.23	172	$ 11.05	12	$ 0.10	5	0.98	174	1648.56	17	8.758	155	131
Cheyenne	WY	$ 1.60	6	$ 20.22	4	$ 1.60	166	$ 3.49	148	2.18	163	10.352	163	376.40	165	$ 9.27	9	$ 0.49	72	0.86	129	5626.36	146	1.636	73	131
Sheboygan	WI	$ 3.60	120	$ 45.43	95	$ 1.24	162	$ 3.47	147	1.08	115	5.282	131	79.59	71	$ 44.58	154	$ 0.70	128	0.80	76	1736.85	21	0.636	25	133
Danville	VA	$ 2.08	14	$ 28.42	16	$ 2.69	175	$ 3.00	129	1.50	148	6.512	148	226.55	147	$ 13.93	29	$ 0.93	156	0.71	31	4823.27	126	4.000	128	134
Wheeling	WV	$ 2.50	37	$ 30.07	17	$ 0.83	127	$ 3.76	151	1.60	157	7.836	157	150.41	121	$ 27.60	98	$ 0.84	150	0.80	76	3903.17	93	1.500	64	135
Hyannis	MA	$ 2.08	14	$ 38.46	51	$ 0.53	56	$ 5.93	173	4.11	174	12.365	168	399.32	166	$ 23.15	68	$ 3.61	176	0.61	12	2628.24	54	5.563	140	136
Monessen	PA	$ 2.87	65	$ 43.39	73	$ 0.16	3	$ 4.26	162	1.49	146	5.889	140	313.70	163	$ 13.58	25	$ 1.24	168	0.71	31	6147.05	154	3.762	124	137
Poughkeepsie	NY	$ 2.13	18	$ 48.14	115	$ 0.25	6	$ 2.81	116	1.69	158	4.739	121	299.64	162	$ 13.83	28	$ 0.88	154	0.79	69	5640.48	147	17.500	167	138
Middletown	OH	$ 3.05	80	$ 44.69	87	$ 0.74	108	$ 2.96	126	1.02	106	4.160	100	233.91	151	$ 13.16	24	$ 0.43	55	0.86	129	9898.00	172	4.000	128	139
Charleston	WV	$ 2.60	42	$ 44.41	85	$ 0.60	75	$ 3.06	133	1.33	134	4.730	119	108.11	98	$ 30.76	114	$ 0.67	123	0.80	76	4282.44	107	16.815	166	140
Lincoln	NE	$ 3.67	126	$ 49.45	121	$ 0.81	121	$ 3.41	144	1.09	116	4.804	122	214.49	140	$ 18.42	43	$ 0.76	138	0.81	89	3496.02	84	0.727	30	141
Palm Springs	CA	$ 5.38	171	$ 83.60	176	$ 0.44	29	$ 2.83	118	0.67	55	2.476	25	78.22	67	$ 38.96	141	$ 0.59	109	0.81	89	5925.00	150	6.650	148	142
Longview	WA	$ 4.38	155	$ 60.81	158	$ 0.63	82	$ 2.90	121	0.84	86	4.128	98	101.27	93	$ 35.12	126	$ 0.17	8	0.95	173	4084.55	100	1.909	87	143
Yakima	WA	$ 6.16	178	$ 73.61	173	$ 1.77	170	$ 3.76	151	0.73	67	3.791	86	66.49	54	$ 61.32	169	$ 0.36	34	0.91	159	2272.57	39	0.607	20	144
Springfield	IL	$ 4.17	147	$ 51.85	129	$ 1.15	159	$ 3.06	133	0.89	91	4.572	114	85.48	77	$ 38.72	140	$ 0.49	72	0.85	121	2813.22	63	1.444	60	145
Springfield	MO	$ 4.58	159	$ 63.87	164	$ 1.13	158	$ 2.94	124	0.71	63	3.191	65	64.79	50	$ 51.03	163	$ 0.30	22	0.91	159	4591.05	113	1.579	69	146
Portsmouth / Dover / Rochester	NH	$ 2.36	28	$ 52.80	132	$ 0.65	88	$ 3.18	139	1.36	135	3.665	83	428.27	168	$ 7.69	5	$ 0.58	106	0.82	98	10564.55	175	18.818	168	147
Columbia	MO	$ 4.16	145	$ 64.20	165	$ 0.81	121	$ 3.15	136	0.84	86	4.119	97	73.82	62	$ 49.94	161	$ 0.27	16	0.93	167	3351.85	79	2.077	92	148
Jackson	MI	$ 3.62	122	$ 43.42	74	$ 0.68	91	$ 2.08	72	1.18	125	4.979	128	204.63	139	$ 20.66	54	$ 0.80	144	0.81	89	4738.71	121	23.226	171	149
Myrtle Beach	SC	$ 1.39	4	$ 33.29	23	$ 0.90	136	$ 4.41	163	4.81	177	12.487	169	248.10	156	$ 22.54	63	$ 1.04	163	0.81	89	1945.47	26	22.933	170	150
San Angelo	TX	$ 2.12	17	$ 33.57	26	$ 0.67	90	$ 3.88	156	2.22	165	10.589	164	447.86	170	$ 9.84	10	$ 0.53	89	0.88	147	8447.40	169	5.000	136	150
Kalamazoo	MI	$ 4.52	157	$ 64.84	167	$ 0.92	139	$ 3.07	135	0.73	67	2.999	58	97.04	89	$ 32.56	117	$ 0.56	99	0.82	98	4766.66	123	2.333	100	152
Hagerstown	MD	$ 2.53	40	$ 34.52	34	$ 1.04	154	$ 3.45	145	1.36	135	5.988	141	216.95	144	$ 15.88	36	$ 1.01	161	0.71	31	6500.00	157	26.700	174	153
Tuscaloosa	AL	$ 2.75	55	$ 44.95	90	$ 0.42	25	$ 3.05	131	1.53	154	6.065	144	594.25	173	$ 7.26	2	$ 0.52	84	0.88	147	15050.00	177	134.000	178	154

area	st.	oper. exp. per veh. rev. mile		oper. exp. per veh. rev. hour		oper. exp. per pass. mile		oper. exp. per pass. trip		veh. rev. miles per trip		veh. rev. minutes per trip		pop. per 1000 trips		total rev. per pop.		fare rev. per trip		non-fare rev. as % of tot.		pop. per vehicle in max. serv.		sq. miles per veh. in max. serv.		overall rank
Manchester	NH	$ 4.10	142	$ 53.89	137	$ 0.70	98	$ 3.16	137	0.86	88	4.376	108	199.88	137	$ 16.99	38	$ 0.49	72	0.86	129	6562.50	158	3.125	116	154
Santa Rosa (Sonoma County)	CA	$ 3.62	122	$ 62.31	162	$ 0.33	14	$ 3.81	155	1.14	122	4.024	94	162.16	127	$ 25.37	80	$ 1.01	161	0.75	55	4679.79	118	7.234	153	156
Lowell	MA	$ 5.62	174	$ 53.32	135	$ 1.06	156	$ 2.55	98	0.72	64	4.189	103	159.27	125	$ 19.24	48	$ 0.60	111	0.80	76	5393.47	139	5.429	139	157
Waterloo / Cedar Falls	IA	$ 3.33	103	$ 48.14	115	$ 0.93	141	$ 3.38	143	1.42	142	6.132	145	179.72	133	$ 22.95	65	$ 0.82	148	0.80	76	2654.05	56	2.342	102	158
Elmira	NY	$ 2.78	57	$ 46.50	103	$ 0.80	118	$ 3.80	154	1.59	156	5.719	139	115.92	107	$ 39.07	142	$ 2.02	173	0.55	3	2799.85	60	12.000	163	159
Pittsfield	MA	$ 2.91	67	$ 55.99	144	$ 1.17	161	$ 4.42	164	1.52	153	4.734	120	237.48	152	$ 23.67	71	$ 1.29	169	0.77	61	1666.04	20	4.923	135	160
Danbury	CT	$ 3.13	88	$ 48.60	120	$ 0.69	96	$ 2.77	114	1.36	135	5.445	134	240.14	153	$ 17.69	41	$ 0.60	111	0.86	129	5582.42	144	9.030	157	161
Frederick	MD	$ 2.87	65	$ 36.77	42	not reported		$ 2.94	124	2.20	164	8.404	159	690.33	175	$ 7.26	2	$ 1.17	167	0.77	61	9473.68	171	34.895	175	162
New Britain (Bristol)	CT	$ 2.34	25	$ 43.08	71	$ 1.00	151	$ 4.00	158	1.71	159	5.577	136	1156.96	178	**$ 3.50**	1	$ 0.91	155	0.78	63	20000.00	178	9.000	156	163
St. Joseph	MO	$ 3.63	125	$ 47.13	106	$ 0.70	98	$ 5.01	168	1.38	140	6.339	146	183.54	134	$ 26.52	91	$ 0.34	30	0.93	167	4800.00	124	3.267	118	164
Santa Fe	NM	$ 3.57	115	$ 59.52	155	$ 1.58	164	$ 6.01	174	3.16	171	11.598	166	105.91	97	$ 60.73	168	$ 0.36	34	0.94	171	1584.60	13	0.976	40	165
Saginaw	MI	$ 5.10	169	$ 64.73	166	$ 0.87	132	$ 2.90	121	0.72	64	23.188	177	137.10	120	$ 23.99	74	$ 0.68	127	0.79	69	4161.56	102	6.744	149	166
Antioch	CA	$ 5.86	175	$ 56.00	145	$ 0.71	101	$ 3.34	142	0.89	91	4.693	117	162.48	128	$ 25.71	85	$ 0.55	94	0.87	144	5216.22	134	6.081	143	167
Fitchburg / Leominster	MA	$ 4.33	154	$ 69.89	172	$ 1.03	153	$ 3.69	150	1.21	126	4.558	112	115.12	106	$ 37.33	135	$ 0.75	137	0.83	109	1752.62	22	3.930	127	168
Battle Creek	MI	$ 4.46	156	$ 66.00	169	$ 1.07	157	$ 3.76	151	1.07	113	4.678	116	122.64	111	$ 38.59	139	$ 0.55	94	0.88	147	2800.00	61	2.400	103	169
Huntington / Ashland	WV	$ 3.49	110	$ 57.04	150	$ 0.99	149	$ 4.48	165	1.51	152	5.520	135	158.22	124	$ 29.48	105	$ 0.58	106	0.88	147	3321.31	78	2.308	99	170
Hesperia / Apple Valley / Victorville	CA	$ 2.85	63	$ 51.83	128	$ 0.72	103	$ 4.55	166	2.64	168	8.664	161	262.02	158	$ 24.17	76	$ 1.00	160	0.84	117	4030.95	99	3.684	122	171
Bryan / College Station	TX	$ 2.92	69	$ 41.33	63	$ 2.02	172	$ 5.86	172	2.81	169	11.229	165	448.38	171	$ 15.64	35	$ 0.49	72	0.93	167	8954.83	170	5.167	138	172
Port Arthur	TX	$ 3.31	101	$ 52.83	133	$ 0.90	136	$ 3.96	157	1.43	143	5.655	138	261.85	157	$ 18.54	44	$ 0.87	152	0.82	98	6302.67	155	9.111	158	173
Merced	CA	$ 3.83	131	$ 67.27	170	$ 2.29	173	$ 5.82	171	2.09	160	6.891	152	0.43	3	$ 12.42	16	$ 0.77	140	0.85	121	8333.33	167	70.833	177	174
Bay City	MI	$ 3.08	83	$ 44.42	86	$ 1.60	166	$ 5.19	169	2.35	166	9.097	162	203.14	138	$ 35.12	126	$ 0.67	123	0.91	159	2661.02	57	10.643	160	175
Muskegon	MI	$ 3.53	114	$ 47.92	112	$ 1.15	159	$ 4.00	158	1.55	155	6.735	150	432.34	169	$ 10.14	11	$ 0.63	117	0.86	129	7949.15	164	26.350	172	176
Medford	OR	$ 5.94	176	$ 92.12	178	$ 1.40	163	$ 4.23	161	1.05	110	3.617	81	226.52	146	$ 21.57	59	$ 0.71	130	0.86	129	5338.70	137	6.913	152	177
Anderson	IN	$ 4.59	160	$ 54.14	138	$ 1.59	165	$ 4.85	167	1.50	148	7.519	155	227.25	149	$ 24.74	78	$ 0.37	37	0.93	167	5405.36	140	3.455	119	178
averages		$ 3.29		$ 45.77		$ 0.73		$ 2.71		1.11		5.08		148.43		$ 29.68		$ 0.66		0.79		4,182.40		5.37		

Appendix C

Demand Response Agencies

The following transit agencies were not included in this report because transit data was given, but not specifically for buses. These transit systems are all likely to have buses, but not fixed-route service, rather a demand response.

- Morgan County Area Transportation System, AL
- Northwest Alabama Council of Local Governments (NATA), AL
- City of Gadsden Dial-A-Ride, AL
- Community Resource Group, Inc. (CRG), AR
- Mesa County (MesABILITY), CO
- Greater Waterbury Transit District (GWTD), CT
- St. Lucie County Council on Aging, Inc., FL
- Okaloosa County Coordinated Transportation, Inc., FL
- Council on Aging of Martin County, Inc., FL
- C.A.R.T., Inc. (CART), ID
- Elkhart Heart City Rider, IN
- City of Kokomo, IN
- Portland-Casco Bay Island Transit District (CBL), ME*
- Portland-Regional Transportation Program, Inc. (RTP), ME
- Cumberland County Office on Aging, NJ
- Bismarck-Bis-Man Transit, ND
- Spartanburg County Transportation Services (SRMC), SC
- City of Longview, TX
- Sherman-Texoma Council of Governments, TX
- City of Temple, TX
- Eau Claire-Chippewa Falls General Public Shared-Ride Taxi, WI

* Portland-Casco Bay Island Transit District only operates ferryboats.

Appendix D

Agencies Receiving Reporting Waivers

In 1997, the FTA granted data reporting exemptions to the following agencies.

- Anniston-E. Alabama, AL
- Auburn-Opelika-Leta, AL
- Dothan-Wiregrass, AL
- Pine Bluff Transit, AR
- Davis Community Transit, CA
- Lompoc Transit, CA
- San Luis Obispo, CA
- Simi Valley Transit, CA
- Vacaville, CA
- Bridgeport-New Milford, CT
- Stamford Dial-A-Ride, CT
- Westport Transit District, CT
- Chicago-Kankakee, IL
- Dubuque Minibus, IL
- Iowa City-Coralville, IA
- Ashland Bus System, KY
- Evansville-HART, KY
- Owensboro-OTS, KY
- Lake Charles, LA
- Cumberland-ATA, MD
- Lewiston-Western Maine, ME
- Portsmouth-YCCAC, ME
- Holland Dial-A-Ride, MI
- Hattiesburg-HART, MS
- NY-Lester Lines, NY
- Newburgh Dial-A-Bus, NY
- Newburgh-New Windsor, NY
- Gastonia Transit System, NC
- Greenville-GREAT, NC
- Hickory-Piedmont Wagon, NC
- Rocky Mount-RMT, NC
- County of Oneida, NY
- Poughkeepsie, NY
- Rome-VIP Transportation, NY
- Lima-ACRTA, OH
- Sharon-SVSS, PA
- Anderson Transit, SC

- Bristol-BTT, TN
- Lewisville Dial-A-Ride, TX
- Wichita Falls, TX
- Bristol-BVT, VA
- Longview-Community Urban, WA
- Parkersburg-Easy Rider, WV
- Weirton Transit Corporation, WV
- Lacrosse-Onalaska, WI

Appendix E

Glossary

Bus Agency: Also referred to in this report as bus operator, bus provider, and bus system.

Efficiency: The assumption is that a bus provider's primary goal is to please its largest supporting group, taxpayers. Pleasing taxpayers is accomplished by providing high-quality service at the lowest possible cost.

Demand Response: Bus service that does not run a fixed-route, but only operates when specifically called or requested by customers.

FTA: Federal Transit Administration.

Operating Expense: Consists of four variables: salaries, wages, benefits; materials and supplies, purchased transportation, and other operating expenses.

Passenger Miles: Passenger miles are the miles accumulated while the bus has passengers on board.

Ridership: Refers to a measure of how many riders use a bus system, usually refers to total riders.

Route Swamping: In a free-market environment for transit service, an incumbent transit company will schedule routes so frequently that the competition cannot expect to get enough riders

Schedule Jockeying: In a free-market environment for transit service, an entering firm can interlope on an incumbent firm by registering its own scheduled service just minutes before the scheduled service of the incumbent.

Small to Mid-Size Bus Systems: Using the Federal Transit Administration's data and classification standards, non-large agencies are found in urbanized areas with a population under 200,000.

Unlinked Passenger Trips: Unlinked passenger trips are the number of trips, minus transfers.

Vehicle Revenue Miles: The total mileage accumulated while a bus is in service for customers.

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